Audit of the International Baccalaureate Approaches to Teaching

Submitted to the International Baccalaureate by UK NARIC

The National Recognition Information Centre for the United Kingdom

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Contents

Acronyms

IB	International Baccalaureate
ATT	Approaches to teaching
ATL	Approaches to learning
LP	Learner profile
IM	International-mindedness
K-12	Kindergarten to 12th grade
PYP	Primary Years Programme
MYP	Middle Years Programme
DP	Diploma Programme
CP	Career-Related Programme
FPIP	From Principles into Practice
TSM	Teacher support material
ATS2020	Assessment of Transversal Skills 2020
NAEYC	National Association for the Education of Young Children
DAP	Developmentally Appropriate Practice
Singapore 21CC	Singapore Framework for 21st Century Competencies
WIAIBE?	What is an IB education?
PS&P	Programme Standards and Practices
RQ	Research question

Executive Summary

Scope and objectives

UK NARIC was commissioned by the International Baccalaureate (IB) to conduct a critical and in-depth study of the IB Approaches to Teaching (ATT). The IB ATT aim to guide and focus educators and students in IB World Schools and are centred on a cycle of inquiry, action, and reflection. The IB ATT underpin teaching in all IB programmes.

The study of the ATT was designed around the following four research questions:

- To what degree are the IB Approaches to Teaching (ATT) an appropriate set of pedagogical principles for K-12 education programmes?
- Collectively, to what extent do the IB ATT pedagogical principles align with and support the IB ATL, IB LP and IB programme goals?
- To what extent are the selected ATT principles – **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** – integrated effectively in programme curricular documents?
- What recommendations can be made to the IB regarding:
    - The ATT principles as a whole
    - Specific ATT principles
    - The guidance provided to IB World Schools for implementing the ATT principles.

Methodological approach

To address the above research questions, the study consisted of the following three components:

1. **Deconstructing the ATT** to enable alternate articulations of the ATT principles and scope for identifying different ways in which the pedagogic ideas behind the ATT principles may be expressed.
2. **A literature review** to ensure a thorough understanding of the ATT, the underpinning evidence base of the principles and whether it is coherent, complete and future-focused.
3. An **audit of the IB programmes and continuum** to determine the ways in and extent to which 1) the ATT collectively aligns with other IB goals and curriculum components and 2) the two selected ATT principles are articulated across and within IB programmes
4. **Evaluation and synthesis of findings across all research questions** to determine recommendations for the IB in terms of the ATT

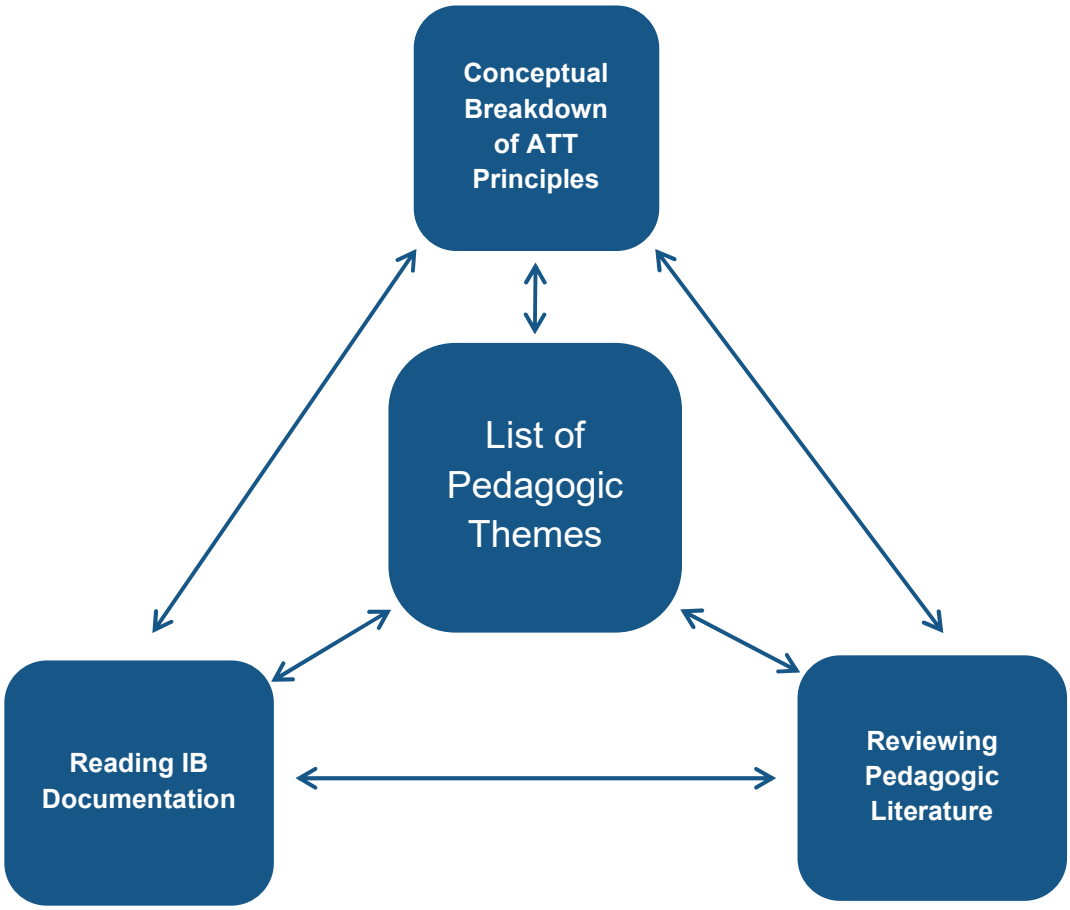
1. Deconstructing the ATT

UK NARIC identified seven pedagogic themes which are either explicitly or implicitly present in multiple IB ATT principles and fully detailed in section 2.2 of the main report. The pedagogic themes supported the comparison of the ATT and alternative frameworks, in addition to the IB documentation audit. The pedagogic themes identified to underpin the ATT were:

- Student-led
- Local and Relevant
- Global/International Citizenship
- Process/Cycle
- Collaboration
- Student Individuality
- Flexibility with Disciplines.

The impetus for the development of the pedagogic themes was to enable an alternative articulation of the ATT, which drew on the most common terms and ideas used in pedagogic literature and in the IB documentation itself. This provided another means of comparing between frameworks, through the Thematic Presence Method, and presented scope for thinking about the different ways in which relevant pedagogic ideas may have been expressed. Figure 1 demonstrates the process by which the pedagogic themes were developed using a breakdown of the ATT principles, pedagogic literature in the field, and IB documentation.

Figure 1: Pedagogic Themes Development Process



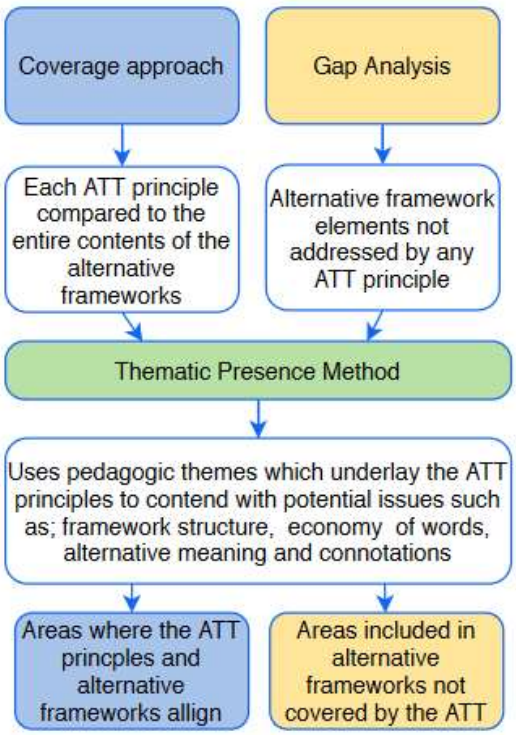
2. Literature review

The literature review identified several alternative frameworks against which to compare the ATT. These frameworks were selected for explicit reference to teaching for future-focused learning, teaching across multiple age ranges, a combination of national and international frameworks, evidence of strong pedagogic underpinning, and emphasis was placed on choosing examples that were practically being deployed or showed evidence of being more than merely theoretical exercises. The selected alternative frameworks used for comparison were:

- The Assessment of Transversal Skills 2020 (ATS2020) Framework
- Cambridge International Learner Attributes
- Eco-Schools Educational Principles
- European Commission Key Competences for Lifelong Learning
- The National Association for the Education of Young Children (NAEYC) Developmentally Appropriate Practice Guidelines for Effective Teaching
- The Singapore Framework for 21st Century Competencies and Student Outcomes
- Singapore Teaching Practice Pedagogical Practices.

The comparative analysis of the ATT and the alternative frameworks was conducted using a three-pronged approach consisting of the coverage approach, gap analysis and thematic presence method. The approaches, demonstrated in Figure 2, were designed to reveal areas of alignment and divergence.

Figure 2: Approaches to alternative framework comparison



3. Audit of IB programmes and continuum

In order to understand the extent to which the ATT principles **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are effectively integrated into programme curricular documents, it was necessary to carry out multiple mapping processes; as demonstrated by Figure 3 below and also Appendix 10 in the main report. This enabled UK NARIC to uncover not only direct references to the principles in question but also indirect references. The latter were particularly important to unearth as some relevant IB documentation was written prior to the formal articulation of the ATT. In those documents, direct references to ATT principles inevitably did not exist, but it was still possible that the ideas behind these principles were being articulated in another form. The indirect mapping of these principles allowed for that possibility.

Direct mapping: This method searched throughout the text of IB documentation for any explicit references to the "Approaches to Teaching", and/or the title of either selected principle – i.e. the phrases "**Based on Inquiry**" or "**Focused on Effective Teamwork and Collaboration**".

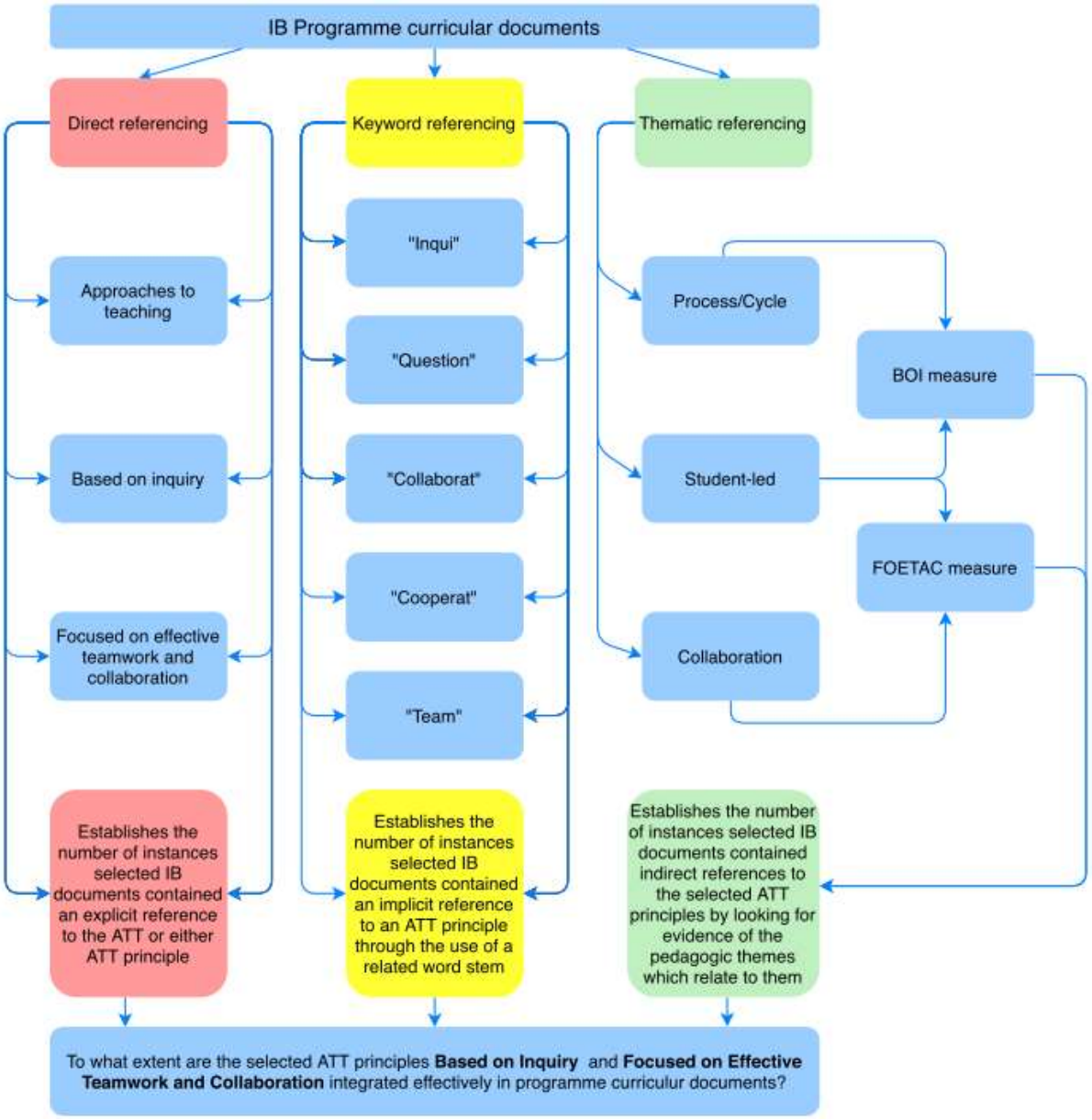
Keyword mapping: This method searched for terms inherently linked to the principles in question. For **Based on Inquiry,** these terms would be "inquiry" (and any of its iterations) and "question" (and any of its iterations). For **Focused on Effective Teamwork and Collaboration,** these terms would be any iteration of "team", "collaboration", or "cooperation".

Thematic referencing: This method uncovered indirect references to the selected ATT principles by looking for evidence of the pedagogic themes which relate to them.

Through conducting the audit with the pedagogic themes as a medium, it was possible to understand the integration of the selected principles (through our detailed understanding of how the themes and principles interrelate) and also allowed us to develop a more nuanced understanding of exactly how principles were articulated. The core ideas of an ATT principle can be expressed without direct reference to the words used in the ATT; this method enables us to observe that phenomenon in IB documentation.

Each IB document is split into subsections (identified on the contents page), generally of 1-10 pages in length. This method sought to document whether or not each subsection of the audited documents contained indirect reference to the ATT selected principles.

Figure 3: Audit mapping processes



Conclusions and Recommendations

4. Evaluation and Synthesis of findings across all research questions

Individual findings were compiled during the deconstruction of the ATT, the literature review, and the document audit. At the end of these processes an evaluation stage considered each individual finding and synthesised these in reference to the original research questions. A final process was undertaken in which this evaluation and synthesis developed a series of recommendations which respond to the research questions and offer directions for the IB to develop further clarity in reference to the construction and articulation of the ATT.

Four key conclusions are highlighted for discussion here, with the relevant report recommendations detailed beneath each. These four conclusions are a representative sample (not an exhaustive list) of the wider findings and recommendations which are discussed in full detail in sections 5 and 6 of the report. These four conclusions have been highlighted from amongst the range of report findings because they give a good overall impression of the larger areas of analysis undertaken in this report, and they may be of interest to a wide range of IB internal stakeholders.

1. The ATT was found to deliver appropriate approaches for a K-12 age range and for future-focused learning; an array of similarities and differences were identified between the ATT and other individual alternative pedagogic frameworks.

The standing of the IB ATT was assessed through a literature review which included detailed comparison with alternative pedagogical frameworks.[1] The ATT, and each of its individual principles, have a firm foundation in pedagogical evidence. This was evidenced by a strong alignment between ATT and alternative frameworks analysed. As expected, some areas of divergence between the ATT and the alternative frameworks were identified:

- The pedagogic theme “Global/International Citizenship” was the least likely to be covered in the alternative frameworks
- The combination of inquiry-based learning and concept-focused learning was expressed and prioritised in the ATT more clearly than in any other alternative framework analysed
- The “gap” analysis revealed a limited number of areas in which alternative frameworks contained elements not found within the ATT. This includes some practical classroom activities, certain precise areas of learning, and explicit prioritisation of innovation and creativity.

This, however, does not rule out the identified “gaps” potentially being included in other IB teaching and learning curriculum components such as the Approaches to Learning and the Learner Profile. The ATT was also found to contain effective and coherent pedagogy for the entire K-12 continuum due to the similarities identified between it and the alternative

[1] The alternative pedagogic frameworks are a combination of national and international frameworks, including a number with explicitly future-focused intent or related to 21st-century challenges, broad coverage in terms of the range of student age demographics, and strong pedagogic credentials.

frameworks with similarly targeted age groups, and the research carried out into pedagogic best practice in the literature review.

Recommendations:

- To further review whether or not additional reference to teaching through and for creativity and innovation should be included in the ATT principles.
- To continue monitoring developing and emerging trends in international pedagogic frameworks, to ensure that the ATT as a whole (and especially the future-focused ideas within with the ATT – which are likely to constantly evolve) continue to represent up-to-date best practice.

2. There is potential to further describe and explain the philosophical constructs which underpin the ATT; for instance, constructivism appears to be an important epistemological outlook for the ATT, but the nature of this foundation and the benefits of constructivism could be explored and articulated more clearly.

It was apparent from the close analysis involved in the document audit that constructivism is an important, and perhaps foundational, epistemological outlook for IB teaching and learning. This is expressed through ideas such as the inquiry cycle and student-centred conceptual learning. However, the IB could do more to make the pedagogic principles behind the ATT, and their links to constructivism (which the literature review suggested is an appropriate foundation for K-12 learning), more clearly evident in documentation. The benefits of the constructivist approach and their relationship to twenty-first century learning could be explored and articulated more clearly.

Recommendations:

- To further explore the epistemological and philosophical underpinnings of IB pedagogy. Along with detailed analysis of current explicit and implicit articulation of constructivism IB documents, this would enable the foundation of IB pedagogy (and its benefits) to be articulated more clearly.

3. The ATT principles are embedded into IB documentation through a combination of explicit and implicit means.[2] Overall, the audit found opportunities to more strongly embed the ATT as a whole, as well as some of its component parts, however, the principle *Based on Inquiry*, in particular, stood out for its effective indirect integration.

Taking all auditing methods into consideration, it is evident that, of the two selected principles, **Based on Inquiry** is more effectively integrated through both keyword and thematic integration than **Focused on Effective Teamwork and Collaboration**, even though both had the same (small) number of direct references. When looking at this through the lens of the

[2] Methods of articulation (measured by the auditing processes) include: direct references to the principles themselves, keywords references which relate to the principles, and indirect references which refer to the pedagogic themes underpinning the principles.

pedagogic themes, it was evident that Process/Cycle was the most common pedagogic theme in audited documentation, followed by Student-Led. Collaboration was a distant third, closely followed by Flexibility with Disciplines. The least referenced themes were Local and Relevant, Global/International Citizenship, and Student Individuality.

When looking at the integration of the principles **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** across document types, we see that all three cross-programme documents[3] contain some direct references to the "Approaches to Teaching", but only *What is an IB Education?* translates this into direct references to the selected principles. Programme-specific documents, like the FPIP and subject guides, demonstrate variations in the integration of the selected ATT principles. A common theme in the findings was the absence of direct references to the principles and fluctuations in the number of keyword and indirect references made to the selected ATT principles or pedagogic themes. The absence of direct references in the selected ATT principles was not necessarily indicative of a lack of ATT pedagogic theme inclusion. Some documents, like the PYP FPIP for example, demonstrated a low number of direct references whilst simultaneously containing an high number of indirect references to the language of inquiry. The trend towards greater representation of the principle **Based of Inquiry** was noted as a constant throughout the cross-programme, programme specific, and subject guide documentation, leading to the conclusion that **Focused on Effective Teamwork and Collaboration** should be considered for potential further integration across the suite of documents sampled in this study.

Researchers also noted through conducting the study that there are some words and phrases used in IB documentation with an at-first-glance simple definition, which have more sophisticated and complex connotations when read within the wider context of IB pedagogy. This, in turn, raised discussion around how IB teachers/educators interpret and apply the ATT principles in their professional practice.

Recommendations

- To embed more direct references to the titles of individual ATT principles within documentation.
- When documents are individually redrafted and revisited, to take the opportunity to strategically deploy indirect references to all six ATT principles in one place in key sections of text – this will often involve adding an extra phrase or sentence in places where currently a large proportion (but not all) of the ATT principles are indirectly referenced.
- To increase emphasis within documentation on the ATT principle **Focused on Effective Teamwork and Collaboration.**
- To strengthen the ATT principle **Focused on Conceptual Understanding** in the IB Mission Statement by adding reference to the pedagogic theme Flexibility with Disciplines. It is the only one of the seven identified pedagogic themes underpinning the ATT which cannot be found in the mission statement.

[3] Cross-programme documents included in this study: What is an IB Education (2019), What is an IB Education Teacher Support Material (2019), Programme Standards and Practices (2019). A full list of the all the documents audited in this study can be found in Appendix 8 of the main report.

- To develop further guidance within documentation which clarifies how readers of IB documents can interpret indirect references to ATT principles – this includes centrally defining keywords and phrases, potentially with a glossary-like resource.
- To further explore (potentially with a survey) the experience of practically deploying the ATT in schools – with particular attention given to how different national and socio-cultural contexts may display variance.

4. An interesting and complex picture of overlap and differences was found between the ATT and other IB curriculum components such as the Learner Profile and the Approaches to Learning. The overall picture is of mutual reinforcement, but some further clarity regarding their interrelationships could be valuable.

Through the document audit's comparison of different elements of the IB curriculum, it was found that there is potential to further clarify the relationship between the ATT and other key curriculum components such as the Learner Profile, Approaches to Learning, International Mindedness, and the stated aims of programmes. The stated aims of all IB programmes were found to integrate all seven of the pedagogic themes which underpin the ATT. Some programmes exhibited varying levels of emphasis on specific themes with pertinent examples being:

- The PYP placed particular emphasis on the themes of Student-Led and Process/Cycle
- The MYP placed a higher emphasis on Student-Individuality than the PYP
- The DP demonstrated no discernible emphasis on or limitation to any single theme
- The CP demonstrated a strong emphasis on Local and Relevant, whilst including only limited implicit reference to the theme of Collaboration.

The other IB teaching and learning curriculum components (LP and ATL) were found to demonstrate varying degrees of alignment with the ATT principles or pedagogic themes. The LP demonstrated the strongest alignment with the ATT's pedagogic themes, despite differences in articulation and emphasis on specific themes. The ATL aligned with some ATT principles or pedagogic themes; however, areas of difference were also found. In addition, the ATL included components in "Thinking skills" which were not seen to be covered by the ATT principles. Overall the alignment of the ATT, LP and ATL demonstrated that the curriculum components not only function as teaching and learning guidance in their own right, but they also mutually reinforce one another by covering many of the same core ideas, in addition to being complementary to each other by providing their own specific focusses.

Recommendations

- To develop further clarity regarding the interrelationships between the Approaches to Teaching, Approaches to Learning, and Learner Profile – focusing on interactions between these curriculum components and the issues of mutual coverage and/or differences.
- To consider describing, more explicitly, in documentation how the ATT principles are not only guidance for curriculum design or classroom teaching but also a description of how all members of the IB community should conduct themselves within the culture of the school. This should begin with internal discussions regarding the intended scope of the ATT in relation to all activities within the school community.

1. Introduction

1.1. Context and scope

UK NARIC was commissioned by the International Baccalaureate (IB) to conduct a critical and in-depth study of the IB Approaches to Teaching (ATT). The IB Approaches to Teaching (ATT) sit within a set of curriculum components upon which all programmes are based including the Learner Profile (LP), Approaches to Learning (ATL), and international mindedness (IM).

Together with the IB Approaches to Learning (ATL), the IB Approaches to Teaching (ATT) aim to guide and focus educators and students in IB World Schools and are centred on a cycle of inquiry action and reflection. The IB Approaches to Teaching (ATT) underpin teaching in all IB programmes and comprise of the following six broad approaches:

Approaches to Teaching[4]

In all IB programmes, teaching is:

- **Based on inquiry:** A strong emphasis is placed on students finding their own information and constructing their own understandings.
- **Focused on conceptual understanding:** Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.
- **Developed in local and global contexts:** Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.
- **Focused on effective teamwork and collaboration:** This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.
- **Designed to remove barriers to learning:** Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.
- **Informed by assessment:** Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.

[4] International Baccalaureate Organization, (2017). *What is an IB education?*

The study centres on four principal research questions:

Research Questions

Research Question 1: To what degree are the IB Approaches to Teaching (ATT) an appropriate set of pedagogical principles for K-12 education programmes?

Research Question 2: Collectively, to what extent do the IB ATT pedagogical principles:

- Align with and support the stated goals of individual IB programmes?
- Align with and support IB Approaches to Learning (ATL)?
- Align with and support the IB Learner Profile (LP)?

Research Question 3: To what extent are the selected ATT principles – **Based on inquiry** and **Focused on effective teamwork and collaboration** – integrated effectively in programme curricular documents?

Research Question 4: What recommendations can be made to the IB regarding:

- The ATT pedagogical principles as a whole?
- Specific ATT principles?
- The guidance provided to IB World Schools for implementing the ATT principles?

2. Methodology

2.1 Overview of the Methodology

To address the above research questions, the study consisted of the following three stages:

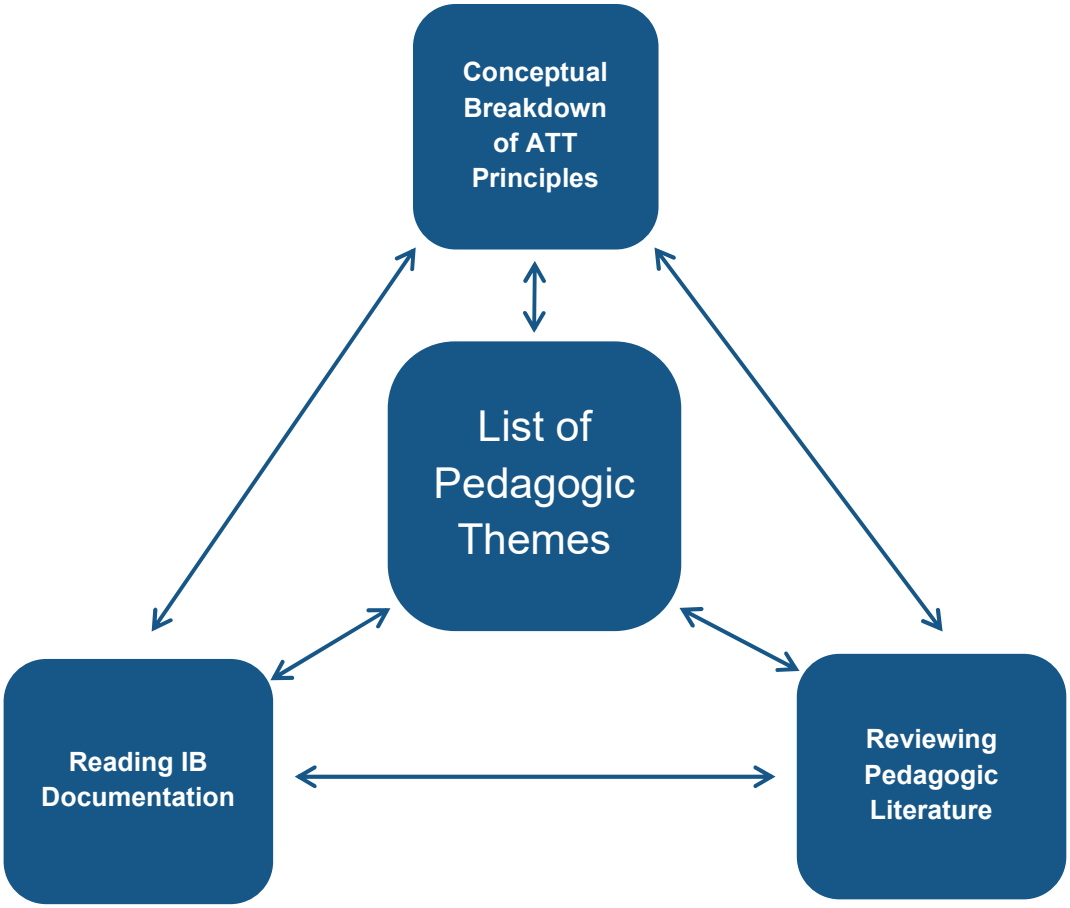
- A literature review is designed to ensure a thorough understanding of the ATT, the underpinning evidence base of the principles and whether it is coherent, complete and future-focused (RQ1). Findings are detailed in Sections 3 and 5.
- An audit of the IB programmes and continuum to determine the ways in and extent to which 1) the ATT collectively aligns with other IB goals and curriculum components and 2) the two selected ATT principles are articulated across and within IB programmes (RQ2 & RQ3). Findings are included in Sections 4 and 5.
- Evaluation and synthesis of findings across all research questions to determine recommendations for the IB in terms of the ATT (RQ5). Recommendations for all research questions are found in Section 6.

2.2 Deconstructing the IB ATT

An important methodological process responding to challenges in the literature review (see section 2), and document audit (see section 4), is the breaking down of the IB ATT principles into the pedagogic themes which underpin them.

A cyclical process was developed in order to create a list of pedagogic themes which provided strong coverage of what the ATT entails. This process involved a repeating pattern of conceptually breaking down the ATT principles and their descriptions, reviewing pedagogic literature, reading IB documentation to develop an understanding of the ATT's context, and creating a list of pedagogic themes. Each stage in this process was carried-out more than once and was therefore informed by all other stages in the process (this mutual reinforcement is represented by the double-ended arrows in Figure 4).

Figure 4: Pedagogic Themes Development Process



2.2.1 Pedagogic Themes

UK NARIC identified seven pedagogic themes which are either explicitly or implicitly present in multiple IB ATT principles. Our analysis suggests that teaching which adheres to the ATT principles will aim to be either student-centred or *student-led* (viewing pupils as active learners with a high degree of autonomy). That teaching would also aim to use a *local and relevant* context, while seeking to develop learners towards a mind-set associated with *global/international citizenship*. All the while, this approach invokes a number of *processes/cycles*, including the inquiry-cycle and an ongoing process of formative assessment. It will also be driven by *collaboration* (at all three levels of student-student, student-teacher, and teacher-teacher). This co-operative approach will also incorporate a sense of *student individuality*, which maintains an appreciation of different learning needs, as well as different social, cultural, and knowledge backgrounds. Finally, the ATT principles encourage teaching to pursue concept-based understanding, enabling a high level of *flexibility with disciplines*.

Rather than merely suggesting that these themes are present in the ATT as a whole, we have sought to demonstrate where the themes are explicitly connected to the ATT principles, and where they are only implicitly connected. Our definitions of the relationship possibilities between ATT principle and pedagogic theme are as follows:

Explicit Link: unambiguous from a direct comparison of the name of the principle (plus the description found in *What is an IB Education?*) and the meaning of the theme.

Implicit Link: requires a process of either thinking through the logical theoretical connotations of the principle name (plus the description found in *What is an IB Education?*), or the potential ways in which the principle might be practically deployed in the classroom.

Table 1 visualises how we have interpreted the pedagogic themes to emerge from within the ATT principles and their short description in the *What is an IB Education?* document. Extended explanations regarding the evidence for each of these links is available in Appendix 2.

An alternative visualisation which demonstrates the extent to which each of these themes is interwoven with the ATT is presented in Table 2.

Table 1: Thematic Deconstruction of ATT Principles

Based on Inquiry

A strong emphasis is placed on students finding their own information and constructing their own understandings.

Focused on Conceptual Understanding

Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.

Developed in Local and Global Contexts

Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.

Focused on Effective Teamwork & Collaboration

This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.

Designed to Remove Barriers to Learning

Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.

Informed by Assessment

Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.

Key: Explicit thematic link highlighted. Implicit thematic link underlined.

Colour Code:	Student-Led
Local and Relevant	Process/Cycle
Global/International Citizenship	Student Individuality
Flexibility with Disciplines	Collaboration

Table 2: Relationships between ATT Principles and Pedagogic Themes

Key: Explicit link / Implicit link / No link	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork & Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Student-Led	Explicit	Explicit	Explicit	Explicit	Implicit	Implicit
Local and Relevant	Implicit	Implicit	Explicit	No link	Implicit	No link
Global/ International Citizenship	No link	Implicit	Explicit	Implicit	Implicit	No link
Process/Cycle	Explicit	Explicit	Explicit	No link	Implicit	Explicit
Collaboration	Implicit	No link	Implicit	Explicit	Implicit	Explicit
Student Individuality	Implicit	Implicit	Explicit	Implicit	Explicit	Explicit
Flexibility with Disciplines	Implicit	Explicit	Implicit	No link	No link	No link

2.2.2 Naming and Defining Themes

Student-Led: This title acts as an umbrella term for such pedagogic ideas as: student-centred learning; learner-centred teaching; active learning; learner autonomy; learner independence; and, to a degree, scaffolding.

Student-led is the term we have chosen to represent this theme, but there are a number of other terms and phrases which are associated with the same conceptual area of pedagogy.[5] None of these are synonyms, and each has an academic literature of its own. For instance, autonomy has certain philosophical connotations which move towards the idea of learning without a teacher (though autonomous learning does not actually remove the teacher).[6] Despite their differences, however, all of these ideas can be said to involve some level of *student-led* teaching and learning.

Student-led learning is generally intended to place a greater emphasis on the student guiding their own instruction, presented in opposition to the outdated model of a teacher pouring knowledge into the head of a student.[7] The outcomes of this approach are often considered to include: improved student motivation and engagement; the development of metacognitive strategies (i.e. learning how to learn); the expansion of understanding, rather than just knowledge; and the activation of prior learning.[8] *Student-led* learning is also frequently associated with (though it does not have to involve) the use of new digital resources and teaching tools.[9] There are often questions raised around the role of the teacher in *student-led* learning, but it is generally considered a misconception that the teacher's role is reduced. Instead, through processes such as scaffolding, and guidance of inquiry-based approaches, the teacher's role is subtly altered, perhaps towards the position of mediator or guide.[10]

Within the list of themes sampled here, *student-led* has numerous close ties with others. There is a link with *process/cycle* in that *student-led* learning may invoke an ongoing movement between cognition and metacognition. Naturally, there is a relationship with *student individuality* because personal learning needs and backgrounds can be stimulated by teaching approaches being centred on the student. *Student-led* learning is also linked to *collaboration* in the sense that attentive scaffolding requires student-teacher cooperation. In fact, nearly all other themes presented here are in some way related to *student-led* pedagogy, a fact representative of the significant role it plays within pedagogic literature and within the IB ATT.

[5] See, for example, European Students' Union (ESU), (2010). *Student-Centred Learning: Toolkit for Students, Staff and Higher Education Institutions*. Brussels: The European Students' Union; Masouleh, N. S., & Jooneghani, R. B. (2012). Autonomous learning: A teacher-less learning!. Procedia-Social and Behavioral Sciences, 55, 835-842; Cambridge Assessment International Education, (2019). Active Learning.

[6] Cambridge Assessment International Education, (2019). *Active Learning*.

[7] "Teaching is not pouring knowledge into a student's head anymore". See, Hyun, J., Ediger, R., & Lee, D. (2017). Students' Satisfaction on Their Learning Process in Active Learning and Traditional Classrooms. International Journal of Teaching and Learning in Higher Education, 29(1), 108-118.

[8] Education Endowment Foundation, (2019). *Metacognition and Self-Regulated Learning: Guidance Report*.

[9] Advanced HE, (n.d.). *Flipped Learning*. Available at:<https://www.heacademy.ac.uk/knowledge-hub/flipped-learning-0>.

[10] Masouleh, N. S., & Jooneghani, R. B. (2012). Autonomous learning: A teacher-less learning!. Procedia-Social and Behavioral Sciences, 55, 835-842.

Local and Relevant: This title acts as an umbrella term for such pedagogic ideas as: using everyday contexts in the classroom; using real-world/real-life contexts; authentic learning; contextual teaching and learning; and some subject-specific pedagogies such as Science-Technology-Society (STS).

Local and relevant is not a term used throughout pedagogic literature, but we use it here to encompass a number of ideas found not only within the IB ATT but also in the broader academic work on teaching and learning.[11] Each of these individually can also cover a broad range of ideas, but at their core, they all contribute to a wider notion that teaching will be in some way improved by relating curriculum material to a local context or one viewed as relevant to the student's experiences.

Local and relevant learning is often intended to improve student engagement and knowledge retention. By making a link between learning something abstract (say a mathematical formula) and doing something practical (say bridging a local river), it is theorised that students will be more motivated and remember more effectively.[12] However, *local and relevant* teaching may do more than shape how a topic is taught; it may also reshape the way that curriculum content is designed or even the way that learning outcomes are perceived.[13]

Among the other pedagogic themes addressed here, *local and relevant* is closely tied to *student individuality* (through the focus on pursuing individually-relevant context) and *flexibility with disciplines* (as relevant, local, and especially practical learning will frequently move between disciplines). Within the IB ATT, *local and relevant* is particularly closely linked to *global/international citizenship*, with the local and global elements acting to provide two contrasting scales of context. For a pedagogic approach with international reach, like the IB ATT, placing emphasis on *local and relevant* teaching practices creates flexibility for teachers, allowing them to develop methods that hold and advance the interest of the students in their specific cultural or geographic context.

[11]Kasanda, C., Lubben, F., Gaoseb, N., Kandjeo-Marenga, U., Kapenda, H., & Campbell, B. (2005). The role of everyday contexts in learner-centred teaching: The practice in Namibian secondary schools. International Journal of Science Education, 27(15), 1805-1823.; Bennett J, Hogarth S, Lubben F, (2003). "A systematic review of the effects of context-based and Science-Technology-Society (STS) approaches in the teaching of secondary science". Research Evidence in Education Library. London: EPPI-Centre, Social Science Research Unit, Institute of Education. Available at: <http://eppi.ioe.ac.uk/cms/Portals/0/PDF%20reviews%20and%20summaries/Science_2003review.pdf?ver=2006-03-02-125252-487>;Lombardi, M. M. (2007). Authentic learning for the 21st century: An overview. Educause learning initiative, 1(2007), 1-12. Available at: <https://www.researchgate.net/profile/Marilyn_Lombardi/publication/220040581_Authentic_Learning_for_the_21st_Century_An_Overview/links/0f317531744eedf4d1000000.pdf>; Johnson, EB, (2002). *Contextual Teaching and Learning: What It Is and Why It's Here to Stay*. Thousand Oaks, California, USA. Corwin Press.

[12]Maina, F. W. (2004). Authentic learning: Perspectives from contemporary educators. Available at: <https://dspace.sunyconnect.suny.edu/bitstream/handle/1951/389/maina.pdf?sequence=1&isAllowed=y>.

[13] Winton, S. (2013). How schools define success: The influence of local contexts on the meaning of success in three schools in Ontario, Canada. Comparative and International Education/Éducation Comparée et Internationale, 42(1), 5.Available at: <http://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=1277&context=cie-eci>; Noor, Idris HM., and Purnamasari, Nina, (2019). "The Use of Local Context Learning Material in Integrated Teaching and Learning Instruction at Junior Secondary School (JSS): A Case Study in Pekanbaru District, Riau Province, Indonesia". *Education Quarterly Reviews*, Vol.2, No.1. 232-241.

Global/International Citizenship: This title acts as an umbrella term for such pedagogic ideas as: teaching for environmental sustainability; international peace; awareness of political, social, and cultural issues; developing an understanding of rights and responsibilities; learning to appreciate different cultures/beliefs; teaching for 21st-century challenges; and future-focused learning.

We have selected the phrase *global/international citizenship* in order to encapsulate multiple ideas frequently discussed in pedagogic literature. One is the notion that students be taught to appreciate issues with a global scale, such as environmental sustainability or international peace.[14] The other idea is that the attributes of good citizenship should be incorporated into the school curriculum.[15] These ideas may be treated separately in pedagogic literature, as citizenship might be developed for a national or regional (rather than global) context.[16] However, much of both the practical and theoretic work in this area emphasises the links between international issues and responsible citizenship.

Teaching targeted towards developing *global/international citizenship* may have a number of intended outcomes. These include but are not limited to increasing student awareness of: political, social and cultural issues; rights and responsibilities; different cultures and beliefs; and environmental issues including global warming, recycling, and caring for the natural world.[17] There is also substantial recognition in academic literature that *global/international citizenship* education has a strong link with preparation for 21st-century challenges and future-focused learning.[18]

As stated above, there is an inherent link and balance between the ATT's prioritisation of *global/international citizenship* and its desire to make teaching *local and relevant*. However, *global/international citizenship* also has links with other themes in this list. There is a strong relationship with *collaboration*, for example, as the idea of working together with a broad group of people is a common attribute discussed within the literature on strong international citizenship. In fact, this is another area where links can be found with almost every other pedagogic theme identified in the ATT. It is a pedagogic theory with substantial momentum behind it, and it plays a core role in the fundamentally international ATT, providing links between the approaches to teaching and, for instance, the IB's Learner Profile and the core value of International Mindedness (see Document Audit, below, section 4).

[14] See, for example, Scheunpflug, A., & Asbrand, B. (2006). Global education and education for sustainability. Environmental Education Research, 12(1), 33-46.
[15] See, for example, Akin, S., Calik, B., & Demir, C. E. (2017). Students as change agents in the community: Developing active citizenship at schools. Educational Sciences: Theory & Practice, 17(3), 809-834.
[16] For an overview of literature on citizenship education, see Stephen, C., & Gadda, A. (2017). Nurturing Citizenship in the Early Years. Available at:
<https://www.gcph.co.uk/assets/0000/6278/Nurturing_Citizenship_in_the_Early_Years.pdf>.
[17] HMIE, (2006). *Education for Citizenship: A Portrait of Current Practice in Scottish Schools and Pre-school Centres*. Available at:
<https://dera.ioe.ac.uk/6352/7/efcpcp1_Redacted.pdf>.
[18] See, for example, UNESCO, (2014). *Global citizenship education: preparing learners for the challenges of the 21st century*. Available at:
<https://unesdoc.unesco.org/ark:/48223/pf0000227729.locale=en>.

Process/Cycle: This title acts as an umbrella term for such pedagogic ideas as: the inquiry cycle; the learning cycle; processes of assessment; reflective learning/thinking; and knowledge building/construction.

The label *process/cycle* perhaps encapsulates more under a single rubric than any other in this list. Within pedagogic literature, numerous processes and cycles have received extensive discussion.[19] Though each of these may significantly diverge in how they are practically implemented, they share the common core of insisting that teaching and learning are not unidirectional procedures, but activities that involve constant change, development, interaction, and movement. All of these ideas propose that a process or cycle of activities lead to more effective teaching and learning practices.

The intended outcomes of a process- or cycle-based approach can be numerous and diverse. It might allow students to develop conceptual understanding and then apply that to different contexts or disciplines.[20] It may enable students to develop inquiry-based models of learning, where questions are used to initiate the development of understanding, and a combination of collaboration and independent research methods are fostered.[21] A process of assessment feedback might also enable students to gain a better sense of their strengths and weaknesses, and develop their learning more effectively through personalised goals.[22] It has also been argued that processes of reflection allow students to cultivate metacognitive strategies – enabling them to think critically about their own learning methods.[23]

The method of employing processes or cycles is embedded within all other themes discussed here. In this sense, *process/cycle* is a thematic construct which underpins all of the IB ATT. It plays a particularly important role in linking the approaches to teaching with pedagogic evidence on the effectiveness of the inquiry cycle and processes of providing useful assessment feedback.

[19] Marek, E. A. (2008). Why the learning cycle?. Journal of Elementary Science Education, 20(3), 63-69. Available at: <http://www.unesco.org/new/fileadmin/MULTIMEDIA/FIELD/Venice/pdf/special_events/Mini-course_print_en.pdf>;Earl, L. M. (2012). Assessment as learning: Using classroom assessment to maximize student learning. Corwin Press. Chapter 3.;White, B. Y., Shimoda, T. A., & Frederiksen, J. R. (1999). Enabling students to construct theories of collaborative inquiry and reflective learning: Computer support for metacognitive development.; Shaw, S., Kuvalja, M., & Suto, I. (2018). An exploration of the nature and assessment of student reflection. Research Matters: A Cambridge Assessment Publication, 25, 2-8. Available at: <https://www.cambridgeassessment.org.uk/Images/476532-an-exploration-of-the-nature-and-assessment-of-student-reflection.pdf>; Palincsar, A. S. (1998). Social constructivist perspectives on teaching and learning. Annual review of psychology, 49(1), 345-375.

[20] See, for example, Pedaste, M., Mäeots, M., Siiman, L. A., De Jong, T., Van Riesen, S. A., Kamp, E. T., ... & Tsourlidaki, E. (2015). Phases of inquiry-based learning: Definitions and the inquiry cycle. Educational research review, 14, 47-61.

[21] For an overview of inquiry-based practical teaching methods see Alberta Learning. (2004). *Focus on Inquiry: A Teacher's Guide to Implementing Inquiry-Based Learning*. Available at: Available at: <https://archive.org/details/focusoninquirylearn04albe>.

[22] Black, P. and Dylan W. (1998). "Inside the Black Box: Raising Standards Through Classroom Assessment". Phi Delta Kappa,1-13. Available at: <https://www.rdc.udel.edu/wp-content/uploads/2015/04/InsideBlackBox.pdf>

[23] On reflection and metacognition see Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. Teachers college record, 104(4), 842-866.

Collaboration: This title acts as an umbrella term for such pedagogic ideas as: encouraging teamwork; cooperative learning; communication; conflict resolution; negotiation; leadership; student-student collaboration; student-teacher collaboration; and teacher-teacher collaboration.

Collaboration is a term widely used in pedagogic literature, though reference may also be made to teamwork or cooperative learning. The label is used here to encapsulate three different, but potentially related, notions: students collaborating together with the intention that they learn more effectively and enhance certain skills; students and teachers collaborating with one another in the process of developing more effective, personalised strategies for teaching and learning; and teachers collaborating within one another in order to share knowledge and develop best practice.

The intended outcomes of collaborative or cooperative approaches are numerous. In regard to student-student collaboration, pedagogic literature often discusses a number of teamwork skills that educators may seek to develop through collaborative activities. These may include but are not limited to: communication, conflict-resolution, negotiation, leadership, shared responsibility, problem-solving, and teamwork.[24] A collaborative learning classroom may also invoke a sense of sharing both knowledge and authority between teachers and students, placing the teacher in the role of mediator rather than instructor.[25] Cooperation between teachers and students is also linked to effective scaffolding and provision of valuable assessment feedback. Collaboration between teachers can also be linked with numerous student benefits resulting from "a shared vision for student learning and teaching".[26]

As this description makes clear, *collaboration* has strong pedagogical thematic links with *student-led* learning. It also relates closely to *global/international citizenship* in that the attributes of strong citizenship may be promoted through collaborative classroom practices. *Student individuality* and *collaboration* also speak to one another, as the personal qualities of individual students contribute to the development of effective collaborative practices. Within the IB ATT, *collaboration* (like *process/cycle*) is an essential theme in guiding how the approaches to teaching might be practically implemented in the classroom.

Student Individuality: This title acts as an umbrella term for such pedagogic ideas as: diversity in the classroom and on the curriculum; inclusivity; differentiation to meet the needs of students; recognition and encouragement of student identity; and tailoring teaching.

Student individuality is a term we are using as an umbrella to capture a number of important themes and keywords within pedagogic literature. Depending on the context in which these terms are used, they may relate to a wide range of differences which make a student body heterogeneous. Although the notion of inclusive education is at times tied to the issue of including disabled students in mainstream schools,[27] inclusivity is generally understood to

[24] Lai, E. R, (2011). "Collaboration: A literature review research report". Available at: <http://images.pearsonassessments.com/images/tmrs/Collaboration-Review.pdf>.
[25] Morze, N., Pavlova, H., Makhahchashvili, R., & Smyrnova-Trybulska, E. (2016). Teacher-student collaboration: challenges and opportunities. 195-208.
[26] Miller Ph D, M., & Burden Ph D, R. (2007). Teacher-teacher collaboration. *Electronic Journal for Inclusive Education*, 2(1), 4.
[27] See, for example, Schuelka, M. J. (2018). Implementing inclusive education. Available at:

have a wider remit related to the ideal of enabling equal participation from *all* students.[28] Differences might stem from social or cultural backgrounds, as well as different ethnicities and personal identities. Diversity of multiple kinds within classrooms has prompted a literature to develop on how teaching can be differentiated to meet the individual needs of students.[29]

As one author has stated, "The goal of a differentiated classroom is maximum student growth and individual success."[30] An approach to teaching which prioritises *student individuality* may thus consist of a wide range of practices, but the intended outcome will generally be improved support for all students in their learning. In practical terms, this may entail flexibility of teaching methods and continually developing processes of assessment and collaboration.[31]

There are numerous links between *student individuality* and other themes contained within the IB ATT, for instance, *collaboration* and *student-led* learning. Independently though, this is an essential component of the ATT as it ties the IB to the evidence for best practice concerning the challenges and opportunities presented by students' individual identities.

Flexibility with Disciplines: This title acts as an umbrella term for such pedagogic ideas as: teaching and learning that are trans-disciplinary; inter-disciplinary; multi-disciplinary; cross-disciplinary; and concept-based.

Flexibility with disciplines is a phrase we use in order to encapsulate a number of related ideas employed within both the IB and broader pedagogic literature.[32] Between them, they cover a range of approaches stretching from using two disciplines to inform one another on a topic, to thinking in a new way that transcends any disciplinary boundaries.[33] Behind each of these (particularly in the IB philosophy) also lays the notion of concept-based teaching.
Teaching through concepts facilitates movement between disciplines and promotes the skill of breaking down disciplinary barriers.[34] The intended outcome of this approach is, therefore, that it can encourage students to develop deeper conceptual knowledge which they can use to build bridges between prior knowledge and new knowledge, or facts and skills relating to

<https://assets.publishing.service.gov.uk/media/5c6eb77340f0b647b214c599/374_Implementing_Inclusive_Education.pdf>.

[28] Messiou, K. (2017). Research in the field of inclusive education: time for a rethink?. *International* journal *of* inclusive education, 21(2), 146-159.

[29] Tomlinson, C and Allan, S., (2000). *Leadership for Differentiating Schools and Classrooms*. Alexandria, Virginia, USA. Association for Supervision and Curriculum Development (ASCD).

[30] Ibid., Chapter 1. "Understanding Differentiated Instruction: Building a Foundation for Leadership".

[31] Liu, D. and Nelson, R., (2017). "Diversity in the Classroom". In *The TESOL Encyclopedia of English Language Teaching* (eds J. I. Liontas, T. and M. Delli Carpini). Available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/9781118784235.eelt0224>.

[32] See Document Audit below for approaches to disciplines within different IB programmes. For the PYP see International Baccalaureate Organisation (2010). *The Primary Years Programme as a model of transdisciplinary learning*.

[33] See, for example, Andresen, M. & Lindenskov, L., (2009). "New roles for mathematics in multi-disciplinary, upper secondary school projects", *ZDM: The International Journal on Mathematics Education*, 41. 213-222; Auld, G. W., Romaniello, C., Heimendinger, J., Hambidge, C., & Hambidge, M. (1998). Outcomes from a school-based nutrition education program using resource teachers and cross-disciplinary models. *Journal of Nutrition Education*, 30(5), 268-280.

[34] Erickson, H.L., (2012). "Concept-based teaching and learning". IB Position Paper. Available at: <http://www.ibmidatlantic.org/Concept_Based_Teaching_Learning.pdf>; Southeast Michigan Stewardship Coalition, (2013). *Getting the Big Idea: Concept-Based Teaching and Learning*. Available at: <https://semiscoalition.org/wp-content/uploads/Getting-the-Big-Idea-Handout.pdf>.

different subject areas.[35] This movement between disciplines may also help students to develop metacognitive skills which allow them to learn about the processes of acquiring and constructing knowledge.[36] Finally, *flexibility with disciplines* enables learners to develop multi-cultural and international understandings.[37]

As with all the themes discussed here, *flexibility with disciplines* has obvious links with other pedagogic themes. It supports the drive towards *global/international citizenship*, and *collaboration* is inherent in how it materialises in practice. Without a flexible approach to disciplines, the IB ATT would not have a clear road-map onto which students could practically deploy and develop the skills and attributes associated with other themes here.

[35] McCoy, J. D., & Ketterlin-Geller, L. R. (2004). Rethinking instructional delivery for diverse student populations: Serving all learners with concept-based instruction. *Intervention in School and Clinic*, 40(2), 88-95.

[36] Erickson, H.L, (2008). *Stirring the Head, Heart and Soul: Redefining Curriculum, Instruction, and Concept-based Learning*. Thousand Oaks, California, USA: Corwin Press.

[37] Erickson, H.L., (2012). "Concept-based teaching and learning". IB Position Paper. Available at: <http://www.ibmidatlantic.org/Concept_Based_Teaching_Learning.pdf>7-8.

2.3 Methodological approach for the literature review

The literature review is intended to address four primary research questions, all of which are derived out of *Research Question 1*. These questions are an expansion of *Research Question 1*, developed from one into four parts in order to reflect the different component elements that can be tested with a literature review:

a) Where are the ATT principles similar and dissimilar to other pedagogic frameworks?
b) To what extent do the ATT reflect the need for future-focused learning?
c) Are the ATT a coherent series of principles, especially as they relate to teaching on the entire K-12 continuum?
d) Are the ATT principles underpinned by strong pedagogic evidence, both individually and collectively?

The following section will expand upon UK NARIC's methodological approach to the above questions by detailing how the other pedagogic frameworks were selected, summarising their characteristics, and describing the analytical challenges involved in answering the research question and the solutions found to counter the challenges. Finally, the section will present the application of the methodological approach by detailing the various comparison methods used.

2.3.1 Selection of comparison frameworks

In order to answer research question *a* it is necessary to identify a number of other pedagogic frameworks with which to compare the ATT. By selecting pedagogic frameworks with explicit reference to teaching for future-focused learning[38] and teaching across multiple age ranges, these alternatives can also help us to answer research questions *b* and *c*. Moreover, by choosing pedagogic frameworks with a strong grounding in pedagogic evidence, comparison between these and the ATT can help us to answer research question *d* (in combination with further analysis of pedagogic literature).

In order to contextualise the ATT within the broader international backdrop of frameworks of teaching principles, it is first important to note that, within the IB, the ATT itself sits inside a broader structure involving the Approaches to Learning, the Learner Profile (LP), and other key elements of the IB education such as International Mindedness (IM).[39] The question of exactly how the ATT interacts with the Approaches to Learning, the LP, and IM will be discussed at more length in the Document Audit (section 4, below). Approaches to teaching are not, in many educational organisations, clearly distinguished from approaches to learning or indeed other principles related to intended learning outcomes or attributes of learners. As a result, there is an inherent challenge in seeking to compare like with like when we examine

[38] The definition of future-focused education is complex, as Rachel Bolstad has discussed in a paper for the Future-Focused Issues in Education (FFI) project. We adopt her working definition here – that future-focused is broadly related to a range of questions such as "How do we think education will help them [students] in their future lives?", "How is schooling changing, and how else might it need to change to better meet the opportunities and challenges of the 21st century?", and "How will humanity address the 'wicked problems' of the 21st century, including those linked with sustainability, globalisation, citizenship, enterprise (and other issues)?". Bolstad, R. (2011). Taking a "future focus" in education—what does it mean. Future-Focused Issues in Education Project, 2. Available at: <https://www.nzcer.org.nz/system/files/taking-future-focus-in-education.pdf>.

[39] For an overview of the LP, ATT, Approaches to Learning, and other key elements see International Baccalaureate Organisation, (2019). *What is an IB Education?*

the ATT in isolation. In order to understand the true international context within which the ATT exists, it is necessary to consider not only frameworks which are strictly of teaching principles, but also those which may label themselves as relating to learning, skills, or other connected terms.

2.3.2 Comparison frameworks

The following pedagogic frameworks have been selected for comparison with the IB ATT.

- The Assessment of Transversal Skills 2020 (ATS2020) Framework
- Cambridge International Learner Attributes
- Eco-Schools Educational Principles
- European Commission Key Competences for Lifelong Learning
- The National Association for the Education of Young Children Developmentally Appropriate Practice Guidelines for Effective Teaching
- The Singapore Framework for 21st Century Competencies and Student Outcomes
- Singapore Teaching Practice Pedagogical Practices

For a demonstration of the criteria used to select these alternative frameworks, see Appendix 3.

In making this selection, we have aimed to identify a combination of national and international frameworks, including a number with explicitly future-focused intent or related to 21st-century challenges, broad coverage in terms of the range of student age demographics, and strong pedagogic credentials. Other frameworks were considered in a longlist before the final selection was made, including other national frameworks and frameworks provided by other international organisations; however, the final shortlist included in Appendix 3 is intended to provide a representation of the breadth that exists in international pedagogy whilst deploying a selection of manageable size. Frameworks still in the process of being finalised while this report was in progress were deselected in favour of those already established and showing a longer record of use.

ATS2020 Transversal Skills Framework[40]

"The Assessment of Transversal Skills 2020 (ATS2020) project proposes a comprehensive learning model to enhance student transversal, 21st-century indispensable, skills, within the diverse EU national curricula, including provision of teachers with modern approaches and innovative tools for the assessment of these skills." This European-Commission-funded project created a Transversal Skills framework as an output. The framework is a valuable source of comparison for the ATT as it was not only developed from extensive transnational research involving more than 800 teachers and 10,000 learners, but it is also explicitly focused on responding to 21st-century challenges. Moreover, the ATS2020 framework seeks specifically to develop "age-suitable transversal competences" and addresses "the development and assessment of transversal skills within upper primary and lower second level

[40] ATS2020, (2020). *Transversal Skills Framework*. Available at: <http://www.ats2020.eu/transversal-skills-framework>.

education".[41] Alongside other frameworks with different age-range focuses, this will create a useful source of comparison with the ATT's applicability with the K-12 continuum.

Cambridge International Learner Attributes[42]

Cambridge International is a not-for-profit organisation that delivers programmes and qualifications in over 10,000 schools and more than 160 countries.[43] At primary, lower-secondary, and upper-secondary levels, Cambridge International aims to deliver programmes which "reflect the latest educational research".[44] This organisation makes for an interesting comparison with the IB ATT, as there are numerous similarities in areas such as international reach and age-range. Cambridge Assessment International Education developed the Cambridge learner attributes in 2011[45] as a response to a perceived need for students "to develop attitudes and life skills throughout their education, as well as academic skills, in order to be successful at university and in employment".[46] This aim reflects the desire for a holistic approach to learner development encompassing both academic and "real-life" aspects. The document "Developing the Cambridge learner attributes"[47] indicates that the attributes now extensively inform curricula design in Cambridge schools. The fact that Cambridge International's framework is articulated as Learner Attributes might suggest that the IB's Learner Profile would be the direct corollary; however, the Cambridge Learner Attributes also include teacher attributes and thus closely reflect the design purposes of the IB ATT. The number of individual elements within the Cambridge attributes (five) is also fairly similar to the ATT's (six) – making for a comparable structure.

Eco-schools Educational Principles[48]

Eco-Schools is a membership organisation run by the Foundation for Environmental Education. The aim of "engaging the next generation in action-based learning", and developing awareness of environmental issues, is achieved by encouraging schools to follow a pathway towards recognition as an "Eco-School". Part of this programme involves taking up the framework of education principles. This is a valuable comparison for the IB ATT as, like the IB, it is genuinely global in scope, with 59,000 member schools in 68 countries. In addition, the Eco-Schools' explicit focus on sustainability and global environmental issues is inevitably future-focused. The Educational Principles are also, like the ATT, intended to be applicable for the entire K-12 continuum.[49] The eight-part structure of this framework makes for a relatively similar length structure when compared to the ATT.

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[41] ATS2020. (2020). *What is ATS2020?* Available at: <http://www.ats2020.eu/what-is-ats2020>.
[42] Cambridge Assessment International Education, (2020). *Developing the Cambridge Learner Attributes*. Available at: <https://www.cambridgeinternational.org/support-and-training-for-schools/teaching-cambridge-at-your-school/cambridge-learner-attributes/>.
[43]Cambridge Assessment International Education, (2020). <https://www.cambridgeinternational.org/about-us/what-we-do/facts-and-figures/>.
[44]Cambridge Assessment International Education, (2020). <https://www.cambridgeinternational.org/about-us/what-we-do/>.
[45] Cambridge International Learner Attributes. Available at: <https://www.cambridgeinternational.org/why-choose-us/parents-and-students/in-class/the-cambridge-learner-attributes/>
[46] Ibid.
[47] Ibid.
[48] Eco-Schools, (2019). *Educational Principles*. Available at: <https://www.ecoschools.global/educational-principles>.
[49] Eco-Schools, (2019). *About Eco-Schools*. Available at: <https://www.ecoschools.global/how-does-it-work>.

European Commission Key Competences for Lifelong Learning[50]

The European Council adopted recommendations (from a Commission proposal) on Key Competences for Lifelong Learning in 2018 in response to the perception that "People need the right set of skills and competences to sustain current standards of living, support high rates of employment and foster social cohesion in the light of tomorrow's society and world of work". Although not explicitly a teaching framework, the combination of knowledge, skills, and attitudes embedded in the Key Competences make for useful comparison to the ATT. Like the ATS2020, the European Commission has designed these recommendations to be transnational, and the impetus for creation was the need to respond to 21st-century working environments, and to meet future challenges. Moreover, the "lifelong learning" element means that the age coverage spans the entire K-12 continuum and goes beyond it.[51]

NAEYC Developmentally Appropriate Practice Guidelines for Effective Teaching[52]

The National Association for the Education of Young Children (NAEYC) aims to promote "high-quality early learning for all children, birth through age 8, by connecting practice, policy, and research". It is a USA-based professional membership organisation, and thus functions at a national level (providing a useful contrast to the IB's international scope). One of the NAEYC's areas of research is Developmentally Appropriate Practice (DAP), and within this field, they have developed Guidelines for Effective Teaching. The specification of teaching methods for children aged birth to 8 is another interesting contrast with the IB ATT. Compared to other frameworks in this list, the attention to future-focused goals is less categorical, though there is an underlying belief in the DAP guidelines that "Teachers and administrators in early childhood education play a critical role in shaping the future of our citizenry and our democracy".[53] Although this framework has structural similarities to the ATT (for instance, a five-part structure, compared to the ATT's six parts), the different core purposes underlying the design of this framework also provide a valuable contrast (for instance: the different age-range of students, and the notion of placing "developmentally appropriate" as an overriding idea).

(Battelle for Kids) P21 Framework for 21st Century Learning[54]

The Partnership for 21st Century Learning (P21) is part of Battelle for Kids, an American company describing itself as "a national not-for-profit organization committed to collaborating with school systems and communities to realize the power and promise of 21st century learning for every student". One of the outputs of P21 is a Framework for 21st Century Learning. This is evidently a 21st-century specified framework, as its core aim is "to ensure 21st-century readiness for every student". In addition to its Framework for 21st Century Learning, P21 has developed a distinct "21st Century Skills Early Learning Framework" for children aged 18 months to 6 years. The Battelle for Kids 21st century learning frameworks

[50] European Commission, (n.d.). *Council Recommendation on Key Competences for Lifelong Learning*. Available at: <https://ec.europa.eu/education/education-in-the-eu/council-recommendation-on-key-competences-for-lifelong-learning_en>.
[51] European Union, (2019). *Key Competences for Lifelong Learning*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en>.
[52] NAEYC, (n.d.). *5 Guidelines for Effective Teaching*. Available at: <https://www.naeyc.org/resources/topics/dap/5-guidelines-effective-teaching>.
[53] NAEYC, (2009). *Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth through Age 8*. 23. Available at: <https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/position-statements/PSDAP.pdf>.
[54] Battelle for Kids, (2019). *Frameworks and Resources*. Available at: <http://www.battelleforkids.org/networks/p21/frameworks-resources>.

therefore cover early learning, K-12 and beyond; sharing a similar target age-range as the IB ATT.[55] With 31 individual components of the P21 Framework, it is structured in a very different way to the ATT – thus providing an opportunity to discern contrasts and analyse any advantages or shortfalls of the ATT's more condensed structure.

Singapore 21CC Framework[56]

The Singapore Framework for 21st Century Competencies and Student Outcomes (hereafter, Singapore 21CC Framework) is a response to 21st-century challenges by the Singaporean Ministry of Education. "To help students thrive in a fast-changing world, MOE has identified competencies that have become increasingly important in the 21st Century". As such, it is explicitly future-focused and applied to the entire K-12 continuum. This is an interesting contrast with the IB ATT because it has substantial contextual differences, not least in that it is national rather than international, and it is not explicitly a set of pedagogic principles, but is framed around knowledge and skills required by students.[57] The framework has more individual elements than the ATT but less than the P21 Framework, offering a middle-ground comparison with the shorter ATT.

Singapore Teaching Practice Pedagogical Practices[58]

Like the Singapore 21CC Framework, the Pedagogical Principles are designed by the national Ministry of Education to be applied to all school-age students across the country. Unlike the 21CC Framework, this is explicitly a set of teaching principles, and therefore provides a useful point of comparison with the IB ATT. Unlike the ATT, it is applied nationally rather than internationally. Also, perhaps because the Singapore 21CC Framework exists, the Pedagogical Principles are not explicitly established as a response to 21st-century challenges. This framework has a large number of individual elements, which is a contrast to the ATT, but like the ATT's relationship to the ATL and LP, this Singaporean teaching principles framework is intended to work alongside other with overlapping spheres of interest – making it an important inclusion in this list.

2.3.3 Framework Comparison – Analytical Challenges and Solutions

Four analytical challenges have been identified in relation to the comparison between the ATT and alternative frameworks. A description of each and a proposed solution are detailed here:

1. Challenge: Direct comparison of the IB ATT with other frameworks is complicated by the wide variety of structures in which they are formatted. Some are similar to the ATT's list arrangement, while others are guided by diagrammatic layouts articulating multiple layers of ideas. Moreover, the frameworks range in the number of principles, from just five DAP Effective Teaching Guidelines to 24 independent components within the Singapore Teaching Practice Pedagogical Principles.

[55] Battelle for Kids, (2019). *Framework for 21st Century Learning: A unified vision for learning to ensure student success in a world where change is constant and learning never stops.* Available at: <http://static.battelleforkids.org/documents/p21/P21_Framework_Brief.pdf>.
[56] Singapore Ministry of Education, (2018). *21st Century Competencies*. Available at: <https://www.moe.gov.sg/education/education-system/21st-century-competencies>.
[57] Ibid.
[58] Singapore Ministry of Education, (2018). *The Singapore Teaching Practice*. Available at: <https://www.moe.gov.sg/about/singapore-teaching-practice>.

a. Solution: In order to accurately compare the contents of these frameworks when their scale and structure can be so different, each framework has been analysed based on its individual components (to be referred to as "principles" in the ATT and as "elements" of alternative frameworks). This facilitated a principle-by-element analysis used in the Coverage Approach (see section 2.3.4.1) and Gap Analysis (see section 2.3.4.2), which together sought to find links between individual components before stepping back to compare the frameworks as a whole.
b. Solution: The IB ATT has been deconstructed further into the Pedagogic Themes (see section 2.2.1) underlying the principles. These themes formed the basis of the Thematic Presence Method (see section 2.3.4.3).

2. Challenge: Another challenge facing inter-framework comparison is the economy of words used to articulate the meaning behind individual principles/elements. Though enabling breadth of interpretation, the brevity of descriptions can make it difficult to ascertain whether or not there is conceptual overlap between, for instance, the IB ATT's **Based on Inquiry** and ATS2020's "Autonomous Learning". Also, terms and phrases used within these frameworks are often vague (perhaps intentionally, allowing them to be interpreted flexibly by practising teachers). The difficulty presented by this ambiguous wording is that unless there is a direct correlation of word-choice – for instance, the IB ATT's **Focused on Effective Teamwork and *Collaboration*** and the ATS2020's "*Collaboration* and communication" – it can be challenging to ascertain the presence and strength of links between frameworks.
    a. Solution: In order to facilitate comparison, the extended descriptions of framework principles/elements have been used wherever these are available. The short descriptions of each ATT principle – found in the *What is an IB Education?* document – have been frequently drawn-upon to clarify the title of each principle. Having used these more detailed descriptions, it is possible to see, for example, that **Based on Inquiry** contains an emphasis on "students finding their own information and constructing their own understandings". It is therefore clear that there is indeed pedagogic overlap between this principle and the ATS2020 Transversal Skill of "Autonomous Learning". Not all alternative frameworks featured these extended descriptions documented, but they have been extensively used when possible.
    b. Solution: The breaking down the ATT principles into underlying Pedagogic Themes (see section 2.2.1) as also provided a more clear point of reference between the ATT and alternative frameworks aided in the avoidance of ambiguity.

3. Challenge: The different contexts in which these frameworks are intended to be applied also make direct comparison challenging. Some, like the IB ATT, are envisioned for use in international teaching contexts, whereas others, such as the Singapore frameworks, are designed for a specific national setting. Cross-comparing national and non-governmental frameworks inevitably results in the identification of certain specific differences driven by the variation in context. Moreover, what appears to be a crossover in either language or concept may be less similar than first appearances would suggest, as different cultural contexts may develop different understandings of seemingly the same concept. "Citizenship" for example, may be broadly understood in

similar terms, but there could be substantial differences in how this is practically defined between an international body and a national ministry.

   a. Solution: Variation in cultural context is inevitable. Similarities in frameworks do not necessarily translate into teaching similarities in practice in the classroom. There is no solution that removes this hurdle, but instead, we must acknowledge that framework comparison can only identify similarities and differences at the level of structures of guidance, not at the level of practical application.

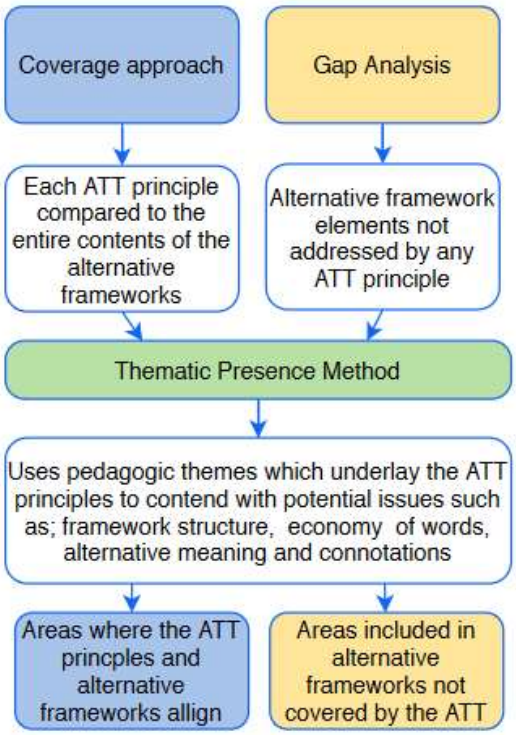
4. Challenge: Even without a cultural difference between frameworks, individual words used in these frameworks can have multiple definitions and connotations. Knowing which meanings are intended is vital to the exercise of cross-comparison, but without lengthy descriptions to accompany the framework principles or elements, there is inevitably a certain level of ambiguity. For instance, the ATT's principle **Focused on Effective Teamwork and Collaboration** is clarified as being related to both "collaboration between students" and "the collaborative relationship between teachers and students". However, the Singapore Teaching Practice's "Facilitating collaborative learning" contains no further explanation as to the specific participants in this "collaborative" exercise. In this case, we can still judge there to be a link between the two, but the precise nature of that link is partially obscured by the ambiguity of the term "collaboration" in relation to teaching and learning.
   a. Solution: Where further descriptions and clarifications were available in documentation these have been used.
   b. Solution: Breaking down the ATT principles into underlying Pedagogic Themes (see section 2.2.1) has enabled an alternative articulation of the ATT, which draws on the most common terms and ideas used in pedagogic literature. This has provided another means of comparing between frameworks, through the Thematic Presence Method (see section 2.3.4.3), and presented scope for thinking about the different ways in which relevant pedagogic ideas may have been expressed.

2.3.4 Framework Comparison – Application

Overall, the challenges posed by the need for comparison between the IB ATT and alternative frameworks can be effectively handled with the implementation of a number of processes: firstly, a principle-by-element comparison between frameworks; secondly, the use of extended descriptions wherever these are available; thirdly, breaking down the ATT principles into the pedagogic themes (see section 2.2.1) which underpin them, and using these themes for comparison; and finally, accepting the proviso that cultural context and space for interpretation will always mean that overlap between frameworks will not necessarily materialise into identical teaching practices in the classroom.

There is more than one way to compare the ATT with alternative frameworks. The variation in structures between different frameworks makes it important to compare at a principle-to-element level (i.e. comparing individual components of frameworks). Using this approach, there are two significant methods of comparison that will be used here, as each answers a different but important question.

Figure 5: Framework Comparison Processes



2.3.4.1 Comparison Method – Coverage approach

The first method is a **coverage approach** which seeks evidence of the extent to which the content of ATT principles can be found in alternative frameworks. This approach takes each individual ATT principle and compares it with the entire contents of all other frameworks. The term "coverage approach" has been coined as it seeks to understand the extent to which these alternative frameworks contain coverage of the contents of the ATT.

By going through the ATT and alternative frameworks principle-by-element, the potential outcomes of the coverage approach are:

Full Coverage: the alternative framework contains the substantive meaning of an ATT principle.

Partial Coverage: the alternative framework contains a partial amount of the meaning of an ATT principle.

No Coverage: the alternative framework provides no tangible coverage of the ATT principle.

2.3.4.2 Comparison Method – Gap analysis

The second method is a **gap analysis**. This, in some ways, is a reversal of the coverage approach, as it explores the extent to which the alternative frameworks contain elements not addressed by any ATT principle.

By comparing the alternative frameworks to the ATT element-by-principle, the potential outcomes of the "gap" analysis are:

> **Full Coverage**: an ATT principle contains the substantive meaning of an alternative framework element.
>
> **Partial Coverage**: an ATT principle contains a partial amount of the meaning of an alternative framework element.
>
> **No Coverage**: the ATT principle contains no coverage of the meaning of an alternative framework element.

Through a combination of the coverage approach and gap analysis, we will answer research question *a*. Moreover, as the alternative frameworks have been selected to provide a diverse coverage of age ranges and emphases on future-focused learning, the findings will also help us to answer research questions *b* and *c*. Contributions to research question *d* will also be made through the comparison with alternative frameworks, as each framework also draws upon pedagogic evidence in their construction.

2.3.4.3 Comparison Method – Thematic presence method

In addition to these approaches, a **thematic method** is also used. As set out in the Analytical Challenges and Solutions (see section 2.3.3), the identified pedagogic themes (see section 2.2.1) reveal the ideas behind the ATT's specific wording. The thematic presence method will be used as a supplement to the coverage approach, in order to better understand the extent to which the ideas behind the ATT are also present in alternative frameworks (see section 2.3.2). The pedagogic themes will also be used later in the literature review, following the results of the gap analysis. Once a list of elements present in alternative frameworks but not present in the ATT has been identified, these will be compared against the pedagogic themes. This will enable us to identify whether the "gaps" in the ATT are a matter of how the ATT is worded compared to alternative frameworks, or how the ATT differs in underlying ideas and priorities.

The potential outcomes of the thematic presence method – which compares the ATT pedagogic themes with all elements of alternative frameworks – are:

> **Noted Presence**: a pedagogic theme is present within an alternative framework. The threshold for this noted level is presence in at least 15% of the total elements in any framework (e.g. two of eight elements, four of 24, etc.).[59]

[59] The reason for the noted threshold being set at a minimum of 15% is that this would roughly equate to presence in one of the six ATT principles (i.e. 16.7% of the total).

Limited Presence: a pedagogic theme is present within an alternative framework but not to the extent that satisfies the noted threshold (e.g. one of eight elements, two of 24 etc.).

Not present: a pedagogic theme is not present within an alternative framework.

A detailed comparison of the relationship between the ATT and alternative pedagogic frameworks is facilitated by this three-pronged approach: the coverage approach (in which alternative frameworks are examined for coverage of the content of ATT principles); the thematic presence method (where alternative frameworks are examined for presence of the pedagogic themes underpinning the ATT); and "gap" analysis (in which the ATT are examined to discern whether they have "gaps" when compared to the content of alternative frameworks – moreover, once "gaps" have been identified they can be compared with the ATT's underlying themes to test whether or not the themes speak to those areas.

2.4 Methodological approach for the document audit

This section will cover the methodology developed to answer Research Questions 2 and 3. This includes how the research questions have been deconstructed, in addition to the potential challenges involved in answering them and solutions identified. It will expand upon UK NARIC's methodological approach to the above questions by detailing how the other pedagogic frameworks were selected, summaries of their characteristics, followed by the analytical challenges involved in answering the research question and the solutions found to counter the challenges. Finally the section will present the application of the methodological approach by detailing the various comparison methods used.

2.4.1 Research Question 2

Research Question 2 addresses the audit of individual IB programme goals and other IB curriculum components: IB Approaches to Learning (ATL) and IB Learner Profile (LP). Three research questions have been derived from Research Question 2 in order to individually address the documents:

Research Question 2: Collectively, to what extent do the IB ATT pedagogical principles:

a) Align with and support the stated goals of individual IB programmes?
b) Align with and support IB Approaches to Learning (ATL)?
    i. Is the relationship between the ATT and Approaches to Learning (ATL) logical, consistent and complete?
c) Align with and support the IB Learner Profile (LP)?
    i. Is the relationship between the ATT and Learner Profile (LP) logical, consistent and complete?

2.4.2 Comparing IB Curriculum Components and the Stated Programme Goals – Analytical Challenges and Solutions

One key challenge has been identified for the comparison of the ATT to the IB Learner Profile (LP), Approaches to Learning (ATL) and stated goals of IB programmes.

1. Challenge: Answering *Research Question 2* necessitates a comprehensive method of comparing the ATT with the LP, Approaches to Learning (ATL), and stated goals of IB programmes. However, a challenge arises due to the fact that each of these has idiosyncratic structures and purposes, making like-for-like comparison difficult.
    a. Solution: An appropriate method for comparing between the ATT and alternative pedagogic frameworks will be refined and developed in the Literature Review of this report. Regarding comparison between the ATT and LP and Approaches to Learning, it is possible to use this same method, as it facilitates comparison from a number of different perspectives in order to develop a full picture of similarities and dissimilarities at both the linguistic and conceptual level. Of course, the LP and Approaches to Learning are not strictly pedagogic frameworks, meaning that comparison with the ATT will still not be a like-with-like comparison, but the analysis in response to *Research Question 2* will recognise this fact and pay appropriate attention to the different aims and structures of these curriculum components. In response to the need to explore alignments between the ATT and the "stated goals of individual IB programmes", this will be handled with a different and bespoke form of qualitative analysis, using the seven pedagogic themes identified within the Approaches to Teaching and extracting key paragraphs from programme documents which state the goals of specific programmes. This enables the stated goals of programmes to be fully explored in reference to the pedagogic themes, and therefore the core ideas and pedagogic content of the ATT.

2.4.3 Comparing IB Curriculum Components and the Stated Programme Goals – Application

2.4.3.1 IB Approaches to Learning (ATL) and IB Learner Profile (LP)

Despite the IB Learner Profile (LP) and Approaches to Learning (ATL) not strictly being pedagogical frameworks, using the coverage approach, gap analysis, and thematic presence methods applied to the alternative pedagogical frameworks in the literature review allows for comparison from a number of different perspectives in order to analyse similarities and dissimilarities at both the linguistic and conceptual level. Included below are summaries of the three approaches developed for Research Question 1, which have been modified to address the specific Analytical Challenges and Solutions identified in this research question.

> **Coverage approach:** This method seeks to evidence the extent to which the content of ATT principles can be found in the IB Learner Profile (LP) and Approaches to Learning (ATL). This approach takes each individual ATT principle and compares it with the entire body of the LP and ATL.

Gap analysis: A reversal of the coverage approach, it explores the extent to which the LP and ATL contain elements not addressed by any ATT principle.

Thematic presence method: Using the identified pedagogical themes (see section 2.2.1) which reveal the ideas behind the ATT's specific wording, the thematic presence method supplements the coverage approach and allows a better understanding the extent to which the ideas behind the ATT are also present in the LP and ATL. Conceived as a way to complement the coverage approach and verify the results of the gap analysis, this approach identifies whether "gaps" identified in the ATT are due to different 'economies of words' between the ATT, LP and Approaches to Learning, or alternatively due to differing underlying ideas and priorities.

Through the combined use of the three approaches outlined above, parts *b* and *c* of Research Question 2 will be answered. The analysis derived from these parts of the research question will contribute towards the document audit and its respective conclusions and recommendations.

2.4.3.2 Stated Programme Goals

As part of the response to Research Question 2 (part *a*), UK NARIC analysts sought to examine the extent to which the collective IB ATT pedagogical principles align with and support the "stated goals of individual IB programmes". Unlike the Approaches to Teaching, the Approaches to Learning, or the Learner Profile, "the stated goals of individual IB programmes" are not formulated into a subdivided framework-style structure. As such, the comparative approaches employed to examine the alignment between the ATT and the ATL and LP (Coverage Approach, Gap Analysis, and Thematic Presence Method) would not be appropriate methods. Instead, we have developed a bespoke approach, using the seven pedagogic themes identified within the Approaches to Teaching and extracting key paragraphs from programme documents which state the goals of specific programmes. This enables the stated goals of programmes to be fully explored in reference to the pedagogic themes, and therefore the core ideas and pedagogic content of the ATT. This bespoke approach uses a form of mapping that cross references the pedagogic themes against words and phrases in the selected paragraphs from programme documents. Using a colour code, this method identifies which pedagogic themes are integrated into those paragraphs, the extent to which they are integrated, and what phrasing is used to do so.

2.4.4 Research Question 3

In combination with Research Question 2, Research Question 3 addresses the Document Audit by focusing on the extent to which the selected ATT principles[60] are effectively integrated into programme curricular documents. Based on the overarching research questions for the report as a whole (see Introduction, section 1 above), the four research questions below have been derived from Research Question 3 in order to guide analysis:

[60] The focus of this research question will be on the following ATT principles: Based on inquiry; Focused on effective teamwork and collaboration.

Research Question 3: To what extent are the selected ATT principles (**Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**) integrated effectively in programme curricular documents?

a) To what extent are the ATT principles highlighted in the curricular documents?
    i. Based on a review of the programme level documents and core guides, do programme subjects/core components collectively integrate the ATT principles?
b) Does articulation of the ATT principles align within programmes?
c) Does articulation of the ATT principles align across programmes?
d) To what degree do IB curricular documents clearly articulate the relationship between the ATT principles with other key elements of an IB education? For example, the IB Learner Profile (LP) and international mindedness (IM).

2.4.5 Document Audit – Analytical Challenges and Solutions

Two challenges have been identified in relation to the analysis of ATT principle integration in programme curricular documents. A description of each and a proposed solution are detailed here:

1. Challenge: In order to answer *Research Question 3* it is necessary to assess either a comprehensive or representative sample of IB documentation (to facilitate an assessment of the extent to which the selected principles are integrated). However, the large number of IB documents in circulation makes this challenging.
    a. Solution: UK NARIC and staff at the IBO developed a select list of documents which has provided a more manageable scale for close document analysis, but also has given a valuable snapshot of the content of all IB programmes (PYP, MYP, DP, and CP). This included some documents which are applicable to all programmes (overarching documents), some documents generally discussing a single programme (programme-level documents) and some documents related to specific subjects or subject-areas within programmes (subject-level documents). Documents were chosen based on a number of factors intended to provide a fair and analytically useful sample of IB materials – these include, but are not limited to: representation of all programmes; a mix of some older and some newer documents; variation in length and format; and coverage of the different levels of content (overarching, programme, and subject). The full list of selected documents can be found in the Document Audit of this report and full publication details can be found in Appendices 1 and 7.
2. Challenge: When analysing the extent to which the selected principles are integrated within IB documentation a significant challenge is posed by the fact that some of the IB documentation in question was designed and published before the inception of the ATT. As a result, it is highly unlikely that the precise wording of the ATT will be found within those less recently published documents.
    a. Solution: This challenge has posed an opportunity to develop the most valuable means possible of mapping IB documentation in relation to the ATT principles. Of course, one simple way that has been useful with some documents was to search for keywords and key phrases directly pulled from the ATT – this has shown us integration of the ATT and selected principles in the most direct sense. However, this has not been useful for all documents and has not

provided a nuanced understanding of the integration of the ideas behind the selected principles; therefore, an alternative approach was warranted. This involved mapping the pedagogic themes (see section 2.2.1) utilised extensively in the Literature Review. By mapping the pedagogic themes it was still possible to understand the integration of the selected principles (through our detailed understanding of how the themes and principles interrelate), but it also allowed us to develop a more nuanced understanding of exactly how principles were articulated. The core ideas of an ATT principle can be expressed without direct reference to the words used in the ATT; this method enables us to observe that phenomenon in IB documentation.

2.4.6 Document Audit – Application

In order to understand the extent to which the ATT principles **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are effectively integrated into programme curricular documents, it is necessary to carry out multiple different mapping processes. This will enable UK NARIC to uncover not only direct references to the principles in question but also indirect references. The latter are particularly important to unearth due to the fact that some relevant IB documentation was written prior to the initial articulation of the ATT. In those documents, direct references to ATT principles will inevitably not exist, but it is still possible that the ideas behind those principles were being articulated in another form. The indirect mapping of these principles will allow for that possibility. There will be three separate mapping processes, displayed in Figure 6 below, the combined results of which will enable us to answer Research Question 3:

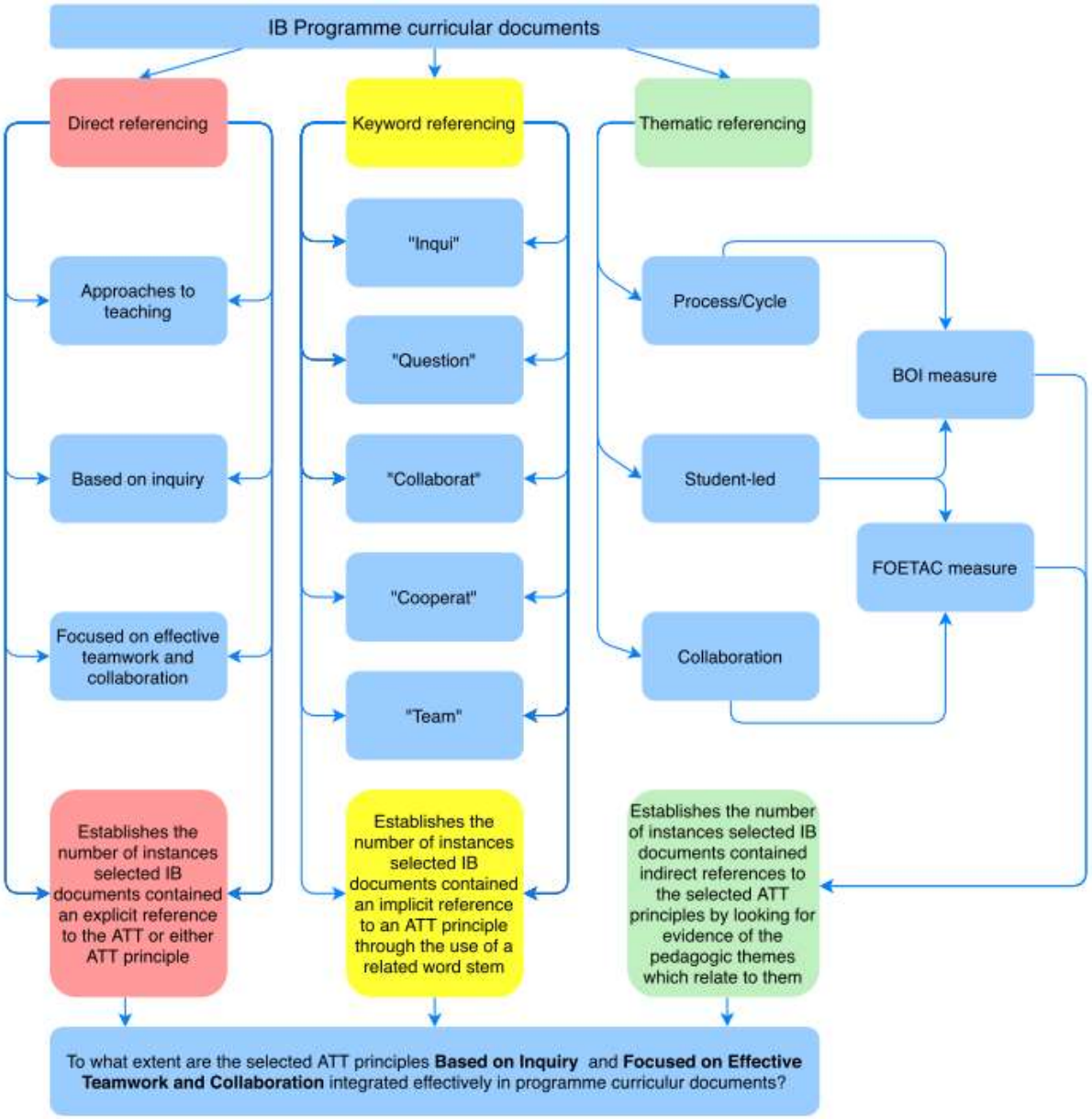
1. **Mapping direct references to the ATT (direct referencing)**. This method searches throughout the text of IB documentation for any explicit references to the "Approaches to Teaching", and/or the title of either selected principle – i.e. the phrases "Based on Inquiry" or "Focused on Effective Teamwork and Collaboration". This method is not expected to yield a large number of results, but it is an important first stage in considering direct discussion of the ATT and the selected principles.
2. **Mapping keywords related to the selected principles (keyword referencing)**. Between the direct and indirect levels of mapping lies this keyword approach. As all IB documents are either available in pdf or HTML format, they are fully text searchable. It is therefore possible to carry out word searches for terms inherently linked to the principles in question. For **Based on Inquiry,** these terms would be "inquiry" (and any of its iterations[61]) and "question" (and any of its iterations). For **Focused on Effective Teamwork and Collaboration,** these terms would be any iteration of "team", "collaboration", or "cooperation". Use of these keywords is highly likely to indicate that although no explicit reference has been made to the title of the principle in question, the same terminology and therefore similar ideas can be found in the text.
3. **Mapping the identified pedagogic themes at sentence level (thematic referencing)**. This third level of mapping seeks to uncover indirect references to the selected ATT principles by looking for evidence of the pedagogic themes which relate

[61] Such iterations include any word deriving from the same stem – for example, in the case of "inquiry" this would include "inquirer", "inquisitive", "inquiring", "inquiries" etc. All of these can be caught by the same word-search for the common stem of such words – i.e. "inqui". The same process can be followed for the other keywords in question – e.g. "question", "collaborat", "cooperat", and "team".

to them.[62] Each IB document is split into subsections (identified on the contents page), generally of 1-10 pages in length. This method will seek to document whether or not each subsection of the audited documents contains indirect reference to the ATT selected principles. This will be ascertained by mapping the pedagogic themes at a sentence level. The sentence-level findings will then be cross-referenced with the known relationships between themes and principles.[63] If a subsection of an IB document is found to contain clear references[64] at sentence level to relevant pedagogic themes, then the subsection will be deemed to contain an indirect reference to the ATT principle. The use of pedagogical themes as a medium through which to uncover references to ATT principles is, by its nature, indirect referencing and therefore will not generate results which can be deemed to be a direct reference to an ATT principle. As this method is slightly more complex than the first two mapping approaches, examples of the mapping at sentence level and document level are demonstrated below.

[62] In part 2.4 of the Methodology seven pedagogic themes which underpin the IB ATT principles have been identified.
[63] The relationships between themes and principles are tabulated in the Methodology section of the report, and described in detail in Appendix 2. They are repeated here in Table 2, below.
[64] Clarity of thematic reference can only be judged qualitatively, using familiarity with what the pedagogic themes mean and what teaching/learning ideas are related to them. Such details are described at length in the Methodology section of the report. An example of interpretation is provided for the IB Mission Statement, below.

Figure 6: Document Audit Processes



Example 1 – Application of mapping processes at sentence level: The IB Mission Statement

The IB Mission Statement is a short section included at the start of every pdf IB curricular document. It establishes the overarching aims of an IB education in a succinct way. The text of the statement is as follows:

> "IB mission statement
>
> The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.
>
> To this end the organization works with schools, governments and international organizations to develop challenging programmes of international education and rigorous assessment.
>
> These programmes encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right."[65]

Including the title, this section (found, for example, in *What is an IB Education?*) contains four sentences.

The first sentence, the title, does not contain reference to any of the pedagogic themes (see section 2.2.1).

The second sentence contains reference to three pedagogic themes. Mention of creating "a better and more peaceful world through intercultural understanding" indicates the presence of *Global/International Citizenship*. The aim of developing "inquiring" young people is a reference to the inquiry cycle and therefore the theme of *Process/Cycle*. And the phrase "intercultural understanding and respect" is indicative of the themes *Collaboration* and *Global/International Citizenship* being present.

The third sentence also contains reference to three pedagogic themes. The mention of "international education" and the reference to "international partners" indicates that the theme *Global/International Citizenship* is present. The reference to working with "schools" and "governments" suggest a *Local and Relevant* input. And the phrase "rigorous assessment" signposts numerous cycles of assessment, which represents the presence of the theme *Process/Cycle*.

The fourth sentence also contains reference to three pedagogic themes. The description of encouragements to make students "active" learners is channelling the theme *Student-led*. The reference to students "across the world" and to "other people, with their differences" indicates the presence of *Global/International Citizenship*. And the implication behind understanding that "other people, with their differences, can also be right" is that students will have a sense of their own perspectives based on their personal *Student Individuality*.

[65] *WIAIBE?*, unpaginated preface.

Overall, we can therefore see that this subsection contains references to all seven pedagogic themes apart from *Flexibility with Disciplines*. *Global/International Citizenship* is the most firmly emphasised (with presence in all three substantial sentences), and *Process/Cycle* is also present in more than one sentence. We can use this information, along with the relationship table linking ATT principles to the pedagogic themes (Table 2) to make a judgment as to whether or not the subsection contains the themes **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**,

Regarding **Based on Inquiry**, the most explicitly linked themes – *Student-led* and *Process/Cycle* – are both present in this subsection of text. This is enough evidence to say that the subsection contains an indirect reference to the principle **Based on Inquiry**. This mapping method also allows us to see that *Flexibility with Disciplines* – an implicitly linked theme – is not present, but the other three implicitly linked themes are.

Regarding **Focused on Effective Teamwork and Collaboration**, the most explicitly linked themes – *Student-led* and *Collaboration* – are both present in this subsection of text, meaning that the principle is indeed being indirectly referenced in this subsection. Moreover, the implicitly linked *Student Individuality* is also present and *Global/International Citizenship* is the most heavily emphasised of any theme in this section.

These judgments are the most straightforward use of the sentence-level thematic mapping, but Example 2 below will demonstrate that by applying it to entire documents we can develop a detailed understanding of not only whether or not the principles are being indirectly referenced, but also the strength of those references and how they vary across a text. To further show the mapping methods, this document will demonstrate the processes on *What is an IB Education?*.

Example 2 – Application of mapping processes at document level: What is an IB Education?

What is an IB Education? is a key, overarching IB document. "Written primarily for educators, *What is an IB Education?* provides an overview and explanation of our educational philosophy. It explains how our mission and philosophy shape and drive our programmes."[66] At only 16 pages it is one of the shortest IB documents, but due to the fact that it has been re-written after the inception of the ATT,[67] and as a result of its nature as a guide to overarching IB teaching and learning practices, this is a document likely to contain more direct and indirect references to the ATT than some lengthier IB documents.

The first level of mapping (direct references to the ATT and selected principles) reveals that both the ATT in general and the specific principles **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are directly referenced in this document.[68] Furthermore, the second level of mapping (use of keywords strongly related to the selected principles) reveals 20 instances of relevant keywords being used; a rate of more than one per page. Some of these hits overlap with the findings of the first level of mapping – for instance, the word "inquiry" is used when the ATT are listed in full, including the phrase "Based on Inquiry". However, relevant keywords also appear in less obvious places; for example, in the "IB mission statement", in the "IB learner profile", in the "International-mindedness" subsection, and in the "Conclusion".

To look into one of these in more detail: the "International-mindedness" subsection of *What is an IB Education?* contains one keyword reference to both selected ATT principles. Regarding **Based on Inquiry**, the reference is found in the sentence "IB programmes therefore provide students with opportunities for sustained inquiry into a range of local and global issues and ideas."[69] Regarding, **Focused on Effective Teamwork and Collaboration**, the reference is found in the sentence "By engaging with diverse beliefs, values and experiences, and by learning to think and collaborate across cultures and disciplines, IB learners gain the understanding necessary to make progress towards a more peaceful world."[70] These sentences contain a number of the pedagogic themes identified to be underpinning the ATT, but the keywords in question also highlight that the two selected ATT principles are being particularly clearly referenced.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) provides a high number of results in this short document. By going through this document sentence-by-sentence, well over 100 references to the seven identified pedagogic themes were identified. The document can be split into eight subsections (excluding the list of documents for additional reading in the conclusion): IB mission statement; IB learner profile; Creating a better world through education; Key elements of an IB education: International-mindedness; Key elements of an IB education: the IB learner profile; Key elements of an IB education: A broad, balanced, conceptual and connected curriculum; Key elements of an IB education: Approaches to teaching and learning; and Conclusion: A worldwide community of educators.[71] Every one of these subsections was found to have references to more than one pedagogic theme, and in multiple cases, all seven themes were referenced at sentence level in the same subsection.

[66] *WIAIBE?*, p. 1.
[67] *WIAIBE?* was published in updated form in November 2019, replacing a version first published in 2013 and updated in 2015 and 2017.
[68] *WIAIBE?*, pp. 1, 6-7.
[69] Ibid., p. 2.
[70] Ibid.
[71] Ibid. contents page.

By taking these thematic findings, and looking subsection-by-subsection at how that thematic content relates to the selected ATT principles, it has been judged that **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are both indirectly referenced in all but two subsections of this document.

These judgments have been made by cross-referencing the sentence-level thematic findings with the known relationships between the selected principles and the list of pedagogic themes (as established in the Methodology of this report and repeated in Table 2). If a subsection contains references to the themes explicitly linked to an ATT principle, then that subsection has been judged to contain an indirect reference to the principle. For **Based on Inquiry,** this is the themes *Student-led* and *Process/Cycle*. For **Focused on Effective Teamwork and Collaboration,** this is the themes *Student-led* and *Collaboration*.

This is the most straightforward use of the sentence-level thematic mapping, but a more detailed view of the extent to which the selected principles are indirectly referenced throughout this text is made possible by analysing the strength of the references in each subsection. Each subsection contains a different number of sentence-level thematic references. A crude comparison would therefore be to examine how many of each thematic reference are found in each subsection. However, such a method would be limited in use due to two factors: firstly, the fact that subsections can vary quite substantially in length; secondly, the fact that two pedagogic themes, not one, are explicitly linked to each principle. A picture of the varying strength of indirect reference to the selected principles is thus made possible by applying the following equations to each subsection of the text:

$$\frac{\left(\frac{\#SL + \#PC}{2}\right)}{Word\ Count} = BOI\ Measure$$

$$\frac{\left(\frac{\#SL + \#C}{2}\right)}{Word\ Count} = FOETAC\ Measure$$

Key:

#SL = number of sentences within the subsection which contain reference to the theme *Student-Led.*

#PC = number of sentences within the subsection which contain reference to the theme *Process/Cycle.*

#C = number of sentences within the subsection which contain reference to the theme *Collaboration*.

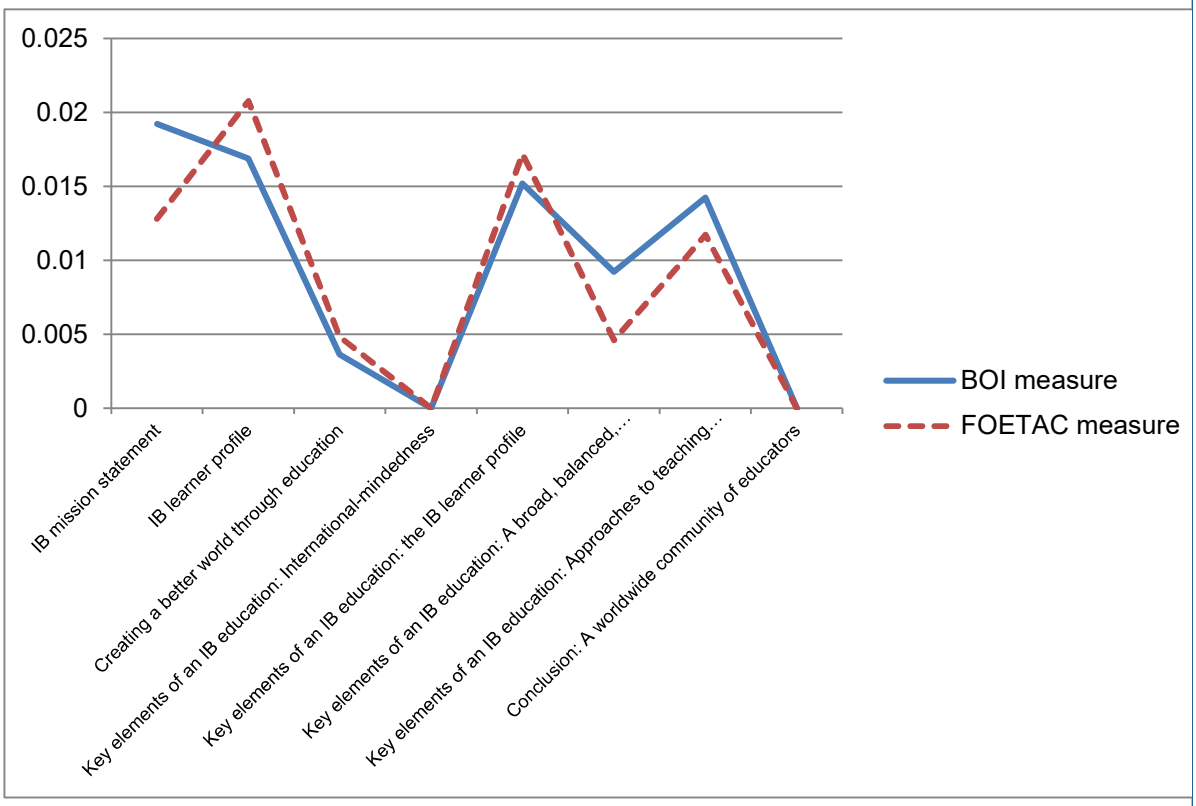
BOI Measure = a measure of the strength of indirect references to the principle **Based on Inquiry** within a subsection. Calculated using the pedagogic themes explicitly linked to the principle and the number of words within the subsection in question.

FOETAC Measure = a measure of the strength of indirect references to the principle **Focused on Effective Teamwork and Collaboration** within a subsection. Calculated using the pedagogic themes explicitly linked to the principle and the number of words within the subsection in question.

By developing BOI Measures and FOETAC Measures in this way, for every subsection which contains indirect references to the principles, we can compare the strength of these references. Initially, this allows comparison of subsections within a single text, but when all documents have been mapped it will also allow us to compare between documents as a whole and even between similar subsections of documents (e.g. introductions or conclusions).

Within *What is an IB Education?*, this method allows us to plot the varying strength of indirect references onto a graph. This is shown in Figure 7.

Figure 7: BOI and FOETAC Measures for subsections of What is an IB Education?[72]



The first notable finding from this graph is that the strength of reference to these principles can vary significantly across the duration of an IB text. In this case, the strongest indirect references to the selected principles come in the "mission statement" and "learner profile", which are prefatory subsections found at the start of all current IB pdf documents. The subsections which come closest to these (in terms of strength of reference to the principles) are those describing "the IB learner profile" and "Approaches to teaching and learning". Given the nature of the subsections in this document, it is perhaps unsurprising that these subsections would contain the most pronounced indirect reference to the selected principles, whereas subsections such as "International-mindedness" contain a large number of references to the theme *Global/International Citizenship* which is not one that is explicitly tied to the two selected principles.

It is also unsurprising that, to a certain degree, the two measures follow a similar pattern across the document, as both contain the number of references to the theme *Student-led* as one of their key variables. However, this graph also demonstrates that the indirect

[72] BOI and FOETAC Measures of certain quantities indicate levels of indirect integration of the principles in question. Based on current data, if this were split into categories, the highest (greatest integration of the principle) would be over 0.02; the middle category would be between 0.01 and 0.02; the lowest category would be above 0 and below 0.01, and the indicator of no indirect integration of the principle is a BOI or FOETAC Measure of 0 .

references to each principle are rarely identical. For instance, in the subsection describing the "broad, balanced, and conceptual curriculum", the indirect reference to **Based on Inquiry** is twice as pronounced as the indirect reference to **Focused on Effective Teamwork and Collaboration**, due to the fact that the subsection contains far more thematic references to *Process/Cycle* than it does to *Collaboration*.

Overall, all three levels of mapping demonstrate that the ATT as a whole, and the selected ATT principles in particular, are deeply embedded in *What is an IB Education?*. Although shaping an answer to Research Question 3 requires broad analysis across the spectrum of IB documentation set out in Appendix 1.

3. Literature Review

3.1 Introduction

The four primary research questions for the literature review are derived out of *Research Question 1* for the report as a whole (see Introduction, section 1). These questions are an expansion of *Research Question 1*, developed from one into four parts in order to reflect the different component elements that can be tested with a literature review:

a) Where are the ATT principles similar and dissimilar to other pedagogic frameworks?
b) To what extent do the ATT reflect the need for future-focused learning?
c) Are the ATT a coherent series of principles, especially as they relate to teaching on the entire K-12 continuum?
d) Are the ATT principles underpinned by strong pedagogic evidence, both individually and collectively?

3.2 Comparing the ATT with Alternative Frameworks

In line with the challenges, solutions and approaches detailed in the Methodological Approach to Research Question 1 (see section 1), the following section demonstrates how the three approaches (coverages / gap / thematic) have been applied to the alternative frameworks. Specific case studies have been used to illustrate findings in this section and the full findings of each approach and each alternative framework can be found in Appendix 3/4/5.

3.2.1 Coverage Approach

By going through the ATT and alternative frameworks principle-by-element, the potential outcomes of the coverage approach are:

Full Coverage: the alternative framework contains the substantive meaning of an ATT principle.

Partial Coverage: the alternative framework contains a partial amount of the meaning of an ATT principle.

No Coverage: the alternative framework provides no tangible coverage of the ATT principle.

The entire coverage approach for each alternative framework is available in Appendix 3. An example for one alternative framework is provided in Table 3, below, in which coverage of the ATT principles is assessed within the ATS2020 Transversal Skills Framework. The structure and contents of the ATS2020 Transversal Skills Framework are shown in Figure 8.

Figure 8: ATS2020 Transversal Skills Framework

Table 3: Coverage Approach for ATS2020 Transversal Skills Framework

ATT Principle	Most Relevant Elements of ATS2020 Transversal Skills Framework	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	Information Literacy: 1. Plan strategies to guide inquiry. Information Literacy: 2. Evaluate and select information sources and tools based on the appropriateness to specific tasks. Information Literacy: 4. Process information and construct new knowledge. Autonomous Learning: 1. Identify significant needs for learning based on their prior knowledge.	Full Coverage The core features of the ATT principle are covered in the ATS2020 Transversal Skills Framework, including: inquiry, finding information, constructing knowledge/understanding, and learner autonomy.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.	Information Literacy: 5. Integrate new knowledge and apply to new situations.	Partial Coverage Part of the meaning of the ATT principle is covered in the ATS2020 Transversal Framework. Specifically, the ability to move learning to new contexts. Explicitly conceptual understanding is not covered.
Developed in Local and Global Contexts. Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.	Collaboration and Communications: 4. Develop cultural understanding and global awareness by engaging with learning of other cultures.	Partial Coverage Part of the meaning of the ATT principle is covered in the ATS2020 Transversal Framework. Specifically, the focus on global contexts. Reference to localised student experiences is not covered.
Focused on Effective Teamwork and Collaboration. This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.	Collaboration and Communication: 1: Interact, collaborate, and publish with peers, experts, or others employing a variety of tools and environments. Collaboration and Communication: 3. Contribute to project teams to	Full Coverage The core features of the ATT principle are covered in the ATS2020 Transversal Skills Framework, including: collaboration and teamwork with peers and others.

ATT Principle	Most Relevant Elements of ATS2020 Transversal Skills Framework	Coverage Evaluation
	produce original works or solve problems.	
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	Autonomous Learning: 1. Identify significant needs for learning based on their prior knowledge. Autonomous Learning: 2. Define goals to achieve and develop a strategy to achieve them. Autonomous Learning: 5. Reflect and explore alternative approaches (metacognition of their Learning Cycle). Creativity and Innovation: 4. Create original works as a means of expression.	Full Coverage The core features of the ATT principle are covered in the ATS2020 Transversal Skills Framework, including: recognition of individual needs, development of goals and means to achieve these, differentiating approaches, variety in the classroom to reflect the variety of students, and the support and development of students expressing their identity.
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.	Autonomous Learning: 2. Define goals to achieve and develop strategy to achieve them. Autonomous Learning: 3. Plan and manage activities to implement strategy. Autonomous Learning: 4. Evaluate process and results and provide evidence for achievement. Autonomous Learning: 5. Reflect and explore alternative approaches (metacognition of their Learning Cycle).	Full Coverage The core features of the ATT principle are covered in the ATS2020 Transversal Skills Framework, including: use of evaluation or assessment; using assessment or evaluation to support learning or alter learning strategies.

Table 3 demonstrates that all of the ATT principles receive some level of coverage in the elements of the ATS2020 Transversal Skills Framework. The majority have "full coverage" – meaning that the substantive meaning of the principle can be found in the ATS2020 framework. **Focused on Conceptual Understanding** and **Developed in Local and Global Contexts** receive only "partial coverage", as at least one important aspect of the principles' meanings are not found in the alternative framework.

Using analysis like this for the ATT's coverage in all eight of the identified alternative frameworks, the following table (Table 4) has been constructed. This demonstrates the overall

extent to which coverage of the ATT is provided by the alternative frameworks. The full analysis upon which this table is based is available in Appendix 3.

Table 4: Summary of Coverage Approach for all Alternative Frameworks

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
ATS2020 Transversal Skills Framework	✓	∗	∗	✓	✓	✓
Cambridge Learner Attributes	✓	∗	∗	✓	✓	∗
Eco-schools Educational Principles	∗	∗	✓	✓	∗	✓
European Commission Key Competences for Lifelong Learning	∗	✓	✓	✓	∗	✓
NAEYC DAP Guidelines	∗	✓	∗	✓	✓	✓
P21 Framework for 21st Century Learning	∗	∗	✓	✓	✓	✓
Singapore 21CC Framework	∗		✓	✓	∗	∗
Singapore Teaching Practice Pedagogic Principles	✓	∗	∗	✓	∗	✓

Table 4 demonstrates a number of things. Firstly, that coverage of the content of the ATT by the alternative frameworks identified here is generally strong. Of the 48 direct relationships assessed here, more than half (27) resulted in the finding of "full coverage", another 20 resulted in the finding of "partial coverage", and only one showed "no coverage" (**Focused on Conceptual Understanding** within the Singapore 21CC Framework). Overall, this suggests that the ATT is closely aligned with alternative pedagogic frameworks.

A second finding from Table 4 is that some ATT principles are more fully covered than others by the alternative frameworks. **Focused on Effective Teamwork and Collaboration** stands out here as having received "full coverage" in all other alternative frameworks. This suggests that the importance of collaboration in the IB is shared by wider international contexts of

approaches to teaching and learning. **Informed by Assessment** also showed widespread strong coverage. **Designed to Remove Barriers to Learning** and **Developed in Local and Global Contexts** fall in the middle-ground here, with a combination of "full" and "partial coverage" across the alternative frameworks. By looking at the full analyses in Appendix 4 we can see that in the case of **Developed in Local and Global Contexts** this is a result of two alternative frameworks choosing not to explicitly mention global contexts, one refraining from discussing students' lived experiences, and another not explicitly describing "real-world" contexts. In the case of **Designed to Remove Barriers to Learning,** it is evident that not all frameworks explicitly discussed both student identities and barriers to learning. The two principles less evident in alternative frameworks were **Based on Inquiry** and **Focused on Conceptual Understanding**. **Based on Inquiry** had slightly more coverage than **Focused on Conceptual Understanding**. The individual analyses reveal, however, that explicit reference to an inquiry cycle or model of inquiry was often not found in alternative frameworks, though they generally did all emphasise student autonomy. A similar conclusion can be drawn for conceptual understanding, as six of the eight alternative frameworks did not explicitly discuss conceptual understanding, even if they may have articulated the need to make connections or work between disciplines.

Overall, this coverage approach tells us a lot about some of the features of the IB ATT that make it stand out from these alternative frameworks. Although many of the alternatives contain full coverage of a number of ATT principles, none of the others examined here contains full coverage of *all* ATT principles. Moreover, on a smaller scale, none of the alternative frameworks examined here contain full coverage of both **Based on Inquiry** and **Focused on Conceptual Understanding**. This suggests that although the IB ATT is not unique in prioritising an inquiry-based teaching model, or unique in prioritising a conceptual learning model, this mixture of ideas, in combination with the precise manner in which these ideas are prioritised and expressed, makes the IB ATT stand out here.

In order to gain a better understanding of how the ATT relates to alternative frameworks, this coverage approach will now be supplemented by a thematic presence method. By examining the extent to which the pedagogic themes in question are found within alternative frameworks, we can add depth to our understanding of whether divergences between the ATT and alternative frameworks are a result of different ideas and priorities, or merely differences in phrasing and articulation.

> **Finding 1**: Close alignment between ATT and alternative frameworks – the coverage approach suggests that the ATT and alternative frameworks are closely aligned, although some ATT principles are reflected in alternative frameworks more commonly/extensively than others.

3.2.2 Thematic Presence Method

The potential outcomes of the thematic presence method – which compares the ATT pedagogic themes (see section 2.2.1) with all elements of alternative frameworks – are:

Noted Presence: a pedagogic theme is present within an alternative framework. The threshold for noted-level is presence in at least 15% of the total elements in any framework (e.g. two of eight elements, four of 24, etc.).[73]

Limited Presence: a pedagogic theme is present within an alternative framework but not to the extent that satisfies the noted threshold (e.g. one of eight elements, two of 24 etc.).

Not present: a pedagogic theme is not present within an alternative framework.

The full thematic presence method for each alternative framework is available in Appendix 4. Here, three case studies will be examined: The Eco-Schools Educational Principles, the Singapore 21CC Framework, and the Singapore Teaching Practice Pedagogic Principles. These have been selected because, as revealed by Table 4, they are the three alternative frameworks with the least "full coverage" of the ATT principles.

3.2.2.1 Thematic Presence Method – Case Study: Eco-Schools

The coverage approach (Table 2 and Appendix 4) revealed that the Eco-Schools Educational Principles contains "full coverage" of the ATT's **Developed in Local and Global Contexts**, **Focused on Effective Teamwork and Collaboration**, and **Informed by Assessment**. "Partial coverage" was found for **Based on Inquiry**, **Focused on Conceptual Understanding**, and **Designed to Remove Barriers to Learning**.

Table 5 demonstrates the extent to which the pedagogic themes identified from the ATT are present in the Eco-Schools Educational Principles. Figure 9 first shows what the Eco-Schools Educational Principles are.

[73] The reason for the extensiveness threshold being set at a minimum 15% is that this would roughly equate to presence in one of the six ATT principles (i.e. 16.7% of the total).

Figure 9: Eco-Schools Educational Principles

1. Ensure that participants are engaged in the learning/teaching process
2. Empower participants to take informed decisions and actions on real life sustainability issues
3. Encourage participants to work together actively and involve their communities in collaborative solutions
4. Support participants to examine their assumptions, knowledge, and experiences, in order to develop critical thinking, and to be open to change
5. Encourage participants to be aware of cultural practices as an integral part of sustainability issues
6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other
7. Continuously explore, test, and share innovative approaches, methodologies, and techniques
8. Ensure that continuous improvements through monitoring and evaluation are central to our programmes

Table 5: Thematic Presence Method for Eco-Schools Educational Principles

ATT Pedagogic Theme	Most Relevant Elements of Eco-Schools Educational Principles	Presence Evaluation
Student-Led	1. Ensure that participants are engaged in the learning/teaching process. 2. Empower participants to take informed decisions and actions on real life sustainability issues.	Noted Presence
Local and Relevant	3. Encourage participants to work together actively and involve their communities in collaborative solutions. 2. Empower participants to take informed decisions and actions on real life sustainability issues. 6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	Noted Presence
Global/ International Citizenship	2. Empower participants to take informed decisions and actions on real life sustainability issues. 5. Encourage participants to be aware of cultural practices as an integral part of sustainability issues.	Noted Presence
Process/Cycle	1. Ensure that participants are engaged in the learning/teaching process. 4. Support participants to examine their assumptions, knowledge, and experiences, in order to develop critical thinking and to be open to change. 8. Ensure that continuous improvements through monitoring and evaluation are central to our programmes.	Noted Presence
Collaboration	3. Encourage participants to work together actively and involve their communities in collaborative solutions. 6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	Noted Presence
Student Individuality	4. Support participants to examine their assumptions, knowledge, and experiences, in order to develop critical thinking and to be open to change. 6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	Noted Presence
Flexibility with Disciplines	2. Empower participants to take informed decisions and actions on real life sustainability issues. 3. Encourage participants to work together actively and involve their communities in collaborative solutions.	Noted Presence

This thematic presence method reveals that all seven of the pedagogic themes have "Higher-Level presence" in the Eco-Schools Educational Principles. Thus, even though certain features of the ATT principles were found not to have "full coverage" in this alternative framework, this method indicates that the underlying ideas of the ATT do exist in the Eco-Schools Principles. A comparison of the underlying themes of the ATT (rather than the specific wording of the principles) with the alternative framework therefore leads us to a slightly adjusted view of the extent to which the Eco-Schools Educational Principles contain coverage of the ATT principles. The combination of these approaches shows that although there are some parts of the ATT principle wording that are not covered by the alternative framework, all underlying ideas in the ATT are present in some form.

3.2.2.2 Thematic Presence Method – Case Study: Singapore 21CC

The coverage approach (Appendix 3) revealed that the Singapore 21CC Framework contains "full coverage" of the ATT's **Developed in Local and Global Contexts** and **Focused on Effective Teamwork and Collaboration**. "Partial coverage" was found for **Based on Inquiry, Designed to Remove Barriers to Learning**, and **Informed by Assessment**. "No coverage" was found for **Focused on Conceptual Understanding**.

Table 6 demonstrates the extent to which the pedagogic themes identified from the ATT are present in the Singapore 21CC Framework. Figure 10 first shows what the contents of the Singapore 21CC Framework are.

Figure 10: Singapore 21CC Framework

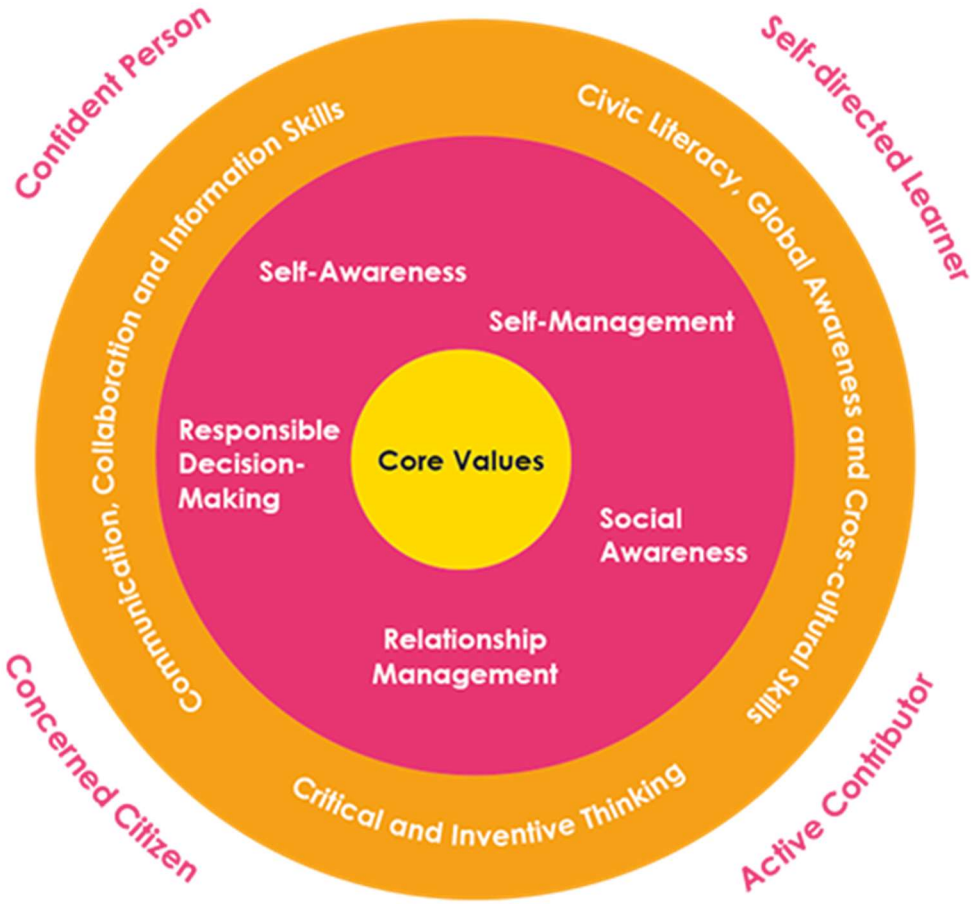


Table 6: Thematic Presence Method for Singapore 21CC Framework

ATT Pedagogic Theme	Most relevant elements of Singapore 21CC Framework	Presence Evaluation
Student-Led	Self-Awareness Self-Management Self-Directed Learner Active Contributor	Noted Presence
Local and Relevant	Civil Literacy, Global Awareness and Cross-cultural Skills Social Awareness Concerned Citizen	Noted Presence
Global/ International Citizenship	Civic Literacy, Global Awareness and Cross-cultural Skills Concerned Citizen	Noted Presence
Process/Cycle		Not Present
Collaboration	Social Awareness Active Contributor Relationship Management Communication, Collaboration and Information Skills	Noted Presence
Student Individuality	Relationship Management Confident Person Self-Awareness	Noted Presence
Flexibility with Disciplines	Civic Literacy, Global Awareness and Cross-cultural Skills	Limited Presence

The thematic presence method reveals a more complex picture for the Singapore 21CC Framework than for the Eco-Schools Educational Principles. The majority of pedagogic themes have "Higher-Level presence" in the Singapore 21CC Framework, but *flexibility with disciplines* was found to only have "Lower-Level Presence" (in one of the 12 elements), and *process/cycle* was found to be "not present". When added to the coverage approach for the same framework, this helps us to see the precise difference with the ATT.

If we consider Table 2 in the Methodology (see section 2.2.1), we find that **Focused on Conceptual Understanding** (the ATT principle for which "no coverage" exists in the Singapore 21CC Framework) has "explicit links" with *student-led*, *process/cycle*, and *flexibility with disciplines*. The thematic presence method reveals that *student-led* is present to a noted level in this alternative framework, but *process/cycle* is "not present" at all, and *flexibility with disciplines* has only "Lower-Level Presence". This combination of approaches thus reveals that the reason the Singapore 21CC Framework does not have coverage of **Focused on Conceptual Understanding** is because that alternative framework does not prioritise disciplinary flexibility to the same extent as the ATT, and does not discuss the processes and cycles of teaching and learning.

The fact that the Singapore 21CC Framework does not contain the theme *process/cycle* also adds depth to our understanding of why that framework only has "partial coverage" of the

ATT's **Based on Inquiry** and **Informed by Assessment**. Table 2 shows that *process/cycle* has "explicit links" with those principles; its absence in the alternative framework would, therefore, make "full coverage" in those areas less likely.

3.2.2.3 Thematic Presence Method – Case Study: Singapore Pedagogic Principles

The coverage approach (Appendix 3) revealed that the Singapore Teaching Practice Pedagogic Principles contains "full coverage" of the ATT's **Based on Inquiry, Focused on Effective Teamwork and Collaboration**, and **Informed by Assessment**. "Partial coverage" was found for **Focused on Conceptual Understanding**, **Developed in Local and Global Contexts**, and **Designed to Remove Barriers to Learning.**

Table 7 demonstrates the extent to which the pedagogic themes identified from the ATT are present in the Singapore Teaching Practice Pedagogic Principles. Figure 11 first shows what the contents of the Singapore Pedagogic Principles are.

Figure 11: Singapore Pedagogical Principles

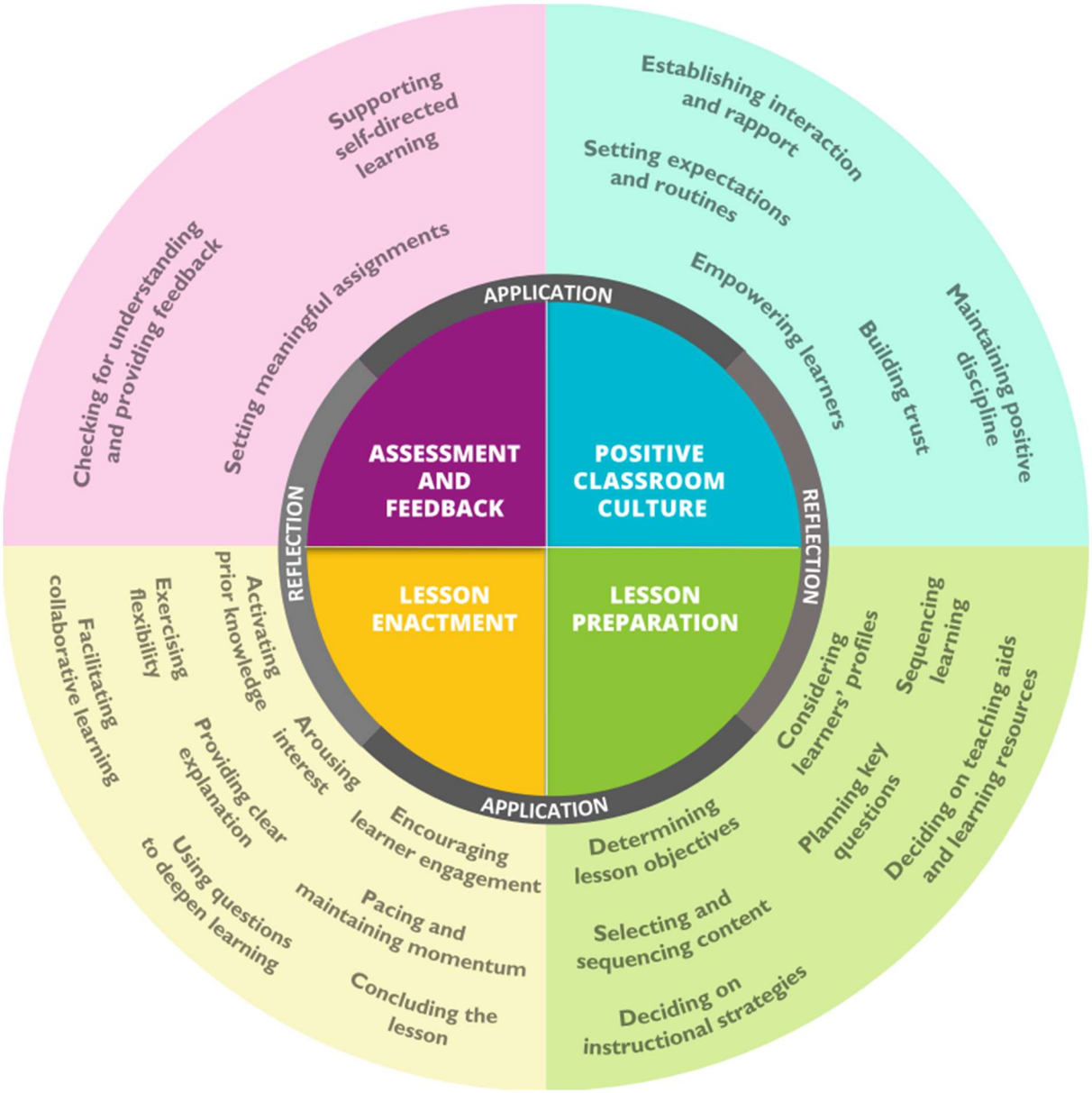


Table 7: Thematic Presence Method for Singapore Pedagogical Principles

ATT Pedagogic Theme	Most relevant elements of Singapore Pedagogic Principles	Presence Evaluation
Student-Led	Empowering learners Encouraging learner engagement Activating prior knowledge Supporting self-directed learning	Noted Presence
Local and Relevant	Considering learners' profiles Arousing interest Encouraging learner engagement Activating prior knowledge	Noted Presence
Global/ International Citizenship		Not Present
Process/Cycle	Sequencing learning Planning key questions Pacing and maintaining momentum Using questions to deepen learning Checking for understanding and providing feedback	Limited Presence
Collaboration	Establishing interaction and rapport Maintaining positive discipline Building trust Facilitating collaborative learning Supporting self-directed learning	Noted Presence
Student Individuality	Setting expectations and routines Building trust Considering learners' profiles Deciding on instructional strategies Pacing and maintaining momentum Arousing interest Exercising flexibility Activating prior knowledge Checking for understanding and providing feedback Setting meaningful assignments	Noted Presence
Flexibility with Disciplines	Selecting and sequencing content Exercising flexibility	Noted Presence

The coverage analysis for the Singapore Teaching Practice Pedagogic Principles (Table 4, above) found three ATT principles that only had "partial coverage". The thematic presence method has only found two themes without "Higher-Level presence": *global/international citizenship* (found to be "not present") and *flexibility with disciplines* ("Lower-Level Presence").

The absence of *global/international citizenship* in the Singapore Teaching Principles adds to our understanding of why there is only "partial coverage" of **Developed in Local and Global Contexts**. Moreover, the theme also has "implicit links" with the other ATT principles only partially covered by this alternative framework. It is also interesting to note that although the ATT principle **Designed to Remove Barriers to Learning** is only partially covered by the Singapore Teaching Principles, the pedagogic theme most explicitly linked to it (s*tudent individuality*) is present to a noted level in this alternative framework. This underscores the difference between coverage of the ideas behind the ATT, and coverage of the specific wording of the principles.

Table 8 draws together the findings from the thematic presence method being applied to all seven alternative frameworks, including the case studies discussed above.

Table 8: Summary of Thematic Presence Method for all Alternative Frameworks

Key: Noted Presence / Limited Presence / No Presence	Student-Led	Local and Relevant	Global/ International Citizenship	Process/Cycle	Collaboration	Student Individuality	Flexibility with Disciplines
ATS2020 Transversal Skills	Noted	Limited	Limited	Noted	Noted	Noted	Noted
Cambridge Learner Attributes	Noted	Noted	Noted	Noted	Noted	Noted	Noted
Eco-schools Educational Principles	Noted	Noted	Noted	Noted	Noted	Noted	Noted
European Commission Key Competences for Lifelong Learning	Noted	Noted	Noted	Noted	Noted	Noted	Noted
NAEYC Developmentally Appropriate Practice Guidelines for Effective Teaching	Noted	Noted	Limited	Noted	Noted	Noted	Noted
P21 Framework for 21st Century Learning	Noted	Noted	Noted	Noted	Noted	Noted	Noted
Singapore 21CC Framework	Noted	Noted	Noted	No	Noted	Noted	Limited
Singapore Teaching Practice Pedagogical Practices	Noted	Noted	No	Noted	Noted	Noted	Limited

This table supports the general finding of the coverage approach (Table 4), which is that the contents of the ATT are consistently strongly covered by alternative frameworks. Areas of "no presence" and even "Lower-Level Presence" are few in number. Specifically, this table shows us that of all the pedagogic themes identified in the ATT principles, *global/international citizenship* is the least consistently present in alternative frameworks, though it is still present in more than half of those analysed here. This table also reveals that four of the eight frameworks contain "noted presence" of all ATT pedagogic themes, and none has no or limited thematic presence in more than two areas. As the case studies discussed above make clear, by putting these thematic findings alongside the coverage approach findings, it is evident that in some places where the specific wording of the ATT and alternative frameworks would lead

us to see divergence, the thematic evidence reveals that often the same ideas are still underpinning both. Put differently, just because there is no overlap in exactly how the ATT and some alternative frameworks describe and structure their priorities, it does not mean they do not have a shared foundation in pedagogic theory.

> **Finding 2**: Similarities in underlying themes of the ATT and alternative frameworks – Use of a thematic approach in the literature review found that whilst the frameworks differ in their wording, there are strong similarities in the pedagogic themes they address. These themes, underpinning the ATT, are consistently strongly covered by alternative frameworks, although coverage varies from theme to theme, with Global/International Citizenship being the least consistently present in other frameworks.

3.2.3 "Gap" Analysis

Thus far, the coverage approach and the thematic presence method have been used to identify where (and to what extent) the alternative frameworks contain the substance of the ATT; we will now use "gap" analysis to identify where (and to what extent) the alternative frameworks contain substance that the ATT does not. The "gap" analysis first seeks to explore where there is coverage of alternative framework elements in the ATT, then – a second step – it applies the pedagogic themes to those identified "gaps" in order to test the extent to which "gaps" are in underlying pedagogy or simply in the wording of principles/elements.

By comparing the alternative frameworks to the ATT element-by-principle, the potential outcomes of the "gap" analysis are:

Full Coverage: an ATT principle contains the substantive meaning of an alternative framework element.

Partial Coverage: an ATT principle contains a partial amount of the meaning of an alternative framework element.

No Coverage: the ATT principle contains no coverage of the meaning of an alternative framework element.

"Gap" analysis tables for each alternative framework are available in Appendix 5. In order to demonstrate the process through which the "gap" analysis was carried-out one of the alternative frameworks was selected; the NAEYC's DAP guidelines were chosen to demonstrate this due to their concise nature and exhibiting a clear gap. Table 9 demonstrates the findings of applying "gap" analysis but Figure 12 first shows how the DAP Guidelines are structured.

Figure 12: NAEYC's DAP Guidelines

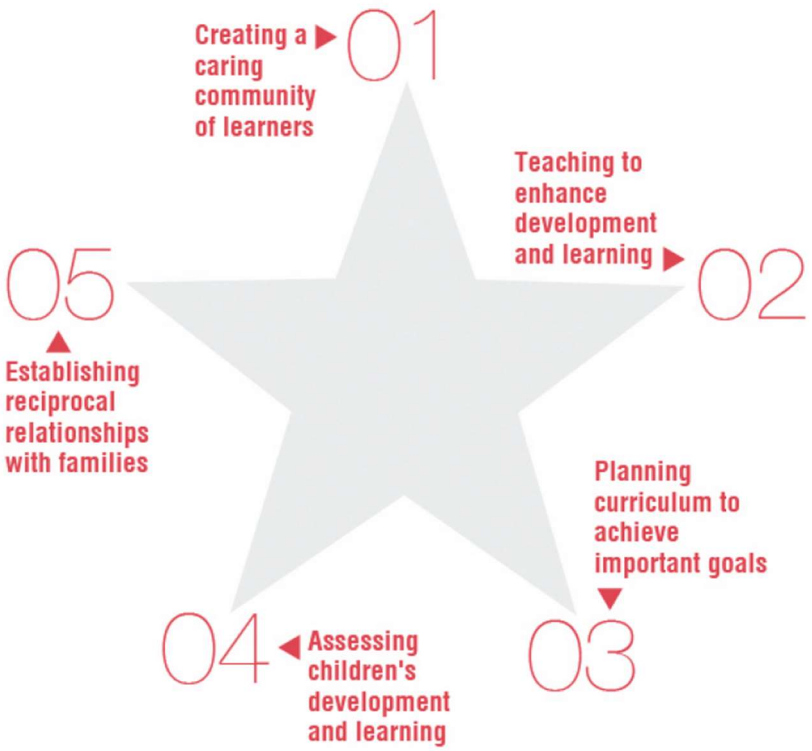


Table 9: "Gap" Analysis for DAP Guidelines

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Creating a Caring Community of Learners			∗	∗	∗	
Teaching to Enhance Development and Learning	∗	∗		∗	∗	∗
Planning Curriculum to Achieve Important Goals		∗	∗			
Assessing Children's Development and Learning					∗	∗
Establishing Reciprocal Relationships with Families						

The five elements of the DAP Guidelines are supplemented by a substantial descriptive document which details the contents behind the brief titles of the elements. By closely reading this document and mapping the presence of contents of the ATT within it, it was found that four of the five DAP elements have "partial coverage" in one or more ATT principle. For instance, "Assessing Children's Development and Learning" was found to have "partial coverage" in **Informed by Assessment** and **Designed to Remove Barriers to Learning**. This is based on the fact that the extended DAP Guidelines documents tells us that "Assessing Children's Development and Learning" involves continuous processes of assessment and feedback (thus tallying with **Informed by Assessment**) and "When a screening or other assessment identifies children who may have special learning or developmental needs, there is appropriate follow-up, evaluation, and, if indicated, referral" (thus tallying with **Designed to Remove Barriers to Learning**). Neither of the ATT principles covers the entire meaning of the DAP element in their own right, but they each contain "partial coverage"; this means that "Assessing Children's Development and Learning" is not a "gap" in the ATT.

On the other hand, "Establishing Reciprocal Relationships with Families" has been identified as a "gap" in the ATT compared to the DAP Guidelines. It is arguable that the ATT principle

Focused on Effective Teamwork and Collaboration could have some overlap with this element of the DAP Guidelines (as relationships between teachers and families involves a form of cooperation); however, the extended description of **Focused on Effective Teamwork and Collaboration** explicitly mentions teachers and students without including families. Also, it is plausible that **Developed in Local and Global Contexts** might involve attention to a student's family – however, this is not directly described by any further elaboration of the ATT principle. Because the DAP Guidelines are specifically focused on young children, the closer involvement of families, and their consultation throughout the teaching process, may be a higher priority in this framework than it would be for the IB ATT and its K-12 applicability.

As this case study demonstrates, although a "gap" has been identified through this method, there are still aspects of the ATT which come close to overlapping with this element of an alternative framework. The wording of the ATT principles does not concretely show coverage, but we can use the pedagogic themes identified within the ATT to consider whether or not similar theories of teaching and learning bridge the "gap" between the ATT and the alternative framework element.

Table 10 lists all of the alternative framework elements (across seven of the eight alternative frameworks) which have been identified as gaps in ATT coverage, and shows how each relates (or does not relate) to the pedagogic principles identified in the Methodology of this report. It is important to reiterate that the ATT sits inside a broader structure involving the Approaches to Learning, the LP, and other key elements of the IB education such as International Mindedness, meaning that aspects of the alternative frameworks not covered by the ATT may nonetheless be covered by one of these other elements

Table 10: Thematic Analysis of Identified "Gaps"

Alternative Framework Element Identified as a "Gap" in the ATT	ATT Pedagogic Theme with Likely Overlap	Aspects of "Gap" Element Remaining without Coverage
ATS2020: Communicate Information and Ideas Effectively to Multiple Audiences Using a Variety of Media and Formats	*Global/International Citizenship*: The idea of "communicating…effectively to multiple audiences" is one that may overlap with the qualities teaching seeks to develop when it is focused on g*lobal/international citizenship*. *Collaboration*: Communication and interactions with multiple audiences are related to a broad understanding of *collaboration*. *Flexibility with Disciplines*: The "variety of media and formats" and the "multiple audiences" referenced in this element may imply the need to work across multiple subject areas at once, and hence deploy *flexibility with disciplines*.	The reference to "a variety of media and formats" is inevitably more precise than the ATT principles or pedagogic themes can directly and explicitly cover as they are both more general and smaller in number than the elements of the ATS2020 Transversal Skills Framework.
ATS2020: Innovate and Creatively Use Tools and Resources	*Student-Led*: Student creativity could be interpreted as being a student-centred process. *Student Individuality*: The nature of the creativity of a particularly student would be likely shaped by the individual profile of that student. *Flexibility with Disciplines*: It is possible that innovation or creativity would involve moving between disciplinary boundaries, but this is not necessarily the case. *Process/Cycle*: Creativity and innovation could be interpreted as multi-stage processes.	The skill of creative innovation is not necessarily embedded in either the wording of the ATT principles or the pedagogic themes which underpin them.
DAP: Establishing Reciprocal Relationships with Families	*Local and Relevant*: The use of *local and relevant* contexts for teaching could be likely to draw upon an understanding of family background. *Student Individuality*: if relationships with families are established on a personal and flexible basis then this may require attention to the individual circumstances of each student. *Collaboration*: A broadly conceived theme of *collaboration* would include collaboration between teachers and families.	None, if the theme of *collaboration* is interpreted broadly.
Eco-Schools: Continuously Explore, Test, and Share Innovative Approaches, Methodologies, and Techniques	*Process/Cycle*: The element clearly demonstrates a cyclical process involving exploring, testing, and sharing. *Collaboration*: The broad idea of sharing is necessarily a collaborative exercise. *Flexibility with Disciplines*: There is an implication in the sustainability context around which this framework is formed, that the "approaches, methodologies, and techniques" may move between traditional disciplinary boundaries.	The specific combination of exploring and collaborating with *innovative* processes is not covered by the ATT.

Alternative Framework Element Identified as a "Gap" in the ATT	ATT Pedagogic Theme with Likely Overlap	Aspects of "Gap" Element Remaining without Coverage
P21: Financial, Economic, Business, and Entrepreneurial Literacy	*Student-Led*: It is possible to interpret an entrepreneurial attitude as being learner-centred in nature. *Local and Relevant*: The areas of literacy identified here could also be described as relevant to living in the 21st century.	None, if the interpretation of relevance within l*ocal and relevant* is broad enough. The specificity of this element is inevitably not described by the necessarily summary ATT principles and themes.
P21: Health Literacy	*Local and Relevant*: Health literacy could be interpreted as a key area of relevant knowledge for students. *Student Individuality*: Understanding health is inevitably a personal process related to individual backgrounds and needs.	None, although precise discussion of health is inevitably too specific for the necessarily summary ATT principles and themes.
P21: Implement Innovations	*Process/Cycle*: One could argue that the implementation of an innovation is bound to be a process with multiple stages. *Flexibility with Disciplines*: It is possible that innovation would involve moving between disciplinary boundaries, but this is not necessarily the case.	The idea of innovation is not explicitly described in the ATT.
P21: Analyse Media	*Local and Relevant*: The ability to analyse media could be argued to be a highly relevant skill in the lives of students. *Flexibility with Disciplines*: The non-specific description of "media" here is likely to imply subject-matters which stretch beyond the limits of traditional disciplines.	Potentially none, though "media" is not something explicitly handled by the ATT principles or the themes underpinning them.
P21: Create Media Products	*Flexibility with Disciplines*: The non-specific description of "media" here is likely to imply subject-matters which stretch beyond the limits of traditional disciplines.	The idea of creativity is not explicitly covered by the ATT, and "media products" are inevitably more precise a description than the necessarily summary ATT principles and themes.
P21: Apply Technology Effectively	*Local and Relevant*: Technology is a highly relevant element of student life in the 21st century.	The effective application of technology (as a distinct idea) is not explicitly covered by the ATT.
Singapore 21CC: Critical and Inventive Thinking	*Student-Led*: Critical thinking and inventiveness could be interpreted as student-centred exercises. *Flexibility with Disciplines*: It is possible that inventiveness would involve moving between disciplinary boundaries, but this is not necessarily the case. *Process/Cycle*: Critical thinking and inventiveness could be interpreted as multi-stage processes.	Inventiveness and critical thinking are both not explicitly covered by either the ATT principles or the underlying pedagogic themes.

Alternative Framework Element Identified as a "Gap" in the ATT	ATT Pedagogic Theme with Likely Overlap	Aspects of "Gap" Element Remaining without Coverage
Singapore PP: Maintaining Positive Discipline	*Collaboration*: It is possible to interpret the maintenance of discipline as a collaborative exercise between student and teacher – but it could also be interpreted purely as an implementation from the teacher. *Student Individuality*: Positive discipline in the classroom may be developed with attention to individual student profiles, though this is only one possible interpretation of how to maintain positive discipline.	This practical classroom technique is not explicitly covered by the more theoretical and general ATT.
Singapore PP: Determining Lesson Objectives	*Collaboration*: It is possible that the process of determining lesson objectives may involve a collaborative exercise between student and teacher – but it could also be interpreted purely as a decision made by the teacher. *Student Individuality*: Lesson objectives may be developed with attention to individual student profiles, though this is only one possible interpretation of how this activity could be practiced.	This specific classroom technique is not explicitly covered by the more theoretical and general ATT.
Singapore PP: Deciding on Instructional Strategies	*Collaboration*: It is possible that the process of deciding on instructional strategies may involve a collaborative exercise between student and teacher – but it could also be interpreted purely as a decision made by the teacher. *Student Individuality*: Instructional strategies may be developed with attention to individual student profiles, though this is only one possible interpretation of how this activity could be practiced.	This specific classroom technique is not explicitly covered by the more theoretical and general ATT.
Singapore PP: Pacing and Maintaining Momentum	*Collaboration*: It is possible that the momentum of a classroom could be jointly established by students and teachers, but this could also be interpreted as something the teacher controls from above. *Student Individuality*: Pacing may be determined with attention to individual student profiles and learner needs, though this is only one possible interpretation.	This specific classroom technique is not explicitly covered by the more theoretical and general ATT.
Singapore PP: Concluding the Lesson		This very practical classroom technique is not specifically discussed by the more general ATT.

The use of the pedagogic themes here, as a secondary level of analysis, demonstrates that a number of areas which appear to be gaps in the ATT (compared to an alternative framework) are in fact covered by the underlying pedagogic themes, despite the precise wording of the ATT not explicitly demonstrating such coverage. An example of this is the DAP Guidelines' "Establishing Reciprocal Relationships with Families", discussed above. The wording of the ATT principles did not demonstrate coverage of this alternative framework element, but by considering that element through the lens of the pedagogic themes, we can see that the

themes *local and relevant*, *student individuality*, and *collaboration*, if interpreted with sufficient breadth, do cover the substantial meaning of "Establishing Reciprocal Relationships with Families".

However, even with the subsequent consideration of the underlying pedagogic themes, there are some areas where alternative frameworks emphasise elements which are not present in the ATT. From the analysis in Table 10, we can see that these gaps fall into three categories:

1. Topic areas of teaching and learning which are too precise to be explicitly mentioned by the ATT.
2. Specific teaching or classroom activities not explicitly mentioned by the ATT, which generalises approaches to teaching at a higher level.
3. Prioritisation of innovation and creativity; not covered by the ATT beyond the fact that these *could* be interpreted as processes and therefore link to the theme *process/cycle*.

The first of these covers alternative framework elements such as ATS2020's "Communicate Information and Ideas Effectively to Multiple Audiences Using a Variety of Media and Formats", and a number from the P21 Framework including "Apply Technology Effectively". The second category covers the gaps stemming from the Singapore Pedagogic Principles such as "Concluding the Lesson". The third category includes elements from the ATS2020, Eco-Schools, P21 Framework, and Singapore CC Framework; for example "Implement Innovations" or "Innovate and Creatively Use Tools and Resources".

Finding 3: Limited gaps between the ATT and alternative frameworks – the "Gap" analysis revealed a limited number of areas in which alternative frameworks contained elements not found within the ATT; the number of "gaps" was reduced when considering them alongside the pedagogic themes underpinning the ATT, but specific, practical classroom activities, certain precise areas of learning, and explicit prioritisation of innovation and creativity remained as "gaps".

Finding 4: Other IB teaching and learning curriculum components may provide coverage of the gaps identified when comparing the ATT to alternative frameworks – the "gaps" discovered through "gap" analysis may be found elsewhere in IB teaching and learning curriculum components, for example in the LP or Approaches to Learning, rather than in the ATT.

3.3 The ATT and Evidence from Pedagogic Literature

Thus far, the coverage approach, thematic presence method, and "gap" analysis have enabled us to develop an understanding of where the ATT is similar and dissimilar to other pedagogic frameworks. This has enabled us to move towards answering research questions *a*, *b*, and *c*. The pedagogic evidence at the root of these alternative frameworks has also allowed this comparison to begin to answer research question *d*. In order to further address that last

question (Are the ATT principles underpinned by strong pedagogic evidence, both individually and collectively?) more attention to theoretical and evidence-based pedagogic literature is required.

3.3.1 The Pedagogic Themes

A substantial amount of pedagogic literature has already been used in this report in the process of linking the ATT principles to the pedagogic themes which underpin them. The process deployed in the Methodology (section 2, above) has already demonstrated that the ATT principles, both individually and collectively, have a **strong relationship to pedagogic evidence**. All of the themes identified in the Methodology, and used throughout this literature review, were named and selected based on not only their relevance to the ATT, but their relevance to pedagogic evidence as described in academic books, journals, and reports related to teaching and learning. As a result, it is clear that the ATT principles are underpinned by strong pedagogic evidence. However, we can understand the pedagogic evidence behind the ATT in more detail by considering the larger underlying theme of constructivism (as well as other broad theories of learning), which supports all other themes deployed in the ATT.

> **Finding 5**: ATT demonstrates a firm foundation in pedagogical evidence – the relationship between the ATT principles and the pedagogic themes demonstrates that the whole ATT and each of its individual parts have a firm foundation in pedagogic evidence.

3.3.2 Constructivism

From an examination of the literature surrounding the pedagogic themes underpinning the IB ATT, it is evident that the epistemological philosophy of constructivism is an important foundation for the IB's approach. There are a small number of references to this fact in IB documentation – for example, the word is used once in both the PYP FPIP and the MYP FPIP.[74] However, the extent to which this is the only epistemological philosophy underpinning the ATT, or the extent to which the IB is fully committed to any particular subcategory of constructivism is impossible to say from explicit statements in the documentation.

Constructivism may be one of the most thoroughly debated topics within pedagogic literature. Its effectiveness and its relationship with inquiry-based learning, student-centred learning, "minimally guided instruction", and other ideas, has been the subject of a substantial number of books and articles.[75] The term "constructivism" can relate broadly to a theory of knowledge acquisition within the scholarly field of the philosophy of mind, or it can be used more precisely to describe a pedagogic principle based loosely on that philosophy.[76] It is not a straightforward

[74] *PYP: From Principles into Practice – Teaching and Learning*, p. 45; *MYP: From Principles into Practice*, 73.
[75] For an overview, see Taber, K. S. (2012). Constructivism as educational theory: Contingency in learning, and optimally guided instruction.39-61.
[76] Bodner, G. M. (1986). Constructivism: A theory of knowledge. *Journal of* chemical education, 63(10), .873-878; Von Glasersfeld, E. (1998). Cognition, construction of knowledge, and teaching. In Constructivism in science education (pp. 11-30). Springer, Dordrecht.121–140.

theory to describe; as one author has put it, "The different associations of constructivism are so diverse, that constructivism in education has been variously seen as progressive, as the basis of current good practice, and as passé".[77] A clear definition may be impossible, but most would agree that the pedagogic approach characterised by constructivism generally invokes the idea that students will build their own understandings through a combination of prior knowledge and scaffolded learning.[78] Constructivism is also associated with a concept-based form of education and one in which all learning takes place in certain contexts because knowledge comes from social construction rather than having objective existence independent of humanity.[79]

The intended outcomes of prioritising a constructivist approach to teaching will vary depending on the definition of the theory. But if it is generally accepted that "Constructivism learning theory holds that learners are active constructors of knowledge meaning, learning subjects", then an approach to teaching which implements this theory will strive to put the learner at the centre of the teaching and learning process.[80] This may involve respecting the uniqueness of each learner and tailoring learning materials appropriately, cultivating learner autonomy, and emphasising cooperation between learners.[81]

> **Finding 6**: Constructivism – it is evident from reading the ATT and considering the pedagogic themes behind them that the epistemological outlook of constructivism is at the root of the ATT; however the extent to which this is made explicit and is expanded upon varies across documents.

3.4 Summary

What follows are brief summaries (framed around the literature review primary research questions, see Introduction) of the reviews of literature and comparison with alternative frameworks.

Similarity and Dissimilarity to other Pedagogic Frameworks

Following the identification of seven alternative frameworks in the Methodology, a coverage approach was employed in order to measure the extent to which ATT principles were covered by the contents of alternative frameworks. Coverage was found to be generally very strong. **Focused on Effective Teamwork and Collaboration** was found to have universal "full coverage", whereas **Based on Inquiry** and **Focused on Conceptual Understanding** were the least well covered due to explicit reference to the inquiry cycle and conceptual

[77] Taber, K. S. (2012). Constructivism as educational theory: Contingency in learning, and optimally guided instruction,40.
[78] Ibid.
[79] Wang, H., (2014). "Learner Autonomy Based on Constructivism Learning Theory". *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*. 8(5). 1552-1554.
[80] Ibid., p. 1553.
[81] Rowe, K. (2006). Effective teaching practices for students with and without learning difficulties: Constructivism as a legitimate theory of learning AND of teaching?. Student Learning Processes, 10.Available at: <https://research.acer.edu.au/cgi/viewcontent.cgi?article=1008&context=learning_processes>.

understanding often not appearing in alternative frameworks. A thematic presence method was subsequently employed, and the ATT pedagogic themes were generally found to be present to a noted level in alternative frameworks. The least consistently present was *global/international citizenship*. Overall, this method demonstrated that some apparent divergence between the ATT and alternative frameworks could be traced to the specific wording of the ATT principles rather than differences in underlying pedagogy, though the international nature of the IB does cause some divergence particularly from national frameworks. A "gap" analysis approach was also deployed, and 16 elements were found in alternative frameworks that were considered neither fully nor partially covered by any ATT principle. A number of these "gaps" were found to receive substantial coverage by one or more ATT pedagogic theme, though three categories still remained: precise topic areas of learning; specific classroom activities; and explicit prioritisation of developing innovation or creativity. Overall, the number of identified "gaps" was very low given the number of elements within alternative frameworks, and mutual coverage was found to be consistently high.

Future-Focused Learning

The thematic breakdown of ATT principles and the review of thematic literature found that future-focused education was embedded in the ATT through its connection to *global/international citizenship*. Analysis of the relationships between ATT principles and pedagogic themes found that g*lobal/international citizenship* was related to four of the six ATT principles. As a theme, *local and relevant* also has the potential to be linked to future-focused education, if the relevance in question corresponds to 21st-century challenges faced by students. That theme was also found to be related to four of six ATT principles, all of which suggests that future-focused learning has a secure place in the ATT. Moreover, comparison with alternative frameworks served to underline this point. Frameworks such as the P21 Framework for 21st Century Learning, Singapore 21CC Framework, ATS2020 Transversal Skills Framework, and Eco-Schools Educational Principles are all explicitly designed to be responses to the modern and future world that students will find themselves in. Through both the coverage approach and thematic presence method, the ATT was found to have significant overlap with such frameworks. Furthermore, "gap" analysis found very few areas where the future-focused emphasis was absent from the ATT, perhaps with the exception of P21's specific discussion of a "Variety of Media and Formats" and P21's "Apply Technology Effectively". Both of these "gaps" can be attributed to the more general nature of the ATT compared to the greater detail found in some alternative frameworks. Overall, evidence analysed here suggests that future-focused learning is firmly embedded in the ATT.

Finding 7: Future-focused learning is effectively articulated and facilitated in the ATT – the ATT's focus on Global/International Citizenship and the similar features it shares with other explicitly future-focused alternative frameworks provide strong evidence to suggest that future-focused learning is effectively articulated in, and facilitated by, the ATT.

The K-12 Continuum

The literature reviewed during the process of creating the list of pedagogic themes contained in the ATT drew upon evidence from all years of school-age education. It is therefore clear that the efficacy of the pedagogic theory underpinning the ATT is evidenced in studies drawing on the entire K-12 continuum. Furthermore, the alternative pedagogic frameworks identified for comparison here have relevance for a wide array of age ranges, including those also designed for K-12 as well others implemented on more limited age groups. The consistently strong overlap between the ATT and these alternative frameworks is therefore further evidence of the ATT's coherency for the entire K-12 continuum. For example, precisely the same level of coverage was found when comparing the ATT with the (K-12) European Commission Key Competences for Lifelong Learning and the (highly age-specific) NAEYC Developmentally Appropriate Practice Guidelines for Effective Teaching.

Finding 8: Suitability of the ATT for the K-12 continuum – the pedagogic evidence underpinning the identified themes, and the similarities between the ATT and alternative frameworks with a range of targeted age groups, provides strong evidence to suggest that the ATT contains effective and coherent pedagogy for the entire K-12 continuum.

Pedagogic Evidence

Part of the pedagogic evidence examined in this literature review has comprised of the alternative frameworks themselves. Each has been developed out of pedagogic theory, and the ATT's substantial similarities with them thus indicate the likelihood that the ATT also has a strong foundation in pedagogic evidence. This is corroborated by the extensive review of literature which formed part of the process of developing the list of pedagogic themes within the ATT. Each of these themes was developed out of a combination of reviewing pedagogic evidence in academic books, journals, and reports, as well as deconstruction of the ATT and IB documentation. Finally, it has been demonstrated that the overall theme of constructivism – which is one of the most widely analysed and evidence-laden theories of education – underpins all of the themes within the IB ATT. In combination with the fact that the ATT principles have been shown to relate to numerous pedagogic themes, and those themes closely interrelated with one another, we can conclude that the pedagogic underpinning of the ATT is also internally coherent and mutually reinforcing.

Finding 9: The ATT has a coherent evidential base: the pedagogic evidence examined in regards to the themes underpinning the ATT principles, the substantial similarities between the ATT and alternative pedagogic frameworks, and the relevance of umbrella learning theories such as constructivism, all indicate that the ATT is supported by a coherent evidential base.

4. Document audit

4.1 Introduction to the document audit

The document audit brings together Research Questions 2 and 3 which focus on the alignment and integration of the ATT principles in IB documentation.

Multiple methods have been used to address the inherent challenges of building an understanding of the alignment and integration of the ATT principles across a wide range of documentation which spans multiple purposes, structures and formats. This introduction to the document audit recaps on the research questions and also the approaches used to analyse the documentation. Following this introductory section, the findings of the document audit are delineated by research question and structured in the following manner:

- Alignment of the IB ATT with the Learner Profile
- Alignment of the IB ATT with the Approaches to Learning
- Comparing the ATT with the Aims of Programmes
- Indirect Mapping of Selected ATT Principles Using Pedagogic Themes

4.1.1 Introduction to Research Question 2

Research Question 2 comprises of the audits of the individual IB programme goals and other IB curriculum components: IB Approaches to Learning (ATL) and IB Learner Profile (LP). Three research questions were derived from Research Question 2 in order to address each document:

Research Question 2: Collectively, to what extent do the IB ATT pedagogical principles:

a) Align with and support the stated goals of individual IB programmes?
b) Align with and support IB Approaches to Learning (ATL)?
    i. Is the relationship between the ATT and Approaches to Learning (ATL) logical, consistent and complete?
c) Align with and support the IB Learner Profile (LP)?
    i. Is the relationship between the ATT and Learner Profile (LP) logical, consistent and complete?

In order to allow for comparison from a number of different perspectives and to also analyse similarities and dissimilarities at both the linguistic and conceptual level, the coverage approach, gap analysis and thematic presence methods were modified and used to answer parts *b* and *c* of Research Question 2. Below is an explanation of how these three methods have been applied to Research Question 2:

Coverage approach: This method seeks to evidence of the extent to which the content of ATT principles can be found in the IB Learner Profile (LP) and Approaches to Learning (ATL). This approach takes each individual ATT principle and compares it with the entire body of the Learner Profile (LP) and Approaches to Learning (ATL).

Gap analysis: A reversal of the coverage approach, it explores the extent to which the Learner Profile (LP) and Approaches to Learning (ATL) contain elements not addressed by any ATT principle.

Thematic presence method: Using the identified pedagogical themes (see section 2.2.1) which reveal the ideas behind the ATT's specific wording, the thematic presence method supplements the coverage approach and allows a better understanding the extent to which the ideas behind the ATT are also present in the Learner Profile (LP) and Approaches to Learning (ATL). Conceived as a way to complement the coverage approach and verify the results of the gap analysis, this approach identifies whether "gaps" identified in the ATT are due to different 'economies of words' between the ATT, LP and Approaches to Learning, or alternatively due to differing underlying ideas and priorities.

With reference to the stated programme goals, the comparative approaches employed to examine the alignment between the ATT and the ATL and LP (Coverage Approach, Gap Analysis, and Thematic Presence Method) would not be appropriate methods. Instead, we have developed a bespoke approach, using the seven pedagogic themes identified within the Approaches to Teaching and extracting key paragraphs from programme documents which state the goals of specific programmes. This enables the stated goals of programmes to be fully explored in reference to the pedagogic themes, and therefore the core ideas and pedagogic content of the ATT.

4.1.2 Introduction to Research Question 3

Research Question 3 comprises of the audits of the selected IB programme curricular documents. Four individual research questions were derived from the over-arching research question with the aim of guiding the analysis:

Research Question 3: To what extent are the selected ATT principles (**Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**) integrated effectively in programme curricular documents?

a) To what extent are the ATT principles highlighted in the curricular documents?
   i) Based on a review of the programme level documents and core guides, do programme subjects/core components collectively integrate the ATT principles?
b) Does articulation of the ATT principles align within programmes?
c) Does articulation of ATT principles align across programmes?
d) To what degree do IB curricular documents clearly articulate the relationship between the ATT principles with other key elements of an IB education? For example, the IB Learner Profile (LP) and international mindedness (IM).

Contrary to Research Questions 1 and 2, Research Question 3 was not answered using the coverage approach, gap analysis and thematic presence method. Three unique mapping techniques were developed and their combined results were used in order to answer Research Question 3:

1. **Mapping direct references to the ATT**. This method searches throughout the text of IB documentation for any explicit references to the "Approaches to Teaching", and/or the title of either selected principle – i.e. the phrases "Based on Inquiry" or "Focused on Effective Teamwork and Collaboration". This method is not expected to yield a large number of results, but it is an important first stage in considering direct discussion of the ATT and the selected principles.

2. **Mapping keywords related to the selected principles**. Between the direct and indirect levels of mapping lies this keyword approach. As all IB documents are either available in pdf or HTML format, they are fully text searchable. It is therefore possible to carry out word searches for terms inherently linked to the principles in question. For **Based on Inquiry,** these terms would be "inquiry" (and any of its iterations[82]) and "question" (and any of its iterations). For **Focused on Effective Teamwork and Collaboration,** these terms would be any iteration of "team", "collaboration", or "cooperation". Use of these keywords is highly likely to indicate that although no explicit reference has been made to the title of the principle in question, the same terminology and therefore similar ideas can be found in the text.
3. **Mapping the identified pedagogic themes at sentence level**. This third level of mapping seeks to uncover indirect references to the selected ATT principles by looking for evidence of the pedagogic themes which relate to them.[83] Each IB document is split into subsections (identified on the contents page), generally of 1-10 pages in length. This method will seek to document whether or not each subsection of the audited documents contains indirect reference to the ATT selected principles. This will be ascertained by mapping the pedagogic themes at a sentence level. The sentence-level findings will then be cross-referenced with the known relationships between themes and principles.[84] If a subsection of an IB document is found to contain clear references[85] at sentence level to relevant pedagogic themes, then the subsection will be deemed to contain an indirect reference to the ATT principle. The use of pedagogical themes as a medium through which to uncover references to ATT principles is, by its nature, indirect referencing and therefore will not generate results which can be deemed to be a direct reference to an ATT principle. As this method is slightly more complex than the first two mapping approaches, examples of the mapping at sentence level and document level are demonstrated below.

[82] Such iterations include any word deriving from the same stem – for example, in the case of "inquiry" this would include "inquirer", "inquisitive", "inquiring", "inquiries" etc. All of these can be caught by the same word-search for the common stem of such words – i.e. "inqui". The same process can be followed for the other keywords in question – e.g. "question", "collaborat", "cooperat", and "team".
[83] In part 2.4 of the Methodology seven pedagogic themes which underpin the IB ATT principles have been identified.
[84] The relationships between themes and principles are tabulated in the Methodology section of the report, and described in detail in Appendix 2. They are repeated here in Table 2, below.
[85] Clarity of thematic reference can only be judged qualitatively, using familiarity with what the pedagogic themes mean and what teaching/learning ideas are related to them. Such details are described at length in the Methodology section of the report. An example of interpretation is provided for the IB Mission Statement, below.

4.2 Alignment of the IB ATT with the Learner Profile

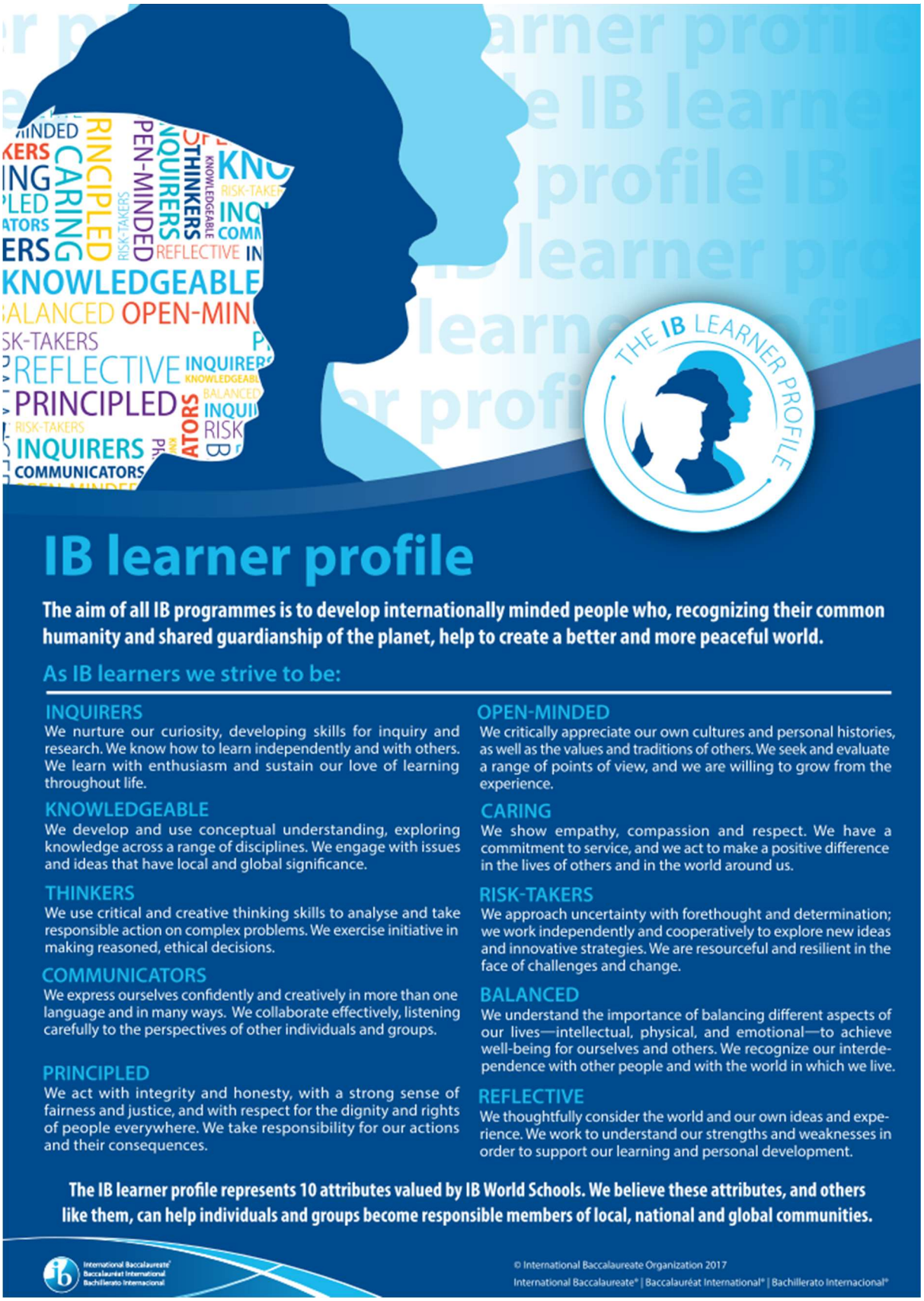
The IB Learner Profile (LP) is articulated at the start of most IB curricular documents. It is an aspirational list of attributes that the IB hopes to develop in all of its students across every programme.[86] Each attribute is also accompanied by a short description.

The ATT can be compared to the LP by treating the LP as an alternative framework (much like the alternative pedagogic frameworks discussed at length and compared to the ATT in the Literature Review of this report). In so doing, we can deploy the coverage approach, thematic presence method, and "gap" analysis, thereby facilitating an understanding of where there are overlaps between the ATT and the LP, and where they contain differing (though potentially complementary) elements. The LP itself is presented in Figure 13.[87] The coverage approach, which examines the extent to which the LP attributes contain coverage of the contents of the ATT principles, is presented in Table 11. Please note that detailed discussion of the methodologies for these table-based approaches can be found in the Methodology section of this report (see section 2.3.4).

It is important to state at the outset that we would expect to find some divergences between these two curriculum components, as comparing a six-part teaching approach and a 10-part learner-profile is not comparing like-with-like. Divergences found at this stage do not, therefore, reflect faulty construction in either the ATT or the LP, merely different emphases of content and structure. Nevertheless, this is a useful methodology for comparison as it allows us to consider the similarities and differences between the ATT and LP from multiple perspectives.

[86] See the description of the LP in *WIAIBE?*, p. 3.
[87] Visualisation lifted from *WIAIBE?*, unpaginated preface.

Figure 13: IB Learner Profile



4.2.1 Coverage Approach – Comparing IB LP and IB ATT

Table 11 demonstrates that the IB LP contains coverage of the ATT principles to a substantial degree. There is no ATT principle which does not at least have "partial coverage" in the LP attributes, and **Focused on Conceptual Understanding**, **Developed in Local and Global Contexts**, and **Focused on Effective Teamwork and Collaboration** all have "full coverage" – meaning that the core elements of those principles are found within the LP attributes. Due to the fact that the LP does not explicitly mention the construction of understandings, inclusivity or barriers to learning, and assessment, the remaining three ATT principles have only partial coverage in the LP.

Table 11: Coverage Approach – Comparing IB LP and IB ATT

ATT Principle	Most relevant attributes of IB Learner Profile	Coverage evaluation
Based on Inquiry.	• Inquirers • Open-Minded	Partial Coverage Part of the meaning of the ATT principle is covered in the IB Learner Profile. Specifically, the use of inquiry and the finding of students' own information (research). Explicit reference to the constructivist notion of understanding is not covered.
Focused on Conceptual Understanding.	• Inquirers • Knowledgeable • Risk-Takers	Full Coverage The core elements of the ATT principle are covered in the IB Learner Profile, including: conceptual understanding, use of disciplines and the movement between them, and the transferral of learning.
Developed in Local and Global Contexts.	• Knowledgeable • Communicators • Caring • Balanced • Reflective • Open-Minded	Full Coverage The core elements of the ATT principle are covered in the IB Learner Profile, including: the use of local contexts, the interest in global contexts, the connection to students own experiences and to the world around them.
Focused on Effective Teamwork and Collaboration.	• Inquirers • Communicators • Risk-Takers • Balanced.	Full Coverage The core elements of the ATT principle are covered in the IB Learner Profile, including: collaboration and cooperation with a diversity of other individuals and groups.
Designed to Remove Barriers to Learning.	• Communicators • Open-Minded • Reflective	Partial Coverage Part of the meaning of the ATT principle is covered in the IB Learner Profile. Specifically, attention to a student's individual background and identity, and linking this to personal development.

ATT Principle	Most relevant attributes of IB Learner Profile	Coverage evaluation
		Explicit reference to barriers to learning and inclusivity of all students are not covered.
Informed by Assessment.	• Reflective	Partial Coverage Part of the meaning of the ATT principle is covered in the IB Learner Profile. Specifically, supporting learning with a reflective process. Explicit reference to assessment is not covered.

4.2.2 Thematic Presence Method – Comparing IB LP and IB ATT

This evidence begins to build a picture of the LP and ATT having similar core ideas, but with some differences regarding the articulation of precise content, as would be expected with one being designed as a set of pedagogic approaches and the other being an aspirational student profile. This initial finding can be further explored by deploying the thematic presence method (Table 12, below).

Table 12: Thematic Presence Method – IB LP

ATT Pedagogic Theme	Most relevant elements of IB Learner Profile	Presence Evaluation
Student-Led	• Inquirers • Principled • Risk-Takers	Present
Local and Relevant	• Knowledgeable • Open-Minded • Caring -	Present
Global/ International Citizenship	• Knowledgeable • Thinkers • Communicators • Principled • Open-Minded • Caring • Balanced	Present
Process/Cycle	• Inquirers. • Open-Minded • Reflective	Present
Collaboration	• Inquirers. • Communicators • Risk-Takers • Balanced	Present
Student Individuality	• Open-Minded • Reflective	Present
Flexibility with Disciplines	• Knowledgeable • Risk-Takers • Balanced	Present

Table 12 demonstrates that the suggestion from the coverage approach – that the LP contains the general ideas found within the ATT – has been sustained by the thematic presence method. All of the pedagogic themes identified to be in the ATT have been judged to be "present" in the LP too. Each pedagogic theme was found to be channelled by at least three LP attributes.

4.2.3 Gap Analysis – Comparing IB LP and IB ATT

Following both the coverage approach and the thematic presence method it is therefore clear that the 10 attributes of the LP may not prioritise the same specifics as the ATT (this is to be expected, given that one is designed to be a curriculum component for teaching, whereas the other is an aspirational student profile), however, despite differences in phrasing and particular content, the general ideas of the ATT are clearly contained in the LP. What these two methods have not addressed is the extent to which the LP contains elements not present in the ATT, this will now be explored in Table 13 with "gap" analysis.

Table 13: "Gap" Analysis – IB LP

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Learner Profile Attribute with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Inquirers	∗	∗		∗		
Knowledgeable		∗	∗			
Thinkers						
Communicators			∗	∗	∗	
Principled						
Open-Minded	∗		∗		∗	
Caring			∗			
Risk-Takers		∗		∗		
Balanced			∗	∗		
Reflective			∗		∗	∗

Table 13 demonstrates that although the vast majority of LP attributes have some degree of coverage in the ATT principles, there are two LP attributes which emerge as "gaps" when compared to the ATT. These are:

> **Thinkers**: We use critical and creative thinking skills to analyse and take responsible action on complex problems. We exercise initiative in making reasoned, ethical decisions.

> **Principled**: We act with integrity and honesty, with a strong sense of fairness and justice, and with respect for the dignity and rights of people everywhere. We take responsibility for our actions and their consequences.

Regarding "Thinkers", it is arguable that the implications of student autonomy contained within **Based on Inquiry** reflect the suggestion in the LP's "Thinkers" that "we exercise initiative". However, within **Based on Inquiry,** the autonomy in question specifically relates to "finding […] information" and "constructing […] understandings". This is distinctively different from the LP attribute's "initiative in making reasoned, ethical decisions". Moreover, it would be natural to assume some overlap between Thinkers **and Focused on Conceptual Understanding**, as they both describe forms of thought and knowledge development prioritised by the IB. However, **Focused on Conceptual Understanding** explicitly focuses upon concepts, transferral of knowledge to new contexts, and cross-disciplinary learning, none of which can be said to explicitly exist in the definition of "Thinkers". Nonetheless, as stated in the introduction to this section, divergences across the IB curriculum components are not necessarily representative of faulty construction. The curriculum components may emphasise different content or structure, which may indeed be complementary when considering the them together and not in isolation from each other.

Regarding "Principled", it is arguable that the references to "fairness and justice" and "rights of people everywhere" could relate to **Developed in Local and Global Contexts**'s suggestion that students make connections "to the world around them". However, these two ideas are not closely enough aligned to merit the judgment of "Principled" having "partial coverage" in that ATT principle.

4.2.4 Applying the Pedagogic Themes to "Gaps"

As was shown with the alternative frameworks examined in the Literature Review of this report, by applying the pedagogic themes to the identified "gaps" it is possible to learn more about the nature of the difference between these curriculum components. The LP attributes "Thinkers" and "Principled" have overlap with the theme *Student-led*, as that theme contains a broad sense of student "initiative" (found in "Thinkers") and "responsibility" (found in "Principled"). Both attributes also have overlap with *Global/International Citizenship*, because that theme includes making "ethical decisions" (as discussed in "Thinkers") in relation to matters of global significance, and the same can be said for "justice" and "the rights of people everywhere" (as found in "Principled"). It is therefore evident, that although two attributes of the LP appear to have no presence in the ATT when we compare with the six principles, when we instead apply the pedagogic themes underpinning the ATT, we find that those themes serve to bridge the gap between the ATT and the LP.

In summary, these comparisons of the ATT and the LP have demonstrated that there are some deviations in what is prioritised by each. Whereas the ATT more explicitly articulates the construction of understandings, inclusivity or barriers to learning, and assessment, the LP gives more direct emphasis to critical and creative thinking, and principled actions. However, when we look at both from a thematic perspective, we can see that the ATT's pedagogic themes are very much present in the LP. Although they are articulated quite differently, the ATT and LP have significant overlaps in underpinning content.

Finding 10: Relationship between ATT and LP – comparison of the ATT and the LP has demonstrated that there are some deviations in what is prioritised by each. Whereas the ATT more explicitly articulates the construction of understandings, inclusivity or barriers to learning, and assessment, the LP gives more direct emphasis to critical and creative thinking, and principled actions. However, when we look at both from a thematic perspective we can see that the ATT's pedagogic themes are very much present in the LP. Although they are articulated quite differently, the ATT and LP have significant overlaps in underpinning content.

4.3 Alignment of the IB ATT with the Approaches to Learning

The IB Approaches to Learning are "five categories of interrelated skills" which span all IB programmes and seek to support learners in achieving the outcomes associated with an IB education.[88] The relationship between the ATT and the Approaches to Learning is a complex one, as they are sometimes brought together in IB documentation under the umbrella of the Approaches to Teaching and Learning (ATL).[89] Despite this link, the two are also distinguishable as independent curriculum components for teaching and learning respectively.

Using the same methodology deployed for the LP, we will assess the extent to which there is overlap between the Approaches to Learning and the ATT, as well as the extent to which they contain different (though perhaps complementary) elements. The Approaches to Learning are as follows:

> **Thinking skills** – including areas such as critical thinking, creative thinking and ethical thinking.
>
> **Research skills** – including skills such as comparing, contrasting, validating and prioritizing information.
>
> **Communication skills** – including skills such as written and oral communication, effective listening, and formulating arguments.
>
> **Social skills** – including areas such as forming and maintaining positive relationships, listening skills, and conflict resolution.
>
> **Self-management** skills – including both organizational skills, such as managing time and tasks, and affective skills, such as managing state of mind and motivation.[90]

4.3.1 Coverage Approach – Comparing IB ATL and IB ATT

The coverage approach, which examines the extent to which the Approaches to Learning skills contain coverage of the contents of the ATT principles, is presented in Table 14. Table 14 demonstrates that, unlike the LP coverage analysis above (Table 11), there is very little "full coverage" of ATT principles in the Approaches to Learning skills. However, there is also no example of an ATT principle that does not have at least "partial coverage" in the Approaches to Learning. The qualities missing from the Approaches to Learning which cause it to diverge from "full coverage" of the ATT are: prioritisation of inquiry; the constructivist approach to understanding; explicit references to conceptual understanding or moving learning to new contexts; direct mention of local or global contexts; the connection of learning to experience; references to diversity, inclusivity, or barriers to learning; and mention of continuing cycles of assessment and feedback. These are some of the most fundamental qualities of the ATT.

[88] *WIAIBE?*, p. 6.
[89] See International Baccalaureate Organisation, (2014). *Approaches to teaching and learning in the International Baccalaureate (IB) Diploma Programme*.
[90] *WIAIBE?*, pp. 6-7.

Table 14: Coverage approach comparing IB Approaches to Learning and IB ATT

ATT Principle	Most relevant attributes of IB Approaches to Learning	Coverage Evaluation
Based on Inquiry	**Research skills** — including skills such as comparing, contrasting, validating and prioritizing information	Partial Coverage Part of the meaning of the ATT principle is covered in the IB Approaches to Learning. Specifically, the finding of information through research. The prioritisation of inquiry and the construction of understanding are not covered.
Focused on Conceptual Understanding	**Research skills** — including skills such as comparing, contrasting, validating and prioritizing information	Partial Coverage Part of the meaning of the ATT principle is covered in the IB Approaches to Learning. Specifically, making connections (or comparisons and contrasts). Conceptual understanding and explicit reference to the movement of learning to new contexts are not covered.
Developed in Local and Global Contexts	**Social skills** — including areas such as forming and maintaining positive relationships, listening skills, and conflict resolution	Partial Coverage Part of the meaning of the ATT principle is covered in the IB Approaches to Learning. Specifically, skills which may be used in real-life contexts such as conflict resolution. Explicit reference to global or local contexts, and encouragement to connect learning with experience, are not covered.
Focused on Effective Teamwork and Collaboration.	**Communication skills** — including skills such as written and oral communication, effective listening, and formulating arguments **Social skills** — including areas such as forming and maintaining positive relationships, listening skills, and conflict resolution	Full Coverage The core elements of the ATT principle are covered in the IB Approaches to Learning, including: the development of skills such as communication which would be vital to enabling collaboration, and the

ATT Principle	Most relevant attributes of IB Approaches to Learning	Coverage Evaluation
		ability to maintain relationships which would enable teamwork.
Designed to Remove Barriers to Learning	**Self-management skills** — including both organizational skills, such as managing time and tasks, and affective skills, such as managing state of mind and motivation.	Partial Coverage Part of the meaning of the ATT principle is covered in the IB Approaches to Learning. Specifically, self-management which would require engagement with one's own personal identity and nature as a learner. Reference to barriers to learning, and diversity or inclusivity, are not covered.
Informed by Assessment	**Self-management skills** — including both organizational skills, such as managing time and tasks, and affective skills, such as managing state of mind and motivation.	Partial Coverage Part of the meaning of the ATT principle is covered in the IB Approaches to Learning. Specifically, the management of time and skills which would require some form of personal reflection or external feedback. Explicit reference to assessment and ongoing feedback are not covered.

4.3.2 Thematic Presence Method – Comparing IB ATL and IB ATT

The only ATT principle with "full coverage" in the Approaches to Learning skills is **Focused on Effective Teamwork and Collaboration**. This evidence is thus suggestive that although there are some areas of overlap between the ATT and the Approaches to Learning, there is also a high level of divergence. In order to understand the nature of this divergence in more detail we can use the thematic presence method of comparison (Table 15, below).

Table 15: Thematic Presence Method for IB Approaches to Learning

ATT Pedagogic Theme	Most relevant elements of IB Approaches to Learning	Presence Evaluation
Student-Led	**Self-management skills** — including both organizational skills, such as managing time and tasks, and affective skills, such as managing state of mind and motivation.	Present
Local and Relevant		Not Present
Global/ International Citizenship	**Communication skills** — including skills such as written and oral communication, effective listening, and formulating arguments **Social skills** — including areas such as forming and maintaining positive relationships, listening skills, and conflict resolution	Present
Process/Cycle		Not Present
Collaboration	**Communication skills** — including skills such as written and oral communication, effective listening, and formulating arguments **Social skills** — including areas such as forming and maintaining positive relationships, listening skills, and conflict resolution	Present
Student Individuality	**Self-management skills** — including both organizational skills, such as managing time and tasks, and affective skills, such as managing state of mind and motivation.	Present
Flexibility with Disciplines		Not Present

Table 15 demonstrates that the mixed picture of similarities and divergence established by the coverage approach is sustained by the thematic presence method. Moreover, the specific nature of where the Approaches to Learning diverge from the ATT is clarified through these results. Table 15 shows that whereas the skills described in the Approaches to Learning do contain the themes *Student-Led*, *Global/International Citizenship*, *Collaboration*, and *Student Individuality*, they do not contain the themes *Local and Relevant*, *Process/Cycle*, and *Flexibility with Disciplines*.

4.3.3 Gap Analysis Comparing – IB ATL and IB ATT

With the fact now established that the Approaches to Learning contain significant differences from the ATT – not only in phrasing but also in underpinning content – it is important to carry-

out "gap" analysis in order to see what the Approaches to Learning may contain that is not present in the ATT. That analysis is visualised in Table 16, below.

Table 16: "Gap" Analysis for IB Approaches to Learning

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage ATL Skill with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Thinking Skills						
Research Skills	∗	∗				
Communication Skills				∗		
Social Skills			∗	∗		
Self-Management Skills					∗	∗

Table 16 demonstrates that despite the fact that three of the seven pedagogic themes found to underpin the ATT were judged to be "not present" in the Approaches to Learning, there is only one Approaches to Learning skill that can be identified as a "gap" in the ATT. The skill in question is: "**Thinking skills** – including areas such as critical thinking, creative thinking and ethical thinking".

4.3.4 Applying the Pedagogic Themes to "Gaps"

As with the alternative frameworks examined in the Literature Review of this report, by applying the pedagogic themes to the identified "gaps", it is possible to learn more about the nature of the differences between the ATT and the ATL.

Thinking Skills has emerged as the only true "gap" when compared to the ATT. However, if we consider the pedagogic themes rather than the specific wording of the ATT principles, then we can see some overlap with the ATL's Thinking Skills. The pedagogic theme *Global/International Citizenship* has a relationship with the idea of "ethical thinking", which is one component of the description of Thinking Skills. *Global/International Citizenship* is often linked to the making of ethical decisions which may relate to the treatment of other people or issues of global scale such as sustainability.[91]

It is also possible to link Thinking Skills to the pedagogic theme *Process/Cycle* because "critical thinking" could be viewed as inherently requiring an analytical *process*, which involves moving through multiple stages of thought. Thinking Skills could also be linked to the

[91] See Literature Review, section 3.

pedagogic theme *Student-Led*, because "creative thinking" – a part of Thinking Skills' definition – implicitly suggests a level of student ownership over a creative process. Creativity cannot be simply delivered by a teacher; it is inherently a learner-centred activity. However, such links are not unambiguous; rather, they are a matter of interpretation. It is therefore the case that at least some substantial aspects of the Approaches to Learning's "Thinking skills" can be interpreted as a "gap" in the ATT.

In summary, these tables demonstrate that there is more divergence between the ATT and the Approaches to Learning than between the ATT and the LP. Although there are some areas where ATT principles or the pedagogic themes are covered by the Approaches to Learning skills, there are also substantial differences. Moreover, "Thinking skills" is an element of the Approaches to Learning that has significant components not covered by either the ATT principles or pedagogic themes.

Overall, the findings of similarities and divergences between the ATT and the LP or Approaches to Learning are not value judgments on the effectiveness or otherwise of these curriculum components. As the *What is an IB Education?* document clearly articulates, these three curriculum components are intended to be delivered in combination across all IB programmes.[92] Areas of dissimilarity between them are thus simply different emphases, with the potential to add to the breadth of ideas used in IB education.

The fact that there are multiple similarities can be viewed as a strength of these curriculum components, because they create a joined-up series of ideas that IB teachers can draw upon. Whether they approach their practice through the ATT (how IB teaching should be delivered), the LP (what IB learners should develop towards), or the Approaches to Learning (the skills IB students should use), teachers will find themselves being guided towards many of the same ideas within pedagogic theory. However, the fact that there are also some differences between the ATT, LP, and Approaches to Learning can also be viewed as a strength. If all three curriculum components guided teachers towards exactly identical notions then there would be no need to have more than one. As the analysis above has demonstrated, teachers will be adding to their pedagogic repertoire by understanding and using all three curriculum components rather than only one. Using the ATT as a starting point (as that is the focus of this report), we can see that adding the LP and the Approaches to Learning would mean adding extra emphasis on encouraging principled behaviour and on critical and creative thinking.

It is interesting to note that the elements of the LP and the Approaches to Learning which were found to be "gaps" in the ATT were quite similar. The wording of the descriptions of the LP's "Thinkers" and "Principled" are notably comparable to the Approaches to Learning's "Thinking skills". Moreover, if we consider the "gaps" identified by the alternative framework analysis in the Literature Review of this report, we find that one of the most notable areas covered by some alternative pedagogic frameworks but not covered by the ATT was the prioritisation of creativity.[93] It is therefore evident that the LP and Approaches to Learning provide strong coverage of an area of pedagogy not covered by the ATT but by some alternative frameworks. Thus, if the alternative international frameworks were analysed against the combination of the ATT, LP, and Approaches to Learning (which are intended to be delivered together), then the

[92] *WIAIBE?*, p. 1.
[93] See Literature Review, page 53.

same gaps in innovation and creativity (ideas found within the LP's Thinkers and the ATL's Thinking Skills) would not have been found. A provisional conclusion to draw from this analysis is, therefore, that the ATT, LP, and Approaches to Learning not only function as teaching and learning curriculum components in their own right, but they also mutually reinforce one another by covering many of the same core ideas, while simultaneously providing their own specific focuses.

Finding 11: Relationship between ATT and Approaches to Learning – there is more divergence between the ATT and the Approaches to Learning than between the ATT and the LP. Although there are some areas where ATT principles or the pedagogic themes are covered by the Approaches to Learning skills, there are also substantial differences. Moreover, "Thinking skills" is an element of the Approaches to Learning that has significant components not covered by either the ATT principles or pedagogic themes.

Finding 12: Overall, IB Curriculum Components – the ATT, LP, and Approaches to Learning not only function as teaching and learning guidelines in their own right, but they also mutually reinforce one another by covering many of the same core ideas, but also providing their own specific focuses.

4.4 Comparing the ATT with the Aims of Programmes

As part of the response to Research Question 2, UK NARIC analysts sought to examine the extent to which the collective IB ATT pedagogical principles align with and support the stated goals of individual IB programmes.

One feature that all IB programmes share, as a goal, is the development of International Mindedness among students. Because this is relevant to the PYP, MYP, DP, and CP, the definition of International Mindedness (offered concisely and clearly in *What is an IB Education?*) will be the first section of IB documentation to have this bespoke analysis (see section 2.4.3) applied to it. In Figure 14, below, a colour-code-based analysis is applied to the definition of International Mindedness. Each colour in the key represents one of the seven pedagogic themes (see section 2.2.1) described at length in the literature review of this report. Where one of those themes is identified as being explicitly or implicitly found in the text (i.e. not just examples of the language directly associated with the themes, but also words or phrases which, taken in context, imply the likelihood of that pedagogic theme being developed) then the appropriate colour is used to highlight that portion of text. The colour-code approach shows, at a glance, the extent to which the pedagogic themes are embedded in the extract of text. The colour-coding is slightly simplified for the sake of readability; in some cases, single words or phrases would refer to more than one pedagogic theme (for example, “inquiry” – based on the context of the sentence – might indicate Student-Led and Process/Cycle).

Figures 15, 16, 17, and 18 then deploy the same analytical process on segments of the *From Principles into Practice* document for each programme. The segments have been taken from the opening pages of each programme FPIP, where it is made clear that the aim of each programme is being broadly described. For some programmes (e.g. the PYP and CP) the broad aims of the programme were described very concisely, whereas in others the broad aims of the programme were described in a more detailed or contextualised way (e.g. DP). In order to provide some comparability between segments, those programmes with lengthier descriptions in their opening FPIP pages have been contracted here to include only those paragraphs which are strictly discussing the broad aims of the programme in question.

Key:	Student-Led	Local and Relevant	Global/International Citizenship
Process/Cycle	Student Individuality	Collaboration	Flexibility with Disciplines

Figure 14: International Mindedness description. From* What is an IB Education?, *p. 2.

The aim of all IB programmes is to develop internationally minded people who recognize their common humanity and shared guardianship of the planet. Central to this aim is international-mindedness.

International-mindedness is a multifaceted concept that captures a way of thinking, being and acting characterized by an openness to the world and a recognition of our deep interconnectedness to others.

To be open to the world, we need to understand it. IB programmes therefore provide students with opportunities for sustained inquiry into a range of local and global issues and ideas. This willingness to see beyond immediate situations and boundaries is essential as globalization and emerging technologies continue to blur traditional distinctions between the local, national and international.

An IB education fosters international-mindedness by helping students reflect on their own perspective, culture and identities, as well as those of others. By engaging with diverse beliefs, values and experiences, and by learning to think and collaborate across cultures and disciplines, IB learners gain the understanding necessary to make progress towards a more peaceful world.

An IB education further enhances the development of international-mindedness through multilingualism. All IB programmes require students to study, or study in, more than one language. This is because we believe that communicating in more than one language helps students to appreciate that his or her own language, culture and world view are just one of many. In this way, it provides excellent opportunities to develop intercultural understanding and respect.

International-mindedness is also encouraged through a focus on global engagement and meaningful service with the community. These elements challenge students to critically consider power and privilege, and to recognize that they hold this planet and its resources in trust for future generations. They also highlight the focus on action in all IB programmes: a focus on moving beyond awareness and understanding to engagement, action and bringing about meaningful change to make a more peaceful and sustainable world for everyone.

The components of an IB education described in this document work together to support the IB's overarching aim of developing international-mindedness.

Figure 15: Aims of the PYP programme. Extracted* from PYP: From Principles into Practice - Overview, *p. 1.

Since its inception, the Primary Years Programme has widely impacted not only students aged 3–12 and their school communities worldwide but also the course of international education. As a transdisciplinary, inquiry-based and student-centred education with responsible action at its core, the PYP has remained trusted, timeless and transformational.

In response to the challenges and opportunities found in our rapidly changing complex world, and in line with movements in global education to develop lifelong learners, a future-focused PYP has evolved. The PYP curriculum framework emphasizes the central principle of agency that is threaded throughout the three pillars of the curriculum: the learner, learning and teaching and the learning community. Augmenting the focus of the "written, taught, and assessed" curriculum with the human elements—the learner and the learning community—underlines that everyone connected to the school community has voice, choice and ownership to impact learning and teaching. These holistic components complement and reinforce each other to form a coherent whole.

Figure 16: Aims of the MYP programme. Extracted from* MYP: From Principles into Practice, *pp. 3-4.

The MYP has been designed as a coherent and comprehensive curriculum framework that provides academic challenge and develops the life skills of students from the ages of 11 to 16. These years are a critical period in the development of young people. Success in school is closely related to personal, social and emotional well-being. At a time when students are establishing their identity and building their self-esteem, the MYP can motivate students and help them to achieve success in school and in life beyond the classroom. The programme allows students to build on their personal strengths and to embrace challenges in subjects in which they might not excel. The MYP offers students opportunities to develop their potential, to explore their own learning preferences, to take appropriate risks, and to reflect on, and develop, a strong sense of personal identity.

Implementation of the MYP is considered to be a whole-school activity that prepares students for further successful study. The programme is designed to be inclusive; the IB believes that all students can benefit from the programme.
[…]
Contemporary MYP educators have continued to focus on how best to meet the needs of adolescents, who are confronted with a vast and often bewildering array of choices in a complex and rapidly changing world. A focus on higher-order thinking skills gives students opportunities to explore their expanding concerns and their growing awareness of themselves and the world in ways that develop sound judgment.

Figure 17: Aims of the DP programme. Extracted from* DP: From Principles into Practice*, pp. 5-7.

The Diploma Programme (DP) provides a challenging, internationally focused, broad and balanced educational experience for students aged 16 to 19. Students are required to study six subjects and a curriculum core concurrently over two years. The programme is designed to equip students with the basic academic skills needed for university study, further education and their chosen profession. Additionally the programme supports the development of the values and life skills needed to live a fulfilled and purposeful life.

[…]

A distinguishing characteristic of the DP is a concern with the whole educational experience of each student. The curriculum framework (see figure 1), and the supporting structures and principles, are designed to ensure that each student is necessarily exposed to a broad and balanced curriculum.

[…]

The whole school community needs to model the values and behaviours associated with education for intercultural understanding. International-mindedness can be achieved in rich national as well as international settings provided the school environment, broadly considered, is supportive. International-mindedness starts with the attitude an individual has towards themselves and others in their immediate environment. Students need to learn to understand themselves, what it means to be human, and to make sense of their place in an increasingly interdependent, globalized and digitized world. International-mindedness, therefore, starts with self-awareness and encompasses the individual and the local/national and cultural setting of the school as well as exploring wider global perspectives.

[…]

Alec Peterson, the first director general of the IB, described the aims of the DP as going beyond the acquisition of knowledge and skills to include the education of the "whole" person. This was in order "to develop to their fullest potential the powers of each individual to understand, to modify and to enjoy his or her environment, both inner and outer, in its physical, social, moral, aesthetic and spiritual aspects" (Peterson 2003: 33).

[…]

Classrooms and school buildings can restrict or support the learning/teaching environment. The more students are involved with the learning process and with making decisions about their learning, the greater the learning outcome. A key purpose of the written curriculum is to provide improved and more coherent opportunities for students and, in turn, teachers to use cross-disciplinary elements (for example, education for citizenship, outdoor adventure and experiential education) as vehicles for learning across curricular areas and subjects. Educational experiences outside the classroom are often easier for the wider community to relate to, so reflections on these experiences can often form powerful aspects of a student's identity.

Figure 18: Aims of the CP programme. Extracted from* CP: From Principles into Practice*, p. 7.

The Career-related Programme (previously known as the IB Career-related Certificate) is the most recent addition to the IB. Its key aim is to provide a choice of different pathways for students aged 16 to 19.

Modern life places complex demands on graduates entering further/higher education or employment. An integral part of the Career-related Programme is enabling students to become self-confident, skilled and career-ready learners.

To prepare students to succeed in a rapidly changing world, schools must not only equip them with the necessary skills and the learning dispositions, but also the ability to manage and influence change.

The Career-related Programme helps students to:
- develop a range of broad work-related competencies and deepen their understanding in specific areas of knowledge through their Diploma Programme courses
- develop flexible strategies for knowledge acquisition and enhancement in varied contexts
- prepare for effective participation in the changing world of work
- foster attitudes and habits of mind that allow them to become lifelong learners willing to consider new perspectives
- become involved in learning that develops their capacity and will to make a positive difference.

4.4.1 Analysis of Programme Aims – Thematic Colour-Coding

In all of the extracts analysed above, all seven of the pedagogic themes were found to be present.

International Mindedness: This description – found in the cross-programme document *What is an IB Education?*, and relevant to all IB programmes – unsurprisingly showed a particularly high level of integration of the pedagogic theme Global/International Citizenship. Flexibility with Disciplines and Student Individuality were the two themes which were least strongly referenced in this extract, but even these were clearly present on more than one occasion. Overall, the stated aim of all IB programmes to develop international mindedness is effectively contextualised alongside the other pedagogic themes found across the continuum.

PYP: The extract of text examined which describes the aims of the PYP was comparably short, but it also contained all seven of the identified pedagogic themes. Student Individuality was the least strongly referenced, with particular emphasis instead being placed on the themes Student-Led and Process/Cycle. The dominance of these two themes is indicative of the PYP: FPIP's dedication to the idea of student-centred inquiry.

MYP: All seven pedagogic themes could be found on multiple occasions in this extract detailing the aims of the MYP. In contrast to the equivalent passage in the PYP FPIP, this passage has a notable emphasis on the pedagogic theme of Student-Individuality. However, all other themes are also highly integrated into this passage.
DP: This longest of all the extracts analysed here, detailing the general aims of the DP, also contains all of the seven pedagogic themes. All themes are embedded on multiple occasions.

CP: This relatively short extract, detailing the general aims of the CP, does contain all seven of the pedagogic themes. The theme of Collaboration is least firmly embedded, with only one reference and that being a somewhat implicit nod to the theme rather than a very clear statement. On the other hand, the theme Local and Relevant is strongly embedded for such a short extract.

Overall, the stated aims (including International Mindedness, and key paragraphs from the programme FPIPs) of all IB programmes integrate all of the pedagogic themes found to underpin the Approaches to Teaching. In specific areas, some programmes have more emphasis than others. For instance, the PYP contains less emphasis on Student-Individuality and more emphasis on Student-Led and Process/Cycle, whereas MYP programme aims have a particularly strong emphasis on Student Individuality, and CP programme aims are slightly weaker on Collaboration but clearly emphasise Local and Relevant. Given that the definition of International-Mindedness is a common aspect of the programme aims for all programmes, however, it is evident that all seven pedagogic themes are repeatedly referenced in multiple places within areas of text outlining programmes' aims. As the pedagogic themes are a result of careful deconstruction of the Approaches to Teaching principles, it is therefore the case that all of the ATT principles are embedded in the stated aims of each individual programme.

> **Finding 13**: Relationship between ATT and Stated Aims of Programmes – the stated aims (including International Mindedness, and key paragraphs from the programme FPIPs) of all IB programmes integrate all seven of the pedagogic themes found to underpin the Approaches to Teaching. Some programmes have slightly different pedagogic emphases compared to others, but all elements of the ATT are nonetheless referenced in key text segments which articulate the aims of programmes.

4.5 Indirect Mapping of Selected ATT Principles Using Pedagogic Themes – Overall Findings

This section uses a sentence-by-sentence mapping of selected IB documentation which discerns references to the pedagogic themes described at length in the Literature Review of this report. The pedagogic theme findings are then used to calculate BOI and FOETAC Measures, which indicate the level of indirect reference being made to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**. For a full discussion of the methodology, see the description and examples above (section 2.4.6).

Individual analyses of every mapped document are available in Appendix 6. This section offers summaries of different document types, subject areas, and programmes – all of which draws from and compares the individual document findings.

Prior to looking at each of the strands of documentation audited, it is first important to consider the findings produced by this method of mapping. There are six over-arching findings detailed below which draw light on both the audit process and the nature of the ATT.

4.5.1 The Impact of Pedagogic Connotations in Words and Phrases

When conducting the auditing process on IB documentation, one finding that applied to all documents (as they were all subject to the thematic referencing [see section 2.4.6]) was that the extent to which pedagogic themes could be perceived to be implicitly present was highly contingent on the extent to which connotations are read into single words or small phrases. There are some words and phrases used in IB documentation with an at-first-glance simple definition, but actually have more sophisticated and complex connotations when read within the wider context of IB pedagogy.

An example of this issue concerns the often-used phrase "in the world around them". To understand the complex connotations of this phrase, it is necessary to see it in context. For example, in the DP: Theory of Knowledge Teacher Support Material, when discussing how to approach the Exhibition, the document states that "Students may begin by being drawn to a particular theme and prompt, and then find objects that exemplify how that question manifests in the world around them."[94] An at-first-glance interpretation of this sentence might seem to suggest that students are expected to find an object that is literally in geographic proximity (i.e. in the world directly *around* them). However, the emphasis changes when we consider that the guide also states that "the objects may also be digital rather than Physical", thus meaning that physical proximity to the object is not a criteria for selection.[95] Moreover, taking a wider perspective, encompassing all IB documentation, we find it stated on numerous occasions that IB teaching and learning "values the world as the broadest context for learning".[96] Taking these ideas into account, the emphasis of the initial statement could be read as "in the *world* around them", rather than "in the world *around* them". This difference in emphasis would mean that instead of the phrase only referring to the theme Local and Relevant, it also refers to the theme of Global/International Citizenship – as it is asking students to consider the whole world as the pool from which to draw their objects.

Another example, where the reading of connotations could have a substantial impact on the pedagogic themes perceived to be in the statement is in the single word "action". Throughout IB documentation students are frequently described as taking (or being encouraged to take) "action", but the precise pedagogic connotations of this term are not always completely clear. "Action" could simply be understood as a moment of Student-Led activity – thus channelling the single theme Student-Led. However, we could also look more deeply into the term by using passages such as that found in the "Service and Action" subsection of *MYP: From Principles into Practice*:

[94] DP: Theory of Knowledge Teacher Support Material, p. 18.
[95] Ibid., p. 16.
[96] WIAIBE? Teacher Support Material, p. 2.

> "In the PYP, action has a specific meaning as an element of the programme in which there is an expectation that successful inquiry will lead to responsible action, initiated by the student as a result of the learning process. This kind of student action may have a wider social impact, and it always represents a voluntary demonstration of a student's empowerment.
>
> Action in the MYP builds upon the action initiated in the PYP and continues as an essential component of the learning process, both as part of the programme's educational philosophy and as a practical outcome of students' learning."

This statement suggests that, in the PYP at least, "action" can channel pedagogic themes such as Process/Cycle (due to the link with inquiry), Local and Relevant (due to wider social impact), and possibly even Global/International Citizenship (due to the focus on responsible action), as well as the natural link to the theme Student-Led. However, the second part of that statement is somewhat unclear regarding whether or not all of those connotations still apply in the MYP context, especially noting the fact that "In the PYP, action as a specific meaning". Furthermore, *PYP: From Principles into Practice* has an effective definition of "action" in its end-of-document glossary: "Action: The act of engaging individually and/or collaboratively with local, national and global challenges and opportunities" (incidentally, this definition also indicates that the theme Collaboration might be relevant to "action").[97] By contrast, *MYP: From Principles into Practice* contains no definition for the word "action" in its glossary. This means that MYP teaching staff reading the word "action" in MYP documentation must use their own interpretation regarding the pedagogic ideas that are being implied by the term.

Similar examples could be drawn from dozens of different words and phrases that are used repeatedly in IB documentation. All of this evidence suggests that the clarity of IB documentation – regarding the highly-important connotations of keywords and phrases – could benefit from a centralised glossary or additional definition guidance.

Finding 14: The Impact of Pedagogic Connotations in Words and Phrases – there are some words and phrases used in IB documentation with an at-first-glance simple definition, which actually have more sophisticated and complex connotations when read within the wider context of IB pedagogy. The clarity of IB documentation – regarding the highly-important connotations of keywords and phrases – could benefit from a centralised glossary or additional definition guidance.

[97] PYP: From Principles into Practice – The Learning Community, p. 64

4.5.2 What Counts as "Teaching" in the Approaches to Teaching?

Another important finding, raised by the auditing process, which applies to all documentation is the question of which activities described in documents can truly be said to be teaching and learning activities, articulating pedagogic themes and indirectly referencing principles in the ATT. For example, when mapping the pedagogic themes, analysts were faced with interpreting whether or not collaboration between IB teachers/educators should be treated as an example of the pedagogic theme Collaboration, and whether or not collegial collaboration of that type could strictly be said to be a part of the Approaches to Teaching.

The decision was made in the mapping process that such examples did constitute the pedagogic theme Collaboration, and therefore could contribute to indirect references to the ATT principle **Focused on Effective Teamwork and Collaboration**. However, there is scope to clarify the fact that the Approaches to Teaching is not just a curriculum component for activities that take place strictly with students (i.e. classroom teaching) but is something that should be embraced by the whole school community in all of their day-to-day activities.

The fact that the Approaches to Teaching apply outside of traditional teaching activities is perhaps implied by some of the more general guidance. For example, in a subsection of DP: From Principles into Practice concerning "School Leadership" is stated that "school-wide adoption of the DP approach will require change not only in the classroom but throughout the school".[98] The fact that IB teachers/educators should deploy the behaviours that teaching and learning curriculum components encourage in students is also suggested later in the document through phrases such as "Teachers and school administrators have a responsibility to model integrity and practise academic honesty themselves."[99] Perhaps the most definitive statement on this matter is found on page 44 of DP: FPIP, where it is explained that "the principle of creative teacher professionalism emphasizes the importance of teachers being critically self-reflective practitioners who model the approaches to learning (ATL) they expect of their students in their own approaches to teaching".[100]

> **Finding 15**: What Counts as "Teaching" in the Approaches to Teaching? – it was found that there are some scattered references throughout IB documents to the fact that IB teaching and learning curriculum components in general should be modelled by staff, thus providing a demonstration of best practice to students. However, this point is not clearly made in places where the ATT are explicitly discussed. There is therefore scope to provide extra clarity around the philosophical position that teachers should develop practices based around ATT principles in their interactions with other members of staff, and in their personal and professional development, not just when carrying-out classroom based teaching.

[98] DP: From Principles into Practice, p. 22.
[99] Ibid., p. 33.
[100] Ibid., p. 44.

4.5.3 Missed Opportunities for Cohesively Articulating the ATT as a whole

Another finding that crossed between numerous documents is that there are sections of text which provide strong opportunities to implicitly reference all seven of the identified pedagogic themes in one place; however, these opportunities are often missed – leading to only five or six of the themes being referenced, and a missed opportunity to articulate the entire ATT cohesively.

To understand this finding, it is most useful to start with an example of a passage of text which successfully refers to all seven pedagogic themes in one place. In DP: From Principles into Practice, there is a strong example of this when a bullet point list is used to articulate the nature of Unit Plans that can be deployed in any subject. In the figure below, we use a colour code to demonstrate that all seven of the pedagogic themes are articulated in this bullet point list. The colour-coding is slightly simplified for the sake of readability; in some cases, single words or phrases would refer to more than one pedagogic theme (for example, "inquiry" – based on the context of the sentence – might indicate Student-Led and Process/Cycle).

Figure 19: DP Unit Planning. Extracted from DP*: From Principles into Practice, *p. 68.

A unit plan is part of the written curriculum for any course and can be defined as a planned study, which can be of various lengths, concluding with summative assessment. Each subject-specific unit plan should:

- stand alone as a significant, engaging, relevant and challenging learning experience
- enable students to demonstrate development against objectives
- contribute to a coherent, school-wide commitment to inquiry that is framed by contexts of personal, local or global significance
- be driven by inquiry that is conceptually based and contextually framed
- involve students in a range of learning experiences planned in response to inquiry-based questions
- make responsible and relevant use of technology when appropriate
- build on the prior knowledge of the students
- be planned and taught to promote positive attitudes and development of the attributes of an IB learner
- have a summative assessment that gives the students the opportunity to demonstrate achievement of the DP objectives set for the unit
- require students to reflect on their learning and encourage them to engage in principled action or service.

Key:	Student-Led	Local and Relevant	Global/International Citizenship
Process/Cycle	Student Individuality	Collaboration	Flexibility with Disciplines

This example demonstrates that all seven themes are embedded in a logical place in the text: a description of a curriculum component with relevance to multiple disciplines.

An example of a passage of text that misses the opportunity to embed all seven themes at once can be found in a subsection of *CP: From Principles into Practice* describing "The Aims of the Career-Related Programme". In another bullet point list, the document suggests:

> "Drawing on the attributes of the learner profile, the core of the programme aims to develop students who are:
>
> - thoughtful and active citizens
> - responsible for their own learning and development
> - competent and confident communicators
> - reflective, creative and critical thinkers
> - aware of our shared human condition
> - able to establish a sense of identity in a context of time and place
> - prepared to think about the needs, values and perspectives of other people
> - active participants in their own intercultural learning".

Although the first sentence suggests that this list is framed around the learner profile, this is also an excellent opportunity to demonstrate how all of the pedagogic principles behind the ATT can also be cohesively developed in the Career-Related Programme. The bullet point list contains six of the pedagogic principles, but not Flexibility with Disciplines, meaning that it fails to fully reference the ATT principle "Focused on Conceptual Understanding". If an extra bullet point were added – with a phrase such as "able to develop conceptual understanding within and between disciplines" – then the opportunity to cohesively refer to the full ATT would have been seized.

Overall, sections of documents which indirectly refer to all components of the ATT simultaneously are useful because they are a method of further embedding the ATT without having to repeat, word-for-word, the titles of each principle. It is therefore worth reviewing opportunities to do so within documents. Other examples of passages which could be developed further can be found in: *MYP: Language Acquisition Guide* (pp. 2-3); *DP: Theory of Knowledge Teacher Support Material* (p. 24); *PYP: Developing a Programme of Inquiry* (p. 5).

Finding 16: Missed Opportunities for Cohesively Articulating the Entire ATT – there are sections of text which provide strong opportunities to implicitly reference all seven of the identified pedagogic themes in one place; however, these opportunities are often missed – leading to only five or six of the themes being referenced, and a missed opportunity to articulate the entire ATT cohesively. Indirectly referring to all components of the ATT simultaneously is useful because it is a method of further embedding the ATT without having to repeat, word-for-word, the titles of each principle. It is therefore worth reviewing opportunities to do so within documents.

4.5.4 Distinguishing Characteristics of Specific Document Subsections

4.5.4.1 Subsections without Indirect Reference to the Selected Principles

Another finding that emerged for the majority of documents audited is that the documents contain some subsections which do not feature indirect references to the two selected principles (**Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**).

Due to the nature of how subsections are delineated within documents, this is not always problematic. For example, if a subsection contains a very limited and very precise discussion of a specific element of teaching and learning, then it is not problematic for **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** to not be indirectly referenced at that point. An example of this would be the subsection named "A Worldwide Community of Educators" within *What is an IB Education?* This subsection involves a limited discussion of the fact that IB educators span a large number of countries and cultures, but are all driven by the same underpinning IB philosophies to form a single community. In this case, it is to be expected that there would be no reference to the theme Student-Led, and therefore no indirect reference to the principles **Based on Inquiry**.

An individual example of a subsection within a text that does not indirectly reference the selected themes is not a finding that requires attention. However, if a document contains a large number of subsections which do not indirectly reference the selected themes, then this is a sign that there is scope to further develop the ideas of inquiry and collaboration in those documents. Where the auditing results of individual documents are displayed below, such patterns are highlighted and discussed.

4.5.4.2 Subsections with Strong Indirect Reference to the Selected Principles

Another finding related to indirect references to the selected themes is that some documents show a very strong indirect reference to a particular theme within specific subsections. The strength of these BOI and FOETAC Measures takes into account the word count of the subsection and the number of sentences which contain thematic links to the relevant pedagogic themes. Based on a comparison of the BOI and FOETAC Measures across the full range of audited documents, it was ascertained that a BOI or FOETAC Measure over 0.02 constitutes a high measure (meaning that the principle in question is strongly integrated into that subsection), and a BOI or FOETAC Measure of over 0.03 constitutes a very high measure (meaning that the principle in question is very strongly integrated into that subsection).

As with subsections which display no indirect reference to the selected principles, strong and very strong indirect references need to be seen within the wider context of trends in the document. As a result, line graphs showing BOI and FOETAC Measures will be displayed in the individual document analyses presented in Appendix 6. Instances of strong and very strong indirect reference to principles will be highlighted.

4.5.5 The Ideal Pattern of Indirect References to the Selected Principles

Given the variation of BOI and FOETAC Measures across all documents, it is worth considering what a "good" BOI or FOETAC chart would look like over the length of a document.

There is not a simple answer to this issue, as different patterns of indirect references will achieve different things. For example, a document showing consistent reference to BOI, but without any high or very high measures within subsections would be likely to imply that **Based on Inquiry** is an ever-present background idea in the document, without necessarily becoming the key focus at any single point. Alternatively, a document with high BOI in certain subsections, but also some subsections with zero BOI Measure, would be likely to imply that **Based on Inquiry** is highly important for individual aspects of the subject/programme, but is not important to all activities described in the document.

The data provided by this mapping show that different documents follow both of these patterns, and many have a combination of the two. This will result in readers (for example, IB teachers) having different interpretations of the consistency of significance of the selected principles from document to document. Some documents imply consistent relevance of one or both principles, while others imply peaks and troughs of relevance. The ideal shape of BOI and FOETAC Measures across a document is dependent on what the IB wants to achieve in terms of this interpretation of significance. However, in general terms, a document will be embedding the ATT principles more effectively if there are zero or minimal subsections lacking any indirect reference (i.e. BOI or FOETAC of zero). It is also likely to be very useful to deploy strategic peaks of high or very high indirect reference in subsections where the ATT principle in question is particularly relevant. Thus, overall, a BOI or FOETAC Measure that generally shows consistently moderate presence throughout a document, with strategic high or very high peaks, is likely to be a model of effective practice.

Finding 17: Quantity of Indirect References to Selected Attributes – the BOI and FOETAC Measures vary significantly within and between documents. Most documents contain at least one subsection where one or both measures drop to zero (meaning no indirect reference to the selected attributes). Many documents also contain one or more subsections with a BOI or FOETAC Measure of high (above 0.02) or very high (above 0.03) strength. A single pattern of best practice is difficult to ascertain due to the varying strengths and weaknesses of different approaches, but, in general terms, a BOI or FOETAC Measure that shows consistently moderate presence throughout a document, with strategic high or very high peaks, is likely to be a model of effective practice. Nevertheless, the meaning of any patterns in BOI and FOETAC measures – including the level of any consistency or the nature of peaks and troughs – must be interpreted in the context of the document as a whole.

4.6 Indirect Mapping of Selected ATT Principles Using Pedagogic Themes – Document Comparisons

4.6.1 Cross-Programme Documentation Comparison

- What is an IB Education?
- What is an IB Education? Teacher Support Material
- Programme Standards and Practices

By examining all of the three selected cross-programme documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in each of these documents.

Note: All direct referencing and keyword tables in this report use a heatmap scale following this pattern:

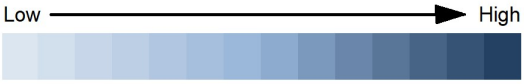


Table 17: Direct Referencing for Cross Programme Documentation[101]

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
WIAIBE?	6	1	1
WIAIBE? TSM	11	0	0
PS&P	25	0	0

These findings indicate that these documents contain a relatively strong presence of references to the "Approaches to Teaching" when considering their length. The *PS&P* document stands out amongst the others for the number of "Approaches to Teaching" direct references, especially due to it being only five pages longer than the *WIABE? TSM*. Direct references to the two selected ATT principles are absent from both the *WIAIBE? TSM* and *PS&P*, which may highlight an opportunity to provide further clarification or exemplification of the individual ATT principles given the high number of references to "Approaches to Teaching".

[101] The 'Direct referencing' and 'Keyword referencing' tables included in this section have been colour-coded in order to distinguish the number of the references found in each document audited. The colour-coding is unique to each table with a sliding scale of shading to represent higher numbers of references (dark blue) and lower numbers (light blue). The shading does not represent a value judgement but simply reflects the number of references without taking document size into account.

It is important to also contextualise the number of direct references alongside the keyword references (see section 2.4.6) relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 18: Keyword Referencing for Cross Programme Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
WIAIBE?	10	2	7	2	2
WIAIBE? TSM	12	26	7	2	1
PS&P	17	2	29	1	10

This data, looking at the use of keyword language of the selected ATT principles, provides an interesting contrast to the direct references included in the previous table. Language pertaining to the two selected ATT principles is present in all three documents, despite no direct references being found for in *WIAIBE? TSM* and *PS&P*. With regard to the fact that the *WIAIBE? TSM* includes a lower number of direct references to the ATT, this is not proportionally reflected in the number of references to keyword language of the selected principles. The distribution of the keyword language across the documents is also of interest. The *WIAIBE?* shows a relatively balanced distribution of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** keyword language, which is not reflected in the other documents. The *WIAIBE? TSM* includes a proportionally greater number of references to the keyword language of **Based on Inquiry**, whereas, interestingly, the *PS&P* document is the opposite, with a higher proportion of **Focused on Effective Teamwork and Collaboration** keyword references.

As is evident from the individual document analyses (in Appendix 6) each of these three documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: none of the documents contain subsections which break the 0.03 threshold of very high integration. When lowering the BOI and FOETAC Measures to 0.015, the *WIAIBE*? contains five data points which exceed this measure, in contrast to the *WIAIBE? TSM* which contains two such data points.

Regarding subsections which do not feature the two principles: both the *WIAIBE?* and *PS&P* documents have the lowest number of subsections with BOI or FOETAC Measures of 0. Each document contains two subsections which do not feature an indirect reference to **Based on Inquiry** and two subsections which do not feature an indirect reference to **Focused on Effective Teamwork and Collaboration**. By contrast, *WIAIBE? TSM* contains six subsections that do not feature an indirect reference **to Based on Inquiry** and six subsections that do not feature an indirect reference to **Focused on Effective Teamwork and Collaboration**.

Overall, this comparison of the audit results for the *WIAIBE?, WIAIBE? TSM*, and *PS&P* demonstrated that none of the documents contain subsections which break the 0.03 threshold of very high indirect integration. Despite having no direct references to the selected principles,

the *PS&P* document shows a greater similarity with *WIAIBE*? in terms of indirect referencing as it has four subsections with BOI and FOETAC Measures over 0.015 and the same number of subsections with no indirect reference to the principles. It was also the only document that registered a BOI or FOETAC score of above 0.02 in a subsection. *WIAIBE? TSM* showed weaker referencing across all fields; direct, keyword, and the BOI and FOETAC scores. The *WIAIBE? TSM* also recorded the highest number of subsections with no indirect reference to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**. This evidence therefore indicates that there is scope to add further reference to both selected ATT principles in all documents, with specific emphasis placed on subsections of the *WIAIBE? TSM* which recorded a zero BOI and FOETAC measure. Measure.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

Finding 18: Mapping Result Comparisons for Cross-Programme Documents – all three cross-programme documents contain some direct references to the "Approaches to Teaching", but only *WIAIBE?* translates this into direct references to the selected attributes. There is scope to add further reference to both selected ATT principles in all documents, with specific emphasis placed on the subsections of the *WIAIBE? TSM* which recorded zero indirect thematic reference to the selected principles.

4.6.2 From Principles into Practice Document Comparison

- PYP: From Principles into Practice
- MYP: From Principles into Practice
- DP: From Principles into Practice
- CP: From Principles into Practice

By examining all four of the *From Principles into Practice* documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in each of these documents.

Table 19: Direct Referencing for From Principles into Practice Documentation

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
PYP: FPIP	9	0	0
MYP: FPIP	17	1	1
DP: FPIP	22	3	3
CP: FPIP	18	3	3

These findings indicate that there is scope to add further explicit references to selected ATT principles, particularly in the *PYP: FPIP*. Considering the fact that these documents are some of the lengthiest in the IB's Programme Resource Centre, even the documents which contain three explicit references to each principle (DP and CP) have the potential to be expanded. Direct references to the exact wording of ATT principles could provide further clarity for IB teaching staff when considering how the ATT interacts with their subject area or programme.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 20: Keyword Referencing for From Principles into Practice Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
PYP: FPIP	640	109	177	12	60
MYP: FPIP	169	78	72	8	30
DP: FPIP	64	25	79	9	30
CP: FPIP	46	10	59	5	19

This data makes an interesting contrast to the direct references in the previous table. This indicates that although the PYP document may be lacking in direct references to the ATT and individual principles, it uses some of the keyword language of those principles considerably more than any other programme FPIP. The *PYP: FPIP* is much longer than the equivalent documents for other programmes (212 pages audited, compared to 140 for MYP, 84 for DP, and 80 for CP), meaning that it would be expected for the *PYP: FPIP* to feature more keyword references than the other documents here. However, the number of references to "inqui" in the PYP document is still remarkably high. This suggests that the PYP document, despite not using the full title of **Based on Inquiry** at any point, incorporates the general idea of inquiry to a very high degree.

As is evident from the individual document analyses, in Appendix 6, each of these lengthy documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: *PYP: From Principles into Practice* contains the most data points over 0.03 (which it has for both the BOI Measure and FOETAC Measure). *CP: From Principles into Practice*, by contrast, contains no subsections which break the 0.03 threshold of very high integration.

Regarding subsections which do not feature the two principles: *DP: From Principles into Practice* has the lowest number of subsections with BOI and FOETAC Measures of 0. There is only one subsection of that document that does not feature an indirect reference to **Based on Inquiry**, and only two subsections that do not feature an indirect reference to **Focused on Effective Teamwork and Collaboration**. By contrast, *CP: From Principles into Practice* contains six subsections that do not feature an indirect reference to **Based on Inquiry** and six subsections that do not feature an indirect reference to **Focused on Effective Teamwork and Collaboration**. *MYP: From Principles into Practice* stands out in this comparison as having the largest number of subsections not featuring these principles. It is notable that this document contains 11 subsections which do not feature an indirect reference to **Focused on Effective Teamwork and Collaboration**.

Overall, this comparison of the audit results for the *From Principles into Practice* documents provides a complex picture of strengths and weaknesses across the board.

> **Finding 19**: Mapping Result Comparisons for FPIP Documents – although the PYP document features the lowest number of direct references to the ATT and selected principles, it does use the language of inquiry to a remarkably high degree. Moreover, the PYP document has considerable indirect reference to **Based on Inquiry**. Given the length of the MYP document, compared to the DP and CP, the direct references to both principles and the keyword references to words related to **Focused on Effective Teamwork and Collaboration** are relatively low (a FOETAC Measure of 0). This tallies with the indirect referencing audit of the MYP document. There is thus scope to add further reference to teamwork and collaboration in *MYP: From Principles into Practice*.

A detailed analysis of every individual document within this audit, and an accompanying chart representing indirect reference to the selected principles, can be found in Appendix 7. However, to provide an example here, using key documents for each IB programme, the detailed analysis of each programme FPIP is provided below.

4.6.2.1 PYP: From Principles into Practice

PYP: From Principles into Practice is a fundamental document for the PYP. In its newest iteration it is split into four components: *Overview* (a four-page introduction to the PYP's guiding principles); *The learner* (a 45-page discussion of what PYP learners are encouraged to develop towards); *Learning and teaching* (a 96-page articulation of learning and teaching practices within the PYP); and *The learning community* (a 67-page document situating the PYP learner within the context of "everyone involved in the life of the school, locally and globally").[102] Together, these four components comprise a comprehensive and in-depth expression of how the principles behind an IB education can be developed into PYP practice in IB world schools.

The first level of mapping (direct references to the ATT and selected principles) shows only nine references across the more than 200 pages of combined documents. Of these nine, all were to the phrase "Approaches to Teaching"; there were no uses of the phrase "Based on Inquiry" or "Focused on Effective Teamwork and Collaboration". This demonstrates that although this version of *PYP: From Principles into Practice* was written after the inception of the ATT, direct references to it are relatively few in number (especially if compared to a similar overarching curriculum component such as the Learner Profile).[103]

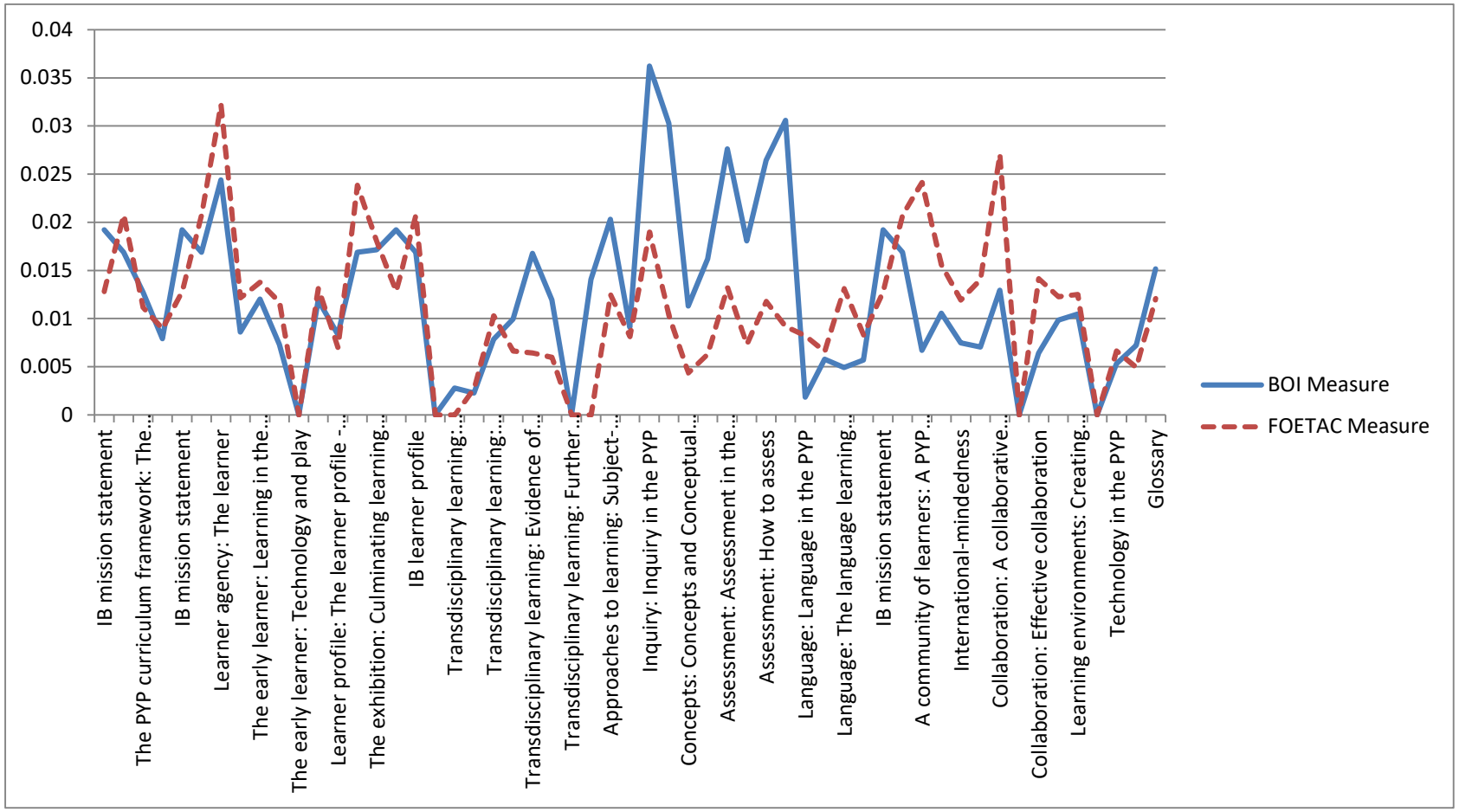
However, the second level of mapping (use of keywords strongly related to the selected principles) shows us that although the most direct level of reference to the ATT and selected principles was low in number, the documents are frequently using the language of inquiry and collaboration. For example, in *The learner* (just 45 pages of the overall PYP: From Principles into Practice) there were 137 examples of keywords related to the **Based on Inquiry** or **Focused on Effective Teamwork and Collaboration** – a rate of more than three per page. Throughout the PYP FPIP it is notable that words beginning with the stem "inqui" are used to a very high degree (640 times).

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) showed that the vast majority of subsections across all individual documents in *PYP: From Principles into Practice* contained indirect reference to the selected principles. A large number of subsections even contained all seven themes. Overall, the most commonly referenced theme was *Process/Cycle* (with 1116 sentences containing that theme). *Collaboration* was not far behind (with 949 references) and the other five themes, though less present by comparison, still appeared consistently throughout the text (none had less than 479 sentence-level references).

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *PYP: From Principles into Practice* has been constructed. This is displayed below.

[102] PYP: FPIP (The learning community), glossary, p. 65.
[103] The number of explicit references to the phrase "Learner Profile" in, for example, just *The learner* section of *PYP: From Principles into Practice* is well over 50.

Figure 20: PYP: FPIP



This chart reveals a complex picture of variation regarding the indirect referencing of the selected principles across the four individual documents of *PYP: From Principles into Practice*. Set out in this way, it is clear that some subsections contain considerably more pronounced indirect reference of the principles in question than other subsections. For example, the most notable spike on the graph tracks the indirect references to **Based on Inquiry** through the subsections "Inquiry: Inquiry in the PYP" and "Inquiry: Further Reading". This is unsurprising, as the title of those subsections imply that the principle **Based on Inquiry** should be expressed particularly clearly there. The same can be said for the fact that the principle **Focused on Effective Teamwork and Collaboration** is indirectly referenced most emphatically in a subsection titled "Collaboration: A collaborative approach to transdisciplinary learning".

4.6.2.2 MYP: From Principles into Practice

MYP: From Principles into Practice is a fundamental document for the MYP. It provides an in-depth explanation of how the principles behind the IB can be integrated into delivery of the MYP in IB World Schools. The document features large sections on "Understanding IB Philosophy", "Organizing the Programme", "Collaborative Planning the Curriculum", "Developing MYP Units", "Approaches to Teaching", and "Assessment for Learning". The "Approaches to Teaching" subsection is relatively short but does feature a notable focus on inquiry-based teaching.

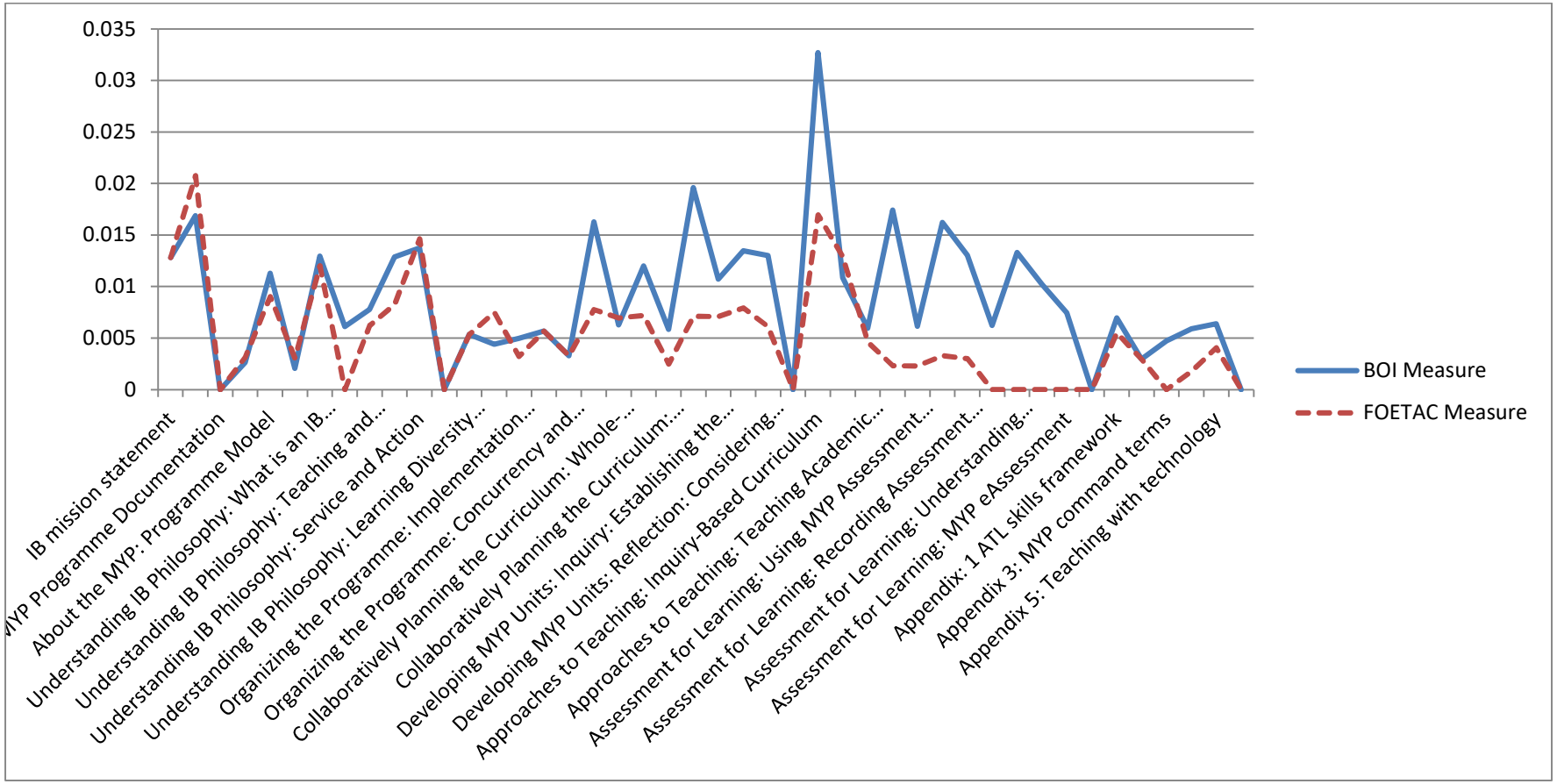
The first level of mapping (direct references to the ATT and selected principles) shows 17 references to the phrase "Approaches to Teaching" but only one reference each to the phrases "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration". Thus, although approaches to teaching are discussed relatively frequently in this document, the full name of individual principles are rarely used.

The second level of mapping (use of keywords strongly related to the selected principles) shows us that words with the stem "inqui" occur at a rate of more than once per page (169 instances) and words beginning with "question" also have a high rate of incidence (78 instances). The keywords related to **Focused on Effective Teamwork and Collaboration** do not approach the same level demonstrated for "inqui" – with 72 for "collaborat", eight for "cooperat", and 30 for "team".

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows a complex and variable picture across this lengthy document. The most notable data point is the BOI Measure that rises above 0.03, which is unsurprisingly taken from the subsection "Approaches to Teaching: Inquiry-Based Curriculum". By contrast, the FOETAC Measure never approaches 0.03, in fact the only subsection in which it reaches 0.02 is the Learner Profile preface at the start of the document. There are also a reasonable number of subsections where the FOETAC Measure is 0. The FOETAC Measure line, in general, is fairly low throughout the document. This tallies with the fact that the number of sentences referencing the theme Collaboration is the joint lowest (along with Global/International Citizenship) at just 215 sentences. By contrast, the theme Process/Cycle (which has close links to the inquiry process and feedback from assessment) is referenced in 544 sentences.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *MYP: From Principles into Practice* has been constructed. This is displayed below.

Figure 21: MYP: FPIP



4.6.2.3 DP: From Principles into Practice

DP: From Principles into Practice is a fundamental document for the DP. It provides an in-depth explanation of how the principles behind the IB can be integrated into delivery of the DP in IB World Schools. The document features large sections on "Understanding IB Philosophy", "Leadership and Structure", "Resources and Support", and "Teaching and Learning". The "Teaching and Learning" includes a short subsection on "Teaching and Learning: Approaches to teaching and learning in the Diploma Programme" which places particular emphasis on the themes Student-Led, Process/Cycle, and Collaboration.

The first level of mapping (direct references to the ATT and selected principles) shows 22 uses of the phrase "Approaches to Teaching" and three each to the phrases "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration". Although the number of references to the individual principle titles is not large, when considered against other documents in the audit, this is a comparatively high number.

The second level of mapping (use of keywords strongly related to the selected principles) shows us that the most commonly found keyword from those searched for was "collaborat" – with 79 instances (a rate of nearly one per page). There were also 69 uses of words beginning with the stem "inqui".

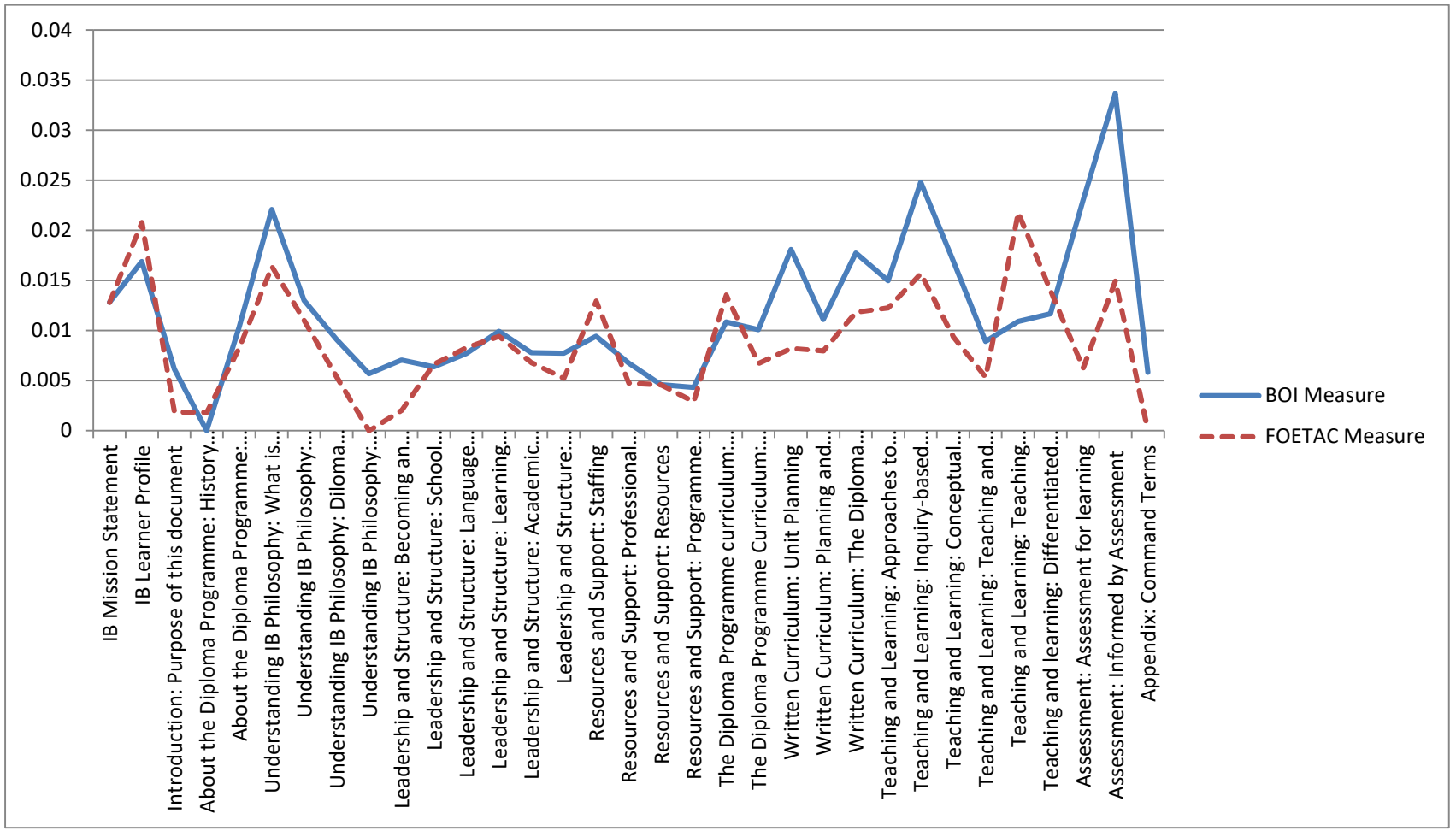
The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows a relatively consistent BOI and FOETAC Measure, with relatively few instances of either measure dropping to 0. The BOI Measure exceeds 0.02 on three occasions and the FOETAC Measure exceeds 0.02 twice. The most notable data point on the chart is where the BOI Measure nearly reaches 0.035 (a very high measure). Surprisingly, this does not take place in the subsection "Teaching and Learning: Inquiry-based learning" (though that subsection does have a high BOI Measure of 0.025), but in the one-page subsection "Assessment: Informed by Assessment". Part of the reason that the BOI Measure is so high in this subsection is because it is relatively short (401 words), yet crammed with thematic references in nearly every sentence. Importantly, the two themes most featured in this subsection are Student-Led and Process/Cycle (the two themes used to calculate BOI). It is interesting to note that the word "inquiry" does not appear on this page, and yet the BOI Measure is so high because of the heavy emphasis on student-led processes of assessment, self-assessment, and peer-assessment. The result provides an interesting insight into how themes and principles interact. At first glance, one would not highlight this section as one likely to heavily refer to **Based on Inquiry**, yet, the fact that students are being asked to develop and carry out processes of (self-)assessment, emphasises the same pedagogic beats as the student-led inquiry process. This provides a valuable window into the fact that seemingly different teaching practices can employ the same underpinning pedagogic ideas. Potentially, therefore, if assessment processes are closely enough centred on students, they have the potential to develop skills and abilities that would also be developed in inquiry-led learning.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: From Principles into Practice* has been constructed. This is displayed below.

On a related note, the number of sentence-level thematic references throughout this document reveals that Student-Led and Process/Cycle are the most common themes (present in 344

and 389 sentences respectively). Global/International Citizenship and Local and Relevant are the themes which appear least commonly in the document (with 160 and 180 sentence-level references respectively). Overall, this suggests that *DP: From Principles into Practice* emphasises student-led processes such as inquiry and self-assessment but pays less attention to the local or international contexts for learning.

Figure 22: DP: FPIP



4.6.2.4 CP: From Principles into Practice

CP: From Principles into Practice is a fundamental document for the CP. It provides an in-depth explanation of how the principles behind the IB can be integrated into delivery of the CP in IB World Schools. The document contains substantial sections on "Overview of the Career-Related Programme", "Staffing and Key Roles", "School Policies for Implementing the Career-Related Programme", "The Career-Related Programme Curriculum", "Assessment", and "Teaching and Learning". The "Teaching and Learning" section contains subsections addressing five of the six ATT principles in turn (Informed by Assessment is missing, though assessment is discussed extensively in the previous section of the document). The seven pedagogic themes appear fairly extensively in the "Teaching and Learning" section, although the discussion also becomes academic analysis of important literature in some places, so moves away from directly discussing the ATT in the context of IB teaching and learning.

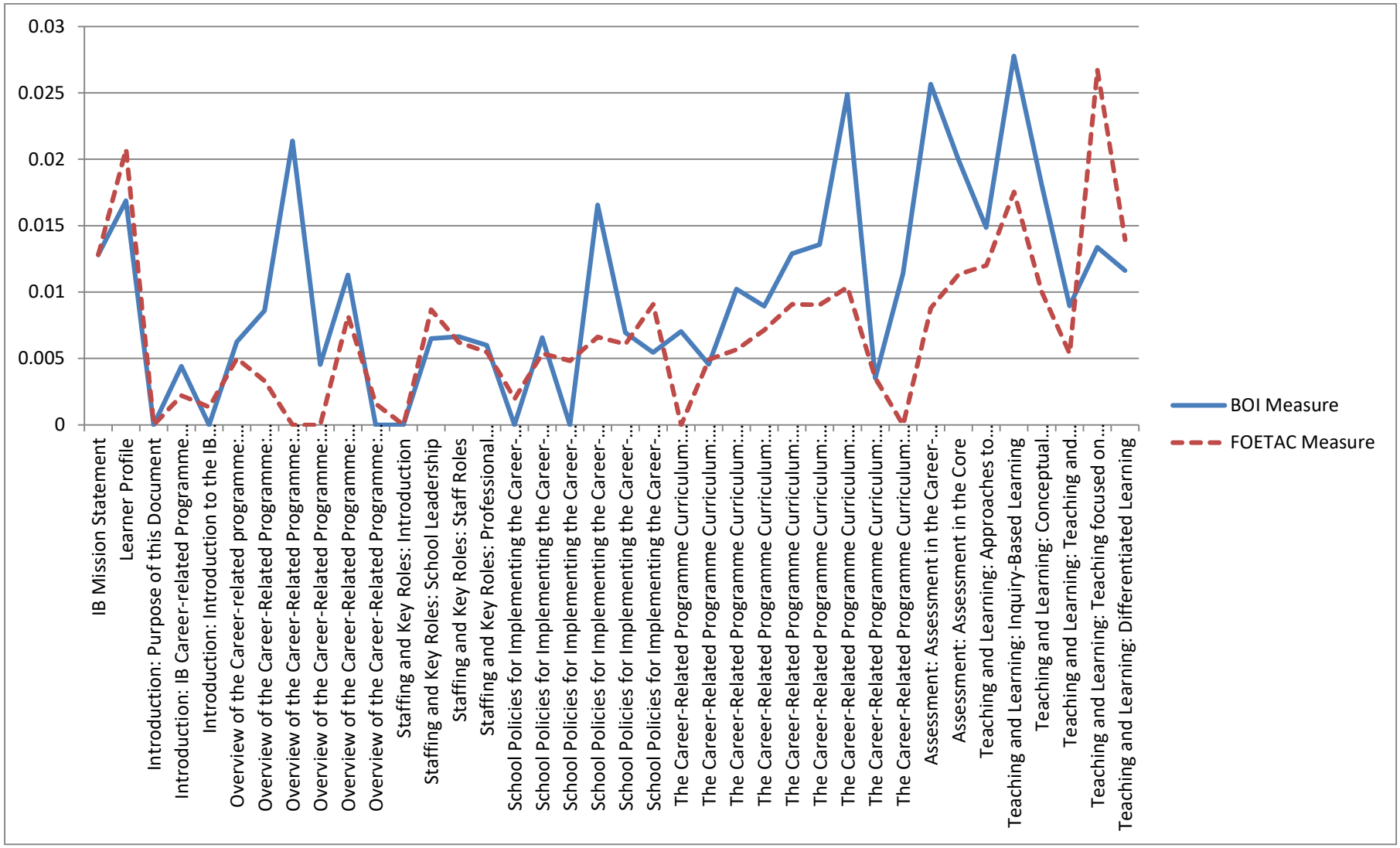
The first level of mapping (direct references to the ATT and selected principles) shows 18 uses of the phrase "Approaches to Teaching", and three each of the phrases "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration". Considering that this document is shorter than some other *From Principles into Practice* documents, these numbers compare relatively strongly.

The second level of mapping (use of keywords strongly related to the selected principles) does not show any results that are notable in terms of showing significant numbers in this document. The most used keyword from the selection used for mapping was the stem "collaborat" (with 59 uses) closely followed by "inqui" (with 46 uses). Overall, the first and second levels of mapping indicate that although the phrase "Approaches to Teaching" appears relatively frequently in the text, the keywords associated with the selected principles are only employed to a moderate degree.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows highly variable movement in the BOI and FOETAC Measures. The 0.02 threshold is passed in four subsections by the BOI Measure, and in two sections for the FOETAC Measure. The highest point for BOI is, unsurprisingly, in the subsection "Teaching and Learning: Inquiry-based learning". The highest point for FOETAC is, also unsurprisingly, in the subsection "Teaching and Learning: Teaching focused on effective teamwork and collaboration". Neither score exceeds the threshold of 0.03 at any point, yet both scores fall to 0 in multiple subsections (six subsections for BOI and six for FOETAC). For the whole document, Student-Led and Process/Cycle are the themes that feature more consistently at the sentence level (with 234 and 310 sentence-level references respectively). At the other end of the spectrum, the number of sentences featuring the theme Global/International Citizenship is notably low (only 86 sentence-level references) and Flexibility with Disciplines is only marginally higher (with 97 sentence-level references). This suggests that issues relating to international citizenship and the fact that teaching should make flexible use of disciplinary boundaries are comparatively infrequently discussed in this document.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *CP: From Principles into Practice* has been constructed. This is displayed below.

Figure 23: CP: FPIP



4.6.3 Mathematics Document Comparison

- MYP: Mathematics Guide
- DP: Mathematics Analysis and Approaches Guide
- DP: Mathematics Analysis and Approaches Teacher Support Material

By examining all of the Mathematics documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in each of these documents.

Table 21: Direct Referencing for Mathematics Documentation

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
MYP: Mathematics Guide	0	0	0
DP: Mathematics Analysis and Approaches Guide	10	0	0
DP: Mathematics Analysis and Approaches Teacher Support Material	21	2	2

These findings indicate that there is definite potential to increase the number of explicit references to "Approaches to Teaching" and the individual ATT principles. Especially in the case of the *MYP: Mathematics Guide*, which did not register any direct references. Whilst both DP documents fared better in terms of references to the "Approaches to Teaching", increasing the number of direct references to the ATT principles could provide further clarity to IB staff. The *DP: Mathematics Analysis and Approaches TSM* registered double the number of direct references to "Approaches to Teaching" compared to the *DP: Mathematics Analysis and Approaches Guide*, despite the latter being nearly double the size.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 22: Keyword Referencing for Mathematics Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
MYP: Mathematics Guide	44	20	5	1	2
DP: Mathematics Analysis and Approaches Guide	22	139	16	1	4
DP: Mathematics Analysis and Approaches Teacher Support Material	30	47	16	1	7

This data demonstrates that despite extremely limited direct references to "Approaches to Teaching" and the individual ATT principles across the documents, some keyword language of the principles is embedded in the documents. The relative size of the documents does not impact the use of keyword language, with no single document standing out for its high number of keyword references. Three noteworthy areas include: the number of references to "inqui" contained in *MYP: Mathematics Guide* and *DP: Mathematics Analysis and Approaches TSM* being higher than the *DP: Mathematics Analysis and Approaches Guide* (a document nearly double in size); the standout number of references to "question" in the *DP: Mathematics Analysis and Approaches Guide*; and the imbalance between keyword references to "inqui", "question" and "collaborat", "cooperat" and "team". This analysis of keyword references shows the presence of references to the language of the ATT principles which was not found in the direct reference and also hints to a greater inclusion of the general idea of inquiry and questioning (the basis of **Based on Inquiry**) within the documents.

As is evident from the individual document analyses, in Appendix 6, each of these three documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: none of the three documents contain subsections with data points over 0.03. When reducing this to 0.02, we see that the *DP: Mathematics Analysis and Approaches Guide* contains the four sections above this data point, followed by the TSM, which contains three. The *DP: Mathematics Analysis and Approaches Guide* also scored the highest data point for a single document subsection, recording a BOI Measure of 0.028. The *MYP: Mathematics Guide* contains the lowest number of subsections recording 0.02 or over, with only one such data point. Of the subsections which recorded a data point of 0.02 or over, five of these were BOI Measures and three were FOETAC Measures.

Regarding subsections which do not feature the two principles: whilst seeming counter-intuitive, the documents recording the highest scores in the BOI and FOETAC Measures also record the greatest number subsections with measures of zero. This is indicative of a pattern whereby emphasising the ATT principles in specific subsections can cause other subsections

to avoid those principles. Eight subsections of the *DP: Mathematics Analysis and Approaches Guide* featured no indirect reference to **Focused on Effective Teamwork and Collaboration** and two subsections recorded no indirect reference to **Based on Inquiry**. The TSM also displayed a similar pattern with six subsections with no indirect reference to **Focused on Effective Teamwork and Collaboration** and one subsection containing no indirect reference to **Based on Inquiry**. The *MYP: Mathematics Guide*, in comparison, reported two subsections with no indirect reference to **Focused on Effective Teamwork and Collaboration** and all subsections featured an indirect reference to **Based on Inquiry**. This pattern of subsections being less likely to contain an indirect reference to **Focused on Effective Teamwork and Collaboration** ties in with the keyword reference findings which displayed lower numbers of references to "Collaborat", "Cooperat", and "Team" across the whole body of the documents.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

> **Finding 20**: Mapping Result Comparisons for Mathematics Subject Documents – this comparison demonstrates that the inclusion of direct, keyword, and indirect references is relatively low; especially in the case of **Focused on Effective Teamwork and Collaboration**. There is not a document here which contains direct or indirect referencing of either **Based on Inquiry** or **Focused on Effective Teamwork and Collaboration** to a significant extent. This evidence therefore suggests that there is scope to add further reference to both ATT principles across these mathematics documents.

4.6.4 Individuals and Societies/History Document Comparison

- MYP: Individuals and Societies Guide
- MYP: Individuals and Societies Teacher Support Material
- DP: History Guide
- DP: History Teacher Support Material

By examining all of the individuals and societies/history documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in each of these documents.

Table 23: Direct Referencing for Individuals and Societies/History Documentation

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
MYP: Individuals and Societies Guide	0	0	0
DP: History Guide	14	0	0

These findings indicate that there is strong potential to expand the number of explicit references to "Approaches to Teaching" and also the selected ATT principles. Whilst the *DP: History Guide* does contain direct references to "Approaches to Teaching" these are not translated into direct references to the principles of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**. The *MYP: Individuals and Societies Guide* contained no direct reference to either the "Approaches to Teaching" or the selected ATT principles.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 24: Keyword Referencing for Individuals and Societies/History Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
MYP: Individuals and Societies Guide	44	80	6	11	1
DP: History Guide	13	95	11	1	2

This data demonstrates that, contrary to the lack of direct references to the principles of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**, both documents use related keyword language. The *MYP: Individuals and Societies Guide*, despite containing more than 50% fewer words than the *DP: History Guide*, demonstrates a higher total of keyword references, especially around "inqui" and "question". This suggests that the *MYP: Individuals and Societies Guide* incorporates the general idea of inquiry and questioning despite not directly referencing **Based on Inquiry**. The *DP: History Guide* also contains a higher total of keyword references around "inqui" and "question", although due to its larger size, the incorporation of these ideas is likely to be weaker than in the *MYP: Individuals and Societies Guide*. Both documents demonstrate a far greater number of keyword reference to "inqui" and "question" than they do "collaborat", "cooperat" and "team". This indicates a greater emphasis on the idea of **Based on Inquiry** when compared to **Focused on Effective Teamwork and Collaboration**.

As is evident from the individual document analyses, in Appendix 6, each of these documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: neither subject guide recorded a BOI or FOETAC score of 0.03 or over. The *MYP: Individuals and Societies Guide*

recorded the highest number of subsections with a BOI or FOETAC Measure of 0.02 or over (three), although this is not markedly different from the *DP: History Guide* which recorded two subsections with a measure of 0.02 or over. The standout document is the *MYP: Individuals and Societies TSM* which recorded six subsections with a BOI or FOETAC Measure of 0.03 or over and one section "Written Curriculum: MYP Unit Planning Process" recording a score of 0.05.

Regarding subsections which do not feature the two principles: the *MYP: Individuals and Societies Guide* contained the greatest number of subsections which recorded a BOI or FOETAC Measure of 0, with a total of 17. The *DP: History Guide* reported a total of 12 similar subsections. However, the size and number of subsections in each document vary significantly. This can be accounted for by ascertaining the percentage of a document's subsections which had a BOI or FOETAC measure of 0. 37.5% of all *DP: History Guide* subsections and 36.89% of all *MYP: Individuals and Societies Guide* subsections showed BOI or FOETAC Measures of 0. Although the overall numbers of subsections showing 0 BOI or FOETAC was different, this percentage approach shows that these numbers equate to similar proportions of each document. In line with the keyword language, both documents are more likely to report a FOETAC measure of 0 than a BOI Measure of 0, and in the case of the *DP: History Guide* instances of a FOETAC Measure of 0 were three times more prevalent. This pattern is also reflected in the *DP: History TSM* but to a lesser extent in the *MYP: Individuals and Societies TSM*.

Overall, this comparison of the audit results for the above documents demonstrate patterns seen in other subject guides. Despite no direct references to "Approaches to Teaching" or the individual ATT principles, the *MYP Individuals and Societies Guide* showed references to the principles in the keyword language used. However the indirect referencing showed that the keyword language references did not necessarily translate into strong BOI or FOETAC scores. The *DP: History Guide* demonstrated a similar pattern with no BOI or FOETAC score of 0.03 or above. Both guides showed a greater number of FOETAC Measure scores of zero, which, in line with the keyword language, indicates that there is an imbalance in the use of this principle. All three referencing methods demonstrate that there is scope to add further "Approaches to Teaching" and ATT principle references to the documents.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

Finding 21: Mapping Result Comparisons for Individuals and Societies/History Subject Documents – similar to other subject documentation, a lack of direct references to "Approaches to Teaching" or the individual ATT principles, does not prevent the *MYP Individuals and Societies Guide* showing keyword references to the selected principles. However the indirect referencing showed that the keyword language references did not necessarily translate into strong indirect referencing through pedagogic themes. The *DP: History Guide* demonstrated a similar pattern. All documents showed more indirect reference to **Based on Inquiry** than **Focused on Effective Teamwork and Collaboration**. All three referencing methods demonstrate that there is scope to add further "Approaches to Teaching" and ATT principle references to the documents.

4.6.5 Language Document Comparison

- MYP: Language Acquisition Guide
- MYP: Language Acquisition Teacher Support Material
- DP: Language B Guide
- DP: Language B Teacher Support Material

By examining all of the MYP and DP language documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in the relevant subject guides.[104]

Table 25: Direct Referencing for Language Documentation

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
MYP: Language Acquisition Guide	1	0	0
DP: Language B Guide	14	3	2

These findings indicate that there is scope to add further explicit references to the selected ATT principles, especially in the *MYP: Language Acquisition Guide*. Considering the size of the *DP: Language B Guide*, there is also potential to consider increasing the number of explicit references contained within it. As the DP guide does contain a number of explicit references to the "Approaches to Teaching", increasing the number of explicit references to the principles could provide further clarity for IB teachers/educators.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 26: Keyword Referencing for Language Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
MYP: Language Acquisition Guide	46	29	6	1	1
DP: Language B Guide	18	57	14	0	6

This data demonstrates that despite a lack of direct references to the principles, the *MYP: Language Acquisition Guide* makes use of the keyword language surrounding the selected

[104] TSMs are not included in these tables, as they are often in html format and therefore can differ significantly in length and format compared to the pdf-format documents. However, a full breakdown of direct mapping numbers for all audited resources can be found in Appendix 11.

principles. The *DP: Language B Guide* also features the keyword language, although this is less surprising due to the number of direct references. When compared to each other, neither guide features a proportionally high or low number of keyword references, although due to its smaller size the *DP: Language B Guide* contains marginally more. Both guides show a tendency to include more keyword language around the idea of inquiry, suggesting that they incorporate the general idea of inquiry to a greater degree than that of teamwork and collaboration. The same pattern can be found in both the MYP and DP TSMs too, where the keyword language of inquiry is more effectively integrated than the keyword language of collaboration.

As is evident from the individual document analyses, in Appendix 6, each of these four language documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: neither guide contained a subsection which broke the threshold of 0.03 for its BOI or FOETAC score. When reducing this measure to 0.02, both guides contained two subsections which measured at or over this figure. In the MYP TSM, the BOI Measure does not exceed 0.02, so it is also not particularly high compared to some other documents, but it more consistently rises above the low FOETAC. A similar pattern can be discerned for the DP TSM. These details can be found on the appropriate document charts in Appendix 7.

Regarding subsections which do not feature the two principles: Whilst marginal, the *DP: Language B Guide* has the lowest number of subsections with BOI and FOETAC Measures of 0, of the two guides. It contained no subsection with a BOI Measure of 0 and four subsections with a FOETAC Measure of 0. In contrast, the MYP guide displayed a more even split of BOI and FOETAC Measures of 0, with two BOI and three FOETAC.

Overall, this comparison of the audit results for the selected DP and MYP language documents demonstrates that despite a low number of direct references to the selected ATT principles, the keyword language of the principles is contained within the documents, albeit with a greater emphasis on inquiry over teamwork and collaboration. This is true for both subject guides as well as the TSMs. Both guides did not demonstrate a BOI of FOETAC score above the 0.03 very high integration threshold. The lower number of keyword language results pertaining to “collaborat”, “cooperat”, and “team” also tallies with the indirect referencing results which found that subsections were more likely to record a FOETAC Measure of 0 than a BOI Measure of 0.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

Finding 22: Mapping Result Comparisons for Language Subject Documents – despite a low number of direct references to the selected ATT principles, the keyword language of the principles is contained within the documents, albeit with a greater emphasis on inquiry over teamwork and collaboration. This is true for both subject guides as well as the TSMs. Overall, there is clear scope to increase direct, indirect, and keyword references to the idea of collaboration in language documentation.

4.6.6 All Subjects Document Comparison

- MYP: Mathematics Guide
- DP: Mathematics Analysis and Approaches Guide
- DP: Mathematics Analysis and Approaches Teacher Support Material
- MYP: Individuals and Societies Guide
- MYP: Individuals and Societies Teacher Support Material
- DP: History Guide
- DP: History Teacher Support Material
- MYP: Language Acquisition Guide
- MYP: Language Acquisition Teacher Support Material
- DP: Language B Guide
- DP: Language B Teacher Support Material

By examining all of the subject documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in each of these documents.

Table 27: Direct Referencing for All Subject guide documentation

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
MYP: Mathematics Guide	0	0	0
DP: Mathematics Analysis and Approaches Guide	10	0	0
MYP: Individuals and Societies Guide	0	0	0
DP: History Guide	14	0	0
MYP: Language Acquisition Guide	1	0	0
DP: Language B Guide	14	3	3

These findings indicate that direct referencing to "Approaches to Teaching" and the selected ATT principles is not a strong feature of the selected subject guides. Whilst the DP guides contain a number of direct references to the "Approaches to Teaching", programme subject guides lack direct references to the selected ATT principles. The exception to this trend is the DP: Language B Guide – with three direct references to each of the selected attributes.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 28: Keyword Referencing for All Subject Guide Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
MYP: Mathematics Guide	44	20	5	1	2
DP: Mathematics Analysis and Approaches Guide	22	139	16	1	4
MYP: Individuals and Societies Guide	44	80	6	11	1
DP: History Guide	13	95	11	1	2
MYP: Language Acquisition Guide	46	29	6	1	1
DP: Language B Guide	18	57	14	0	6

This data demonstrates that despite the lack of direct referencing to the ATT and individual principles, the subject guides include the keyword language of these principles. No individual document appears as a standout regarding high or low use of keyword language. There is a trend towards greater use of keyword language pertaining to inquiry across the documents as references to the stems "inqui" and "question" were markedly higher than those of "collaborat", "cooperat", and "team". In terms of preference towards usage of specific stems, "question" recorded a higher number of references across all DP programmes, whereas two of the three MYP programmes included more references to "inqui".

As is evident from the individual document analyses, in Appendix 6, each of these subject documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: across the range of selected DP and MYP subject guides no document contained a subsection which broke the 0.03 threshold for very high integration of the BOI and FOETAC Measures. When considering a reduced BOI and FOETAC Measure of 0.02, the *DP: Mathematics Analysis and Approaches Guide* contained the highest number of subsections which met this data point, by contrast, the *MYP: Mathematics Guide* contained the fewest.

Regarding subsections which do not feature the two principles: The *MYP: Individuals and Societies Guide* has the highest number of subsections with BOI and FOETAC Measures of 0. It features eleven subsections which contain no indirect reference to **Focused on Effective Teamwork and Collaboration** and six which contain no indirect reference to **Based on Inquiry**. By contrast, the *DP: Language B Guide* has the lowest number of subsections with BOI and FOETAC Measure of 0. All subsections contain an indirect reference to **Based on Inquiry** and four subsections contain no indirect reference to **Focused on Effective Teamwork and Collaboration**.

Overall, this comparison of the audit results for the selected DP and MYP subject documents demonstrates an imbalance in the keyword language – noticeably emphasising inquiry above collaboration. In addition, no subsection of any selected DP or MYP subject guide met the BOI or FOETAC Measure very high integration threshold of 0.03, with relatively few instances of subsections achieving a score of 0.02 or over. The subsections which achieved a measure of 0.02 or over were equally split between BOI and FOETAC. Of the subsections which featured no indirect reference to the two principles, 41 subsections recorded a FOETAC Measure of 0 and 17 subsections recorded a BOI Measure of 0. This absence of indirect references to **Focused on Effective Teamwork and Collaboration** demonstrates a further imbalance across the documents, which is also mirrored in the keyword language results. This evidence therefore indicates that further direct reference to both **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** can be included in the selected DP and MYP subject guides, with specific emphasis on addressing the underrepresentation of the idea of collaboration.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

Finding 23: Mapping Result Comparisons for Subject Documentation – subject documents across the DP (which also applies to the CP) and MYP demonstrate far more keyword and indirect reference to the idea of inquiry than to the idea of collaboration. This suggests that **Focused on Effective Teamwork and Collaboration** is underrepresented as an ATT principle in these subject guides. Moreover, all subject documentation examined here had scope to increase direct reference to ATT principles, which were entirely absent in the majority of instances.

4.6.7 PYP Document Comparison

- PYP: From Principles into Practice
- PYP: Developing a Programme of Inquiry

By examining all of the PYP documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

The number of PYP documents mapped in this audit was comparatively low. However, this is made up for, to a degree, by the considerable length of the *PYP: FPIP*. To summarise the results of analysing these documents in relation to the research questions (i.e. where **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are integrated into the programme documentation): it is evident that **Based on Inquiry** is most effectively integrated in the *Learning and Teaching* pdf of the FPIP and in *Developing a Programme of Inquiry*. **Focused on Effective Teamwork and Collaboration**, on the other hand, is most effectively integrated into the *Learning Community* pdf of the FPIP. Regarding both selected principles,

there is a lack of direct references across PYP documentation, but keyword and indirect references makeup this shortfall, particularly in the case of **Based on Inquiry**.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in each of these documents.

Table 29: Direct Referencing for PYP Documentation

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
PYP: FPIP	9	0	0
PYP: Developing a Programme of Inquiry	0	0	0

These findings indicate that there is definite scope to add more direct references to both "Approaches to Teaching" and the selected ATT principle titles in both documents. As noted in the section on FPIPs, whilst the *PYP: FPIP* does contain nine references to "Approaches to Teaching", this is the lowest number across all other FPIPs.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 30: Keyword Referencing for PYP Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
PYP: FPIP	640	109	177	12	60
PYP: Developing a Programme of Inquiry	117	12	12	1	1

This data provides a marked contrast to the results of the direct referencing. This indicates that although both documents are lacking in direct references to the ATT and individual principles, they both use some of the keyword language of those principles. The *PYP: FPIP* document is considerably longer than the *PYP: Developing a Programme of Inquiry* document so whilst the number of "inqui", "question" and "collaborat" keywords referenced in the FPIP appears impressive at first glance, *PYP: Developing a Programme of Inquiry* records a higher average of keyword references of "inqui" and "question". However the number of references to "inqui" in both documents is high, suggesting that despite a lack of direct referencing to **Based on Inquiry**, they both incorporate the general idea of inquiry to a very high degree.

As is evident from the individual document analyses, in Appendix 6, each of these PYP documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: *PYP: Developing a Programme of Inquiry* contains the most data points over 0.03. Four of the six data points exceed the very high integration threshold of 0.03, rising well beyond that level in a number of places. Despite its size and much higher number of subsections, the *PYP: FPIP* recorded four data points over the 0.03 threshold. Though this is considerably fewer very high data points per page than *PYP: Developing a Programme of Inquiry*, it is nonetheless a sign that the document has specific subsections which very strongly indirectly reference the selected principles.

Regarding subsections which do not feature the two principles: *PYP: FPIP* has the highest number of subsections with BOI or FOETAC Measures of 0. It contains five subsections that do not feature an indirect reference to **Based on Inquiry** and seven subsections that feature no indirect reference to **Focused on Effective Teamwork and Collaboration**. By contrast *PYP: Developing a Programme of Inquiry* featured only one subsection with no indirect reference to **Focused on Effective Teamwork and Collaboration**. All subsections of *PYP Developing a Programme of Inquiry* featured an indirect reference to **Based on Inquiry**.

Overall, this comparison of the audit results for the two selected PYP documents shows that both documents feature a low number of direct references to the ATT principles, although both use the language of inquiry to a high degree. *PYP: Developing a Programme of Inquiry* has very high BOI Measures, suggesting that the principles behind **Based on Inquiry** are present to a significant extent. Comparing the relatively low results of both documents' FOETAC Measures and their keyword references of "collaborat", "cooperat" and "team", it is apparent that **Focused on Effective Teamwork and Collaboration** is not as strongly embedded as **Based on Inquiry**.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

> **Finding 24**: Mapping Result Comparisons for PYP Documentation – **Based on Inquiry** is most effectively integrated in this programme in the *Learning and Teaching* pdf of the FPIP and in *Developing a Programme of Inquiry*. **Focused on Effective Teamwork and Collaboration**, on the other hand, is most effectively integrated into the *Learning Community* pdf of the FPIP. Regarding both selected principles, there is a lack of direct references across PYP documentation, but keyword and indirect references makeup this shortfall, particularly in the case of **Based on Inquiry**. There is clear scope to add more direct reference to ATT principles, and to generally integrate the idea of collaboration through relevant keywords and indirectly through pedagogic themes.

4.6.8 MYP Document Comparison

- MYP: From Principles into Practice
- MYP: Mathematics Guide
- MYP: Individuals and Societies Guide

- MYP: Individuals and Societies Teacher Support Material
- MYP: Language Acquisition Guide
- MYP: Language Acquisition Teacher Support Material
- MYP: Projects Guide
- MYP: Projects Teacher Support Material
- MYP: Approaches to Learning, Inquiry and Service Teacher Support Material

By examining all of the MYP documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

A large number of MYP resources were examined, including subject guides, the FPIP, and various TSMs. To summarise the results of analysing these resources in relation to the research questions (i.e. where **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are integrated into the programme documentation): it is evident that there is a highly variable picture of integration that differs significantly from document to document. In general terms, some of the strongest indirect references to the selected attributes are not to be found in subject documents, but in the Projects guide and selected subsections of the FPIP and TSMs. The *MYP: Projects Guide* provides a good example of a document that effectively maintains steady indirect reference to both selected attributes throughout the document. In the programme as a whole, there is clear scope to expand direct references to the ATT in general and the selected principles, while the keyword and indirect reference analysis suggests that inquiry is generally better integrated than collaboration.

Regarding direct references to “Approaches to Teaching”, “Based on Inquiry”, and “Focused on Effective Teamwork and Collaboration”, the following table demonstrates the comparative number of direct references in each of these documents.

Table 31: Direct Referencing for MYP Guide Documentation

	“Approaches to Teaching”	“Based on Inquiry”	“Focused on Effective Teamwork and Collaboration”
MYP: FPIP	17	1	1
MYP: Mathematics Guide	0	0	0
MYP: Individuals and Societies Guide	0	0	0
MYP: Language Acquisition Guide	1	0	0
MYP: Projects Guide	0	0	0

These findings indicate that there is definite scope to add more direct references to the selected MYP documents. As noted in the section on FPIPs, whilst the *MYP: FPIP* does contain seventeen references to “Approaches to Teaching”, this is the second lowest number across the other four FPIP documents.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 32: Keyword Referencing for MYP Guide Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
MYP: FPIP	169	78	72	8	30
MYP: Mathematics Guide	44	20	5	1	2
MYP: Individuals and Societies Guide	44	80	6	11	1
MYP: Language Acquisition Guide	46	29	6	1	1
MYP: Projects Guide	26	7	13	0	4

This data provides an interesting contrast to the direct references in the previous table. This indicates that the keyword language of the principles is used in the documents, despite a lack of direct references. The *MYP: FPIP* is longer than the other MYP documents included, therefore it is not unexpected that it contains a greater number of keyword references when compared to the other selected documents. All documents contain a greater number of keyword references to "inqui" and "question" than they do "collaborat", "cooperat" and "team", however the imbalance is least marked in the *MYP: Projects Guide* and *MYP: FPIP*, and most marked in the *MYP: Language Acquisition Guide*.

As is evident from the individual document analyses, in Appendix 6, each of these MYP documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: *MYP: FPIP* is the only document among the selected MYP documents which contains a data point over 0.03 (the very high integration threshold). This was recorded in one subsection's BOI Measure. The other documents failed to record a BOI or FOETAC Measure which met this threshold in any subsection. There are numerous data points over the high integration threshold of 0.02 for both selected attributes, with the *Projects Guide* and parts of the FPIP and TSM achieving this marker more frequently than the subject guides.

Regarding subsections which do not feature the two principles: MYP: Projects Guide has the best results here of any of the lengthy documents. Of the subject guides, *MYP: Language Acquisition Guide* has the lowest number of subsections with BOI and FOETAC Measures of 0. There are two subsections of the document that do not feature an indirect reference to **Based on Inquiry**, and three subsections that do not feature an indirect reference to **Focused on Effective Teamwork and Collaboration**. By contrast, *MYP: Individuals and Societies Guide* contains 17 instances of a subsection not featuring indirect reference to **Based on Inquiry** or **Focused on Effective Teamwork and Collaboration**. An overall picture of the

documents selected shows 31 instances of a subsection yielding a FOETAC Measure of 0, compared to 17 similar BOI Measures.

Overall, this comparison of the audit results for the selected MYP demonstrates the scope for increased direct referencing of both principles across the documentation, in addition to the possibility to further indirect references to both principles due to their relatively low BOI and FOETAC Measures. Further to the increased direct and indirect referencing of the principles, the evidence indicates an imbalance towards increased keyword references and indirect referencing of **Based on Inquiry** when compared to **Focused on Effective Teamwork and Collaboration**. The *MYP: Individuals and Societies Guide* in particular demonstrates a high number of FOETAC Measures of 0 in addition to a far greater number of inquiry-linked keyword references.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

> **Finding 25**: Mapping Result Comparisons for MYP Documentation – this programme presents a highly variable picture of principle integration from document to document. In general terms, some of the strongest indirect references to the selected attributes are not to be found in subject documents, but in the *Projects Guide* and selected subsections of the FPIP and TSMs. The *Projects Guide* provides a good example of a document that effectively maintains steady indirect reference to both selected attributes throughout the document. In the programme as a whole, there is clear scope to expand direct references to the ATT in general and the selected principles, while the keyword and indirect reference analysis suggests that inquiry is generally better integrated than collaboration, with the *Individuals and Societies Guide* showing this imbalance particularly clearly.

4.6.9 DP Document Comparison

- DP: From Principles into Practice
- DP: Theory of Knowledge Guide
- DP: Theory of Knowledge Teacher Support Material
- DP: Approaches to Teaching and Learning
- DP: Mathematics Analysis and Approaches Guide
- DP: Mathematics Analysis and Approaches Teacher Support Material
- DP: History Guide
- DP: History Teacher Support Material
- DP: Language B Guide
- DP: Language B Teacher Support Material

By examining the DP documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

A large number of DP resources were analysed in this mapping process, including subject guides, the FPIP, and various TSMs. To summarise the results of analysing these resources in relation to the research questions (i.e. where **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are integrated into the programme documentation): **Based on Inquiry** was indirectly referenced to a reasonable degree in many documents (including subject and core guides) with the moment of highest integration coming towards the end of the FPIP. **Focused on Effective Teamwork and Collaboration** was often indirectly referenced to the highest degree in the Learner Profile preface at the start of documents. This is an indication that there is significant scope to further indirectly embed the idea of collaboration – though keyword references in the DP: FPIP are an exception to that trend in this programme. Direct reference to the ATT and selected principles was higher in the DP than the MYP or PYP. However, both keyword and indirect references to the selected principles (particularly **Focused on Effective Teamwork and Collaboration**) have scope for development across the programme.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in each of these documents.

Table 33: Direct Referencing for DP Guide Documentation

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
DP: FPIP	22	3	3
DP: Theory of Knowledge Guide	3	1	1
DP: Mathematics Analysis and Approaches Guide	10	0	0
DP: History Guide	14	0	0
DP: Language B Guide	14	3	2

These findings indicate variation in the use of direct references across the selected DP documents. Despite not being the longest examples of their document types, the *DP: FPIP* and *DP: Language B Guide* contain the highest number of direct references to both "Approaches to Teaching" and the selected principles.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 34: Keyword Referencing for DP Guide Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
DP: FPIP	64	25	79	9	30
DP: Theory of Knowledge Guide	16	122	6	1	1
DP: Mathematics Analysis and Approaches Guide	22	139	16	1	4
DP: History Guide	13	95	11	1	2
DP: Language B Guide	18	57	14	0	6

This data provides an interesting contrast to the direct references in the previous table. This indicates that the keyword language of the principles is used in some documents where there is a lack of direct references. A pertinent example is the *DP: Theory of Knowledge Guide* as it contains a low number of direct references compared to the other selected DP documents, however the keyword referencing reveals a high number of keyword references to "inqui" and "question" relative to its size. In line with keyword referencing conducted on other documents, this set of DP documents tends to contain a greater number of keyword references to "inqui" and "question" than they do "collaborat", "cooperat" and "team", however the *DP FPIP* goes against the trend in this case containing a greater number of keyword references to the latter.

As is evident from the individual document analyses above, each of these DP documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: The *DP: FPIP* is the only document which contains a subsection with a BOI or FOETAC Measure of over 0.03. The other documents contain a limited number of subsections with lower BOI or FOETAC Measures of 0.02 or over, generally between two and four subsections.

Regarding subsections which do not feature the two principles: *DP: History Guide* contained the highest number of subsections which recorded a BOI or FOETAC Measure of zero with three subsections containing no indirect reference to **Based on Inquiry** and nine subsections containing no indirect reference to **Focused on Effective Teamwork and Collaboration**. The *DP: History TSM* also featured a high number of BOI or FOETAC Measures of zero with half of all subsections recording a zero measure. The *DP: FPIP* contained the lowest number of subsections with a BOI or FOETAC Measure of zero: one subsection with no indirect reference to **Based on Inquiry** and two subsections with no indirect reference to **Focused on Effective Teamwork and Collaboration**. Across the set of selected DP documents, a greater number of subsections contained no indirect reference to **Focused on Effective Teamwork and Collaboration**.

Overall, this comparison of the audit results for the DP documents demonstrates the keyword language of "inqui" and "question" is common across this set of documents. The large number of references indicating the language of **Based on Inquiry** is further supported by a lower number subsections which record a BOI Measure of zero. The document in this set which did not strictly follow this trend (towards emphasising **Based on Inquiry** over **Focused on Effective Teamwork and Collaboration**) is the *DP: FPIP* as it contained an equal number of direct references between the two selected principles and arguably more keyword references to the language and ideas of collaboration and teamwork than inquiry.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

> **Finding 26**: Mapping Result Comparisons for DP Documentation – **Based on Inquiry** was indirectly referenced to a reasonable degree in many documents (including subject and core guides) with the point of highest integration coming towards the end of the FPIP. **Focused on Effective Teamwork and Collaboration** was often indirectly referenced to the highest degree in the Learner Profile preface at the start of documents. This is an indication that there is significant scope to further indirectly embed the idea of collaboration – though keyword references in the DP: FPIP are an exception to that trend in this programme. Direct reference to the ATT and selected principles was higher in the DP than the MYP or PYP. However, both keyword and indirect references to the selected principles (particularly **Focused on Effective Teamwork and Collaboration**) have scope for development across the programme.

4.6.10 CP Document Comparison

- CP: From Principles into Practice
- CP: Personal and Professional Skills Guide
- CP: Personal and Professional Skills Teacher Support Material
- DP: Approaches to Teaching and Learning
- DP: Mathematics Analysis and Approaches Guide
- DP: Mathematics Analysis and Approaches Teacher Support Material
- DP: History Guide
- DP: History Teacher Support Material
- DP: Language B Guide
- DP: Language B Teacher Support Material

By examining all of the selected CP documents, and comparing the mapping results, it is possible to learn more about the respective strengths and weaknesses of each in relation to the articulation of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.

Only three of the resources examined here were strictly for CP use only, because DP subject and TSM documentation is used by both programmes (due to DP courses being used for the Career-Related Programme). As such, many of the findings regarding subjects are identical

for the CP and the DP. To summarise the results of analysing these resources in relation to the research questions (i.e. where **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are integrated into the programme documentation): the FPIP does contain some notable spikes in indirect reference to the selected principles (**Based on Inquiry** having more of these than **Focused on Effective Teamwork and Collaboration**), but other CP documents do not have noticeably high levels of indirect principle integration. CP documentation demonstrates a similar level to DP documentation of direct reference to the ATT and the principles (much of the documentation is shared); direct integration is therefore higher here than in the PYP or MYP. Overall, by all audit measures used here, there is scope to develop further references to both selected principles across this programme, though **Based on Inquiry** is generally integrated to a higher degree than **Focused on Effective Teamwork and Collaboration**.

Regarding direct references to "Approaches to Teaching", "Based on Inquiry", and "Focused on Effective Teamwork and Collaboration", the following table demonstrates the comparative number of direct references in each of these documents.

Table 35: Direct Referencing for CP Documentation

	"Approaches to Teaching"	"Based on Inquiry"	"Focused on Effective Teamwork and Collaboration"
CP: FPIP	18	3	3
CP: Personal and Professional Skills Guide	11	1	1
DP: Mathematics Analysis and Approaches Guide	10	0	0
DP: History Guide	14	0	0
DP: Language B Guide	14	3	2

These findings indicate that all the selected documents contained direct references to "Approaches to Teaching", however not all reference the selected principles, especially in the case of the *DP: History Guide* and *DP: Mathematics Analysis and Approaches Guide*. With their respective sizes taken into consideration, the *DP: Language B Guide* and *CP: FPIP* contains the highest proportion of direct references to "Approaches to Teaching" and the selected principles.

It is important to also contextualise the number of direct references alongside the keyword references relevant to the selected principles. The table below demonstrates the comparative number of keyword references in each of these documents.

Table 36: Keyword Referencing for CP Documentation

	"Inqui"	"Question"	"Collaborat"	"Cooperat"	"Team"
CP: FPIP	46	10	59	5	19
CP: Personal and Professional Skills Guide	2	19	25	1	5
DP: Mathematics Analysis and Approaches Guide	22	139	16	1	4
DP: History Guide	13	95	11	1	2
DP: Language B Guide	18	57	14	0	6

This data provides an interesting insight into the results of the direct referencing. One of the standout points is the higher number of keyword references to "inqui" and "question" found in the *DP: History* and *DP: Mathematics Analysis and Approaches Guide* when compared to the fact they contain no direct reference to **Based on Inquiry**. This indicates that while not directly referenced, the idea of the principle **Based on Inquiry** is embedded to a certain degree in these two documents. The second interesting outcome of the keyword referencing is that the *CP: FPIP* and *CP: Personal and Professional Skills Guide* contain a greater number of keyword references to **Focused on Effective Teamwork and Collaboration**, which together with the *DP: FPIP*, mean that these documents go against the general pattern of keyword references which tend to display a greater number of keyword references to **Based on Inquiry**.

As is evident from the individual document analyses, in Appendix 6, each of these documents contains indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** in the majority of subsections.

Regarding subsections which feature the two principles most strongly: None of the selected documents featured a BOI or FOETAC Measure above the very high integration threshold of 0.03. When examining the measures achieved, the *CP: FPIP* featured the highest number of subsections which features a BOI or FOETAC Measure of 0.02 or above.

Regarding subsections which do not feature the two principles: *DP: History Guide* contained the highest number of subsections which recorded a BOI or FOETAC Measure of zero with three subsections containing no indirect reference to **Based on Inquiry** and nine subsections containing no indirect reference to **Focused on Effective Teamwork and Collaboration**. The *DP: Language Guide B* contained the lowest number of subsections with a BOI or FOETAC Measure of zero: all subsections featured an indirect reference to **Based on Inquiry** and four subsections featured no indirect reference to **Focused on Effective Teamwork and Collaboration**. Across the set of selected CP and DP documents, a greater number of subsections contained no indirect reference to **Focused on Effective Teamwork and Collaboration**.

Overall, this comparison of the audit results for the CP documents demonstrates that the principle of **Based on Inquiry** is more effectively integrated than **Focused on Effective Teamwork and Collaboration**. Using the *CP: FPIP* as an example: it demonstrates an equal number of direct references to both selected principles and indeed contains more keyword references to the general idea of collaboration than inquiry. However, when examining the BOI and FOETAC Measures, the document contains a greater number of BOI Measures over 0.02 and a higher average BOI Measure across the document. In addition, the document displayed an equal number of subsections with a BOI or FOETAC Measure of zero. This indicates that whilst the distribution of the principles is relatively similar, references to **Based on Inquiry** appear stronger despite appearing weaker in the keyword referencing.

For detailed analysis of each individual document discussed in this section, including BOI and FOETAC charts, see Appendix 7.

> **Finding 27**: Mapping Result Comparisons for CP Documentation – the programme FPIP contains some notable spikes in indirect reference to the selected attributes (**Based on Inquiry** having more of these than **Focused on Effective Teamwork and Collaboration**), but other documents do not have noticeably high levels of indirect principle integration. CP documentation demonstrates a similar level to the DP documentation of direct reference to the ATT and the principles (much of the documentation is shared); direct integration is therefore higher here than in the PYP or MYP. Overall, by all audit measures used here, there is scope to develop further references to both selected principles across this programme, though **Based on Inquiry** is generally integrated to a higher degree than **Focused on Effective Teamwork and Collaboration**.

4.7 Indirect Mapping of Selected ATT Principles Using Pedagogic Themes – Principles

There was no difference between **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** when it came to direct references to the title of the principles. Keywords references, on the other hand, revealed a mixed picture; some documents had similar numbers of keywords related to each of the two selected principles, whereas others had significantly more related to one principle compared to the other. Looking across all pdf documents, there were generally more than twice as many uses of keywords related to **Based on Inquiry** compared to those related to **Focused on Effective Teamwork and Collaboration**.

When we consider the thematic mapping, and the BOI and FOETAC Measures that were produced as a result, **Based on Inquiry** was also found to be indirectly integrated in documents more consistently and more emphatically than **Focused on Effective Teamwork and Collaboration**. Not all documents followed this pattern, but it is the general trend taking all pdf documents and html resources into account.

Taking all mapping methods into consideration, it is evident that, of the two principles, **Based on Inquiry** is more effectively integrated through both keyword and thematic integration.

> **Finding 28**: Quantitative Comparison of Selected Attributes – taking all mapping methods into consideration, it is evident that, of the two principles, **Based on Inquiry** is more effectively integrated through both keyword and thematic integration than Focused on Effective Teamwork and Collaboration, even though both had the same (small) number of direct references.

Based on Inquiry

Across the full range of audit documents and resources, there were only 15 uses of the exact phrase “Based on Inquiry”. This indicates that there is clear scope to expand direct articulation of the principle title, in order to give unambiguous advice regarding how teachers can integrate the principle into their syllabi.

Although direct references to the title itself are infrequently used in IB documentation, the keywords which would point a reader towards an idea of that principle (such as “inquiry” and “question”) do appear frequently. Indeed, in several documents there was more than one use of the word “inquiry” per page of text. *PYP: From Principles into Practice* is a strong model here of how the idea of inquiry can be embedded consistently and strongly into the whole document, even without direct reference to the ATT principle title. That document displayed 640 instances of words that begin with the stem “inqui” (i.e. inquiry, inquiring, inquirers, etc.). Other documents, for instance the *DP: Theory of Knowledge Guide*, did not make frequent use of the “inqui” family of terms, but did make consistent reference to words beginning with the stem “question” (i.e. question, questions, questioning, etc.). In such cases, the broad idea of inquiry-based teaching and learning is still likely to consistently come across to the reader, even if the word “inquiry” is not frequently used. The majority of documents made frequent use of one of these keywords related **Based on Inquiry**.

Using the mapping of pedagogic themes at the sentence level, **Based on Inquiry** could be indirectly referenced in documents through subsections which simultaneously articulated both of the themes Student-Led and Process/Cycle. Looking across the full range of audited documents, these two pedagogic themes were the most frequently referenced (for comparison, see Themes section below). The result of this is that **Based on Inquiry** was indirectly referenced in the majority of the subsections of all documents in this audit. The top-level finding resulting from this is that the ideas and themes embedded in the ATT principle **Based on Inquiry** are consistently articulated in IB documentation. There is scope, within individual documents, to expand both direct and indirect reference to that theme; however, its key position of philosophical importance to IB teaching and learning does come across in documentation, when considered across the board.

It is interesting to note that because the pedagogic themes Student-Led and Process/Cycle were found by the literature review to be the combination which would lead to indirect articulation of Based on Inquiry, there are also a number of places in IB documentation where

the same themes are used to discuss student-centred assessment and feedback processes. This suggests that the teaching processes and learning skills encouraged by the pedagogic philosophy underpinning **Based on Inquiry** can also overlap with those encouraged by some assessment practices. The IB may wish to consider a deeper examination of the broadly constructivist pedagogic philosophy underpinning the ATT in order to more closely understand potential links between different elements of like these.

> **Finding 29**: Based on Inquiry – there is scope to expand direct reference to the principle **Based on Inquiry** in order to highlight its key position of philosophical importance to IB teaching and learning. By increasing usage of the exact title of the principle, there is less chance that teachers will miss any indirect references – supporting greater consistency in the embedding of the principle into teaching practice. However, given that most IB documents do not currently refer to the principle's title on numerous occasions, the combination of keywords and thematic references indirectly reference **Based**

Focused on Effective Teamwork and Collaboration

Across the full range of audit documents and resources, there were only 14 uses of the exact phrase "Focused on Effective Teamwork and Collaboration". This indicates that there is clear scope to expand direct articulation of the principle title, in order to give unambiguous advice regarding how teachers can integrate the principle into their syllabi.

Keyword references which could be linked to principle were certainly more numerous than direct references to the title of the principle, but there is also significant scope to further embed words such as "teamwork" and "collaboration" across the majority of documents. *PS&P* is a good example of a document that incorporates the language of this ATT principle consistently throughout its pages, even though direct reference to the title is lacking. In only 28 pages, the document contains 29 instances of words beginning with the stem "collaborat" (i.e. collaboration, collaborating, collaborative) and 10 uses of words beginning with the stem "team" (i.e. "team", "teams", "teamwork"). Consistently using such language will result in readers interpreting the broad idea of collaboration to be firmly embedded into IB teaching and learning philosophies, even if direct reference to the phrase "Focused on Effective Teamwork and Collaboration" is lacking.

Where *PS&P* does this effectively, however, there are also a large number of audited documents which have considerable scope to increase the language of collaboration in their pages. To highlight just one example, the *DP: History Guide* is 96 pages in length, yet it contains only 11 uses of "collaborat", one of "cooperat", and two of "team". This document is representative of many audited in this report which contain some reference to keywords that can be associated with **Focused on Effective Teamwork and Collaboration**, but not to a sufficient level for the documents to have been judged to have successfully integrated the idea of collaboration throughout.

By mapping pedagogic themes at sentence level, indirect reference to **Focused on Effective Teamwork and Collaboration** was construed through the combination of the themes Student-Led and Collaboration in the same subsection of documents. This approach in fact revealed that the majority of subsections in all documents and resources examined did contain some level of indirect reference to this principle. However, compared to the other ATT principle examined here, the strength and consistency of those indirect references was less effective. Although the pedagogic theme Student-Led appeared frequently throughout virtually all documents, the theme Collaboration was to be found less frequently (for a full comparison see the Themes section, below). Overall, this lower level of integration of the theme Collaboration caused many documents to have fairly low levels of indirect reference to **Focused on Effective Teamwork and Collaboration**.

The fact that the majority of subsections do have indirect reference to the principle should not be overlooked. It indicated that readers of IB documents are likely to take away, on some level, the significance of effective teamwork and collaboration to IB teaching and learning. However, these results suggest that through further direct reference to the principle title, further use of words such as collaboration and cooperation, and a generally increased emphasis on collaborative practices in some documents, the emphasis on this principle could be brought up to that of **Based on Inquiry**. If the IB considers these two principles to be of equal importance, then there is scope to improve the integration of **Focused on Effective Teamwork and Collaboration**, from its current moderate level, to a more emphatic level.

Having said that, the only two ATT principles examined in detail in this audit have been **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**. Thematic audit evidence suggests that **Based on Inquiry** may be significantly the most consistently indirectly referenced ATT principle, so **Focused on Effective Teamwork and Collaboration**'s failure to reach the same level does not mean this principle is not more effectively embedded than some others in the ATT. A comparable exploration of other principles, beginning with the thematic evidence presented below, would be needed to ascertain a full picture of **Focused on Effective Teamwork and Collaboration**'s relative position (in terms of indirect integration) compared to all other ATT principles.

Finding 30: Focused on Effective Teamwork and Collaboration – through further direct reference to the principle title, further use of words such as collaboration and cooperation, and a generally increased emphasis on collaborative practices in some documents, the emphasis on this principle could be brought up to that of **Based on Inquiry**. If the IB considers these two principles to be of equal importance, then there is scope to improve the integration of **Focused on Effective Teamwork and Collaboration**, from its current moderate level, to a more emphatic level.

4.8 Themes Indirect Mapping of Selected ATT Principles Using Pedagogic – Themes

Table 37: Total Pedagogical Theme References across all documentation

Pedagogic Theme	Student-Led	Local and Relevant	Global/ International Citizenship	Process/ Cycle	Collaboration	Student Individuality	Flexibility with Disciplines
Number of Sentence-Level References in Entire Audit	4588	2453	2398	5843	3182	2370	2944
Ranking order of themes based on number of sentence-level references	2	5	6	1	3	7	4

Student-Led

The pedagogic theme Student-Led was found to be referenced at sentence level on 4588 occasions in the documents audited. This places it second out of seven when compared to the other pedagogic themes; directly between Process/Cycle (which was considerably more common) and Collaboration (which was considerably less common).

Throughout the audit, this was generally found to be expressed in sentences involving ideas including (but not limited to): student-led inquiry; student self-assessment; student-student collaboration; curriculum design targeted at student needs; and students making choices about their learning.

Local and Relative

The pedagogic theme Local and Relative was found to be referenced at sentence level on 2453 occasions in the documents audited. This places it fifth out of seven when compared to the other pedagogic themes; on a very similar level to Global/International Citizenship and Student Individuality.

Throughout the audit, this was generally found to be expressed in sentences involving ideas including (but not limited to): curriculum content explicitly relevant to a student's life; curriculum content explicitly relevant to a student's needs; use of authentic and real-world contexts for learning; experience-based learning; and core and subject learning involving interactions with a student's local community.

Global/International Citizenship

The pedagogic theme Global/International Citizenship was found to be referenced at sentence level on 2398 occasions in the documents audited. This places it sixth out of seven when compared to the other pedagogic themes; on a very similar level to Local and Relevant and Student Individuality.

Throughout the audit, this was generally found to be expressed in sentences involving ideas including (but not limited to): the development of international-mindedness; the development of intercultural understanding and respect; the development of language skills in order to understand other cultures; awareness of global environmental issues; awareness of international politics and rights and responsibilities.

Process/Cycle

The pedagogic theme Process/Cycle was found to be referenced at sentence level on 5843 occasions in the documents audited. This places it first out of seven when compared to the other pedagogic themes; a considerable distance beyond the next most frequently referenced theme, Student-Led.

Throughout the audit, this was generally found to be expressed in sentences involving ideas including (but not limited to): the process of inquiry; cycles of assessment and feedback; development of students from an initial position towards specific goals; and forms of thinking that involve multiple stages of analysis such as critical thinking.

Collaboration

The pedagogic theme Collaboration was found to be referenced at sentence level on 3182 occasions in the documents audited. This places it third out of seven when compared to the other pedagogic themes; far below Student-Led, and slightly higher than Flexibility with Disciplines.

Throughout the audit, this was generally found to be expressed in sentences involving ideas including (but not limited to): student-student collaboration; student-teacher collaboration; teacher-teacher collaboration; collaboration between either students or school staff and parents or members of local society; and collaboration between individuals from different schools or countries.

Student Individuality

The pedagogic theme Student Individuality was found to be referenced at sentence level on 2370 occasions in the documents audited. This places it seventh out of seven when compared to the other pedagogic themes; though the numbers are very similar when compared with Global/International Citizenship and Local and Relevant.

Throughout the audit, this was generally found to be expressed in sentences involving ideas including (but not limited to): taking students' social and cultural background into account; developing inclusion policies and inclusive teaching practices; scaffolding teaching to account for students' prior knowledge; building the curriculum around students' personal preferences or individual interests.

Flexibility with Disciplines

The pedagogic theme Flexibility with Disciplines was found to be referenced at sentence level on 2944 occasions in the documents audited. This places it fourth out of seven when compared to the other pedagogic themes; far below Process/Cycle and Student-Led, but with appearing at very similar frequency to Collaboration.

Throughout the audit, this was generally found to be expressed in sentences involving ideas including (but not limited to): encouraging students to make connections between subjects; developing conceptual understanding that moves between disciplines; developing links between knowledge developed in subjects and activities of the programme core; and enabling students to pursue subject-specific knowledge as part of a balanced curriculum.

The IB Mission Statement and Flexibility with Disciplines

One noticeable feature of the analysis of the theme Flexibility with Disciplines – which is relevant to every IB document in pdf format – is that it is the only one of the identified pedagogic themes which is not present in the IB Mission Statement. The mapping of the IB Mission Statement was described at length in the Methodology of this report (see section 2.4.6). That mapping found that reference was made to the themes Student-Led, Local and Relevant, Global/International Citizenship, Process/Cycle, and Student Individuality, but not Flexibility with Disciplines. As the Mission Statement is intended as a concise articulation of the IB philosophy, it would be an opportune space to indirectly reference the entire ATT in a cohesive way. An example of how this could be achieved is demonstrated below, with new text underlined.

> IB mission statement
>
> The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.
>
> To this end the organization works with schools, governments and international organizations to ~~develop~~ produce challenging programmes of international education and rigorous assessment, in which students are encouraged to develop conceptual understandings within and between subjects.
>
> These programmes encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right.

This statement would continue to concisely represent the key features of an IB education, without omitting the important fact that IB students are encouraged to develop within traditional academic disciplines but are also prompted to draw links between them in order to widen their perspectives. This is a key feature of the IB philosophy, and could therefore be more concretely represented in this core statement.

Finding 31: Pedagogic Themes – Process/Cycle was the most common pedagogic theme in audited documentation, followed by Student-Led. Collaboration was a distant third, closely followed by Flexibility with Disciplines. The least referenced themes were Local and Relevant, Global/International Citizenship, and Student Individuality.

Finding 32: Pedagogic Themes – The IB Mission Statement contains all pedagogic themes identified in the ATT except Flexibility with Disciplines. There is thus scope to add a short phrase or sentence to incorporate this theme and therefore holistically deliver indirect reference to the entire ATT in this key passage for IB documentation.

5. Key Findings

This section provides a consolidated summary of the key findings interspersed throughout the report, with reference to the overarching research questions.

Research Question 1: To what degree are the IB Approaches to Teaching (ATT) an appropriate set of pedagogical principles for K-12 education programmes?

- **Where are the ATT principles similar and dissimilar to other pedagogic frameworks?**
- **To what extent do the ATT reflect the need for future-focused learning?**
- **Are the ATT a coherent series of principles, especially as they relate to teaching on the entire K-12 continuum?**
- **Are the ATT principles underpinned by strong pedagogic evidence, both individually and collectively?**

Similarities and Differences with other frameworks

- There is close alignment between ATT and alternative frameworks – the coverage approach suggests that the ATT and alternative frameworks[105] are closely aligned, although some ATT principles are reflected in alternative frameworks more commonly/extensively than others.
- Use of a thematic approach[106] in the literature review found that the pedagogic themes underpinning the ATT are consistently strongly covered by alternative frameworks, although coverage varies from theme to theme, with Global/International Citizenship being the least consistently present in other frameworks. Global/International Citizenship thus stands out here as an area of emphasis that makes the IB ATT standout from some other frameworks. Whilst the frameworks differ in their wording, analysis of the pedagogic themes revealed many strong similarities.
- The "gap" analysis revealed a limited number of areas in which alternative frameworks contained elements not found within the ATT; the number of "gaps" was reduced when considering them alongside the pedagogic themes underpinning the ATT, but specific, practical classroom activities, certain precise areas of learning, and explicit prioritisation of innovation and creativity as key areas remained as "gaps".
- Other IB teaching and learning curriculum components may provide coverage of the gaps identified when comparing the ATT to alternative frameworks – the "gaps" discovered through "gap" analysis may be found elsewhere in IB teaching and learning curriculum components, for example in the LP or Approaches to Learning, rather than in the ATT.

Future-focused learning

- Future-focused learning is effectively articulated and facilitated in the ATT – the ATT's focus on Global/International Citizenship and the similar features it shares with other

[105] ATS2020 Transversal Skills Framework, Cambridge International Learner Attributes, Eco-schools Educational Principles, European Commission Key Competences for Lifelong Learning, NAEYC DAP Guidelines, P21 Framework for 21st Century Learning, Singapore 21CC Framework, Singapore Teaching Practice Pedagogic Principles

[106] See section 2.3.4.3.

explicitly future-focused alternative frameworks provide strong evidence to suggest that future-focused learning is effectively articulated in, and facilitated by, the ATT.

Coherence and pedagogic underpinnings

- The relationship between the ATT principles and the pedagogic themes demonstrates that the whole ATT and each of its individual parts have a firm foundation in pedagogic evidence.
- Constructivism – it is evident from reading the ATT and considering the pedagogic themes behind them that the epistemological outlook of constructivism is at the root of the ATT; however the extent to which this is made explicit and is expanded upon varies across documents.
- Suitability of the ATT for the K-12 continuum – the pedagogic evidence underpinning the identified themes, and the similarities between the ATT and alternative frameworks with a range of targeted age groups, provides strong evidence to suggest that the ATT contains effective and coherent pedagogy for the entire K-12 continuum.

Research Question 2: Collectively, to what extent do the IB ATT pedagogical principles align with and support the:

- **Stated goals of individual IB programmes?**
- **IB Approaches to Learning (ATL)?**
- **IB Learner Profile (LP)?**

Goals of the programmes

- The stated aims (including International Mindedness, and key paragraphs from the programme FPIPs) of all IB programmes integrate all seven of the pedagogic themes found to underpin the Approaches to Teaching. Some programmes have slightly different pedagogic emphases compared to others, but all elements of the ATT are nonetheless referenced in key text segments which articulate the aims of programmes.
  - In the PYP, Student Individuality was the least strongly referenced, with particular emphasis instead being placed on the themes Student-Led and Process/Cycle. The dominance of these two themes is indicative of the PYP: FPIP's dedication to the idea of student-centred inquiry.
  - In the MYP, there was more notable emphasis on Student Individuality than was found in the PYP, but all seven pedagogic themes could be found in the MYP FPIP.
  - In both the CP and the DP, all seven pedagogic themes were observed. In the DP, there was no discernible emphasis on or limitation to any single theme. In the CP, the theme Local and Relevant was strongly embedded (in the context of what was a short extract), whilst there was only a limited, implicit reference to the theme of Collaboration.

IB LP

- Comparison of the ATT and the LP has demonstrated that there are some deviations in what is prioritised by each. Whereas the ATT more explicitly articulates the

construction of understandings, inclusivity or barriers to learning, and assessment, the LP gives more direct emphasis to critical and creative thinking, and principled actions. However, when we look at both from a thematic perspective we can see that the ATT's pedagogic themes are very much present in the LP. Although they are articulated quite differently, the ATT and LP have significant overlaps in underpinning content.

Approaches to Learning (ATL)

- There is more divergence between the ATT and the Approaches to Learning than between the ATT and the LP. Although there are some areas where ATT principles or the pedagogic themes are covered by the Approaches to Learning skills, there are also substantial differences. Moreover, "Thinking skills" is an element of the Approaches to Learning that has significant components not covered by either the ATT principles or pedagogic themes.

Overall IB Curriculum Components

- The ATT, LP, and Approaches to Learning not only function as teaching and learning curriculum components in their own right, but they also mutually reinforce one another by covering many of the same core ideas, but also providing their own specific focuses.

Research Question 3: To what extent are the selected ATT principles – Based on Inquiry and Focused on Effective Teamwork and Collaboration – integrated effectively in programme curricular documents?

- **Do programme subjects/core components collectively integrate the ATT principles?**
- **Does articulation of the ATT principles align within programmes?**
- **Does articulation of ATT principles align across programmes?**
- **To what degree do IB curricular documents clearly articulate the relationship between the ATT principles with other key elements of an IB education? For example, the IB Learner Profile (LP) and international mindedness (IM).**

Integration of the principles

- Taking all mapping methods into consideration, it is evident that, of the two principles, **Based on Inquiry** is more effectively integrated through both keyword and thematic integration than **Focused on Effective Teamwork and Collaboration**, even though both had the same (small) number of direct references.

- There is scope to expand direct reference to the principle **Based on Inquiry**. By increasing usage of the exact title of the principle, there is less chance that teachers will miss any indirect references – guaranteeing that the principle will be consistently embedded into teaching. However, given that most IB documents do not currently refer to the principle's title on numerous occasions, the combination of keywords and thematic references indirectly reference **Based on Inquiry** in an effective way in the majority of documents.

- Through further direct reference to the principle title, **Focused on Effective Teamwork and Collaboration**, further use of words such as collaboration and cooperation, and a generally increased emphasis on collaborative practices in some documents, the emphasis on this principle could be brought up to that of **Based on Inquiry**. If the IB considers these two principles to be of equal importance, then there is scope to improve the integration of **Focused on Effective Teamwork and Collaboration**, from its current moderate level, to a more emphatic level.

Pedagogic Themes

- Process/Cycle was the most common pedagogic theme[107] in audited documentation, followed by Student-Led. Collaboration was a distant third, closely followed by Flexibility with Disciplines. The least referenced themes were Local and Relevant, Global/International Citizenship, and Student Individuality.

- The IB Mission Statement contains all pedagogic themes identified in the ATT except Flexibility with Disciplines. There is thus scope to add a short phrase or sentence to incorporate this theme and therefore holistically deliver indirect reference to the entire ATT in this key passage for IB documentation.

Cross-programme observations

- The Impact of Pedagogic Connotations in Words and Phrases – there are some words and phrases used in IB documentation with an at-first-glance simple definition, which actually have more sophisticated and complex connotations when read within the wider context of IB pedagogy. The clarity of IB documentation – regarding the highly-important connotations of keywords and phrases – could benefit from a centralised glossary or additional definition guidance.

- What Counts as "Teaching" in the Approaches to Teaching? – it was found that there are some scattered references throughout IB documents to the fact that IB teaching and learning curriculum components in general should be modelled by staff, thus providing a demonstration of best practice to students. However, this point is not clearly made in places where the ATT are explicitly discussed. There is therefore scope to provide extra clarity around the philosophical position that teachers should develop practices based around ATT principles in their interactions with other members of staff, and in their personal and professional development, not just when carrying-out classroom based teaching.

- Missed Opportunities for Cohesively Articulating the Entire ATT – there are sections of text which provide strong opportunities to implicitly reference all seven of the identified pedagogic themes in one place; however, these opportunities are often missed – leading to only five or six of the themes being referenced, and a missed opportunity to articulate the entire ATT cohesively. Indirectly referring to all components of the ATT simultaneously is useful because it is a method of further embedding the ATT without

[107] On the pedagogic themes deconstructed from the ATT, see section 2.2.1.

having to repeat, word-for-word, the titles of each principle. It is therefore worth reviewing opportunities to do so within documents.

- Quantity of Indirect References to Selected Attributes – the BOI and FOETAC Measures vary significantly within and between documents. Most documents contain at least one subsection where one or both measures drop to zero (meaning no indirect reference to the selected attributes). Many documents also contain one or more subsections with a BOI or FOETAC Measure of high (above 0.02) or very high (above 0.03) strength. A single pattern of best practice is difficult to ascertain due to the varying strengths and weaknesses of different approaches, but, in general terms, a BOI or FOETAC Measure that shows consistently moderate presence throughout a document, with strategic high or very high peaks, is likely to be a model of effective practice.

Document Types:

Cross-Programme Documents	All three cross-programme documents[108] contain some direct references to the "Approaches to Teaching", but only *WIAIBE?* translates this into direct references to the selected attributes. There is scope to add further reference to both selected ATT principles in all documents, with specific emphasis placed on the subsections of the *WIAIBE? TSM* which recorded zero indirect thematic reference to the selected principles.
Programme FPIP Documents	Although the PYP document features the lowest number of direct references to the ATT and selected principles, it does use the language of inquiry to a remarkably high degree. Moreover, the PYP document has impressive indirect reference to **Based on Inquiry**. Given the length of the MYP document, compared to the DP and CP, the direct references to both principles and the keyword references to words related to **Focused on Effective Teamwork and Collaboration** are relatively low. This tallies with the indirect referencing audit of the MYP document. There is thus scope to add further reference to teamwork and collaboration in *MYP: From Principles into Practice*.
Mathematics Subject Documents	This comparison demonstrates that the inclusion of direct, keyword, and indirect references is relatively low; especially in the case of **Focused on Effective Teamwork and Collaboration**. There is not a document here which contains direct or indirect referencing of either **Based on Inquiry** or **Focused on Effective Teamwork and Collaboration** to a significant extent. This evidence therefore suggests that there is scope to add further reference to both ATT principles across these mathematics documents.
Individuals and Societies/History Subject Documents	Similar to other subject documentation, a lack of direct references to "Approaches to Teaching" or the individual ATT principles, does not prevent the *MYP Individuals and Societies Guide* showing keyword references to the selected principles. However, the indirect referencing showed that the keyword language references did not necessarily translate into strong indirect referencing through pedagogic themes. The *DP: History Guide* demonstrated a similar pattern. All documents showed more indirect reference to **Based on**

[108] The three cross-programme documents audited were: *WIAIBE?*, *WIAIBE? TSM*, *PS&P*.

	Inquiry than **Focused on Effective Teamwork and Collaboration**. All three referencing methods demonstrate that there is scope to add further "Approaches to Teaching" and ATT principle references to the documents.
Language Acquisition Subject Documents	Despite a low number of direct references to the selected ATT principles, the keyword language of the principles is contained within the documents, albeit with a greater emphasis on inquiry over teamwork and collaboration. This is true for both subject guides as well as the TSMs. Overall, there is clear scope to increase direct, indirect, and keyword references to the idea of collaboration in language documentation.
Programme Subject Documentation	Subject documents across the DP (which also applies to the CP) and MYP demonstrate far more keyword and indirect reference to the idea of inquiry than to the idea of collaboration. This suggests that **Focused on Effective Teamwork and Collaboration** is underrepresented as an ATT principle in these subject guides. Moreover, all subject documentation examined here had scope to increase direct references to ATT principles, which were entirely absent in the majority of instances.

Individual Programme Documentation:

PYP documentation	**Based on Inquiry** is most effectively integrated in this programme in the *Learning and Teaching* pdf of the FPIP and in *Developing a Programme of Inquiry*. **Focused on Effective Teamwork and Collaboration**, on the other hand, is most effectively integrated into the *Learning Community* pdf of the FPIP. Regarding both selected principles, there is a lack of direct references across PYP documentation, but keyword and indirect references makeup this shortfall, particularly in the case of **Based on Inquiry**. There is clear scope to add more direct reference to ATT principles, and to generally integrate the idea of collaboration through relevant keywords and indirectly through pedagogic themes.
MYP documentation	This programme presents a highly variable picture of principle integration from document to document. In general terms, some of the strongest indirect references to the selected attributes are not to be found in subject documents, but in the *Projects Guide* and selected subsections of the FPIP and TSMs. The *Projects Guide* provides a good example of a document that effectively maintains steady indirect reference to both selected attributes throughout the document. In the programme as a whole, there is clear scope to expand direct references to the ATT in general and the selected principles, while the keyword and indirect reference analysis suggests that inquiry is generally better integrated than collaboration, with the *Individuals and Societies Guide* showing this imbalance particularly clearly.

DP documentation	**Based on Inquiry** was indirectly referenced to a reasonable degree in many documents (including subject and core guides) with the point of highest integration coming towards the end of the FPIP. **Focused on Effective Teamwork and Collaboration** was often indirectly referenced to the highest degree in the Learner Profile preface at the start of documents. This is an indication that there is significant scope to further indirectly embed the idea of collaboration – though keyword references in the DP: FPIP are an exception to that trend in this programme. Direct reference to the ATT and selected principles was higher in the DP than the MYP or PYP. However, both keyword and indirect references to the selected principles (particularly **Focused on Effective Teamwork and Collaboration**) have scope for development across the programme.
CP documentation	The programme FPIP contains some notable spikes in indirect reference to the selected principles (**Based on Inquiry** having more of these than **Focused on Effective Teamwork and Collaboration**), but other documents do not have noticeably high levels of indirect principle integration. CP documentation demonstrates a similar level to the DP documentation of direct reference to the ATT and the principles (much of the documentation is shared); direct integration is therefore higher here than in the PYP or MYP. Overall, by all audit measures used here, there is scope to develop further references to both selected principles across this programme, though **Based on Inquiry** is generally integrated to a higher degree than **Focused on Effective Teamwork and Collaboration**.

Research Question 4: What recommendations can be made to the IB regarding:

- **The ATT pedagogical principles as a whole?**
- **Specific ATT principles?**
- **The guidance provided to IB World Schools for implementing the ATT principles?**

Please see Section 6 for recommendations.

6. Recommendations

Recommendation 1: To develop further clarity regarding the interrelationships between the Approaches to Teaching, Approaches to Learning, and Learner Profile – focusing on interactions between these curriculum components and the issues of mutual coverage and/or differences.

The analysis of the ATT carried out in this report, and the comparisons that have been made with the Approaches to Learning and Learner Profile have revealed that these curriculum components are mutually reinforcing in many ways. A large number of the underpinning ideas implicit in the ATT can also be found in these other IB curriculum components, and a large number of the ideas contained in those curriculum components are also to be found in the ATT. However, there are also some areas of divergence. Whereas the ATT more explicitly articulates the construction of understandings, inclusivity or barriers to learning, and assessment, the LP gives more direct emphasis to critical and creative thinking, and principled actions. Moreover, "Thinking skills" is an element of the Approaches to Learning that has significant components (for example, creativity and innovation) not covered by either the ATT principles or pedagogic themes behind the ATT.

Although cross-programme documents such as *What is an IB Education?* do give some guidance regarding how these curriculum components interact – with the implication being that the ATT and ATL are the vehicles which enable students to reach the destination of LP attributes – how teachers are intended to interpret the complex relationship of overlaps and divergences is not made clear. For instance, must all elements of the ATT and ATL always be synchronously delivered, or (because they contain many of the same themes) is it possible to focus on only one of these curriculum components at a time and still to deliver effective IB pedagogy?

The findings responding to Research Question 2[109] as part of the document audit suggest that further clarity surrounding these issues is merited. It is possible that this guidance could be incorporated into existing cross-programme documentation such as *What is an IB Education?* or developed as a new cross-programme support document.

Recommendation 2: To increase emphasis within documentation on the ATT principle **Focused on Effective Teamwork and Collaboration.**

The auditing of IB documentation found that the vast majority of documents contained more (and sometimes significantly more) keyword and indirect references to **Based on Inquiry** than to **Focused on Effective Teamwork and Collaboration**. The findings from the document comparisons within the audit, as well as the individual document analyses, suggested that not all documents, but many, had scope for further embedding **Focused on Effective Teamwork and Collaboration**, an important ATT principle. There is scope to increase both keyword and

[109] Research Question 2: Collectively, to what extent do the IB ATT pedagogical principles:
- Align with and support the stated goals of individual IB programmes?
- Align with and support IB Approaches to Learning (ATL)?
- Align with and support the IB Learner Profile (LP)?

indirect references to **Focused on Effective Teamwork and Collaboration** in the majority of documents examined here. The number of document subsections which contain zero indirect reference to the principle (as calculated through our FOETAC Measure process) is perhaps the most straightforward symptom of this issue. This can be ameliorated by further use of keywords such as “collaboration”, “cooperation”, and “teamwork”, and also increasing the quantity of documentation content that makes reference to the broad pedagogic theme of Collaboration.

The IB should consider whether or not parity of integration of the two selected principles – **Focused on Effective Teamwork and Collaboration** and **Based on Inquiry** – is desired. Currently, the documents selected for auditing provide an overall impression that **Focused on Effective Teamwork and Collaboration** is less central to an IB education than **Based on Inquiry**. It would be possible to change this pattern through further indirect and direct expressions of **Focused on Effective Teamwork and Collaboration**, but it is important to first consider whether or not all ATT principles are expected to be integrated within documentation to a roughly equal degree. If that is not the case, and some form of hierarchy of importance between the principles is a desired pattern, then the IB may wish to consider expressing this and explaining it explicitly in a cross-programme document such as *WIAIBE?*.

Recommendation 3: To embed more direct references to the titles of individual ATT principles within documentation.

As part of the auditing process, it was found that the majority of documents do not contain any direct reference to the titles of the selected ATT principles – i.e. the phrases “Based on Inquiry” and “Focused on Effective Teamwork and Collaboration”. Such direct references would act as valuable signals to teachers that the ATT are important and are expected to feature in teaching and learning.

A significant number of documents do use the phrase “Approaches to Teaching”, but only a relatively small number translate this into direct references to the principle titles. The documents which provided the largest number of direct references to principle titles were the DP and CP FPIPs, which both contain three references to each of the selected principle titles. Overall, it is recommended that every FPIP, subject guide, core-element guide, and cross-programme document should contain at least one direct reference to each of the ATT principles. This would bring the ATT closer to the LP, in terms of direct references, which has guaranteed direct references to all attribute titles in all substantial documents due to the repeated Learner Profile preface. A similar preface could be employed for the Approaches to Teaching, or a less formulaic method of directly referencing the principle titles could achieve the same effect.

Recommendation 4: To develop further guidance within documentation which clarifies how readers of IB documents can interpret indirect references to ATT principles – this includes centrally defining keywords and phrases, potentially with a glossary-like resource.

Currently, a significant proportion of references to the ATT as a whole and to individual principles within the ATT, are delivered through keywords or indirectly through references to pedagogic themes. Appreciating the full extent to which the ATT is embedded in IB

documentation therefore requires a combination of very close reading and processes of inference. In order to make it easier for teachers to interpret relevant keywords and indirect references, a centralised glossary-like resource could be developed.

Some existing documents – often the FPIPs and subject guides – do contain end-of-document glossaries, which provide guidance on how to interpret certain words and phrases. However, the process of mapping IB documentation has revealed that documents do not always share the same definitions, and also do not always define some of the most connotation-laden words and phrases. In the document audit we highlighted the importance but complexity of phrases such as "in the world around them" and words such as "action". The mapping process also highlighted the importance of principle-related keywords such as "cooperation", "collaboration", and "team" for the principle **Focused on Effective Teamwork and Collaboration**.

Overall, the embedding of ATT principles in documents could be made more beneficial for IB teachers/educators if a glossary-like tool enabled them to make easier sense of keyword and indirect references. Further centralised guidance regarding the correct pedagogic interpretations of keywords and phrases would therefore provide notable benefit. Moreover, it may be possible to show the relationships between terms with links to the same pedagogic themes and demonstrate the intricate relationships of keywords to pedagogic ideas using a html-based glossary.[110]

Recommendation 5: To consider describing, more explicitly, in documentation how the ATT principles are not only a structure for curriculum design or classroom teaching but also a description of how all members of the IB community should conduct themselves within the culture of the school. This should begin with internal discussions regarding the intended scope of the ATT in relation to all activities within the school community.

The document audit found that there are some scattered references throughout IB documents to the fact that IB teaching and learning curriculum components in general should be modelled by staff, thus providing a demonstration of best practice to students. However, this point is not clearly made in places where the ATT are explicitly discussed. There is therefore scope to provide extra clarity around the fundamental position that teachers should develop practices based around ATT principles in their interactions with other members of staff, and in their personal and professional development, not just when carrying-out classroom-based teaching.

In some national contexts it is common practice that approaches to teaching are fundamental to school culture, not only to classroom practice. However, the breadth of international and local contexts in which IB programmes are delivered means that it cannot be guaranteed that all schools will always interpret the Approaches to Teaching through a lens of holistic school behaviours. Further understanding of this could be developed through a survey (see Recommendation 10), but added clarity in a cross-programme document such as *What is an*

[110] For an example of how this can work, see UNESCO-UNEVOC's Tvetipedia. Definitions within this glossary can also provide hyperlinks to extended forum dicussions about the pedagogic issues within those definitions. See, for example, the entry on "Access and Equity". https://unevoc.unesco.org/home/TVETipedia+Glossary/lang=en/filt=all/id=4. Accessed 16/09/20.

IB Education? could support teachers' understanding of how far the ATT reaches into school culture as a whole.

Recommendation 6: When documents are individually redrafted and revisited, to take the opportunity to strategically deploy indirect references to all six ATT principles in one place in key sections of text – this will often involve adding an extra phrase or sentence in places where currently a large proportion (but not all) of the ATT principles are indirectly referenced.

There are sections of IB documentation which provide strong opportunities to indirectly reference all seven of the pedagogic themes (which have been identified to underpin the ATT [see section 2.2.1]) in one place; however, these opportunities are often missed – leading to only five or six of the seven pedagogic themes being referenced, and a missed opportunity to articulate the entire underpinning of the ATT cohesively. Indirectly referring to all components of the ATT simultaneously is useful because it is a method of further embedding the ATT without having to repeat, word-for-word, the titles of each principle (though this is also valuable, see Recommendation 3).

In the document audit we have provided examples of sections of text which currently demonstrate this cohesive indirect referencing. We have also identified sections of texts where opportunities to provide cohesive indirect referencing are missed. The analysis of individual programme's stated aims provides a good example of how all aspects of the whole ATT can be indirectly referenced in relatively small passages of text.

When documents are gradually revised and redrafted, it is therefore worth examining (particularly introductory and over-arching) passages of text, and to add phrases or sentences which allows key subsections to indirectly reference the entire ATT, rather than just five or six of the pedagogic themes and therefore only four of five of the six principles.

Recommendation 7: To strengthen the ATT principle **Focused on Conceptual Understanding** in the IB Mission Statement by adding reference to the pedagogic theme Flexibility with Disciplines. It is the only one of the seven identified pedagogic themes underpinning the ATT which cannot be found in the mission statement.

The IB Mission Statement is a key passage of text found at the start of all documents. In the process of mapping IB documentation it was found that the Mission Statement contains all of the pedagogic themes identified in the ATT (see section 2.2.1) except Flexibility with Disciplines. This results in the ATT principle **Focused on Conceptual Understanding** not being fully integrated into the mission statement. There is thus scope to add a short phrase or sentence to incorporate the pedagogic theme Flexibility with Disciplines and therefore holistically deliver indirect reference to the entire ATT in this key passage. As has also been discussed in Recommendation 6, opportunities to indirectly reference the entire ATT in one place are valuable because they demonstrate that the ATT is not composed of six unrelated parts, but constitute one cohesive and mutually reinforcing unit.

As the ATT does not currently have an explicit place in the preface of resources (unlike the LP, which has a dedicated page in the preface of all pdf documents), the Mission Statement provides a valuable opportunity to indirectly reference the principles of the IB's Approaches to Teaching. In the document audit section of this report, a demonstration is made of how a single

phrase added to the Mission Statement could allow it to indirectly reference all seven of the ATT's pedagogic themes, and therefore all six of its principles.

Recommendation 8: To further review whether or not additional reference to teaching through and for creativity and innovation should be included in the ATT principles.

As part of the auditing process, the Approaches to Teaching were compared to the Approaches to Learning through a "coverage approach", "gap analysis", and "thematic presence method".[111] This process revealed that although the ATL does contain reference to the ideas of creativity and innovation (as part of "Thinking Skills"), the Approaches to Teaching principles do not contain any explicit reference to those ideas.

The wider context of the literature review also suggested that some other international frameworks contain the ideas of teaching through and for creativity and innovation far more explicitly than the IB ATT (for example, Singapore 21CC).

Taking both of these contexts into account, there is scope for the IB to further review whether or not the ideas of creativity and innovation are sufficiently embedded into the combined teaching and learning curriculum components. In part, this recommendation also relates to Recommendation 1, as further clarity regarding the relationship between the ATT and ATL may explain to teachers that creativity and innovation are purposefully placed in the latter but not the former. However, even with further clarification of the relationship between these curriculum components, there may remain further scope to embed creativity and innovation into the ATT. Taken together with Recommendation 1, this recommendation therefore involves a developing process of examining the IB's pedagogic stance on creativity and innovation, and where that philosophy should be expressed in curriculum components and documentation.

Recommendation 9: To continue monitoring developing and emerging trends in international pedagogic frameworks, to ensure that the ATT as a whole (and especially the future-focused ideas within with the ATT – which are likely to constantly evolve) continue to represent up-to-date best practice.

This report has given a broad assessment of the international landscape of pedagogic frameworks, based on detailed examination of a selection that represents many wider trends. However, new pedagogic and skills frameworks are always in the process of being developed (for example, the OECD 2030 Learning Compass has continued to evolve while this report was in production)[112]. There is therefore a benefit in continuing to monitor international examples of good practice, so as to ensure that the IB ATT reflects the best qualities of those alternative frameworks.

Furthermore, the literature review of this report recognised that the IB ATT has sufficient emphasis on future-focused learning (including topics such as international citizenship). However, the practicalities of future-focused learning are always evolving in response to the needs of students, further and higher education providers, and labour markets. Even in the

[111] On these processes see section 2.3.4.
[112] http://www.oecd.org/education/2030-project/teaching-and-learning/learning/learning-compass-2030/.

space of the last six months, the impact of the COVID-19 pandemic has had an immediate impact on the practicalities of deploying pedagogy all over the world. As a result, it is important that the IB's consistent monitoring of international best practice pays particular heed to the constant evolution of what future-focused learning means and how it can be implemented.

Recommendation 10: To further explore (potentially with a survey) the experience of practically deploying the ATT in schools – with particular attention given to how different national and socio-cultural contexts may display variance.

The original scope for this report would have included a survey to explore the practicalities and experiences of deploying the ATT in IB world schools. Unfortunately, the COVID-19 pandemic put a stop to the possibility of carrying out this survey. However, when it becomes possible again to carry out further research into the deployment of the ATT, this continues to be a process that would yield valuable information.

In fact, the literature review and audit processes carried out in this report have underscored the importance of carrying out such a survey. The literature review found that some other international frameworks (for example, Singapore PP) contain practical classroom guidance in their pedagogic frameworks to a higher degree of detail than that found in the ATT. Moreover, the audit of documentation uncovered a number of words and phrases with important pedagogic connotations that could be perceived differently by teachers in different contexts – thus impacting the implementation of the ATT. As a result of both of these findings, it is evident that there would be significant benefit to understanding far more about how the ATT is interpreted at different IB world schools, and how it is practically deployed in the wide variety of contexts in which IB programmes are delivered.

Recommendation 11: To further explore the epistemological and philosophical underpinnings of IB pedagogy. Along with detailed analysis of current explicit and implicit articulation of constructivism in IB documents, this would enable the foundation of IB pedagogy (and its benefits) to be articulated more clearly.

From an examination of the literature surrounding the pedagogic themes underpinning the IB ATT, it is evident that the epistemological philosophy of constructivism is an important foundation for the IB's approach. There are a small number of references to this fact in IB documentation. However, the extent to which this is the only epistemological philosophy underpinning the ATT, or the extent to which the IB is fully committed to any particular subcategory of constructivism, is impossible to say from current explicit statements in documentation.

There is therefore scope to conduct further exploration of how epistemological and pedagogical philosophies are embedded into IB documentation. Moreover, a literature review of the international best practice of deploying constructivism and other related pedagogies would help to develop an understanding of how the IB could provide further explicit guidance on its underpinning philosophies. Although not all users of IB documentation will have a sustained interest in philosophies of teaching and learning, it is something that teachers will inevitably engage with to varying levels. It would therefore be beneficial for the messaging on the IB's particular constructivist emphases to be clear and consistent throughout documentation.

Appendices

Appendix 1 – Bibliography

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Appendix 2 – Links between ATT Principles and Pedagogic Themes

Based on Inquiry

A strong emphasis is placed on students finding their own information and constructing their own understandings.

Theme	Link	Justification
Student-Led	Explicit	The *Based on Inquiry* description uses the phrases "finding their own information" and "constructing their own understandings". These are explicitly student-led exercises.
Local and Relevant	Implicit	There is no explicit statement in the title or description of *Based on Inquiry*, but it is highly likely that a student-led, inquiry-based approach (as described in this principle) will involve students asking questions and pursuing lines of exploration that are relevant to them and the local culture in which they have developed.
Global/International Citizenship	None	
Process/Cycle	Explicit	The *Based on Inquiry* description invokes the idea of a process: moving from the "finding" of information to the "construction" (also a process) of understandings. Also, the implications of "inquiry" are that it is a process (i.e. starting with a question and moving forward from there). This link is embedded in the name of the widely referenced inquiry cycle.
Collaboration	Implicit	The description of *Based on Inquiry* uses the terms "**their** own information" and "constructing **their** own understanding**s**". There is ambiguity here but this sentence is potentially plural, thus suggesting a process involving more than one student. Also, the implications within "constructing their own understandings" are potentially collaborative between student and teacher, as the construction of knowledge from inquiry generally requires guidance or scaffolding from the teacher. Neither of these points are unambiguous in the text, hence the link is implicit.
Student Individuality	Implicit	The description of *Based on Inquiry* uses the terms "their **own** information" and "their **own** understandings". Again, this is not explicitly in the text, but the implications behind these statements are that each student's individual identities and backgrounds may shape the way that they gather information or construct understanding.
Flexibility with Disciplines	Implicit	The implications of the term "inquiry" are that it is an open-ended activity – therefore not constrained by traditional disciplinary boundaries. But this is not explicitly defined this way in the description, so the link is only implicit.

Focused on Conceptual Understanding

Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.

Theme	Link	Justification
Student-Led	Explicit	The description of *Focused on Conceptual Understanding* tells us that "students **make** connections". This is explicitly a student-driven action, rather than one instigated by the teacher.
Local and Relevant	Implicit	The description of *Focused on Conceptual Understanding* explains that students will "make connections and transfer learning". It is not explicitly stated here, but it is likely that connections and transferrals will involve the local context in which students find themselves, and the topics they consider relevant to their lives.
Global/International Citizenship	Implicit	The description of *Focused on Conceptual Understanding* tells us that students are to "transfer learning to new contexts". Part of our list of ideas associated with Global/International Citizenship is to do with new contexts (new as in new 21st-century challenges; and new as in take your learning and skills and deploy them in a country or culture that is new to you). However, this requires an unpicking of the phrase "new contexts" and is therefore not explicit.
Process/Cycle	Explicit	The description of *Focused on Conceptual Understanding* tells us that students will undergo actions in relation to their conceptual understanding: "make connections and transfer learning". This is an explicit reference to a two-part process.
Collaboration	None	
Student Individuality	Implicit	The description of *Focused on Conceptual Understanding* uses the phrase "help students make connections". It is not explicitly described this way, but the connections students make are likely to be shaped by their individual learning backgrounds and identities. Moreover, teachers may need to tailor or differentiate activities in order to "help students make connections".
Flexibility with Disciplines	Explicit	The description of *Focused on Conceptual Understanding* tells us that conceptual understanding is intended to "deepen disciplinary understanding and to help students make connections". This explicitly tells us that the principle simultaneously enables use of traditional disciplines, and blurs the boundaries between them. Thus they are being flexible with disciplines.

Developed in Local and Global Contexts

Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.

Theme	Link	Justification
Student-Led	Explicit	The description of Developed in Local and Global Contexts uses the phrases “process new information” and “connecting it to their own experiences”. These activities encourage student agency. A definition of Developed in Local and Global Contexts that was not explicitly student-led might use phrases like “learn new information” and “be shown how it connects to their own experiences”.
Local and Relevant	Explicit	The title of Developed in Local and Global Contexts explicitly states that this is about the use of “local” contexts. Moreover, the “experiences” of students are likely to be relevant and take place in their local society/culture.
Global/International Citizenship	Explicit	The title of Developed in Local and Global Contexts explicitly states that this is about the use of “global” contexts. Moreover, “the world around them” is a clear reference to not only the world directly around them but the wider and more distant world – thus linking to global and international issues.
Process/Cycle	Explicit	The description of Developed in Local and Global Contexts explicitly contains the word “process”, and suggests that this involves multiple stages by linking it to the making of connections. If this were not explicitly a process it would perhaps describe merely the reception of information rather than the processing and connecting of it.
Collaboration	Implicit	Some of the language in the description of Developed in Local and Global Contexts implies a certain level of collaboration. For instance the terms “students”, “their”, and “understandings” are potentially plural, thus being suggestive of a co-operative exercise between multiple students.
Student Individuality	Explicit	The description of Developed in Local and Global Contexts tells us that the principle relies on students using “their own experiences”. These will be particular to each student and therefore draws on a notion of student individuality, and the idea of shoring up their identities.
Flexibility with Disciplines	Implicit	The definition of Developed in Local and Global Contexts tells us that students are expected to connect learning to “their own experiences”. These experiences are unlikely to fall neatly within a disciplinary boundary (for example, you do not experience trigonometry as a mathematical concept in the real world, but you might experience it as part of engineering when you notice the construction of a bridge, or as part of Physical Education when you observe the trajectory of a ball). However, this link requires logical deconstruction of the meaning of the text here, so it is not explicit.

Focused on Effective Teamwork & Collaboration

This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.

Theme	Link	Justification
Student-Led	Explicit	The definition of *Focused on Effective Teamwork & Collaboration* tells us that "collaboration between students" is key to this principle. This is an explicitly student-led exercise (i.e. students guiding the learning process by driving the interactions with one another).
Local and Relevant	None	
Global/International Citizenship	Implicit	The title and definition of *Focused on Effective Teamwork & Collaboration* tell us that this principle requires teamwork and the development of a "collaborative relationship". An important part of our definition of Global/International Citizenship is that it leads students towards skills such as negotiation and the ability to communicate with people with differences to oneself. Teamwork and collaboration pushes students towards these skills, however it takes reading-between-the-lines to create this link – hence it is implicit.
Process/Cycle	None	
Collaboration	Explicit	The title of *Focused on Effective Teamwork & Collaboration* explicitly tells us that teamwork and collaboration are the nature of this principle. Both are key to this pedagogic theme too.
Student Individuality	Implicit	The title of *Focused on Effective Teamwork & Collaboration* tells us that teamwork is at the heart of this principle. And the definition tells us that this team may consist of multiple students. Implicit within the notion of a team is the idea of people with different individual strengths/weakness/profiles working in tandem. This is thus drawing on the fact that different students have different individual identities. However, in order to discern this it is necessary to breakdown the idea of "teamwork", hence making the theme only implicit.
Flexibility with Disciplines	None	

Designed to Remove Barriers to Learning

Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.

Theme	Link	Justification
Student-Led	Implicit	The description of *Designed to Remove Barriers to Learning* tells us that students will "pursue appropriate personal goals". The act of pursuing, and the personalisation of these goals, suggest a level of student-led activity – more so than if they were asked (for instance) to "achieve established outcomes". However, the sentence is not clear over the fact of who establishes the personalised goals – it could be a process very much controlled by the teacher in a more traditional sense. Hence, the ambiguity leads us to an implicit link only.
Local and Relevant	Implicit	The title tells us of *Designed to Remove Barriers to Learning* that "barriers to learning" are being addressed here. Due to the vagueness of that phrase we can infer that such barriers could be socio-economic or a result of cultural background (as well as the obvious links to learning difficulty/disability etc.). If we interpret it along those socio-economic-cultural lines, then the barriers are inevitably shaped by locality and the context in which the student lives and grows up. This is only one reading of the description though (albeit a convincing one), so the link remains implicit.
Global/ International Citizenship	Implicit	The title of *Designed to Remove Barriers to Learning* tells us that this is about "removing barriers", and the description informs us that the principle holds inclusivity and diversity in high regard. All of these qualities are strongly related to qualities that emerge in the literature on citizenship, and particularly international citizenship (where there is an emphasis on working with people from multiple backgrounds and taking strength from diversity). However, this is not based on direct linguistic overlap but on the interpretation of both the theme and principle, hence making the link implicit.
Process/Cycle	Implicit	The description of *Designed to Remove Barriers to Learning* uses the phrase "learning opportunities" which allow students to "develop and pursue" goals. All of these phrases are suggestive of multiple-part procedures, however there is no explicit reference to how one part necessarily follows another in a continuous progression, so the link remains implicit as we must draw on associations of words used.
Collaboration	Implicit	The description of *Designed to Remove Barriers to Learning* tells us that teaching "aims to create learning opportunities that enable every student to develop" personal goals. The relationship between the teaching-developed opportunities and the eventually personalised goals could be read as a collaborative back-and-forth between teacher and student. This is suggestive of a collaborative relationship, but is only a likely

		reading of the text, not a certain one, so the link can only be implicit.
Student Individuality	Explicit	The description for *Designed to Remove Barriers to Learning* shows an explicit focus on inclusivity, diversity, and individual student identities. All of these are core components of student individuality.
Flexibility with Disciplines	None	

Informed by Assessment

Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognises the crucial role of providing students with effective feedback.

Theme	Link	Justification
Student-Led	Implicit	The description of *Informed by Assessment* states that "assessment plays a crucial role in supporting" learning. This is not an explicit link to any student-led approach, but the choice of wording tallies with student-centred approaches more generally – casting the teacher as a guide or mediator rather than traditional instructor.
Local and Relevant	None	
Global/International Citizenship	None	
Process/Cycle	Explicit	The description of *Informed by Assessment* accurately and explicitly describes a feedback or assessment cycle – one of the most well-known cycles or processes in pedagogy.
Collaboration	Explicit	The description of *Informed by Assessment* uses the terms "supporting…learning" and "providing students with effective feedback". The straightforward interpretation of all of this is that the ongoing assessment process is collaborative between teacher and student.
Student Individuality	Explicit	The description of *Informed by Assessment* emphasises that feedback be "effective". This is clearly a shorthand for feedback that will allow the specific student to improve or grow; as such, the nature of that feedback process is inevitably framed on the specific needs of students as individuals.
Flexibility with Disciplines	None	

Appendix 3 – Alternative Framework Selection Criteria

	Strong grounding in pedagogical evidence	Future-focused learning	Multiple age ranges	Age ranges[113]	International	National	Geographic location
ATS2020	x	x	x	ISCED levels 1 - 2	x		Europe
Cambridge International Learner Attributes	x	x	x	ISCED levels 1-3	x		Worldwide
Eco-schools Educational Principles	x	x	x	ISCED levels 0-3	x		Worldwide
European Commission Key Competences for Lifelong Learning	x	x	x	ISCED levels 0-3+	x		Europe
NAEYC Developmentally Appropriate Practice Guidelines for Effective Teaching	x	x	x	ISCED levels 0 - 1		x	North America
P21 Framework for 21st Century Learning	x	x	x	ISCED levels 0-3+		x	North America
Singapore 21 CC Framework	x	x	x	ISCED levels 1-3		x	Asia
Singapore Teaching Practice Pedagogical Practices	x	x	x	ISCED levels 1-3		x	Asia

Appendix 4 – Coverage Approach (ATT Principles and Alternative Frameworks)

[113] In order to address various categorisations of education levels, ISCED levels have been referred to in this table. ISCED level 0 (early childhood education) to ISCED level 3 (upper secondary education) correspond to K-12.

ATS2020 Transversal Skills Framework

ATT Principle	Most Relevant Elements of ATS2020 Transversal Skills Framework	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	Information Literacy: 1. Plan strategies to guide inquiry. Information Literacy: 2. Evaluate and select information sources and tools based on the appropriateness to specific tasks. Information Literacy: 4. Process information and construct new knowledge. Autonomous Learning: 1. Identify significant needs for learning based on their prior knowledge.	Full Coverage The core elements of the ATT principle are covered in the ATS2020 Transversal Skills Framework, including: inquiry, finding information, constructing knowledge/understanding, and learner autonomy.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.	Information Literacy: 5. Integrate new knowledge and apply to new situations.	Partial Coverage Part of the meaning of the ATT principle is covered in the ATS2020 Transversal Framework. Specifically, the ability to move learning to new contexts. Explicitly conceptual understanding is not covered.
Developed in Local and Global Contexts. Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.	Collaboration and Communications: 4. Develop cultural understanding and global awareness by engaging with learning of other cultures.	Partial Coverage Part of the meaning of the ATT principle is covered in the ATS2020 Transversal Framework. Specifically, the focus on global contexts. Reference to localised student experiences is not covered.
Focused on Effective Teamwork and Collaboration. This includes	Collaboration and Communication: 1: Interact, collaborate, and publish with peers, experts, or others employing a variety of tools and environments.	Full Coverage

ATT Principle	Most Relevant Elements of ATS2020 Transversal Skills Framework	Coverage Evaluation
promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.	Collaboration and Communication: 3. Contribute to project teams to produce original works or solve problems.	The core elements of the ATT principle are covered in the ATS2020 Transversal Skills Framework, including: collaboration and teamwork with peers and others.
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	Autonomous Learning: 1. Identify significant needs for learning based on their prior knowledge. Autonomous Learning: 2. Define goals to achieve and develop a strategy to achieve them. Autonomous Learning: 5. Reflect and explore alternative approaches (metacognition of their Learning Cycle). Collaboration and Communication: 2. Communicate information and ideas effectively to multiple audiences using a variety of media and formats. Creativity and Innovation: Create original works as a means of expression.	Full Coverage The core elements of the ATT principle are covered in the ATS2020 Transversal Skills Framework, including: recognition of individual needs, development of goals and means to achieve these, differentiating approaches, variety in the classroom to reflect the variety of students, and the support and development of students expressing their identity.
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.	Autonomous Learning: 2. Define goals to achieve and develop strategy to achieve them. Autonomous Learning: 3. Plan and manage activities to implement strategy. Autonomous Learning: 4. Evaluate process and results and provide evidence for achievement. Autonomous Learning: 5. Reflect and explore alternative approaches (metacognition of their Learning Cycle).	Full Coverage The core elements of the ATT principle are covered in the ATS2020 Transversal Skills Framework, including: use of evaluation or assessment; using assessment or evaluation to support learning or alter learning strategies.

Cambridge Learner Attributes

ATT Principle	Most Relevant Elements of the Cambridge Learner Attributes	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	Cambridge Learners: Confident in working with information and ideas. "Cambridge students are keen to explore and evaluate ideas and arguments in a structured, critical and analytical way." Cambridge Learners: Engaged intellectually and socially, ready to make a difference. 'Cambridge students…embody a spirit of enquiry…"	Full Coverage The concept of 'finding their own information' can be seen in the exploration and evaluation of ideas. Although the descriptor does not directly state constructivist approaches, it seems implied through the idea of evaluation, critique and analysis of ideas. A spirit of 'enquiry' implies a questioning approach, likely to reflect inquiry-based pedagogies.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.	Cambridge Learners: Confident in working with information and ideas – their own and those of others. 'Cambridge students are…secure in their knowledge…keen to explore and evaluate ideas and arguments in a structured, critical and analytical way. Cambridge Learners: Engaged intellectually and socially, ready to make a difference. 'Cambridge students…are keen to learn new skills and are receptive to new ideas.' Cambridge Learners: Engaged intellectually and socially, ready to make a difference. 'Cambridge students…want to dig more deeply.' Cambridge Learners: Innovative and equipped for new and future challenges. 'Cambridge students…are capable of applying their knowledge and understanding to solve new and unfamiliar problems. They can adapt flexibly to new situations requiring new ways of thinking.'	Partial Coverage Thematically some clear links: deepening of knowledge (dig more deeply); connections and transference of knowledge (apply knowledge to new and unfamiliar problems/new situations). Exploration of ideas and disciplinary understanding could be seen as closely aligned to conceptual exploration and understanding. Explicitly conceptual understanding is not covered. In the Cambridge teachers' attribute, reflection is included, which may support students to make connections - Reflective: 'they support students to become independent and reflective learners.'

	Cambridge Learners: Reflective as learners, developing their ability to learn. 'Cambridge learners…develop the awareness and strategies to be life-long learners.'	Lifelong learning, as in the 'reflective' attribute for students may indicate development of skills that allow connections/transference of knowledge, but this is not explicit.
Developed in Local and Global Contexts. Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.	Cambridge Learners: Responsible for themselves, responsive to and respectful of others. 'Cambridge students…understand that their actions have impacts on others and the environment. They appreciate the importance of culture, context and community.'	Partial Coverage Context is a key concept here- this implies an understanding of global difference as well as the idea of 'real-life' potentially emerging through both context and culture. Note that the 'Cambridge teachers' attribute does not specifically reference the use of real-life examples beyond the attribute 'Responsible' which states that 'they understand their actions will help shape future generations.' At first glance, 'Engaged' may imply this- 'Cambridge teachers are passionate about learning within and beyond the classroom,' but the following sentence may indicate that this is less about teaching reflecting real-life contexts and more about community ('sharing their knowledge and skills with teachers in the wider educational community.')
Focused on Effective Teamwork and Collaboration. This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship	Cambridge Learners: Engaged intellectually and socially, ready to make a difference. 'Cambridge students…work well independently but also with others. They are equipped to participate constructively in society and the economy – locally, nationally and globally.' Cambridge Learners: Responsible for themselves, responsive to and respectful of others. 'Cambridge learners…are collaborative and	Full Coverage The core elements of the ATT principle are covered in the Cambridge Learner Attributes, including: collaboration and teamwork with peers and others.

between teachers and students.	supportive. They understand that their actions have impacts on others…they appreciate the importance of culture.'	
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	Cambridge Learners: Responsible for themselves, responsive to and respectful of others. "Cambridge learners…appreciate the importance of culture, context and community." Cambridge Teachers: Responsible for themselves, responsive to and respectful of others. "Cambridge teachers…are concerned about the holistic development of every individual they teach." Cambridge Teachers: Confident in teaching their subject and engaging each student in learning. "Cambridge teachers…seek to understand their students and their educational needs." Cambridge Learners: Reflective as learners, developing their ability to learn. "Cambridge learners…develop the awareness and strategies to be life-long learners." Cambridge Learners: Responsible for themselves, responsive to and respectful of others. "Cambridge learners take ownership of their learning, set targets..."	Full coverage The emphasis placed on learners' appreciation of culture and community indicate that diversity is prized as a classroom principle. 'Holistic development' in the teachers' attribute implies teachers' need to have an understanding of the student as a whole (therefore their diversity/individualism is encompassed here potentially). This is reiterated in 'Confident' where they are expected to have an understanding of individual student needs. Setting the environment to support the pursuit of appropriate personal goals is strongly implied through the teaching attribute 'Confident' where teachers are expected to 'encourage students to engage actively in their own learning.' Coupled with 'Reflective' as a learner attribute ('Cambridge learners…develop the awareness and strategies to be life-long learners') and 'Responsible' (Cambridge learners set targets') it seems very likely that development of personal goals would be part of the teaching approach
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This	Cambridge Teachers: Confident: "Cambridge teachers know their subject well and know how to teach it. They seek to understand their students and their educational needs."	Partial Coverage Understanding of students' educational needs and the development of independent students

approach also recognizes the crucial role of providing students with effective feedback.	Cambridge Teachers: Responsible: "Cambridge teachers…are concerned about the holistic development of every individual they teach." Cambridge Teachers: Reflective: "Cambridge teachers…support students to become independent and reflective learners." Cambridge Learners: Reflective: "Cambridge learners understand themselves as learners. They are concerned with the processes as well as the products of their learning and develop the awareness and strategies to be life-long learners."	(Cambridge teacher attributes) are linked to providing appropriate feedback for development. No specific reference to assessment per se. Reflective practitioner approach would have some bearing on this: with the expectation that teachers would look at the effectiveness of their teaching in terms of learning outcomes (e.g. assessment). The learner attribute 'reflective' potentially implies both AFL (assessment for learning) – 'processes' / 'lifelong learning' as well as assessment of learning.

NAEYC Developmentally Appropriate Practice Guidelines for Effective Teaching

ATT Principle	Most Relevant Elements of DAP guideline	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	Creating a caring community of learners: "Teachers help children develop responsibility and self-regulation". Teaching to enhance development and learning: "children are active constructors of their own understanding of the world around them". Teaching to enhance development and learning: "To help children develop initiative, teachers encourage them to choose and plan their own learning activities".	Partial Coverage Part of the meaning of the ATT principle is covered in the DAP guidelines. Specifically, the idea that students are active learners, and construct their own understandings. Explicit reference to an inquiry-cycle model is not covered.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.	Teaching to enhance development and learning: "To enhance children's conceptual understanding, teachers use various strategies, including intensive interview and conversation, that encourage children to reflect on and 'revisit' their experiences". Planning curriculum to achieve important goals: "Teachers make meaningful connections a priority in the learning experiences they provide children, to reflect that all learners, and certainly young children, learn best when the concepts, language, and skills they encounter are related to something they know and care about, and when the new learnings are themselves interconnected in meaningful, coherent ways". Planning curriculum to achieve important goals: "Teachers plan curriculum experiences that integrate children's learning within and across the domains (physical, social, emotional, cognitive) and the disciplines (including language, literacy, mathematics, social studies, science, art, music, physical education, and health)."	Full Coverage The core elements of the ATT principle are covered in the DAP guidelines, including: the development of conceptual understanding; relating learning topics to one another across disciplinary boundaries; and helping students to link learning to different contexts.
Developed in Local and Global Contexts. Teaching uses real-life contexts and examples, and students are encouraged to process new	Creating a caring community of learners: "Children hear and see their home language and culture reflected in the daily interactions and activities of the classroom".	Partial Coverage

ATT Principle	Most Relevant Elements of DAP guideline	Coverage Evaluation
information by connecting it to their own experiences and to the world around them.		Part of the meaning of the ATT principle is covered in the DAP guidelines. Specifically, the fact that teaching emerges out of local context. Explicit reference to the teaching of global context issues is not covered.
Focused on Effective Teamwork and Collaboration. This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.	Creating a caring community of learners: "The foundation for the community is consistent, positive, caring relationships between the adults and children, among children, among teachers, and between teachers and families". Creating a caring community of learners: "Opportunities to play together, collaborate on investigations and projects, and talk with peers and adults enhance children's development and learning". Teaching to enhance development and learning: "Teachers can provide the scaffolding (e.g. teacher models the skill) or peers can (e.g. the child's learning buddy models); in either case, it is the teacher who recognizes and plans for each child's need for support and assistance".	Full Coverage The core elements of the ATT principle are covered in the DAP guidelines, including: teamwork and collaboration between students and between teachers and students.
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	Creating a caring community of learners: "practitioners create and foster a 'community of learners' that supports *all* children to develop and learn" Creating a caring community of learners: "Each child has unique strengths, interests, and perspectives to contribute". Creating a caring community of learners: "Practitioners ensure members of the community feel psychologically safe. The overall social and emotional climate is positive". Teaching to enhance development and learning: "Teachers make it a priority to know each child well, and also the people most significant in the child's life".	Full Coverage The core elements of the ATT principle are covered in the DAP guidelines, including: the fact that each student has an individual profile; that numerous barriers to learning must be overcome; that students' backgrounds are recognised.

ATT Principle	Most Relevant Elements of DAP guideline	Coverage Evaluation
	Teaching to enhance development and learning: "the ability to adapt curriculum, activities, and materials to ensure full participation of *all* children" Teaching to enhance development and learning: "When children have missed some of the learning opportunities necessary for school success (most often children from low-income households), programs and teachers provide them with even more extended, enriched, and intensive learning experiences than are provided to their peers". Teaching to enhance development and learning: "Teachers make experiences in their classrooms accessible and responsive to all children and their needs—including children who are English language learners, have special needs or disabilities, live in poverty or other challenging circumstances, or are from different cultures".	
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.	Teaching to enhance development and learning: "Teachers continually gather information about children in a variety of ways and monitor each child's learning and development to make plans to help children progress". Teaching to enhance development and learning: "giving specific feedback". Teaching to enhance development and learning: "give specific feedback". Assessing children's development and learning: "Assessment of children's development and learning is essential for teachers and programs in order to plan, implement, and evaluate the effectiveness of the classroom experiences they provide. Assessment also is a tool for monitoring children's progress toward a program's desired goals. In developmentally appropriate practice, the experiences and the assessments are linked (the experiences are developing what is being assessed, and vice versa); both are aligned with the program's desired outcomes or goals for children. Teachers cannot be intentional about	Full Coverage The core elements of the ATT principle are covered in the DAP guidelines, including: that teachers use ongoing assessment and ongoing feedback to shape the future direction of individualised learner goals.

ATT Principle	Most Relevant Elements of DAP guideline	Coverage Evaluation
	helping children to progress unless they know where each child is with respect to learning goals."	

Eco-Schools Educational Principles

ATT Principle	Most Relevant Elements of Eco-Schools Educational Principles	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	1. Ensure that participants are engaged in the learning/teaching process.	Partial Coverage Part of the meaning of the ATT principle is covered in the Eco-Schools Educational Principles. Specifically, the active student role in the learning process. Explicit reference to inquiry is not covered.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.	2. Empower participants to take informed decisions and actions on real life sustainability issues.	Partial Coverage Part of the meaning of the ATT principle is covered in the Eco-Schools Educational Principles. Specifically, application of knowledge to real life issues which is likely to cross disciplines. Explicit reference to conceptual understanding is not covered.
Developed in Local and Global Contexts. Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.	2. Empower participants to take informed decisions and actions on real life sustainability issues. 3. Encourage participants to work together actively and involve their communities in collaborative solutions. 5. Encourage participants to be aware of cultural practices as an integral part of sustainability issues.	Full Coverage The core elements of the ATT principle are covered in the Eco-Schools Educational Principles, including: awareness of global issues; use of student experiences; and involvement in local community.

ATT Principle	Most Relevant Elements of Eco-Schools Educational Principles	Coverage Evaluation
	6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	
Focused on Effective Teamwork and Collaboration. This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.	3. Encourage participants to work together actively and involve their communities in collaborative solutions. 6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	Full Coverage The core elements of the ATT principle are covered in the Eco-Schools Educational Principles, including: collaboration with students and others; mutual support.
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	4. Support participants to examine their assumptions, knowledge, and experiences, in order to develop critical thinking, and to be open to change. 6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	Partial Coverage Part of the meaning of the ATT principle is covered in the Eco-Schools Educational Principles. Specifically, the use of individual knowledge backgrounds, and the adaptation of support strategies. Explicit reference to identity or barriers to learning are not covered.
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.	7. Continuously explore, test and share innovative approaches, methodologies, and techniques. 8. Ensure that continuous improvements through monitoring and evaluation are central to our programmes.	Full Coverage The core elements of the ATT principle are covered in the Eco-Schools Educational Principles, including: a continuous process of assessment or evaluation; evaluation being used to make improvements.

European Commission Key Competences for Lifelong Learning

ATT Principle	Most Relevant Elements of European Commission Key Competences for Lifelong Learning	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	Competence in science, technology and engineering: "to identify questions and to draw evidence-based conclusions". Personal, social and learning to learn competence: "the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient and manage one's own learning and career". Entrepreneurship Competence: "An entrepreneurial attitude is characterised by a sense of initiative and agency, pro-activity, being forward-looking, courage and perseverance in achieving objectives".	Partial Coverage Part of the meaning of the ATT principle is covered in the European Commission Key Competences for Lifelong Learning. Specifically, the ability to work from questions, and for students to take an active role in their learning. Explicit reference to using an inquiry-model of learning is not covered.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.	Literacy competence: "Literacy is the ability to identify, understand, express, create and interpret concepts, feelings, facts and opinions in both oral and written forms, using visual, sound/audio and digital materials across disciplines and contexts". Citizenship competence: "Citizenship competence is based on knowledge of basic concepts and phenomena relating to individuals, groups, work organisations, society, economy and culture." Cultural awareness and expression competence: "It includes understanding the different ways of communicating ideas between creator, participant and audience within written, printed and digital texts, theatre, film, dance, games, art and design, music, rituals, and architecture, as well as hybrid forms."	Full Coverage The core elements of the ATT principle are covered in the European Commission Key Competences for Lifelong Learning, including: the need to develop conceptual understanding in multiple areas; and the ability to move between different disciplines.
Developed in Local and Global Contexts. Teaching uses real-life contexts and	Multilingual competence: "an appropriate range of societal and cultural contexts".	Full Coverage

ATT Principle	Most Relevant Elements of European Commission Key Competences for Lifelong Learning	Coverage Evaluation
examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.	Multilingual competence: "Knowledge of societal conventions, and the cultural aspect and variability of languages is important." Competence in science, technology and engineering: "a concern for ethical issues and support for both safety and environmental sustainability, in particular as regards scientific and technological progress in relation to oneself, family, community, and global issues." Personal, social and learning to learn competence: "different societies and environments". Personal, social and learning to learn competence: "the desire to apply prior learning and life experiences and the curiosity to look for opportunities to learn and develop in a variety of life contexts." Citizenship competence: "awareness of the aims, values and policies of social and political movements, as well as of sustainable systems, in particular climate and demographic change at the global level and their underlying causes."	The core elements of the ATT principle are covered in the European Commission Key Competences for Lifelong Learning, including: drawing from experience and local context; thinking about global issues; understanding differences in the world around them.
Focused on Effective Teamwork and Collaboration. This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.	Literacy competence: "communicate and connect effectively with others" Digital competence: "communication and collaboration". Digital competence: "collaboration with others". Citizenship competence: "Skills for citizenship competence relate to the ability to engage effectively with others". Entrepreneurship competence: "the ability to work collaboratively".	Full Coverage The core elements of the ATT principle are covered in the European Commission Key Competences for Lifelong Learning, including: collaboration with others; and effective communication.

ATT Principle	Most Relevant Elements of European Commission Key Competences for Lifelong Learning	Coverage Evaluation
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	Personal, social and learning to learn competence: "empathize and manage conflict in an inclusive and supportive context". Personal, social and learning to learn competence: "Individuals should be able to identify and set goals, motivate themselves, and develop resilience and confidence to pursue and succeed at learning throughout their lives". Cultural awareness and expression competence: "expressing one's own ideas and sense of place or role in society in a variety of ways and contexts."	Partial Coverage Part of the meaning of the ATT principle is covered in the European Commission Key Competences for Lifelong Learning. Specifically, there are suggestions of an inclusive learning environment, the ability to confidently establish one's own goals, and the ability to express oneself. Explicit reference to barriers to learning is not covered.
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.	Personal, social and learning to learn competence: "Skills include the ability to identify one's capacities, focus, deal with complexity, critically reflect and make decisions". Not within a specific competence, but discussed at length in the competence documentation: "Assessment and validation of competences". "Assessment influences individuals and their progress in learning. It can help in gaining and processing new knowledge and skills. It can also help learners understand their preferred learning styles and become autonomous and confident in learning."	Full Coverage The core elements of the ATT principle are covered in the European Commission Key Competences for Lifelong Learning, including: the use of assessment; self-assessment; and feedback's ability to shape future learning directions and methods.

P21 Framework for 21st Century Learning

ATT Principle	Most Relevant Elements of P21 Framework	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	Think Creatively: "Elaborate, refine, analyse, and evaluate their own ideas in order to improve and maximize creative efforts". Solve Problems: "Identify and ask significant questions that clarify various points of view and lead to better solutions". Initiative and Self-Direction. Work Independently: "Be self-directed learners". 21st Century Curriculum and Instruction: "Enable innovative learning methods that integrate the use of supportive technologies, inquiry- and problem-based approaches and higher order thinking skills".	Partial Coverage Part of the meaning of the ATT principle is covered in the P21 Framework. Specifically, the possibility of using inquiry, and student independence. Explicit prioritisation of inquiry-based approaches, and reference to the construction of understandings are not covered.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.	Reason Effectively: "Synthesize and make connections between information and arguments". Flexibility and Adaptability: Adapt to Change. Flexibility and Adaptability: Be Flexible. 21st Century Standards: "Build understanding across and among key subjects as well as 21st century interdisciplinary themes". 21st Century Standards: "Emphasize deep understanding rather than shallow knowledge". 21st Century Curriculum and Instruction: "Teach 21st century skills discretely in the context of key subjects and 21st century interdisciplinary themes".	Partial Coverage Part of the meaning of the ATT principle is covered in the P21 Framework. Specifically, moving learning to new contexts and making connections. Explicit reference to concept-based understanding is not covered.

ATT Principle	Most Relevant Elements of P21 Framework	Coverage Evaluation
Developed in Local and Global Contexts. Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.	Global Awareness: "Use 21st century skills to understand and address global issues". Global Awareness: "Learn from working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in a personal, work, and community contexts". Global Awareness: "Understand other nations and cultures, including the use of non-English language". Civic Literacy: "Understand the local and global implications of civic decisions". Environmental Literacy: "Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water, and ecosystems". Environmental Literacy: "Take individual and collective actions towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues). 21st Century Standards: "Engage students with the real-world data, tools, and experts they will encounter in college, on the job, and in life; students learn best when actively engaged in solving meaningful problems". 21st Century Learning Environments: "Enable students to learn in relevant, real-world 21st century contexts (e.g. through project-based or other applied work)".	Full Coverage The core elements of the ATT principle are covered in the P21 Framework, including: fostering interest in global issues; using local context; developing learning approaches by using context relevant to students.

ATT Principle	Most Relevant Elements of P21 Framework	Coverage Evaluation
Focused on Effective Teamwork and Collaboration. This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.	Global Awareness: "Learn from working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in a personal, work, and community contexts". Work Creatively with Others: "Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work". Communicate Clearly: "Collaborate with others". Communicate Clearly: "Assume shared responsibility for collaborative work, and value the individual contributions made by each team member". Produce Results: "Collaborate and cooperate effectively with teams". Be Responsible to Others: Encourage knowledge sharing among communities of practitioners, using face-to-face, virtual, and blended communications". 21st Century Learning Environments: "Support professional learning communities that enable educators to collaborate, share best practices, and integrate 21st century skills into classroom practice".	Full Coverage The core elements of the ATT principle are covered in the P21 Framework, including: collaboration between peers and collaboration between teachers.
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	Manage Goals and Time: "Set goals with tangible and intangible success criteria". Work Independently: "Reflect critically on past experiences in order to inform future progress".	Full Coverage The core elements of the ATT principle are covered in the P21 Framework, including: developing teaching methods and differentiation to reach a diversity of students; and recognising student individuality.

ATT Principle	Most Relevant Elements of P21 Framework	Coverage Evaluation
	21st Century Professional Development: "Cultivate teachers' ability to identify students' particular learning styles, intelligences, strengths, and weaknesses". Be Responsible to Others: "Help teachers develop their abilities to use various strategies (such as formative assessments) to reach diverse students and create environments that support differentiated teaching and learning".	
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.	Be Flexible: "Incorporate feedback effectively" Assessment of 21st Century Skills: "Support a balance of assessments, including high-quality standardized testing along with effective formative and summative classroom assessments". Assessment of 21st Century Skills: "Emphasize useful feedback on student performance that is embedded into everyday learning". Be Responsible to Others: "Support the continuous evaluation of students' 21st century skills development".	Full Coverage The core elements of the ATT principle are covered in the P21 Framework, including: the development of useful feedback; and the ongoing use of assessment in various forms to support learning.

Singapore 21CC Framework

ATT Principle	Most Relevant Elements of Singapore 21CC Framework	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	Self-directed learner. Self-management.	Partial Coverage Part of the meaning of the ATT principle is covered in the Singapore 21CC Framework. Specifically, the notion of student autonomy and self-direction. Explicit reference to inquiry-based approaches is not covered.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.		No Coverage
Developed in Local and Global Contexts. Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.	Civic Literacy, Global Awareness and Cross-cultural Skills. Social Awareness. Concerned Citizen.	Full Coverage The core elements of the ATT principle are covered in the Singapore 21CC Framework, including: awareness of global issues, and a strong relationship with local society (through social awareness and citizenship).
Focused on Effective Teamwork and Collaboration. This includes promoting teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.	Communication, Collaboration and Information Skills. Social Awareness. Active Contributor. Relationship Management	Full Coverage The core elements of the ATT principle are covered in the Singapore 21CC Framework, including: collaboration with others; development of collaborative relationships; and development of communication skills that would further teamwork.

ATT Principle	Most Relevant Elements of Singapore 21CC Framework	Coverage Evaluation
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	Confident Person. Self-Awareness. Self-Management.	Partial Coverage Part of the meaning of the ATT principle is covered in the Singapore 21CC Framework. Specifically, awareness and management of the self that could contribute to building and achieving personal goals; confidence which could be based on sureness in personal identity. Explicit reference to barriers to learning is not covered.
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.	Self-Awareness. Self-Management.	Partial Coverage Part of the meaning of the ATT principle is covered in the Singapore 21CC Framework. Specifically, awareness and management of the self may entail both measuring and supporting personal learning goals. Explicit reference to assessment is not covered.

Singapore Teaching Practice Pedagogic Principles

ATT Principle	Most Relevant Elements of Singapore Teaching Practice Pedagogic Principles	Coverage Evaluation
Based on Inquiry. A strong emphasis is placed on students finding their own information and constructing their own understandings.	Assessment and Feedback: Supporting self-directed learning. Positive Classroom Culture: Empowering learners. Lesson Enactment: Encouraging learner engagement. Lesson Enactment: Using questions to deepen understanding.	Full Coverage The core elements of the ATT principle are covered in the Singapore Teaching Practice Pedagogic Principles, including: use of inquiry; active learning; student autonomy.
Focused on Conceptual Understanding. Concepts are explored in order to both deepen disciplinary understanding and to help students make connections and transfer learning to new contexts.	Lesson Enactment: Exercising flexibility.	Partial Coverage Part of the meaning of the ATT principle is covered in the Singapore Teaching Practice Pedagogic Principles. Specifically, working flexibly (which may entail flexibility with disciplines). Explicit reference to conceptual understanding is not covered.
Developed in Local and Global Contexts. Teaching uses real-life contexts and examples, and students are encouraged to process new information by connecting it to their own experiences and to the world around them.	Lesson Enactment: Arousing interest. Lesson Enactment: Activating prior knowledge.	Partial Coverage Part of the meaning of the ATT principle is covered in the Singapore Teaching Practice Pedagogic Principles. Specifically, the arousal of interest and activation of prior knowledge is likely to be informed by the context local to the student and their experiences. Explicit reference to global issues is not covered.
Focused on Effective Teamwork and Collaboration. This includes promoting	Positive Classroom Culture: Establishing interaction and rapport.	Full Coverage

ATT Principle	Most Relevant Elements of Singapore Teaching Practice Pedagogic Principles	Coverage Evaluation
teamwork and collaboration between students, but also refers to the collaborative relationship between teachers and students.	Positive Classroom Culture: Building trust. Lesson Enactment: Facilitating collaborative learning.	The core elements of the ATT principle are covered in the Singapore Teaching Practice Pedagogic Principles, including: collaborative learning; trusting relationships; and establishing teamwork through rapport.
Designed to Remove Barriers to Learning. Teaching is inclusive and values diversity. It affirms students' identities, and aims to create learning opportunities that enable every student to develop and pursue appropriate personal goals.	Lesson Preparation: Considering learner's profiles. Lesson Preparation: Deciding on instructional strategies. Lesson Preparation: Selecting and sequencing content. Positive Classroom Culture: Setting expectations and routines. Positive Classroom Culture: Maintaining positive discipline.	Partial Coverage Part of the meaning of the ATT principle is covered in the Singapore Teaching Practice Pedagogic Principles. Specifically, considering learner profiles, altering instructional strategies; and developing positive classroom culture. Explicit reference to student identities is only partial, and barriers to learning are only implied.
Informed by Assessment. Assessment plays a crucial role in supporting, as well as measuring, learning. This approach also recognizes the crucial role of providing students with effective feedback.	Assessment and Feedback: Checking for understanding and providing feedback. Assessment and Feedback: Setting meaningful assignments. Assessment and Feedback: Supporting self-directed learning.	Full Coverage The core elements of the ATT principle are covered in the Singapore Teaching Practice Pedagogic Principles, including: the use of assessment and feedback; making feedback useful in directing further leaning.

Appendix 5 – Thematic Presence Method (Pedagogic Themes and Alternative Frameworks)

ATS2020 Transversal Skills Framework

ATT Pedagogic Theme	Most Relevant Elements of ATS2020 Framework	Presence Evaluation
Student-Led	Autonomous Learning: 2. Define goals to achieve and develop a strategy to achieve them. Autonomous Learning: 3. Plan and manage activities to implement strategy. Autonomous Learning: 5. Reflect and explore alternative approaches (metacognition of their Learning Cycle).	Noted Presence
Local and Relevant	Autonomous Learning: 1. Identify significant needs for learning based on their prior knowledge. Collaboration and Communication: 4. Develop cultural understanding and global awareness by engaging with learning of other cultures.	Limited Presence
Global/ International Citizenship	Information Literacy: 5. Integrate new knowledge and apply to new situations. Collaboration and Communication: 4. Develop cultural understanding and global awareness by engaging with learning of other cultures.	Limited Presence
Process/Cycle	Information Literacy: 1. Plan strategies to guide inquiry. Information Literacy: 3. Locate, organise, analyse, evaluate, synthesize and ethically use information from a variety of sources and media. Information Literacy: 4. Process information and construct new knowledge.	Noted Presence

	Autonomous Learning: 2. Define goals to achieve and develop a strategy to achieve them. Autonomous Learning: 4. Evaluate process and results and provide evidence for achievement. Autonomous Learning: 5. Reflect and explore alternative approaches (metacognition of their Learning Cycle).	
Collaboration	Collaboration and Communication: 1. Interact, collaborate, and publish with peers, experts, or others employing a variety of tools and environments. Collaboration and Communication: 2. Communicate information and ideas effectively to multiple audiences using a variety of media and formats. Collaboration and Communication: 3. Contribute to project teams to produce original works or solve problems.	Noted Presence
Student Individuality	Autonomous Learning: 1. Identify significant needs for learning based on their prior knowledge. Autonomous Learning: 5. Reflect and explore alternative approaches (metacognition of their Learning Cycle). Creativity and Innovation: 4. Create original works as a means of expression.	Noted Presence
Flexibility with Disciplines	Information Literacy: 2. Evaluate and select information sources and tools based on the appropriateness to specific tasks. Information Literacy: 3. Locate, organise, analyse, evaluate, synthesize and ethically use information from a variety of sources and media.	Noted Presence

	Locate, organise, analyse, evaluate, synthesize and ethically use information from a variety of sources and media. Creativity and Innovation: 2. Integrate and re-elaborate.	

Cambridge Learner Attributes

ATT Pedagogic Theme	Most Relevant Elements of the Cambridge Learner Attributes	Presence Evaluation
Student-Led	Cambridge learners: Confident in working with information and ideas- their own and those of others / Cambridge teachers: Confident in teaching their subject and engaging each student in learning. Cambridge learners: Reflective as learners, developing their ability to learn/ Cambridge teachers: Reflective as learners themselves, developing their practice. Cambridge learners: Responsible for themselves, responsive to and respectful of others / Cambridge teachers: Responsible for themselves, responsive to and respectful of others.	Noted Presence
Local and Relevant	Cambridge learners: Engaged intellectually and socially, ready to make a difference/ Cambridge teachers: Engaged intellectually, professionally and socially, ready to make a difference.	Noted Presence
Global/ International Citizenship	Cambridge learners: Engaged intellectually and socially, ready to make a difference/ Cambridge teachers: Engaged intellectually, professionally and socially, ready to make a difference.	Noted Presence
Process/Cycle	Cambridge learners: Reflective as learners, developing their ability to learn / Cambridge teachers: Reflective as learners themselves, developing their practice. Cambridge learners: Confident in working with information and ideas- their own and those of others / Cambridge teachers: Confident in teaching their subject and engaging each student in learning.	Noted Presence
Collaboration	Cambridge learners: Responsible for themselves, responsive to and respectful of others / Cambridge teachers: Responsible for themselves, responsive to and respectful of others.	Noted Presence

	Cambridge learners: Engaged intellectually and socially, ready to make a difference/ Cambridge teachers: Engaged intellectually, professionally and socially, ready to make a difference.	
Student Individuality	Cambridge learners: Confident in working with information and ideas- their own and those of others/ Cambridge teachers: Confident in teaching their subject and engaging each student in learning. Cambridge learners: Responsible for themselves, responsive to and respectful of others/ Cambridge teachers: Responsible for themselves, responsive to and respectful of others.	Noted Presence
Flexibility with Disciplines	Innovative and equipped for new and future challenges.	Noted Presence

NAEYC Developmentally Appropriate Practice Guidelines for Effective Teaching

ATT Pedagogic Theme	Most Relevant Elements of NAEYC DAP Guidelines	Presence Evaluation
Student-Led	Creating a Caring Community of Learners: "Teachers help children develop responsibility and self-regulation". Teaching to Enhance Development and Learning: "children are active constructors of their own understanding of the world around them".	Noted Presence
Local and Relevant	Creating a Caring Community of Learners: "Children hear and see their home language and culture reflected in the daily interactions and activities of the classroom". Teaching to Enhance Development and Learning: "Teachers bring each child's home culture and language into the shared culture of the learning community so that the unique contributions of that home culture and language can be recognized and valued by the other community members, and the child's connection with family and home is supported". Planning Curriculum to Achieve Important Goals: "Teachers plan curriculum experiences to draw on children's own interests and introduce children to thinks likely to interest them". Assessing Children's Development and Learning: "Sound assessment of young children is challenging because they develop and learn in ways that are characteristically uneven and embedded within the specific cultural and linguistic contexts in which they live". Establishing Reciprocal Relationships with Families: "Developmentally appropriate practices derive from deep knowledge of child development principles and of the program's children in particular, as well as the context within which each of them is living".	Noted Presence

Global/ International Citizenship		Not Present
Process/Cycle	Teaching to Enhance Development and Learning: "strategies include, but are not limited to, acknowledging, encouraging, giving specific feedback, modelling, demonstrating, adding challenge, giving clues or other assistance, providing information, and giving directions". Assessing Children's Development and Learning: "Assessment of young children's progress and achievements is ongoing, strategic, and purposeful. The results of assessment are used to inform the planning and implementation of experiences, to communicate with the child's family, and to evaluate and improve teachers' and the program's effectiveness".	Noted Presence
Collaboration	Creating a Caring Community of Learners: "opportunities to play together, collaborate on investigations and projects, and talk with peers and adults enhance children's development and learning". Teaching to Enhance Development and Learning: "Teachers know how and when to *scaffold* children's learning – that is providing just enough assistance to enable each child to perform at a skill level just beyond what the child can do on his or her own, then gradually reducing the support as the child begins to master the skill, and setting the stage for the next challenge." Planning Curriculum to Achieve Important Goals: "Teachers collaborate with those teaching in the preceding and subsequent grade levels".	Noted Presence
Student Individuality	Creating a Caring Community of Learners: "practitioners create and foster a 'community of learners' that supports *all* children to develop and learn". Teaching to Enhance Development and Learning: "Teachers make it a priority to know each child well, and also the people most significant in the child's life".	Noted Presence

	Planning Curriculum to Achieve Important Goals: “they carefully shape and adapt the experiences they provide children to enable each child to reach the goals outlined in the curriculum”. Assessing Children’s Development and Learning: “The methods of assessment…recognise individual variation in learners and allow children to demonstrate their competence in different ways”. Establishing Reciprocal Relationships with Families: “Teachers and the family share with each other their knowledge of the particular child”.	
Flexibility with Disciplines	Teaching to Enhance Development and Learning: “Teachers plan for learning experiences that effectively implement a comprehensive curriculum so that children attain key goals across the domains (physical, social, emotional, cognitive) and across the disciplines (language and literacy, including English acquisition, mathematics, social studies, science, art, music, physical education, and health).” Planning Curriculum to Achieve Important Goals: “Teachers consider what children should know, understand, and be able to do across the domains of physical, social, emotional, and cognitive development and across the disciplines, including language, literacy, mathematics, social studies, science, art, music, physical education and health”.	Noted Presence

Eco-Schools Educational Principles

ATT Pedagogic Theme	Most Relevant Elements of Eco-Schools Educational Principles	Presence Evaluation
Student-Led	1. Ensure that participants are engaged in the learning/teaching process. 2. Empower participants to take informed decisions and actions on real life sustainability issues.	Noted Presence
Local and Relevant	3. Encourage participants to work together actively and involve their communities in collaborative solutions. 2. Empower participants to take informed decisions and actions on real life sustainability issues. 6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	Noted Presence
Global/ International Citizenship	2. Empower participants to take informed decisions and actions on real life sustainability issues. 5. Encourage participants to be aware of cultural practices as an integral part of sustainability issues.	Noted Presence
Process/Cycle	1. Ensure that participants are engaged in the learning/teaching process. 4. Support participants to examine their assumptions, knowledge, and experiences, in order to develop critical thinking and to be open to change. 8. Ensure that continuous improvements through monitoring and evaluation are central to our programmes.	Noted Presence

Collaboration	3. Encourage participants to work together actively and involve their communities in collaborative solutions. 6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	Noted Presence
Student Individuality	4. Support participants to examine their assumptions, knowledge, and experiences, in order to develop critical thinking and to be open to change. 6. Encourage participants to share inspirational stories of their achievements, failures, and values, to learn from them, and to support each other.	Noted Presence
Flexibility with Disciplines	2. Empower participants to take informed decisions and actions on real life sustainability issues. 3. Encourage participants to work together actively and involve their communities in collaborative solutions.	Noted Presence

European Commission Key Competences for Lifelong Learning

ATT Pedagogic Theme	Most Relevant Elements of European Commission Key Competences for Lifelong Learning Framework	Presence Evaluation
Student-Led	Mathematical Competence and Competence in Science, Technology and Engineering: "Competence in science refers to the ability and willingness to explain the natural world by making use of the body of knowledge and methodology employed, including observation and experimentation, in order to identify questions and to draw evidence-based conclusions." Personal, Social and Learning to Learn Competence: "remain resilient and manage one's own learning and career". Entrepreneurship Competence: "An entrepreneurial attitude is characterised by a sense of initiative and agency, pro-activity, being forward-looking, courage and perseverance in achieving objectives".	Noted Presence
Local and Relevant	Personal, Social and Learning to Learn Competence: "It includes the desire to apply prior learning and life experiences and the curiosity to look for opportunities to learn and develop in a variety of life contexts." Citizenship Competence: "skills to develop arguments and constructive participation in community activities, as well as in decision-making at all levels, from local and national to the European and international level". Entrepreneurship Competence: "They should have an understanding of economics and the social and economic opportunities and challenges facing an employer, organisation or society". Cultural Awareness and Expression Competence: "This competence requires knowledge of local, national, regional, European and global cultures and expressions, including their languages, heritage and traditions, and cultural products, and an understanding of how these	Noted Presence

	expressions can influence each other as well as the ideas of the individual".	
Global/ International Citizenship	Multilingual Competence: "ability to understand, express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing) in an appropriate range of societal and cultural contexts according to one's wants or needs". Mathematical Competence and Competence in Science, Technology and Engineering: "Competence in science, technology and engineering involves an understanding of the changes caused by human activity and responsibility as an individual citizen." Digital Competence: "Individuals should be able to use digital technologies to support their active citizenship and social inclusion". Citizenship Competence: "Citizenship competence is the ability to act as responsible citizens and to fully participate in civic and social life". Cultural Awareness and Expression Competence: "This competence requires knowledge of local, national, regional, European and global cultures and expressions, including their languages, heritage and traditions, and cultural products, and an understanding of how these expressions can influence each other as well as the ideas of the individual".	Noted Presence
Process/Cycle	Mathematical Competence and Competence in Science, Technology and Engineering: "Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge." Personal, Social and Learning to Learn Competence: "Personal, social and learning to learn competence is the ability to reflect upon oneself". Entrepreneurship Competence: "Individuals should know and understand approaches to planning and management of projects, which include both processes and resources".	Noted Presence

Collaboration	Literacy Competence: "It implies the ability to communicate and connect effectively with others, in an appropriate and creative way." Multilingual Competence: "This competence defines the ability to use different languages appropriately and effectively for communication." Digital Competence: "It includes information and data literacy, communication and collaboration". Personal, Social and Learning to Learn Competence: "work with others in a constructive way". Entrepreneurship Competence: "the ability to work collaboratively in order to plan and manage projects that are of cultural, social or financial value".	Noted Presence
Student Individuality	Multilingual Competence: "It also involves respect for each person's individual linguistic profile, including both respect for the mother tongue of persons belonging to minorities and/or with a migrant background and appreciation for a country's official language(s) as a common framework for interaction." Personal, Social and Learning to Learn Competence: "It involves knowing one's preferred learning strategies, knowing one's competence development needs and various ways to develop competences and search for the education, training and career opportunities and guidance or support available." Entrepreneurship Competence: "They should also be aware of ethical principles and challenges of sustainable development and have self-awareness of their own strengths and weaknesses".	Noted Presence
Flexibility with Disciplines	Literacy Competence: "Literacy is the ability to identify, understand, express, create and interpret concepts, feelings, facts and opinions in both oral and written forms, using visual, sound/audio and digital materials across disciplines and contexts."	Noted Presence

	Citizenship Competence: “Citizenship competence is based on knowledge of basic concepts and phenomena relating to individuals, groups, work organisations, society, economy and culture”. Cultural Awareness and Expression Competence: “how ideas and meaning are creatively expressed and communicated in different cultures and through a range of arts and other cultural forms”.	

P21 Framework for 21st Century Learning

ATT Pedagogic Theme	Most Relevant Elements of P21 Framework for 21st Century Learning	Presence Evaluation
Student-Led	Health Literacy: Establish and monitor personal and family health goals. Environmental Literacy: Investigate and analyze environmental issues, and make accurate conclusions about effective solutions. Think Creatively: Elaborate, refine, analyze, and evaluate their own ideas in order to improve and maximize creative efforts. Manage Goals and Time: Set goals with tangible and intangible success criteria. Work Independently: Monitor, define, prioritize, and complete tasks without direct oversight.	Noted Presence
Local and Relevant	Financial, Economic, Business, and Entrepreneurial Literacy: Know how to make appropriate personal economic choices. Civic Literacy: Understand the local and global implications of civic decisions. Health Literacy: Understand preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance, and stress reduction. Work Creatively with Others: Demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas.	Noted Presence

	21st Century Curriculum and Instruction: Encourage the integration of community resources beyond school walls. 21st Century Learning Environments: Enable students to learn in relevant, real-world 21st century contexts (e.g., through project-based or other applied work).	
Global/ International Citizenship	Global Awareness: Use 21st century skills to understand and address global issues. Civic Literacy: Participate effectively in civic life through knowing how to stay informed and understanding governmental processes. Civic Literacy: Exercise the rights and obligations of citizenship at local, state, national, and global levels. Environmental Literacy: Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water, and ecosystems. Create Media Products: Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments. 21st Century Learning Environments: Support expanded community and international involvement in learning, both face-to-face and online.	Noted Presence
Process/Cycle	Health Literacy: Obtain, interpret, and understand basic health information and services and using such information and services in ways that enhance health. Think Creatively: Elaborate, refine, analyze, and evaluate their own ideas in order to improve and maximize creative efforts.	Noted Presence

	Reason Effectively: Reflect critically on learning experiences and processes. Be Flexible: Incorporate feedback effectively. Assessment of 21st Century Skills: Support a balance of assessments, including high-quality standardized testing along with effective formative and summative classroom assessments.	
Collaboration	Global Awareness: Learn from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts. Environmental Literacy: Take individual and collective action towards addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues). Work Creatively with Others: Develop, implement, and communicate new ideas to others effectively. Communicate Clearly: Collaborate with others. Be Responsible to Others: Encourage knowledge sharing among communities of practitioners, using face-to-face, virtual, and blended communications. 21st Century Learning Environments: Support professional learning communities that enable educators to collaborate, share best practices, and integrate 21st century skills into classroom practice.	Noted Presence
Student Individuality	Health Literacy: Establish and monitor personal and family health goals.	Noted Presence

	Work Independently: Reflect critically on past experiences in order to inform future progress. Work Effectively in Diverse Teams: Respect cultural differences and work effectively with people from a range of social and cultural backgrounds. 21st Century Professional Development: Cultivate teachers' ability to identify students' particular learning styles, intelligences, strengths, and weaknesses. Be Responsible to Others: Help teachers develop their abilities to use various strategies (such as formative assessments) to reach diverse students and create environments that support differentiated teaching and learning.	
Flexibility with Disciplines	Global Awareness: Learn from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts. Reason Effectively: Synthesize and make connections between information and arguments. Adapt to Change: Adapt to varied roles, job responsibilities, schedules, and contexts. Work Independently: Go beyond basic mastery of skills and/or curriculum to explore and expand one's own learning and opportunities to gain expertise. 21st Century Curriculum and Instruction: Teach 21st century skills discretely in the context of key subjects and 21st century interdisciplinary themes.	Noted Presence

Singapore 21CC Framework

ATT Pedagogic Theme	Most relevant elements of Singapore 21CC Framework	Presence Evaluation
Student-Led	Self-Awareness. Self-Management. Self-Directed Learner. Active Contributor.	Noted Presence
Local and Relevant	Civil Literacy, Global Awareness and Cross-cultural Skills. Social Awareness. Concerned Citizen.	Noted Presence
Global/ International Citizenship	Civic Literacy, Global Awareness and Cross-cultural Skills. Concerned Citizen.	Noted Presence
Process/Cycle		Not Present
Collaboration	Social Awareness. Active Contributor. Relationship Management. Communication, Collaboration and Information Skills.	Noted Presence
Student Individuality	Relationship Management. Confident Person.	Noted Presence

	Self-Awareness.	
Flexibility with Disciplines	Civic Literacy, Global Awareness and Cross-cultural Skills.	Limited Presence

Singapore Teaching Practice Pedagogic Principles

ATT Pedagogic Theme	Most Relevant Elements of Singapore Pedagogic Principles	Presence Evaluation
Student-Led	Empowering learners. Encouraging learner engagement. Activating prior knowledge. Supporting self-directed learning.	Noted Presence
Local and Relevant	Considering learners' profiles. Arousing interest. Encouraging learner engagement. Activating prior knowledge.	Noted Presence
Global/ International Citizenship		Not Present
Process/Cycle	Sequencing learning. Planning key questions. Pacing and maintaining momentum. Using questions to deepen learning. Checking for understanding and providing feedback.	Noted Presence
Collaboration	Establishing interaction and rapport.	Noted Presence

	Maintaining positive discipline. Building trust. Facilitating collaborative learning. Supporting self-directed learning.	
Student Individuality	Setting expectations and routines. Building trust. Considering learners' profiles. Deciding on instructional strategies. Pacing and maintaining momentum. Arousing interest. Exercising flexibility. Activating prior knowledge. Checking for understanding and providing feedback. Setting meaningful assignments.	Noted Presence
Flexibility with Disciplines	Selecting and sequencing content. Exercising flexibility.	Limited Presence

Appendix 6 – Gap Analysis (ATT Principles and Alternative Framework Elements)

ATS2020 Transversal Skills Framework

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Plan Strategies to Guide Inquiry	∗				∗	
Evaluate and Select Information Sources and Tools Based on the Appropriateness to Specific Tasks	∗	∗				
Locate, Organise, Analyse, Evaluate, Synthesize and Ethically Use Information from a Variety of Sources and Media		∗				
Process Information and Construct New Knowledge	∗					
Integrate New Knowledge and Apply to New Situations		∗				
Interact, Collaborate, and Publish with Peers, Experts, or Others Employing a Variety of Tools and Environments				∗		
Communicate Information and Ideas Effectively to Multiple Audiences Using a Variety of Media and Formats						
Contribute to Project Teams to Produce Original Works or Solve Problems				∗		
Develop Cultural Understanding and Global Awareness by Engaging with Learners of Other Cultures			∗			

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Identify Significant Needs for Learning Based on their Prior Knowledge			∗		✓	
Define Goals to Achieve and Develop a Strategy to Achieve Them					∗	
Plan and Manage Activities to Implement a Strategy	∗					
Evaluate Process and Results and Provide Evidence for Achievement						✓
Reflect and Explore Alternative Approaches (Metacognition of their Learning Cycle)						∗
Identify and Match Needs with Possible Solutions					∗	
Integrate and Re-elaborate		∗				
Innovate and Creatively Use Tools and Resources						
Create Original Works as a Means of Expression					∗	

Cambridge International Learner Attributes

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Cambridge learners: Confident in working with information and ideas – their own and those of others Cambridge teachers: Confident in teaching their subject and engaging each student in learning	∗	∗		∗	∗	
Cambridge learners: Responsible for themselves, responsive to and respectful of others Cambridge teachers: Responsible for themselves, responsive to and respectful of others.	∗		∗	∗		∗
Cambridge learners: Reflective as learners, developing their ability to learn Cambridge teachers: Reflective as learners themselves, developing their practice	∗	∗			∗	∗
Cambridge learners and Cambridge teachers: Innovative and equipped for new and future challenges		∗				
Cambridge learners: Engaged intellectually and socially, ready to make a difference Cambridge teachers: Engage intellectually, professionally and socially, ready to make a difference	∗	∗	∗	∗	∗	

NAEYC Developmentally Appropriate Practice Guidelines for Effective Teaching

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective and Teamwork Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Creating a Caring Community of Learners			∗	∗	∗	
Teaching to Enhance Development and Learning	∗	∗		∗	∗	∗
Planning Curriculum to Achieve Important Goals		∗	∗			
Assessing Children's Development and Learning					∗	∗
Establishing Reciprocal Relationships with Families						

Eco-Schools Educational Principles

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Ensure that Participants are Engaged in the Learning/Teaching Process	∗		∗			
Empower Participants to take Informed Decisions and Actions on Real Life Sustainability Issues			∗			
Encourage Participants to Work Together Actively and Involve their Communities in Collaborative Solutions			∗	✓		
Support Participants to Examine their Assumptions, Knowledge, and Experiences, in order to Develop Critical Thinking and to be Open to Change			∗			
Encourage Participants to be Aware of Cultural Practices as an Integral Part of Sustainability Issues			∗			
Encourage Participants to Share Inspirational Stories of their Achievements, Failures, and Values, to Learn from them, and to Support Each Other				∗		
Continuously Explore, Test, and Share Innovative Approaches, Methodologies, and Techniques						
Ensure that Continuous Improvements through Monitoring and Evaluation are Central to our Programmes						✓

European Commission Key Competences for Lifelong Learning

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Literacy Competence		∗		∗		
Multilingual Competence		∗	∗	∗		
Mathematical Competence and Competence in Science, Technology and Medicine	∗	∗	∗			
Digital Competence				∗		
Personal, Social and Learning to Learn Competence	∗				∗	
Citizenship Competence			∗	∗		
Entrepreneurship Competence	∗			∗	∗	
Cultural Awareness and Expression Competence			∗		∗	

P21 Framework for 21st Century Learning

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Global Awareness			∗	∗		
Financial, Economic, Business, and Entrepreneurial Literacy						
Civic Literacy			∗			
Health Literacy						
Environmental Literacy			∗			
Think Creatively	∗					
Work Creatively with Others				∗		
Implement Innovations						
Reason Effectively		∗				
Solve Problems	∗					

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Communicate Clearly				∗		
Access and Evaluate Information	∗					
Use and Manage Information		∗				
Analyse Media						
Create Media Products						
Apply Technology Effectively						
Adapt to Change		∗	∗			
Be Flexible		∗	∗			∗
Manage Goals and Time	∗				∗	
Work Independently	∗					
Interact Effectively with Others				∗		

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Work Effectively in Diverse Teams				∗	∗	
Manage Projects	∗					
21st Century Standards		∗	∗			
Assessment of 21st Century Skills						∗
21st Century Curriculum and Instruction	∗	∗				
21st Century Professional Development					∗	
Produce Results				∗		
Guide and Lead Others	∗			∗		
Be Responsible to Others				∗	∗	∗
21st Century Learning Environments			∗	∗		

Singapore 21CC Framework

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Confident Person					∗	
Self-Directed Learner	✓					
Concerned Citizen			∗			
Active Contributor	∗			∗		
Communication, Collaboration and Information Skills				∗		
Civic Literacy, Global Awareness and Cross-Cultural Skills			∗			
Critical and Inventive Thinking						
Responsible Decision-Making	∗		∗			
Self-Awareness	∗					
Self-Management	∗					∗

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Social Awareness			∗	∗		
Relationship Management				✓		

Singapore Teaching Practice Pedagogic Principles

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Establishing Interaction and Rapport				✓		
Setting Expectations and Routines				∗		
Empowering Learners	✓					
Maintaining Positive Discipline						
Building Trust				∗		
Sequencing Learning	∗	∗				
Considering Learners' Profiles					✓	
Planning Key Questions	∗					
Deciding on Teaching Aids and Learning Resources					∗	
Determining Lesson Objectives						

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Selecting and Sequencing Content		∗			∗	
Deciding on Instructional Strategies						
Encouraging Learner Engagement	∗		∗		∗	
Pacing and Maintaining Momentum						
Concluding the Lesson						
Arousing Interest			∗		∗	
Providing Clear Explanation					∗	∗
Using Questions to Deepen Learning	∗	∗				
Activating Prior Knowledge		∗	∗		∗	
Exercising Flexibility		∗				
Facilitating Collaborative Learning				✓		

Key: ✓ = Full Coverage ∗ = Partial Coverage Blank = No Coverage Alternative Framework Element with no coverage in ATT principles. This is the identified "gap".	Based on Inquiry	Focused on Conceptual Understanding	Developed in Local and Global Contexts	Focused on Effective Teamwork and Collaboration	Designed to Remove Barriers to Learning	Informed by Assessment
Checking Understanding and Providing Feedback						✓
Supporting Self-Directed Learning	✓					
Setting Meaningful Assignments			∗			∗

Appendix 7 – Results for Individual Document Mapping

1. Cross-Programme Documentation

1.1 What is an IB Education?

See Audit Methodology (section 2.4.6), above, for document analysis

1.2 What is an IB Education? Support Material

What is an IB Education? Support Material is intended as a companion document to *What is an IB Education?*. It is intended, specifically, to "providing further guidance and support on the three key areas of international-mindedness, the IB learner profile, and the approaches to teaching and learning".[114] The document, though fairly short at just 23 pages, contains substantial sections on each of those three key areas.

The first level of mapping (direct references to the ATT and selected principles) shows 11 uses of the phrase "Approaches to Teaching", though none to the selected principle titles "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration". The lack of reference to such titles is perhaps slightly surprising, given the existence of subsections explicitly focused on the ATT. There are further resources hyperlinked in the document which were not part of the full mapping process, however none of these further resources appear to feature the selected principle titles either. Given the nature of this document is explicitly to support the integration of the ATT, there is perhaps a missed opportunity here to more clearly discuss the specific principles, adding detail to the existing high-level discussion of "Approaches to Teaching".

The second level of mapping (use of keywords strongly related to the selected principles) shows 12 uses of words with the stem "inqui", seven with the stem "collaborat", and less than five words with the stem "cooperat" or "team". However, the stem "question" features 26 times in this short document – a rate of more than once per page. So although the phrase **Based on Inquiry** does not feature in this document, one of the key words related to the idea of inquiry is used relatively frequently.

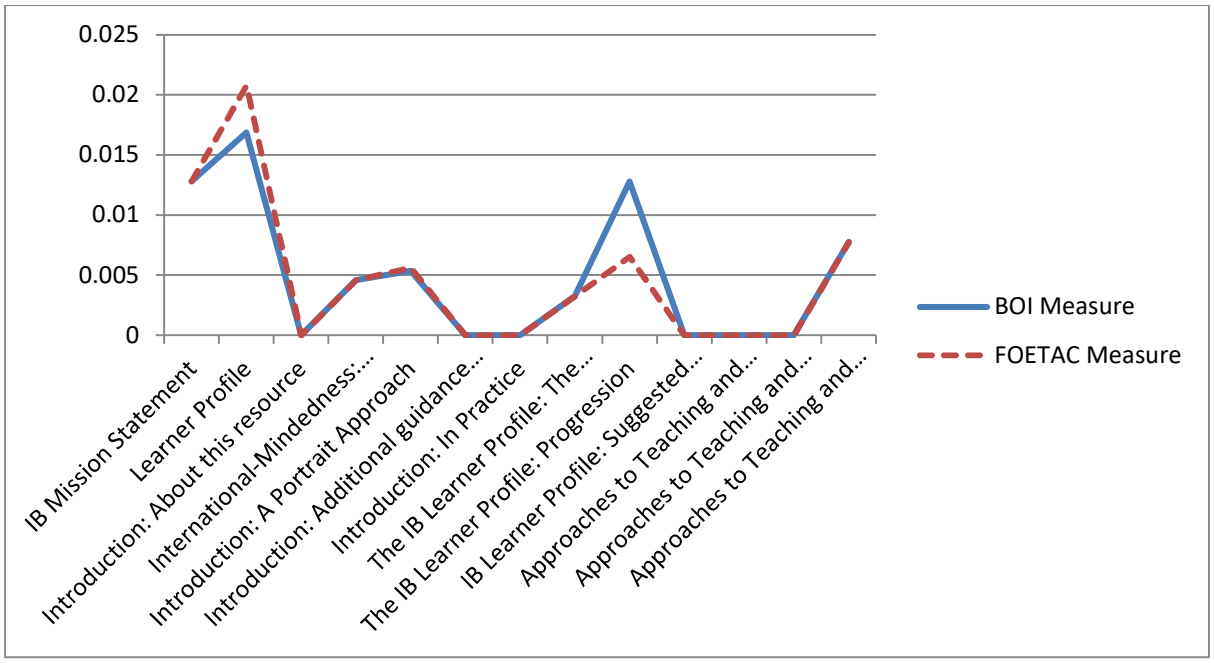
The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes), however, does not suggest that these uses of words with the stem "question" generally translated into a high level of indirect references to **Based on Inquiry**. The BOI Measure and the FOETAC Measure are both generally low throughout the document – both peaking in the Learner Profile preface shared by all documents. Moreover, of the 13 subsections contained in this document, six contained no indirect reference to either of the selected principles. In an unusual trend compared to the majority of mapped documents, there were fewer thematic references to Process/Cycle (59), Student-Led (43), and Collaboration (44) than to other pedagogic themes. Local and Relevant was more frequently referenced (62 times at sentence level) but by far the most frequently referenced themes was Global/International Citizenship (with 136 sentence-level references). This suggests that the document that aims to offer supporting material on "the three key areas of international-mindedness, the IB learner profile, and the approaches to teaching and learning" has more

[114]WIAIBE? Support Material, p. 1.

integration of themes linked to international mindedness than to the other themes also relevant in the approaches to teaching.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *What is an IB Education? Support Material* has been constructed. This is displayed below.

Figure 24: WIAIBE? TSM



1.3 Programmes Standards and Practices

PS&P is a relatively short document detailing the standards and practices which are foundational to the implementation of any IB programme in a World School. The document features sections on standards and practices related to Purpose, Environment, Culture, and Learning.

The first level of mapping (direct references to the ATT and selected principles) shows 25 uses of the phrase “Approaches to Teaching”. In such a short document (only 28 pages) this is a very high level of integration of the broad idea of the ATT. By contrast, the phrases “Based on Inquiry” and “Focused on Effective Teamwork and Understanding” are not used at all. Instead, in places where it would be possible to see these titles, the slightly different phrases are used instead. For example, “Approaches to teaching 1: Teachers use inquiry, action and reflection to develop natural curiosity in students. (0403-01)” and “Approaches to teaching 4: Teachers promote effective relationships and purposeful collaboration to create a positive and dynamic learning community. (0403-04)”.[115] Thus, although the phrase “Approaches to Teaching” is significantly featured in this document, the phrasing used to convey individual principles cannot be considered to constitute direct referencing.

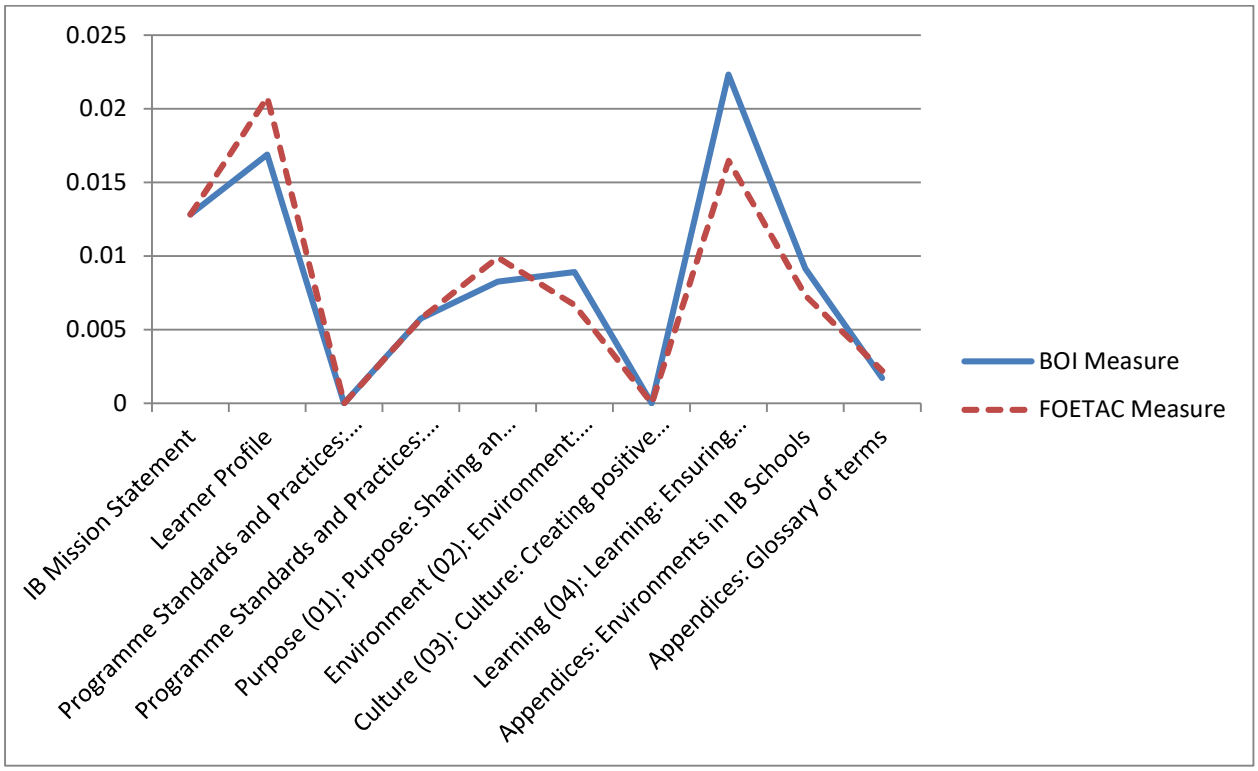
[115] Programme Standards and Practices, pp. 16-17.

The second level of mapping (use of keywords strongly related to the selected principles) shows us that words with the stem “inqui” were featured 17 times and words with the stem “collaborat” were featured 26 times. Again, given the relatively short length of this document, these numbers are fairly high. This supports the findings of the first level of mapping, which is that the precise titles of individual principles are not used, but that the language of the principles still features in some form within wider discussion of the ATT.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows that each of the main sections of the document contains quite different levels of indirect reference to the selected principles. The FOETAC Measure only rises over 0.02 in the Learner Profile preface that features at the start of every document. The BOI Measure also only rises over 0.02 in one place, the subsection on “Learning” which features the Approaches to Teaching phrases quoted above. Outside of these two subsections of the document (the preface and “Learning: Ensuring Effective Education), neither the BOI nor FOETAC Measure rise over 0.01, and both twice fall to 0. Overall, Process/Cycle is the most heavily referenced pedagogic theme in *PS&P*, with Student-Led and Collaboration also featuring considerably more than other themes.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *PS&P* has been constructed. This is displayed below.

Figure 25: Programmes Standards & Practices



2. Mathematics

2.1 MYP: Mathematics Guide

MYP: Mathematics Guide is the new subject guide for mathematics in the MYP. It is a medium length document (57 pages) with substantial sections discussing “Mathematics in the MYP”, “Written and Taught Curriculum”, and “Assessed Curriculum”. The document does not feature a specific section addressing the relationship between MYP mathematics and the approaches to teaching.

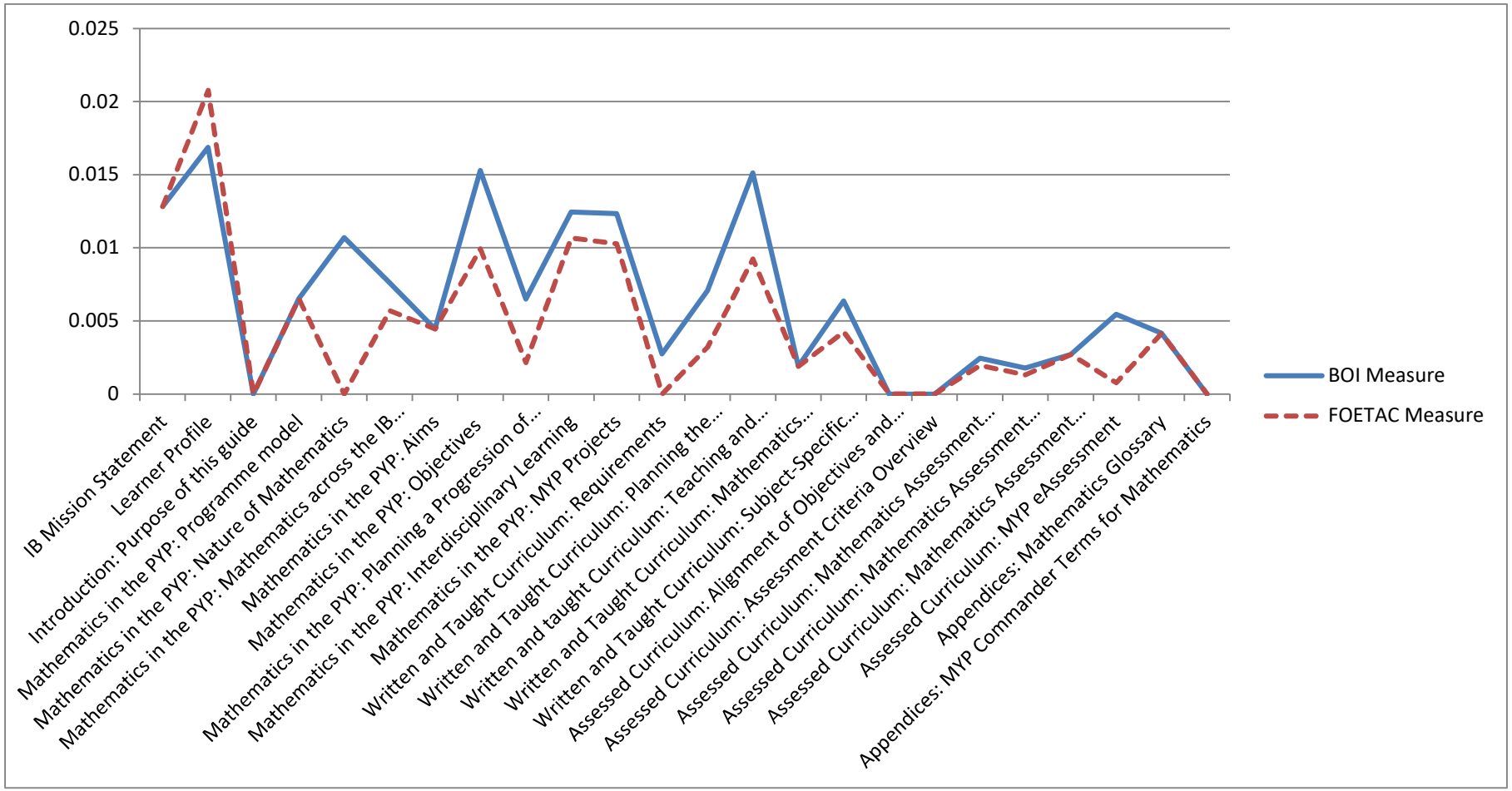
The first level of mapping (direct references to the ATT and selected principles) shows no references to the phrases “Approaches to Teaching”, “Based on Inquiry”, or “Focused on Effective Teamwork and Collaboration”. The document was written and published well after the inception of the ATT, so there is no reason why the document could not incorporate direct reference to the general curriculum component or the titles of specific principles.

The second level of mapping (use of keywords strongly related to the selected principles) shows us that words associated with the principle Based on Inquiry feature relatively frequently. There are 44 instances of words starting with the stem “inqui” and 20 instances of words starting with the stem “question”. This indicates that although the title of **Based on Inquiry** does not feature in the document, the idea of inquiry may be present to reasonable degree. On the other hand, keywords associated with the principle **Focused on Effective Teamwork and Collaboration** only exist in very low numbers in the document. There are less than 10 references, combined, to words starting with “collaborat”, “cooperat”, and “team”. This indicates that **Focused on Effective Teamwork and Collaboration** may not be consistently referenced in the document.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) supports the indication from the first and second levels of mapping that **Focused on Effective Teamwork and Collaboration** is not consistently referenced in this document, either directly, through keywords, or indirectly. The FOETAC Measure peaks in the preface (shared by all documents) and barely rises above 0.01 in any other subsection. The BOI Measure, by comparison, also peaks in the preface and often tracks the same pattern as the FOETAC Measure. However, the BOI generally sits above the FOETAC throughout the document – going above 0.015 on two occasions outside of the preface. Alongside the keyword search evidence, this indicates that **Based on Inquiry** is better integrated into MYP: Mathematics Guide than **Focused on Effective Teamwork and Collaboration**. This is further substantiated by the total number of thematic references in the document as a whole. Process/Cycle and Student-Led are the two most frequently referenced themes (with 132 and 91 sentence-level references respectively). Collaboration, on the other hand, is one of the least frequently referenced themes, with only 49 sentence-level references.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *MYP: Mathematics Guide* has been constructed. This is displayed below.

Figure 26: MYP Mathematics Guide



2.2 DP: Mathematics Analysis and Approaches Guide

DP: Mathematics Analysis and Approaches Guide "is intended to guide the planning, teaching and assessment of the subject in schools. Subject teachers are the primary audience, although it is expected that teachers will use the guide to inform students and parents about the subject".[116] It is a fairly long document, at 94 pages, containing substantive sections delivering a general "Introduction", discussion of the "Syllabus", and information on subject "Assessment". A nine-page subsection discusses "Approaches to the Teaching and Learning of Mathematics: Analysis and Approaches".

The first level of mapping (direct references to the ATT and selected principles) shows 10 examples of the phrase "Approaches to Teaching" being used, but no references to the phrases "Based on Inquiry" or "Focused on Effective Teamwork and Collaboration". Although the idea of a pedagogic framework for teaching is part of this document, the fact that the titles of ATT principles are not used indicates that the specific ATT curriculum component is not explicitly discussed in *DP: Mathematics Analysis and Approaches Guide*.

The second level of mapping (use of keywords strongly related to the selected principles) shows us that there are a relatively low number of references to words beginning with the stems "inqui" and "collaborat" (22 and 16 respectively). There are also only a handful of references to "cooperat" or "team" (four and one respectively). However, there are 139 uses of words using the stem "question" in this document – the largest tally for this word stem in any of the documents mapped in this audit. Although the language of asking and using questions often indicates an inquiry-based method (and there are, for example, two paragraphs dedicated to describing "Mathematical Inquiry"), this particularly high number in the document does not entirely reflect frequent reference to inquiry-based approaches to teaching. The 18-page section discussing the assessment processes of the subject use the words "question" or "questions" on a very regular basis to describe the contents of examination papers. Although it could be argued that the earlier reference to Mathematic Inquiry, and the subsequent use of the word "questions" to describe elements of an exam, could be an implicit reference to inquiry, this is not the same as a reference to the inquiry-based teaching method with its student-led and process-based mechanisms described by the **Based on Inquiry** ATT principle. As a result, the high number of uses of the word stem "question" do not represent a reference to that principle in quite the same way here as in some other documents.

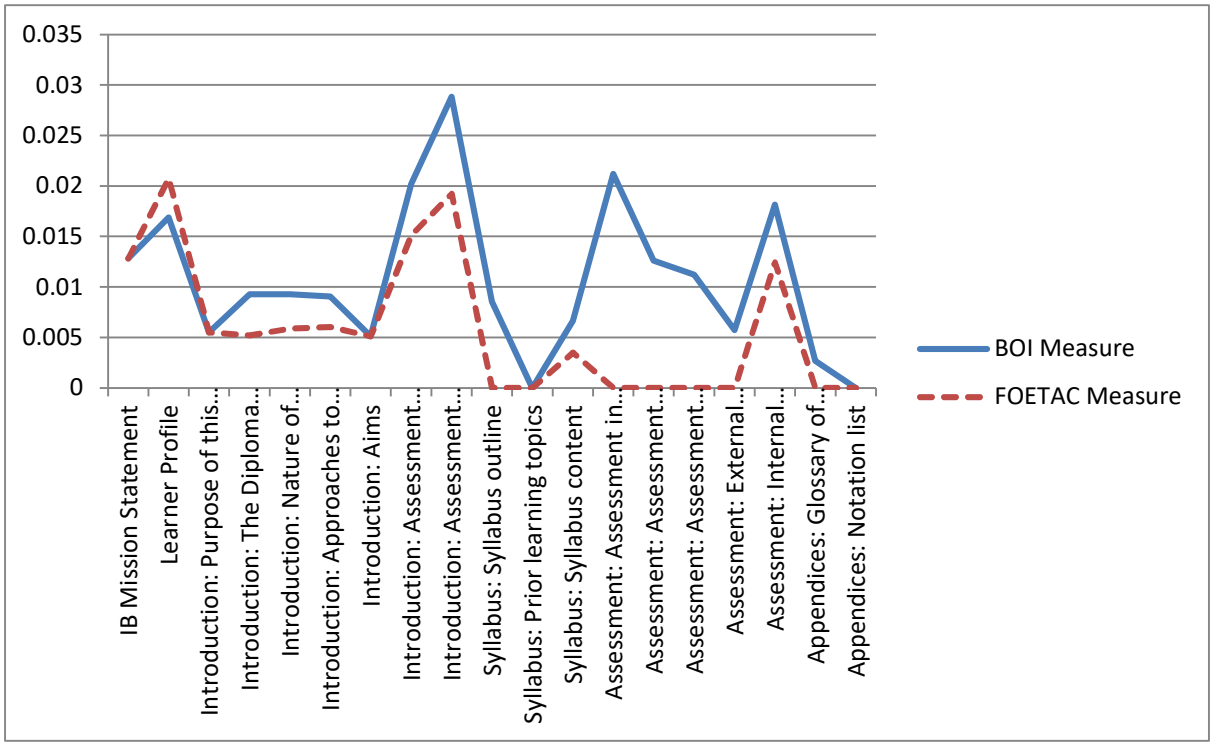
The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) presents an interesting picture, featuring some notable peaks in specific subsections but also fairly low BOI and FOETAC Measures in others. It is also interesting to note that this document demonstrates quite a substantial difference between the BOI and FOETAC Measures in a large number of subsections. For almost the entire document after the Mission Statement and Learner Profile preface, the FOETAC Measure is lower than the BOI Measure. Indeed, the FOETAC Measure only rises above 0.02 in the preface, and, in the second half of the document, eight of the 10 subsections demonstrate a FOETAC Measure of 0 (signifying no indirect reference to **Focused on Effective Teamwork and Collaboration**. By contrast, the BOI Measure approaches 0.03 on one occasion, rises above 0.02 on another, and only falls to 0 twice in the whole document. The takeaway from this is that there is significantly higher indirect reference to **Based on Inquiry** of the two principles selected for

[116] DP: Mathematics Analysis and Approaches Guide, p. 1.

closer examination in this audit. The totals of sentence-level thematic references support this finding from the BOI and FOETAC Measures. Student-Led and Process/Cycle are the two most frequently referenced themes (with 290 and 306 sentence-level references respectively). Collaboration, on the other hand, which is a vital theme for indirect references to **Focused on Effective Teamwork and Collaboration** is only referenced 62 times at sentence level. Considering the length of the document, this is a low result of Collaboration, and a further indication that *DP: Mathematics Analysis and Approaches Guide* does not consistently integrate the principle **Focused on Effective Teamwork and Collaboration**, although indirect references to **Based on Inquiry** are considerably stronger.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: Mathematics Analysis and Approaches Guide* has been constructed. This is displayed below.

Figure 27: DP: Mathematics Analysis and Approaches Guide



3.3 DP: Mathematics Analysis and Approaches Teacher Support Material

DP: Mathematics Analysis and Approaches Teacher Support Material "is designed to assist both new and experienced teachers to build or revise their course design so that it reflects the aims and objectives of the mathematics courses".[117] It offers 52 pages of supplementary support to the subject guide described above, and it contains substantive sections on topics such as "Structuring the Courses and Making Connections", "The Toolkit" (example classroom activities), and "Assessment".

The first level of mapping (direct references to the ATT and selected principles) shows 21 uses of the phrase "Approaches to Teaching" and two references each to the phrases "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration". Thus, although the subject

[117] *DP: Mathematics Analysis and Approaches Teacher Support Material*, p. 1.

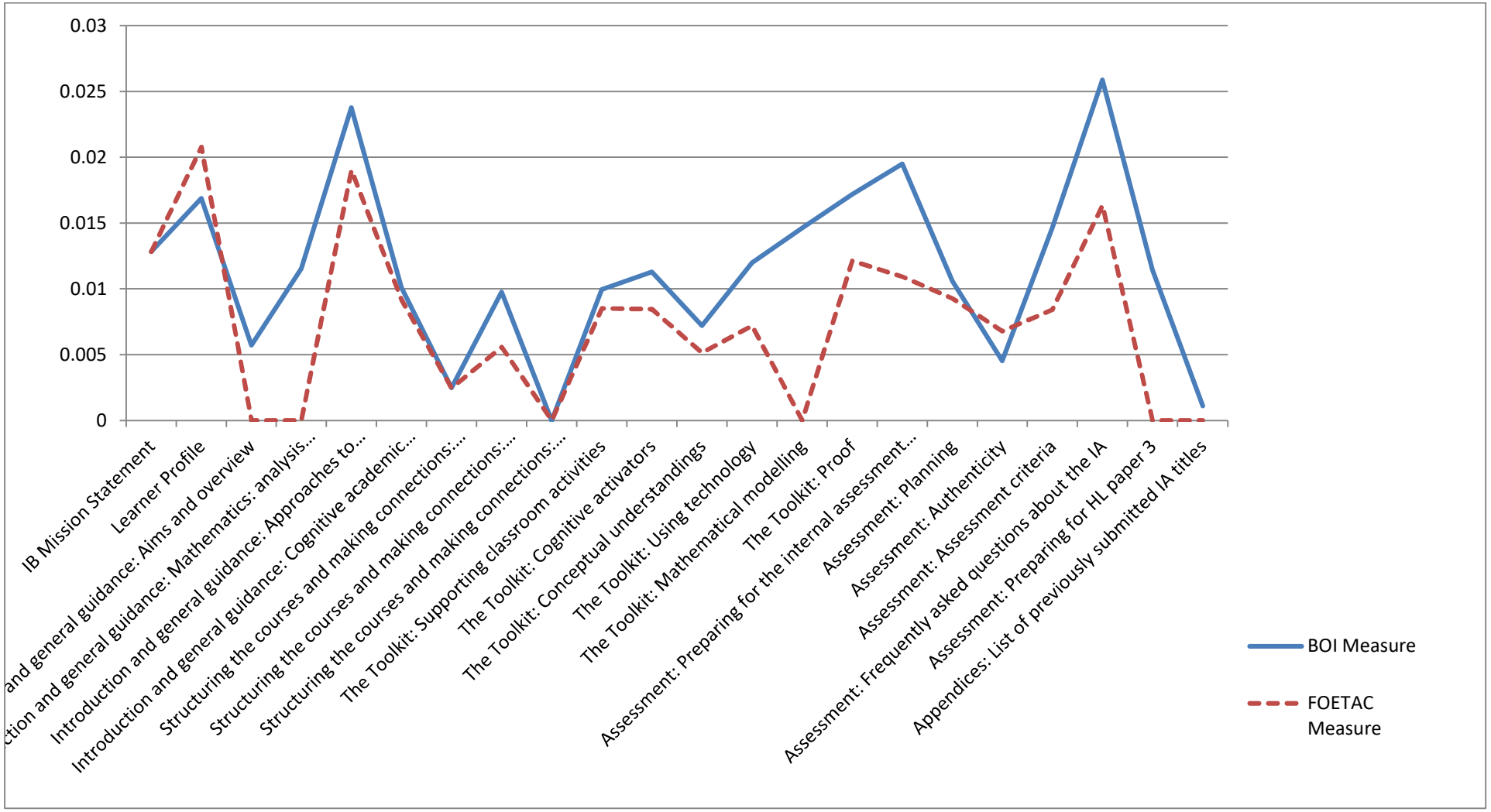
guide for DP: Mathematics Analysis and Approaches does not feature the titles of individual ATT principles at all, they are present in the Teacher Support Material. The number of references to “Approaches to Teaching” is also more than twice as high in this support material, compared to the subject guide, despite the guide being close to twice as long.

The second level of mapping (use of keywords strongly related to the selected principles) shows 30 uses of words with the stem “inqui” and 47 to words with the stem “question”. As was discovered in the subject guide, the word question is often used very practically in IB mathematics documentation to describe elements of the exam, however the number of references to “inqui” in a document of only moderate length is a reasonable indication that the idea of inquiry occurs reasonably frequently within the document. Regarding the keywords related to **Focused on Effective Teamwork and Collaboration**, the use of these terms is considerably lower (with only 16 uses of the stem “collaborat”, seven of “team”, and one of “cooperat”. The pattern here roughly follows that of the subject guide, emphasising inquiry-related terms more than collaboration-related terms.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) also shows a somewhat similar pattern to that of the subject guide. The BOI Measure generally exceeds the FOETAC Measure in the vast majority of subsections. The FOETAC Measure also peaks in the Learner Profile preface, before reaching zero in several subsections. The BOI Measure rises above 0.02 in two subsections, with a notable peak over 0.025 in the subsection titled “Assessment: Frequently asked questions about the IA [Internal Assessment]”. This subsection provides numerous details about “The Exploration” – a student-led extended exploration of an idea related to mathematics. This element of the DP mathematics course clearly lends itself to the idea of inquiry, and therefore to the ATT principles **Based on Inquiry**. Indeed, the fact that a large portion of this document discusses “The Exploration” results in the pedagogic themes relates to inquiry coming through strongly at sentence-level. In the document as a whole, there are 300 sentence-level references to the theme Student-Led, and 291 to the theme Process/Cycle. These are the two most common themes in the document. By contrast, Collaboration, as a theme, appears in only 114 sentences – indicating that **Focused on Effective Teamwork and Collaboration** is not indirectly referenced in this document nearly as clearly as **Based on Inquiry**.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: Mathematics Analysis and Approaches Teacher Support Material* has been constructed. This is displayed below.

Figure 28: DP: Mathematics Analysis and Approaches TSM



3. Individuals and Societies/History

3.1 MYP: Individuals and Societies Guide

MYP: Individuals and Societies Guide is a moderate length document (at 59 pages) with substantive sections on "Individuals and Societies in the MYP", "Written and Taught Curriculum", and "Assessed Curriculum". There is no specific section relating this subject-area to the ATT, but there are subsections which indirectly discuss some individual ATT principles – for example, "Teaching and Learning through Inquiry".

The first level of mapping (direct references to the ATT and selected principles) shows no direct reference to any of the phrases "Approaches to Teaching", "Based on Inquiry", or "Focused on Effective Teamwork and Collaboration". However, this is an older document than many of the others examined in this audit (first used from September 2014/January 2015), meaning that the ATT was not widely incorporated into IB documentation at the time of its writing. The document was updated as recently as 2019, but the reference to pedagogic frameworks was not part of that update.

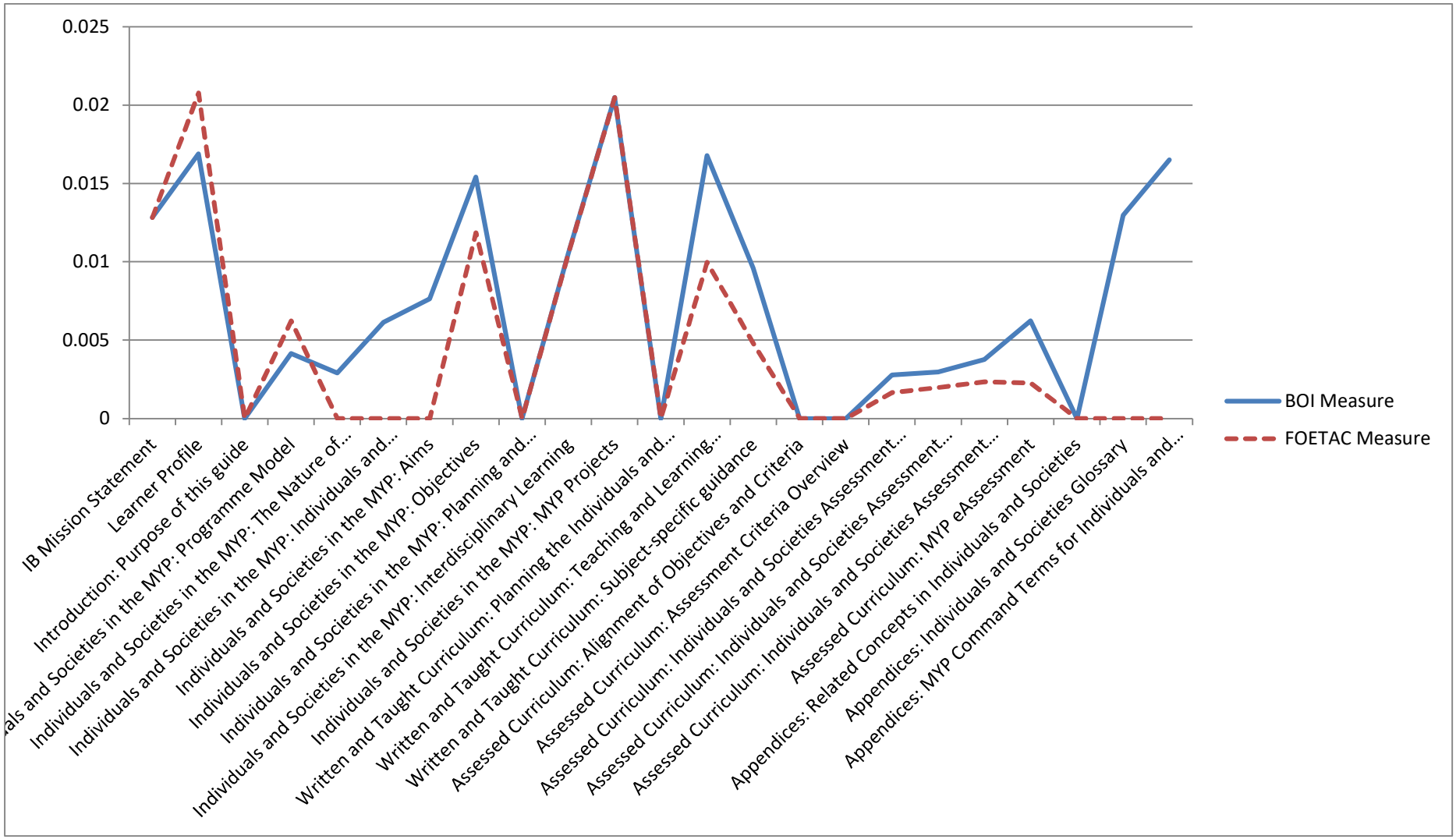
The second level of mapping (use of keywords strongly related to the selected principles) shows us that there are 44 uses of words with the stem "inqui" and 80 uses of words starting with the stem "question". This is a reasonable indication, in the document of moderate length, that the general idea of inquiry may be consistently embedded, though perhaps not to an emphatic degree. Keywords related to the idea of collaboration, on the other hand, are far fewer in number. The word stems "collaborat", "cooperat", and "team" appear only six times, 11 times, and once respectively. This indicates that the idea of collaboration (and perhaps, therefore, the ATT principle **Focused on Effective Teamwork and Collaboration**) may be relatively scarcely referenced in the document.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows that the BOI Measure slightly exceeds the FOETAC Measure over the course of the document – with a particular difference occurring in the final two appendices subsections, in which BOI reaches 0.017, whereas FOETAC remains at 0. However, both measures show a notable peak in the same subsection – exceeding 0.02 in "Individuals and Societies in the MYP: MYP Projects". That subsection discusses the general intention of MYP Projects and successfully references a number of pedagogic themes in only one page.[118] Overall, in terms of sentence-level references to pedagogic themes, the document displays 124 references to Process/Cycle, the most consistently referenced theme. There are also 89 references to Student-Led (joint with Flexibility with Disciplines), while Collaboration has only 45 references (similar to Student Individuality). The overall picture provided by the BOI and FOETAC Measures and the number of pedagogic themes is that there are more indirect references to **Based on Inquiry** in this document than there are to **Focused on Effective Teamwork and Collaboration.**

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *MYP: Individuals and Societies Guide* has been constructed. This is displayed below.

[118] MYP: Individuals and Societies guide, p. 13.

Figure 29: MYP: Individuals and Societies Guide



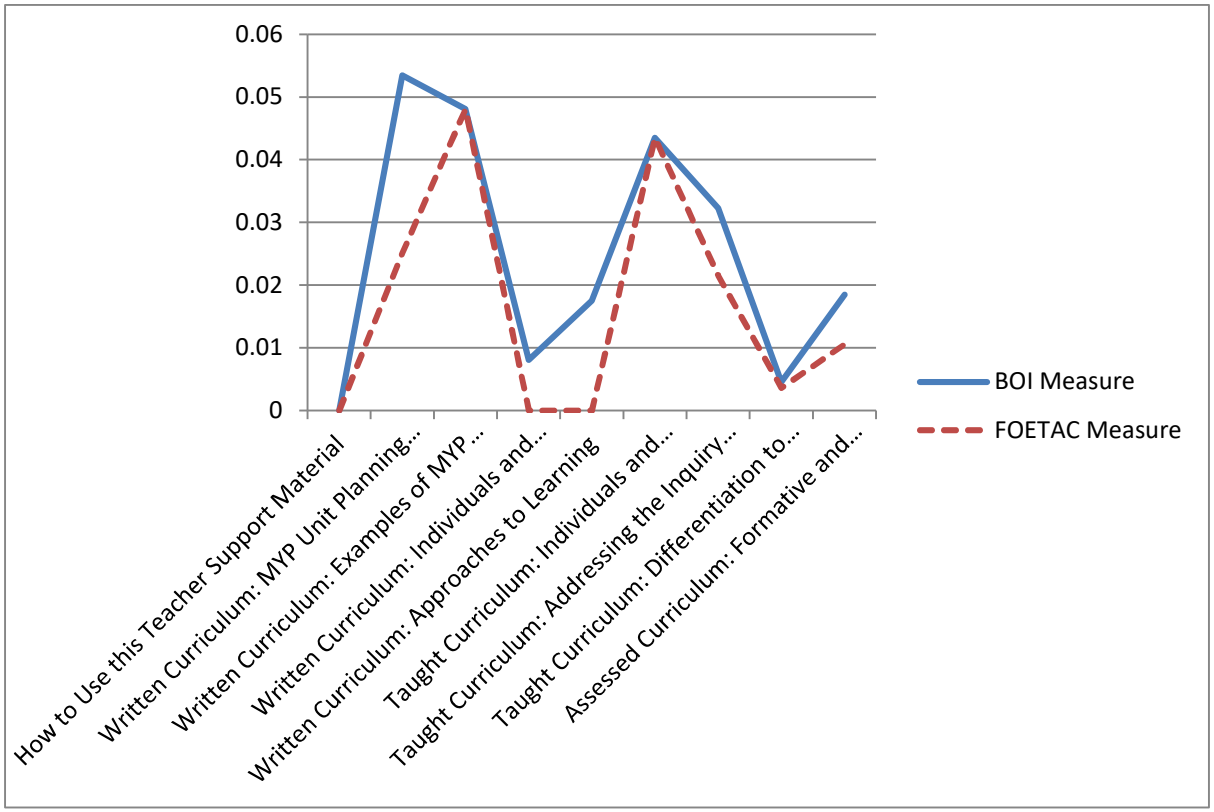
3.2 MYP: Individuals and Societies Teacher Support Material

MYP: Individuals and Societies Teacher Support Material is an html (website) resource that supports the subject guide, discussed above, with further details in areas such as the "Written Curriculum", the "Taught Curriculum", and the "Assessed Curriculum". Although there is no specific section on the ATT, there is a page of the website dedicated to "Written Curriculum: Approaches to Learning". However, this page and the pdf documents which are hyperlinked from it, refer specifically to the Approaches to Learning as an individual curriculum component, and do not discuss explicitly the Approaches to Teaching as a curriculum component or through individual principles.

The BOI and FOETAC Measures demonstrate some very high numbers. In part this is because, as an html resource, *MYP: Individuals and Societies Teacher Support Material* is very concisely written – referencing a large number of pedagogic themes in a small space. Both the BOI and FOETAC Measures exceed 0.03 on multiple occasions, with BOI peaking at very high indeed 0.053 in the subsection "Written Curriculum: MYP Unit Planning Process", and the FOETAC Measure peaking at 0.048 in a subsection titled "Written Curriculum: Examples of MYP Individuals and Societies Unit Plans". Although these scores do suggest that both **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are strongly indirectly referenced in this resource, it is important to contextualise this with the brevity of the sections. Overall, the Teacher Support Material offers very concise sections which effectively deliver indirect links to ATT principles in a small space, creating space for more extended and diffuse discussions of ideas such as inquiry and collaboration in some of the pdf resources hyperlinked on the core html resource.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *MYP: Individuals and Societies Teacher Support Material* has been constructed. This is displayed below.

Figure 30: MYP: Individuals and Societies TSM



3.3 DP: History Guide

DP: History Guide is relatively new (first assessment 2020) and quite long (106 pages) document offering subject guidance for History in the Diploma Programme. It features substantive sections on the subject "Syllabus", "Assessment", and "Approaches to Teaching and Learning". The last of these does discuss approaches to teaching and learning in a general way, but does not explicitly refer to the IB pedagogic curriculum component being examined in this report.

The first level of mapping (direct references to the ATT and selected principles) shows 14 references to the phrase "Approaches to Teaching", but none to phrases "Based on Inquiry" or "Focused on Effective Teamwork and Collaboration".

The second level of mapping (use of keywords strongly related to the selected principles) shows us that the word stem "question" appears frequently (96 instances), but none of the other keywords searched for had more than 15 results. As with other subject documents described above, the assessment-focus of this guide does cause the word "question" or "questions" to appear a large number of times when practically describing the individual components of exams that will be sat by students. However, the word stem "question" is also used many times in this document outside of the exam context. For example, in relation to the links between TOK and history the guide states that history "is an interesting area of knowledge because it raises *questions* such as how far we can speak with certainty about anything in the past, and whether historians" accounts are necessarily subjective".[119] The frequency of the word stem "question" in the document does therefore provide some

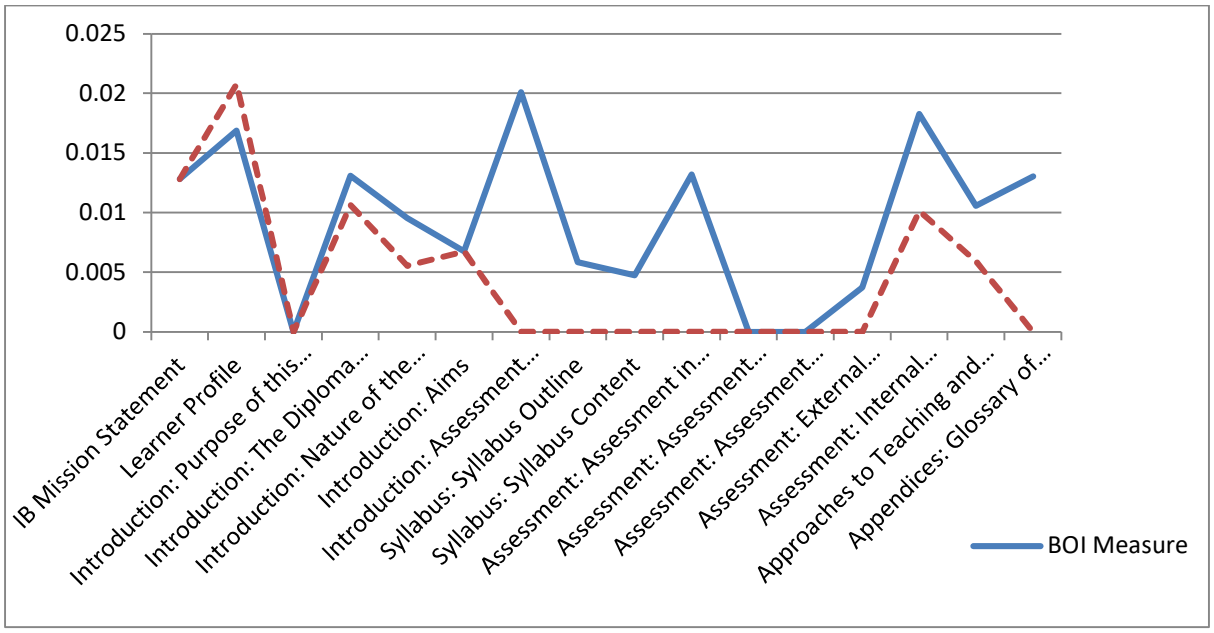
[119] *DP: History Guide*, p. 8. Our italics.

indication, like the sentence quoted, that students may be expected to inquire into specific and general areas of historical knowledge.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) does indeed show that the BOI Measure does reach relatively high numbers in some places (for instance, rising above 0.02 in "Introduction: Assessment Objectives". However, easily the highest point for the FOETAC Measure is the Learner Profile preface, and there are seven sequential subsections in which the FOETAC Measure is 0 (meaning no indirect reference to **Focused on Effective Teamwork and Collaboration**). The total number of thematic sentence-level references for the document as whole also further substantiate that the *DP: History Guide* integrates indirect references to **Based on Inquiry** most effectively of the two selected principles. Process/Cycle is by far the most consistently referenced pedagogic theme (present 272 times at sentence level), and while there are also a significant number of references to the theme Student-Led (131), Collaboration is by a good distance the least referenced of the pedagogic themes (with 42 sentence-level references). The theme that is integral to indirectly referencing **Focused on Effective Teamwork and Collaboration** is therefore infrequently referenced, whereas the combination of themes needed to indirectly reference **Based on Inquiry** is comparatively high.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: History Guide* has been constructed. This is displayed below.

Figure 31: DP: History Guide



3.4 DP: History Teacher Support Material

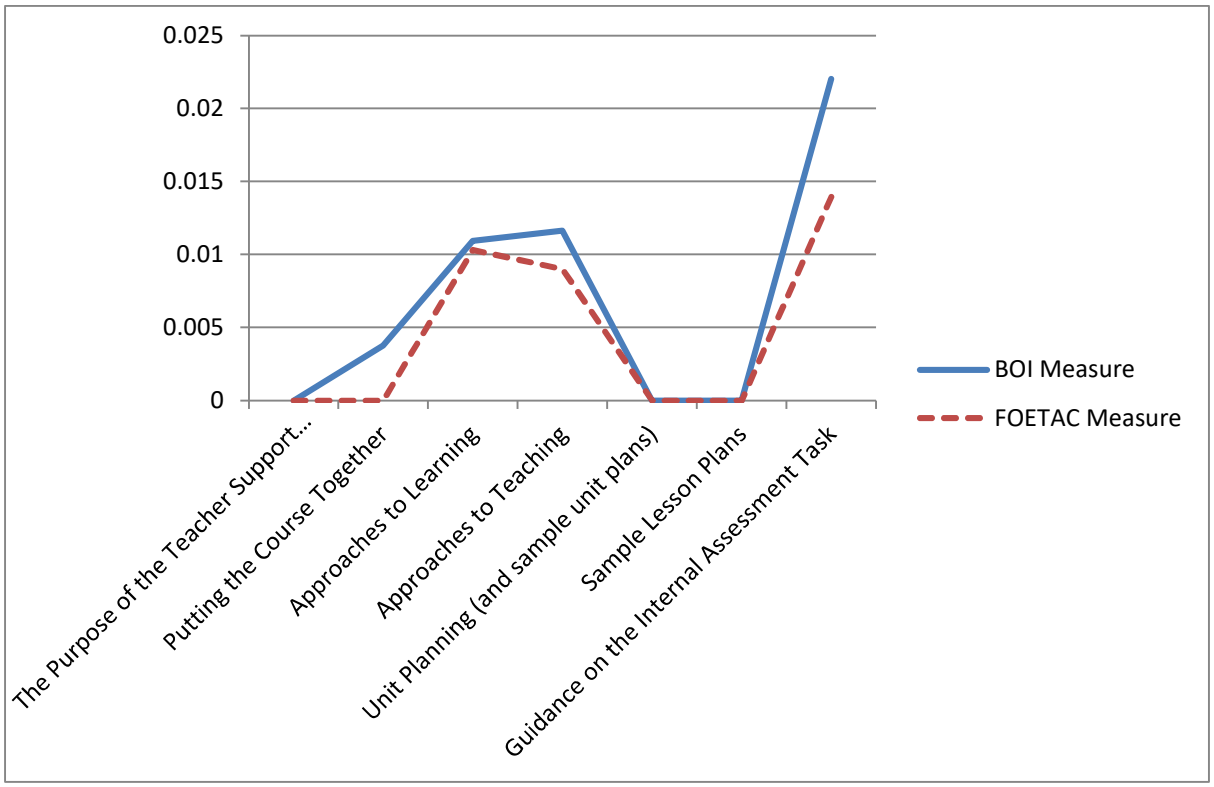
DP: History Teacher Support Material provides additional guidance to support the subject guide described above. As with other html resources it also links to other resources which teachers could follow-up with to receive even further detail. This teacher support material contains substantive sections covering topics including "Approaches to Learning", "Approaches to Teaching", and "Guidance on the Internal Assessment Task".

The “Approaches to Teaching” section explicitly refers to the ATT curriculum component as a whole, but it also refers to the title of all ATT principles – including “Based on Inquiry” and “Focused on Effective Teamwork and Collaboration”. The BOI and FOETAC Measures for this section are not particularly high (0.012 and 0.009) because the section does not dwell on any single ATT principle, instead describing briefly how each individual ATT principle links to the teaching of DP history.

Throughout the rest of the resource, the BOI and FOETAC Measures do fall to zero on three and four occasions respectively, though the BOI Measure also exceeds 0.02 in the subsection discussing the internal assessment task. Overall, the two principles identified for closer examination (**Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**) are not indirectly referenced in an extensive way in this teacher support material, but the particular subsection explicitly discussing the ATT would be useful for teachers seeking a clear idea of how the ATT principles relate to the subject.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: History Teacher Support Material* has been constructed. This is displayed below.

Figure 32: DP: History TSM



4. Language

4.1 MYP: Language Acquisition Guide

MYP: Language Acquisition Guide is a relatively new (for use from September 2020/January 2021) and relatively long (76 pages) document providing general guidance for the teaching of language acquisition in the Middle Years Programme. The document contains substantive sections on "Language Acquisition in the MYP", "Written and Taught Curriculum", and "Assessed Curriculum". There is no specific section relating MYP language acquisition to the ATT, but there are subsections implicitly handling specific ATT principle – for example, "Language Acquisition in the MYP: Interdisciplinary Learning" and "Written and Taught Curriculum: Teaching and Learning through Inquiry".

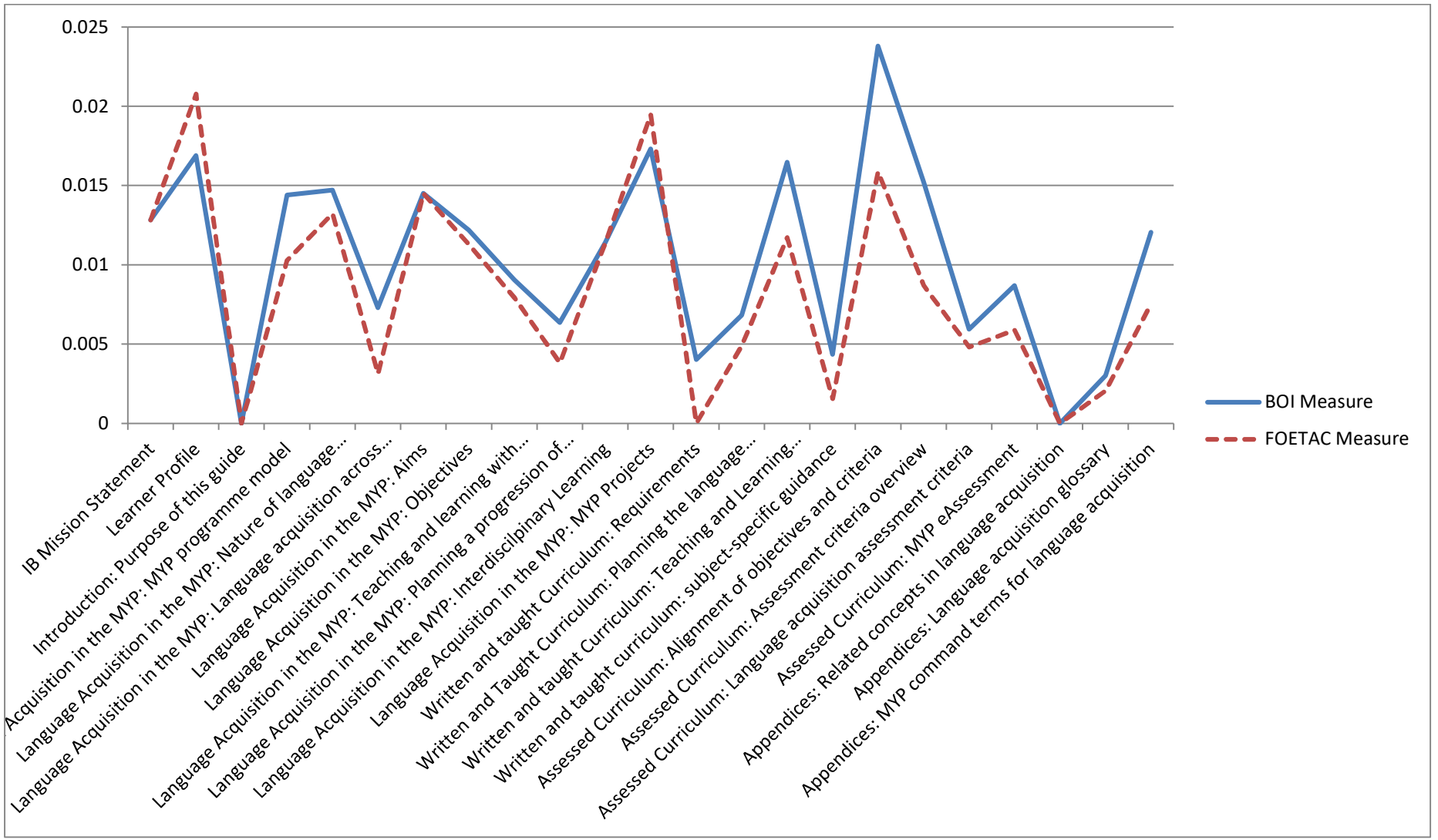
The first level of mapping (direct references to the ATT and selected principles) shows one use of the phrase "Approaches to Teaching" but no use of the phrases "Based on Inquiry" or "Focused on Effective Teamwork and Collaboration". That particular reference to "Approaches to Teaching" is not specifically to the IB's pedagogic curriculum component, but as part of a general comment, stating: "group work, as one aspect of a wide range of approaches to teaching and learning, may well be incorporated as one type of formative assessment used throughout the course". As such, it is evident that there are no direct references to the ATT as a curriculum component, or its individual principles (by name) in this document.

The second level of mapping (use of keywords strongly related to the selected principles) shows us that there are very few uses of words with the stems "collaborat", "cooperat", and "team" (six, one, and one). However, words conceptually linked to inquiry feature more frequently – with 46 instances of the word stem "inqui" and 29 instances of the word stem "question". This indicates that the document as a whole may not be referencing the broad idea of collaboration to the same extent as the broad idea of inquiry.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows a large number of peaks and troughs, with the BOI and FOETAC Measure tracking each other fairly closely, and neither being noticeably higher than the other. The exception to this rule is one subsection "Assessed Curriculum: Alignment of Objectives and Criteria", in which the BOI Measure rises over 0.02, while the FOETAC Measure remains at 0.016. Overall, though BOI and FOETAC Measures appear to fluctuate frequently, they often remain within a broadly moderate band and rarely drop to 0. This finding is substantiated by the total number of thematic sentence-level references in the document as a whole. Although Process/Cycle and Student-Led are the most commonly referenced themes (with 228 and 206 references respectively), Collaboration is the third most present theme and still appears at a fairly frequent rate in the document (with 116 sentence-level references). Overall this is indicative of a document that does not directly discuss **Based on Inquiry** or **Focused on Effective Teamwork and Collaboration**, but the general ideas of inquiry and collaboration are indirectly referenced to a reasonable degree. **Focused on Effective Teamwork and Collaboration** could be integrated more effectively if keywords such as "collaboration" and "teamwork" were used more frequently.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *MYP: Language Acquisition Guide* has been constructed. This is displayed below.

Figure 33: MYP Language Acquisition Guide



4.2 MYP: Language Acquisition Teacher Support Material

MYP: Language Acquisition Teacher Support Material "is intended to give practical help to support teachers understanding and implementation of the subject group [language acquisition] framework".[120] The document is quite short, at only 29 pages, though it does contain embedded hyperlinks which can take the reader through to examples of assessment. This teacher support material contains substantive sections addressing "Written Curriculum" and "Assessed Curriculum".

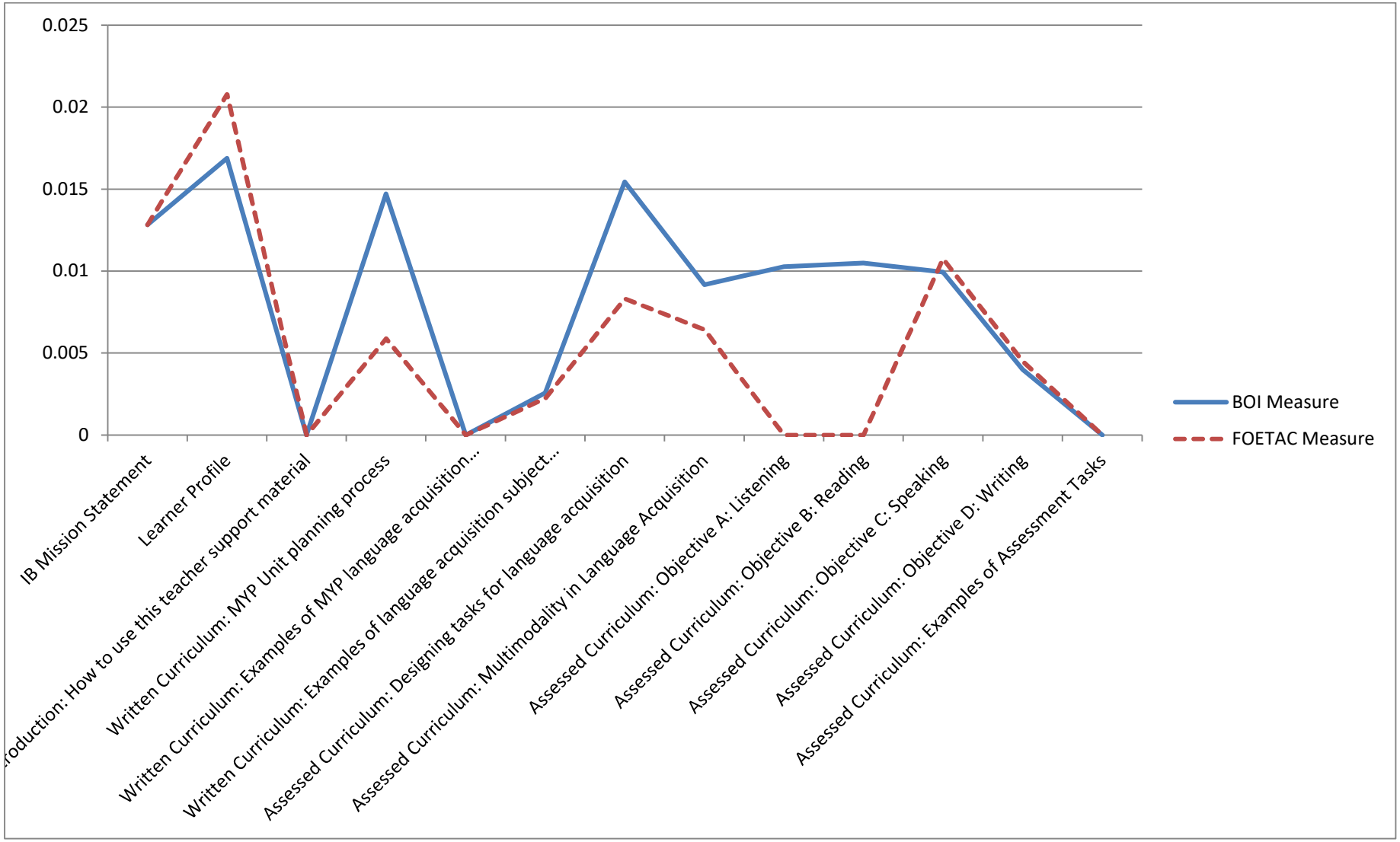
The document does not show any direct references to "Approaches to Teaching", "Based on Inquiry", or "Focused on Effective Teamwork and Collaboration". This teacher support material also uses the keyword language associated with the idea of collaboration on only a few occasions (the word stem "collaborat" twice, and "cooperat" once). On the other hand, the word stem "inqui" is used 39 times and "question" 25 times, which is fairly high for a relatively brief document. Overall this indicated that the ATT itself and the actual titles of ATT principles are not directly referenced, but **Based on Inquiry** may be more effectively indirectly referenced compared to **Focused on Effective Teamwork and Collaboration**.

The BOI and FOETAC Measures bear out these findings, as the BOI Measure generally exceeds the FOETAC Measure. Following the Learner Profile preface, the FOETAC Measure is low throughout. The BOI Measure, does not exceed 0.02, so it is also not particularly high compared to some other documents, but it more consistently rises above the low FOETAC.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *MYP: Language Acquisition Teacher Support Material* has been constructed. This is displayed below.

[120] MYP: Language Acquisition Teacher Support Material, p. 1.

Figure 34: MYP: Language Acquisition TSM



4.3 DP: Language B Guide

DP: Language B Guide is a fairly new (first assessment 2020) and moderately long (69 pages) document. "Intended to guide the planning, teaching and assessment of the subject in schools", the document contains substantive sections on the "Syllabus", "Assessment", and "Approaches to Teaching and Learning". The latter section includes direct but brief instructions on the relationship between the subject and each of the ATT principles.

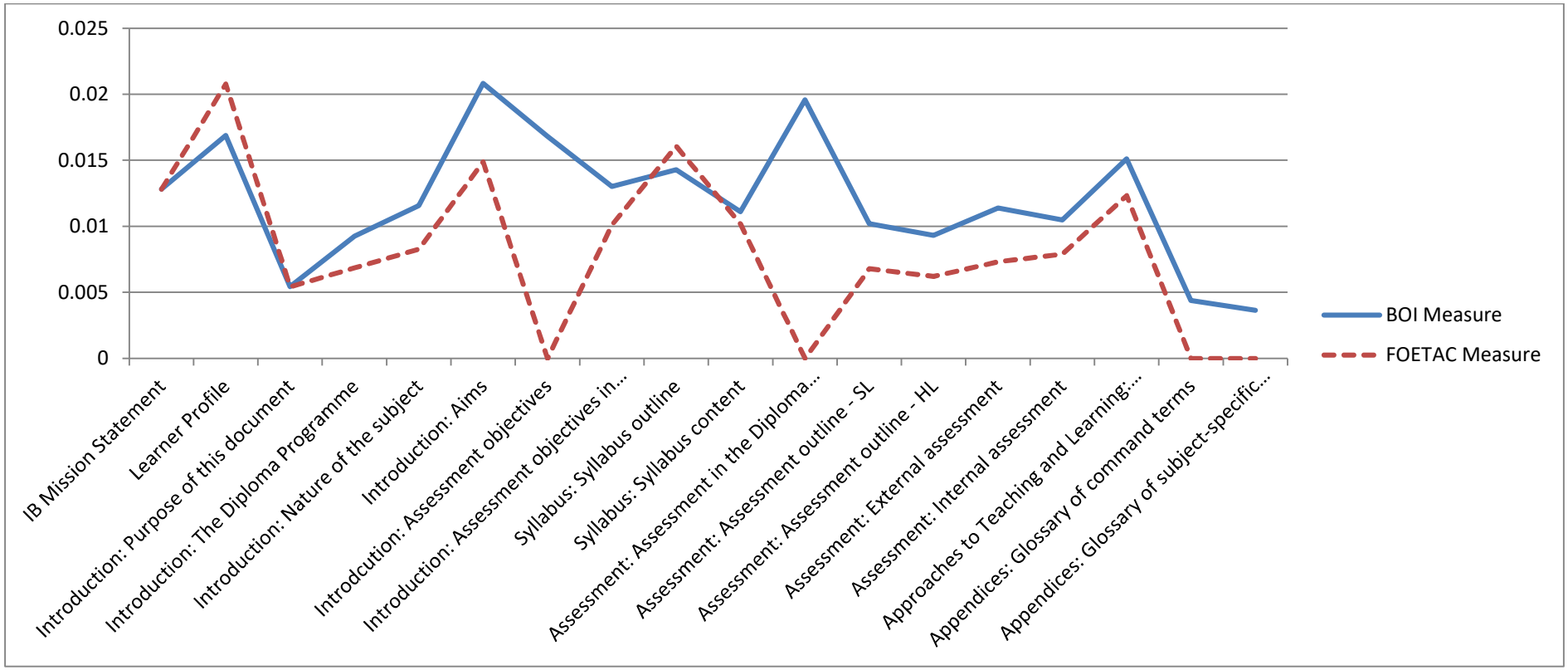
The first level of mapping (direct references to the ATT and selected principles) shows 14 uses of the phrase "Approaches to Teaching", and three each of the phrases "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration". Compared to many other documents this constitutes a high level of integration of direct references to the ATT in general and the selected principles more specifically.

The second level of mapping (use of keywords strongly related to the selected principles) shows us that there are 14 uses of the word stem "collaborat", six of "team, and 18 of "inqui". These figures are not particularly notable, but the document does contain 57 instances of the word stem "question". Overall, though, quite a large number of these uses of the word stem "question" are related to practical descriptions of questions which may appear on examination papers, rather than exhortations for students to, for example, develop their own lines of questioning. As such, *DP: Language B Guide* appears to use direct references to the ATT and selected principles, but not a large number of indirect references through keywords related to the ideas embedded in the ATT principles.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows a slightly different picture for the BOI and FOETAC Measures. The BOI Measure is fairly high throughout the document – generally staying above 0.01 and rising above 0.02 once (in a subsection in the introduction). The FOETAC Measure is generally lower than the BOI Measure, often tracking below 0.01, and it falls to 0 on two occasions when the BOI Measure is over 0.015. This pattern tallies with the sentence-level thematic findings, which reveal that Process/Cycle is the most frequently referenced theme (in 301 sentences), while Student-Led is not far behind (247 references) and Collaboration appears in roughly half as many sentences as Process/Cycle (158 times). Overall, this document (unlike many) does prioritise direct references to the ATT and individual principles. It also shows relatively consistent integration of indirect references to **Based on Inquiry** – more so than **Focused on Effective Teamwork and Collaboration** – although the keyword references to both of the selected principles are relatively low.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: Language B Guide* has been constructed. This is displayed below.

Figure 35: DP: Language B Guide



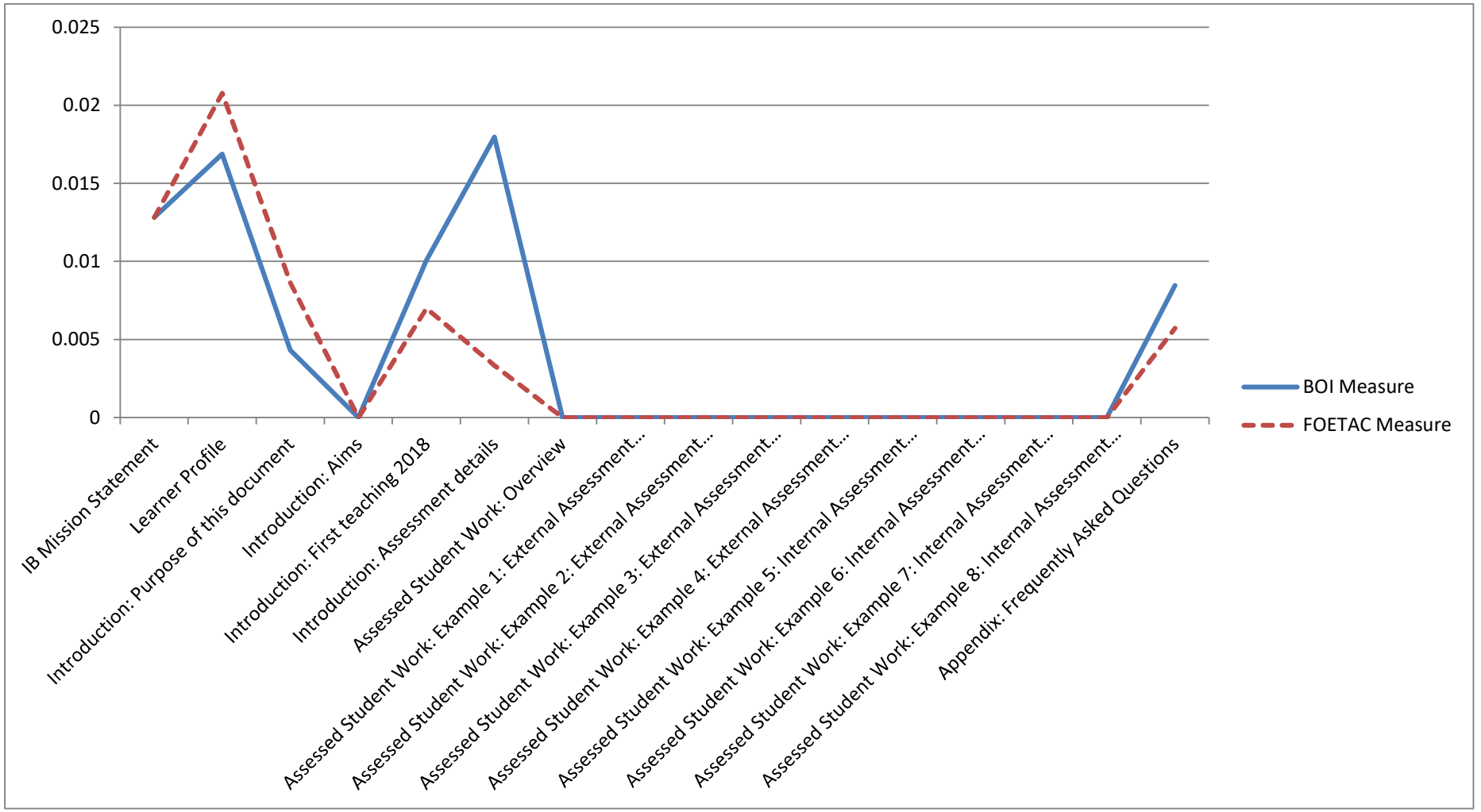
4.4 DP: Language B Teacher Support Material

DP: Language B Teacher Support Material is a fairly short (27 pages) document that supports the subject guide, mostly with further details "Assessed Student Work". Although the document is relatively short, it also contains hyperlinks leading to specific assessment examples.

The document does not contain direct references to the phrases "Approaches to Teaching", "Based on Inquiry", or "Focused on Effective Teamwork and Collaboration", nor does it feature more than a handful of keyword references to words associated with the idea of collaboration. However, for such as short document, the 39 uses of the word stem "inqui" and the 25 instances of the word stem "question" suggest that indirect references to the ATT principles **Based on Inquiry** may be reasonably high.

The BOI and FOETAC Measures are not particularly revealing for this document, because a large number of the later subsections are only lists of hyperlinks to external material (thus showing 0 for BOI and FOETAC Measures). Nonetheless, the chart of BOI and FOETAC Measures is demonstrated below. Overall, the first half of this document does show reasonably high BOI Measure in some subsections, which, combined with the number of keywords references related to inquiry, indicates that **Based on Inquiry** does have some indirect integration in this document, but **Focused on Effective Teamwork and Collaboration** does not really feature substantially outside of the Learner Profile preface.

Figure 36: DP: Language B TSM



5. PYP

5.1 PYP: From Principles into Practice – The Learner (Exhibition elements)

The PYP core does not have an individual document to describe its features. Instead, the PYP Exhibition is discussed in a seven-page subsection of *The Learner* document of *PYP: From Principles into Practice*. The document as a whole is discussed in detail above, but it is worth noting that this seven-page subsection discussing "The Exhibition: Culminating Learning Experiences" does feature a significant amount of indirect integration of the selected pedagogic themes. In only seven pages there are 31 instances of the word stem "inqui" and 24 instances of the word stem "collaborat". This indicates that the language of inquiry and collaboration is consistently appearing in relation to description of the PYP Exhibition.

Because this is only one subsection of a document a BOI and FOETAC Measure line-chart cannot be constructed, however the bar chart below does demonstrate that both the BOI and FOETAC Measures are fairly high in this subsection. The FOETAC Measure slightly exceeds the BOI Measure here, however the difference is minimal. Direct references to the ATT and the selected principles do not appear in relation to the PYP Exhibition, however it is clear that the general ideas of inquiry and collaboration do appear relatively consistently.

5.2 PYP: Developing a Programme of Inquiry

PYP: Developing a Programme of Inquiry is a very short document (only 16 pages) that does exactly what the title suggests: it gives teachers guidance on how to integrate the notion of inquiry-based teaching into the PYP programme. The document contains substantive sections on "Early years Programmes of Inquiry", "Primary Years Programme (PYP) Scope and Sequence Programmes of Inquiry", "National Curriculum Programmes of Inquiry", and "Criteria for Designing and Reviewing a Programme of Inquiry".

The first level of mapping (direct references to the ATT and selected principles) shows no direct references to the phrases "Approaches to Teaching", "Based on Inquiry", or "Focused on Effective Teamwork and Collaboration".

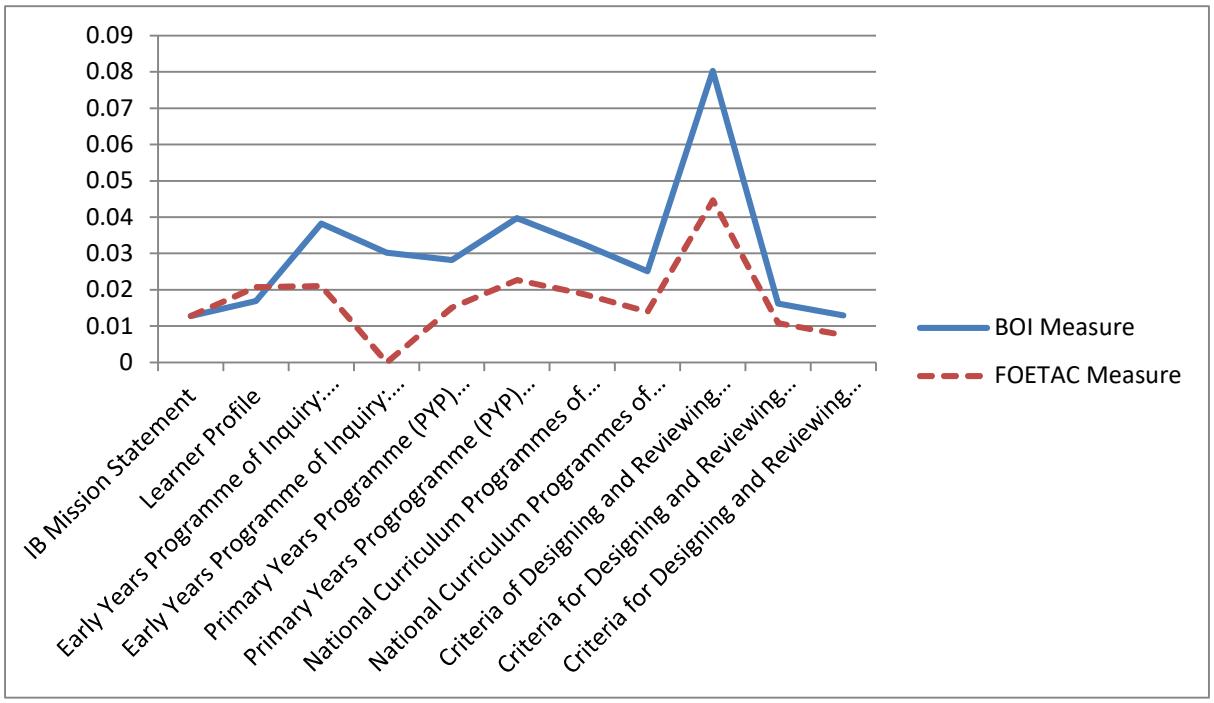
The second level of mapping (use of keywords strongly related to the selected principles) shows an unremarkable, low number for most of the selected keywords. However, perhaps unsurprisingly, there are 117 instances of the word stem "inqui" being used. In this very short document that amounts to the highest keyword-reference-per-page ratio of any document within this audit. As would be expected from a document with this title, the concept of inquiry is clearly strongly and consistently embedded within it.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows, again predictably, that the BOI Measure is considerably higher than has been found in any other subsection of other documents. Peaking at over 0.08, the BOI Measure is frequently over the usual threshold of very high indirect integration (0.03), and doesn't drop to 0 at any point. Interestingly, though, the FOETAC Measure is also very high in this document. The FOETAC Measure is often over 0.02 (a high level of indirect integration) and reaches a peak of 0.045. The peaks of both measures, however, must be taken within the context that the subsection in question is only 56 words in length. Thus, although it is entirely focused on indirectly referencing **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**, the actual effect within the document is not as impactful as those very

high BOI and FOETAC Measures would suggest. Despite this reservation concerning the length of some subsections (which makes a very high BOI and FOETAC easier to obtain), the document as a whole clearly integrates indirect reference to both selected principles very effectively.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *PYP: Developing a Programme of Inquiry* has been constructed. This is displayed below.

Figure 37: PYP: Developing a Programme of Inquiry



6. MYP

6.1 MYP: Projects Guide

MYP: Projects Guide is a moderate length document (63 pages) which "provides the framework for the community project and the personal project in the Middle Years Programme (MYP)". It contains substantive sections addressing "Organizing MYP Projects", "Pedagogy of MYP Projects", "Completing the MYP Community Project", and "Completing the MYP Personal Project". The pedagogy section of the document contains a dedicated subsection on the Approaches to Learning, but no dedicated section to the Approaches to Teaching. Although, some of the subsections do focus on individual issues closely linked to the ATT – for instance, "Inquiry in MYP Projects" or "Global Contexts".

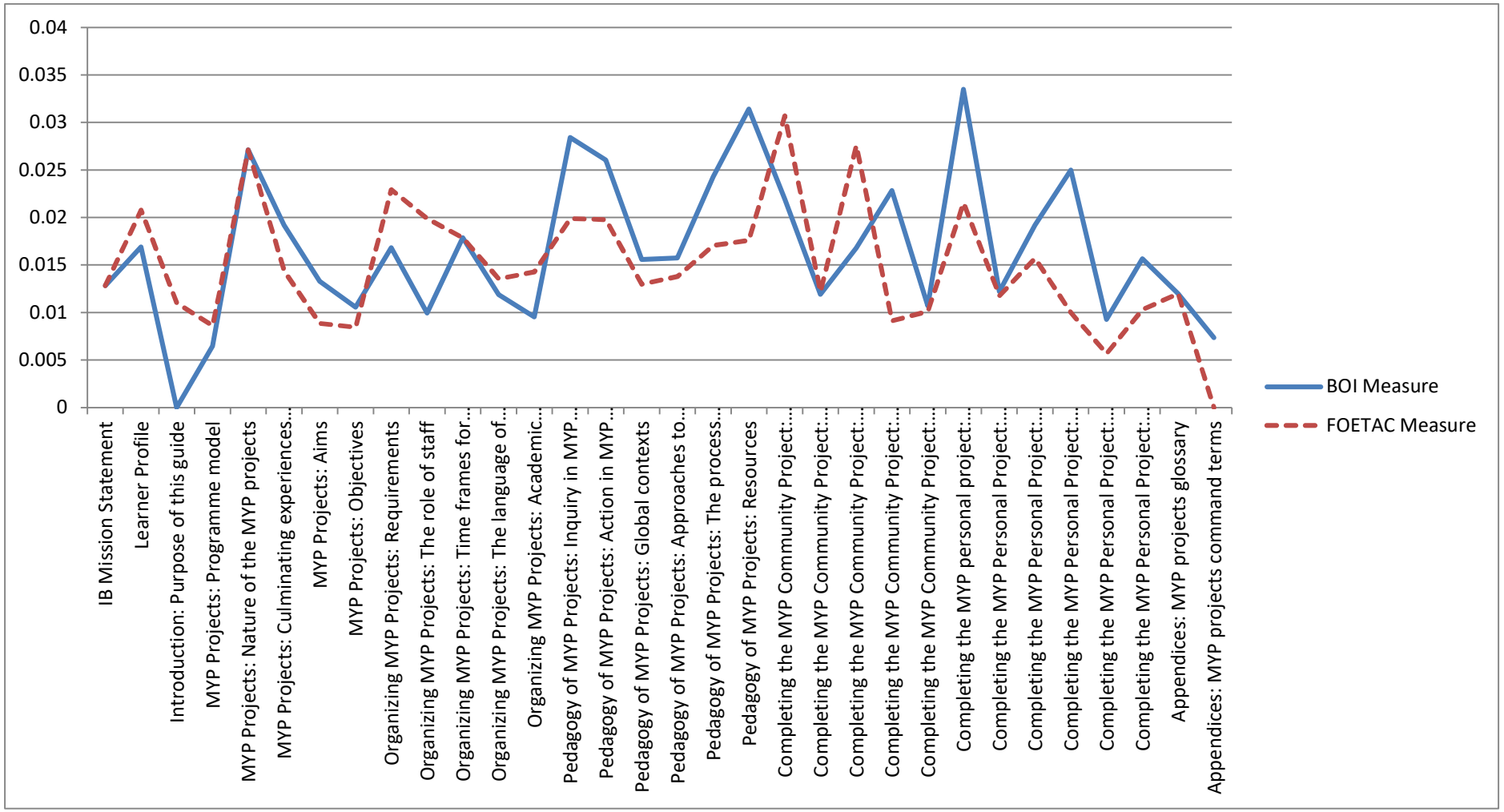
The first level of mapping (direct references to the ATT and selected principles) shows no direct references to the phrases "Approaches to Teaching", "Based on Inquiry", or "Focused on Effective Teamwork and Collaboration". As the document is relatively old (for use from September 2014/January 2015), this is not surprising.

The second level of mapping (use of keywords strongly related to the selected principles) reveals no particularly notable levels of keyword usage throughout the document. There are 26 uses of the word stem "inqui" and 13 of the word stem "collaborat", so the language of **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** certainly does exist in the document, but not to a particularly high degree given the document length.

However, the third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) provide an alternative insight. This document is a good example of where direct and keyword references do not necessarily indicate a high level of integration of the selected principles, but the BOI and FOETAC Measures actually show consistently strong levels throughout. The BOI Measure drops to 0 in one subsection, but other than that it stays above 0.01 almost without exception, and surpasses the very high integration threshold of 0.03 on two occasions. The FOETAC Measure follows a very similar pattern – dropping to 0 in one subsection but staying moderately high throughout the rest, including one subsection that rises over 0.03. All three of the pedagogic themes related to the selected ATT principles are strongly present throughout, with Process/Cycle having 226 references, Student-Led having 310, and Collaboration having 172. The levels of integration of indirect references to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are thus strong throughout. Other themes are considerably less present (for instance Flexibility with Disciplines has only 46 references, and Global/International Citizenship only 66), so other ATT principles are likely to be embedded less effectively. However, the two selected principles are good examples here of how indirect integration can make up for unremarkable keyword and non-existent direct reference.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *MYP: Projects Guide* has been constructed. This is displayed below.

Figure 38: MYP: Projects Guide



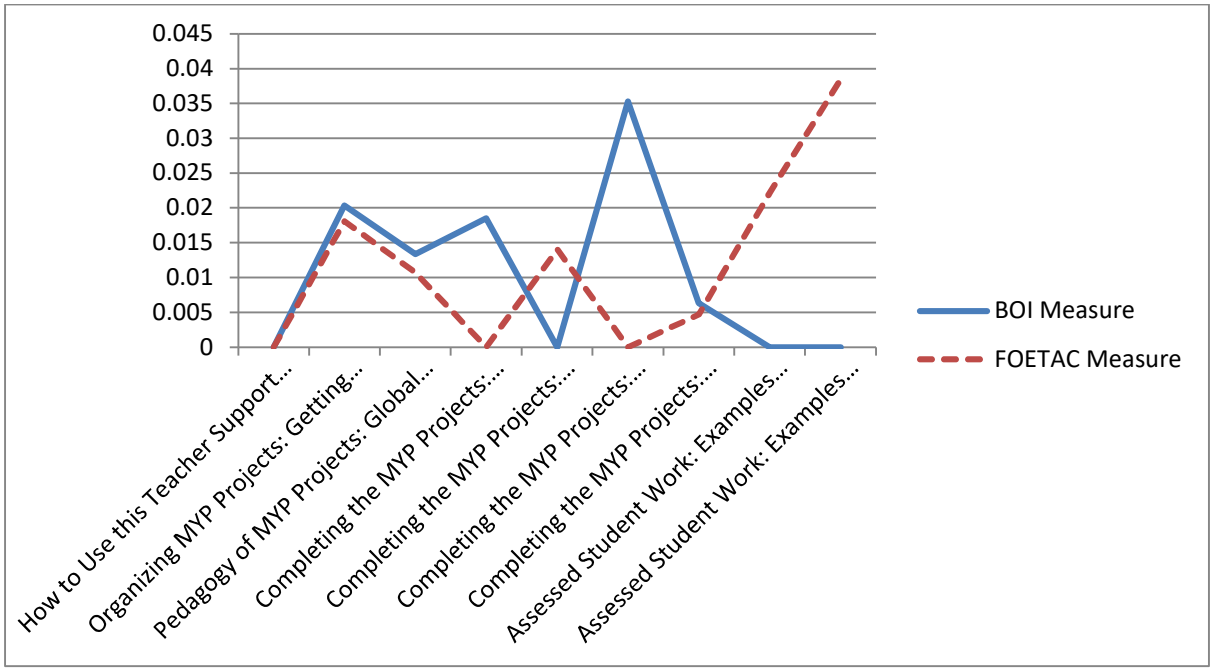
6.2 MYP: Projects Teacher Support Material

MYP: Projects Teacher Support Material is an html (website) resource designed to offer further details to support the teaching of MYP Projects, and to be read in conjunction with the guide described above. The resource contains substantive sections on “Organizing MYP Projects”, “Pedagogy of MYP Projects”, “Completing the MYP Projects”, and “Assessed Student Work”. As with most IB html resources, the core website content is concise, but teachers have the option to click through to linked resources in order to read examples of assessment materials etc.

As with the *MYP: Projects Guide*, this resource was designed for original use in 2014/2015, so the section focused on “Pedagogy of MYP Projects” does not explicitly feature the Approaches to Teaching as a whole curriculum component, or its individual principles. However, by using BOI and FOETAC Measures we can still assess the extent to which the selected ATT principles are indirectly integrated. Both the BOI and FOETAC Measures present a mixed picture in this resource, with some subsections showing very high measures (over 0.03) and some showing a measure of 0. As with other html resources, the word counts for individual subsections can be very low, meaning that it is more likely that the BOI or FOETAC Measure will reach extremes at either end of the spectrum.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *MYP: Projects Teacher Support Material* has been constructed. This is displayed below.

Figure 39: MYP: Projects TSM



6.3 MYP: Approaches to Learning, Inquiry and Service Teacher Support Material

MYP: Approaches to Learning, Inquiry and Service Teacher Support Material is another relatively old (2014/15) html resource designed to support teaching in the MYP. This specific resource “is designed to accompany all the Middle Years Programme (MYP) guides. It contains examples of teacher and student work related to approaches to learning (ATL),

inquiry and service learning. It is intended to give practical help to support teachers understanding and implementation of the theory presented in MYP guides".[121] The resource contains substantive sections addressing "Philosophy, School Culture and Research", "Policies, Learning Stories", and "Curriculum Activities". As with most other html resources, concise html content also links through to more extended discussion in a variety of pdfs.

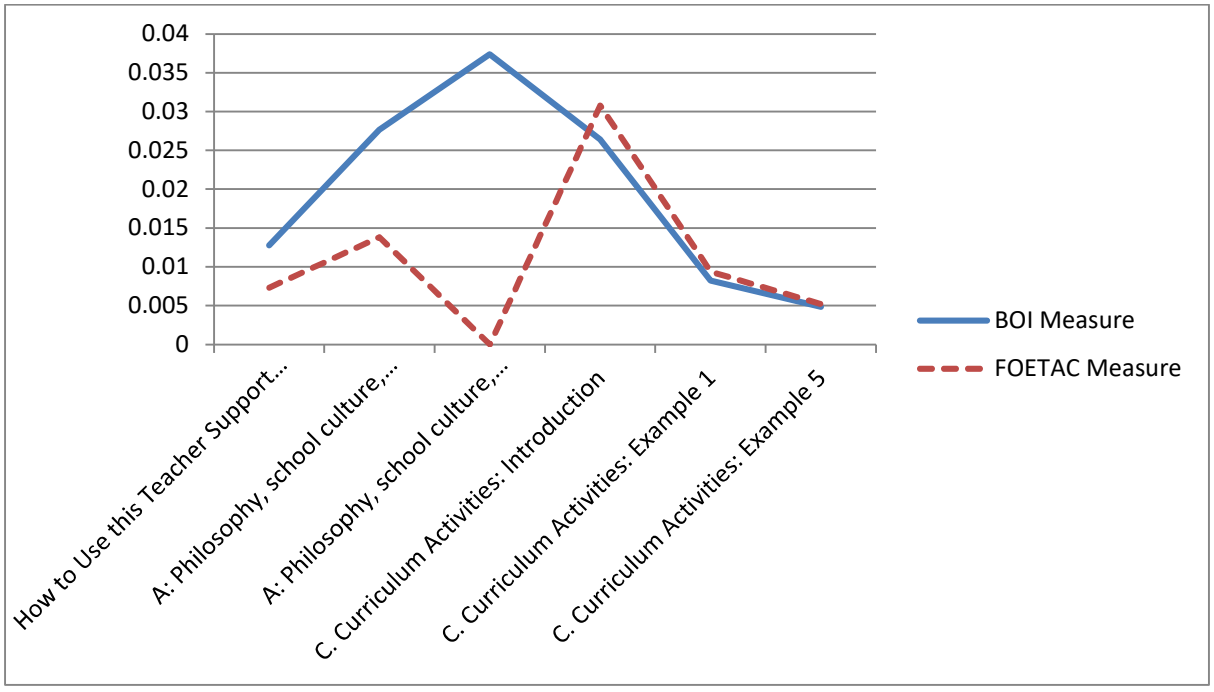
Interestingly, although many other MYP resources designed for use from the same period do not feature any explicit discussion of the ATT, this resource does contain an explicit reference to the curriculum component. In the introductory page, it is stated that:

> "This TSM exemplifies aspects of the MYP that are at the heart of the programme model.
> - Approaches to learning—demonstrating a commitment to ATL as a key component of the MYP for developing skills for learning.
> - Approaches to teaching—emphasizing MYP pedagogy, including collaborative, authentic learning through inquiry."

Although this statement does not use the familiar titles of ATT principles, it is clear that many of the same ideas are being referenced.

As with many other IB html resources, the brevity of the core text can make the BOI and FOETAC Measures more likely to reach high and low extremes. The chart below does indeed show that both the BOI and FOETAC Measures exceed the very high indirect integration threshold of 0.03 on one occasion each, while FOETAC also drops to 0 once, and BOI drops below 0.005.

Figure 40: MYP: Approaches to Learning, Inquiry and Service TSM



[121] *MYP: Approaches to Learning, Inquiry and Service Teacher Support Material*, "How to use this Teacher Support Material".

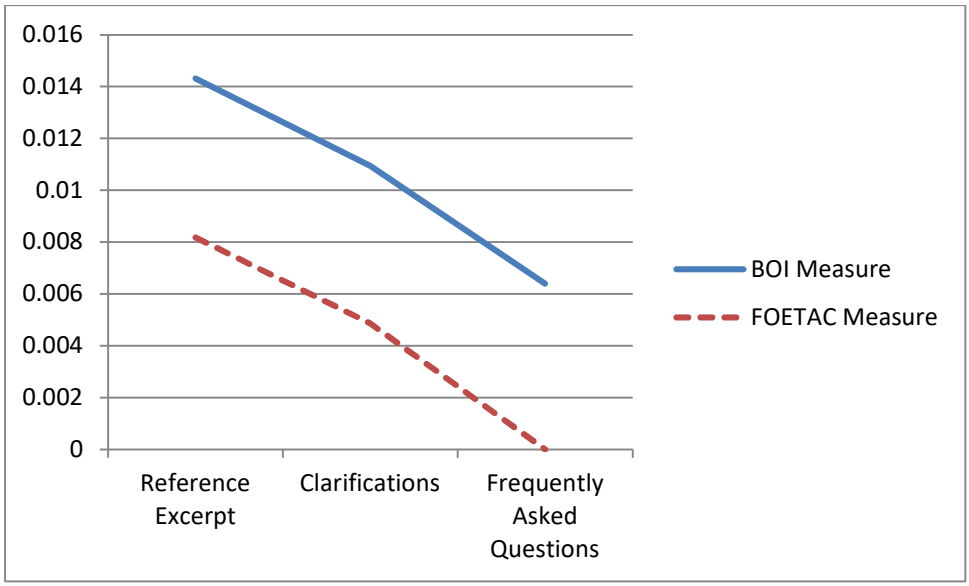
6.4 MYP: Further Guidance for Developing MYP Written Curriculum

MYP: Further Guidance for Developing MYP Written Curriculum is not an html resource, but it is the shortest of the documents examined in this audit, at only six pages. Having said that, those six pages are filled with a considerable amount of text and a large number of references to pedagogic themes – making it an interesting document for analysis. The document contains information such as clarifications and frequently asked questions on issues relating to the planning and writing of a coherent curriculum.

The first level of mapping (direct references to the ATT and selected principles) shows no direct use of the phrases “Approaches to Teaching”, “Based on Inquiry”, or “Focused on Effective Teamwork and Collaboration”. Similarly, the second level of mapping (use of keywords strongly related to the selected principles) shows very little use of relevant keywords (the most frequent being the word stem “inqui”, with seven uses.

Because there are so few subsections, the BOI and FOETAC Measures also do not reveal a large amount about the document. The BOI Measure stays at a moderate level throughout, whereas the FOETAC Measure begins at a moderate level before dropping to 0 by the end of the document. The graph showing the strength of indirect references to the selected principles through *MYP: Further Guidance for Developing MYP Written Curriculum* has been constructed and is displayed below. The number of thematic references in this document is more revealing than the BOI and FOETAC Measures. Flexibility with Disciplines is by far the most frequently referenced pedagogic themes (with 63 sentence-level references – a rate of more than 10 per page). Student-Led and Process/Cycle have a moderate number of references by comparison (18 and 36 respectively), but Collaboration is notable for having only seven. In comparison with Flexibility with Disciplines, this highlights that the idea of collaboration is not a key element of this document – making the level of indirect reference to **Focused on Effective Teamwork and Collaboration** relatively low.

Figure 41: MYP: Further Guidance for Developing the MYP Written Curriculum



7. DP

7.1 DP: Theory of Knowledge Guide

DP: Theory of Knowledge Guide is a moderate length document (52 pages) published in 2020. It is intended to guide the planning, teaching, and assessment of the element of the DP core: Theory of Knowledge. The document contains substantive sections on "Theory of Knowledge", "Syllabus", and "Assessment". There is no specific section or subsection describing the relationship between the ATT and TOK.

The first level of mapping (direct references to the ATT and selected principles) shows three references to the phrase "Approaches to Teaching", and one to each of the phrases "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration". The direct references to the selected principles come in an early paragraph which briefly lists the ATT principles and ATL skills.[122]

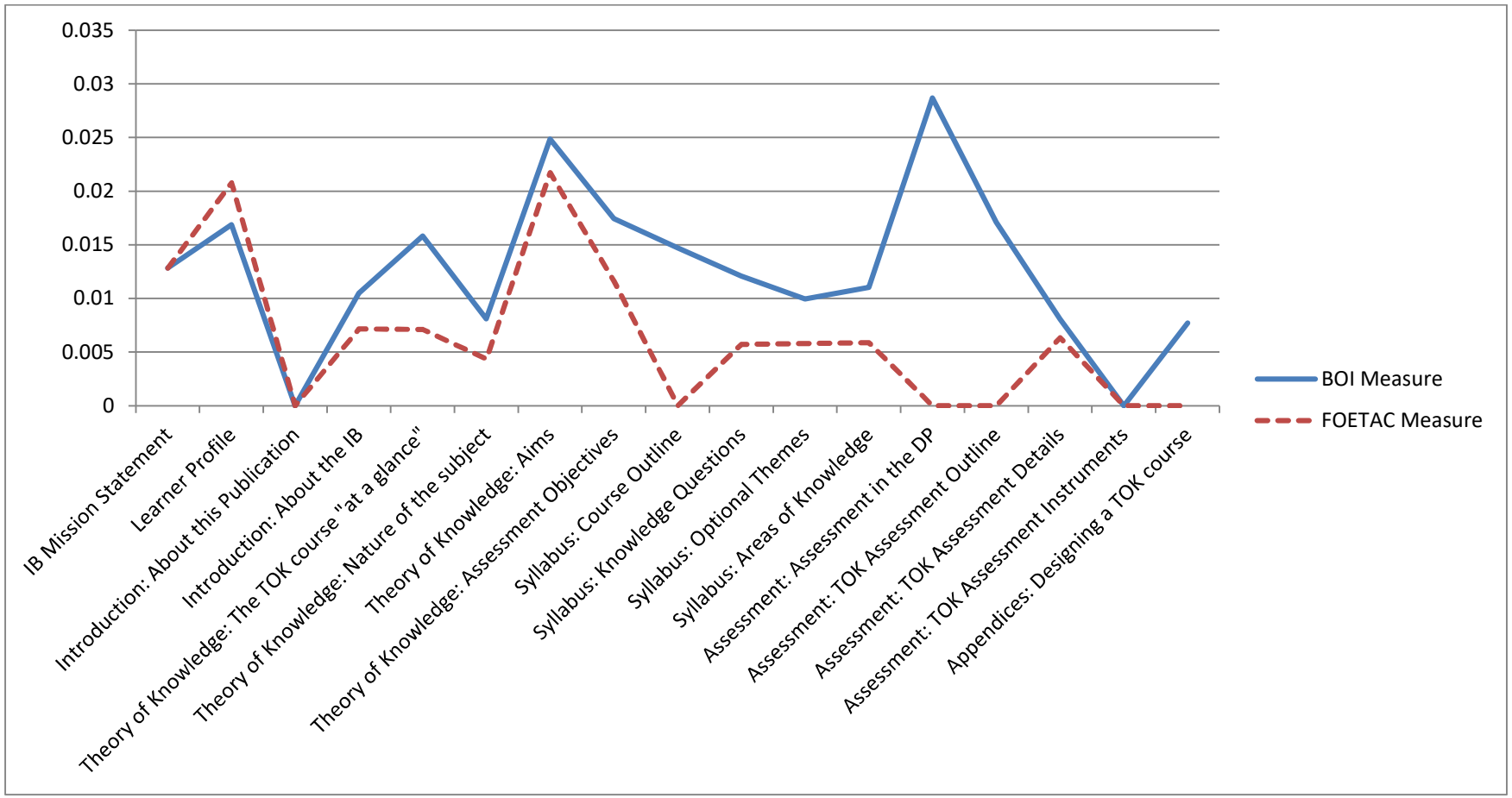
The second level of mapping (use of keywords strongly related to the selected principles) shows us that there are a low number of references to most of the keywords related to the two selected principles; however, the word stem "question" has a considerable 122 uses in the document. This is representative of the fact that TOK is built around "Knowledge Questions". Thus, even though the word "inquiry" is only used 16 times in the document, the idea of inquiry-based teaching and learning is embedded in the concept of the TOK syllabus. This is a strong example of where keywords outside of those used in the specific title of the principle in question (**Based on Inquiry**) can channel the core ideas in that principle.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows that indirect integration of **Based on Inquiry** is indeed more consistently strong than indirect reference to **Focused on Effective Teamwork and Collaboration**. The BOI Measure is relatively high throughout – rising to a peak at 0.029. In the second half of the document, in particular, the BOI Measure is considerably higher than the FOETAC Measure. In the sections of the document addressing the syllabus and assessment the FOETAC Measure is either very low or even 0. The fact that **Based on Inquiry** is more effectively indirectly integrated than **Focused on Effective Teamwork and Collaboration** is substantiated by the total number of sentence-level references to each pedagogic theme. Where Process/Cycle and Student-Led are both high (260 and 194 references respectively), Collaboration only has 68 references. Along with Global/International Citizenship, Collaboration is the least frequently referenced pedagogic theme in this document.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: Theory of Knowledge Guide* has been constructed. This is displayed below.

[122] DP: Theory of Knowledge Guide, p. 2.

Figure 42: DP: Theory of Knowledge Guide



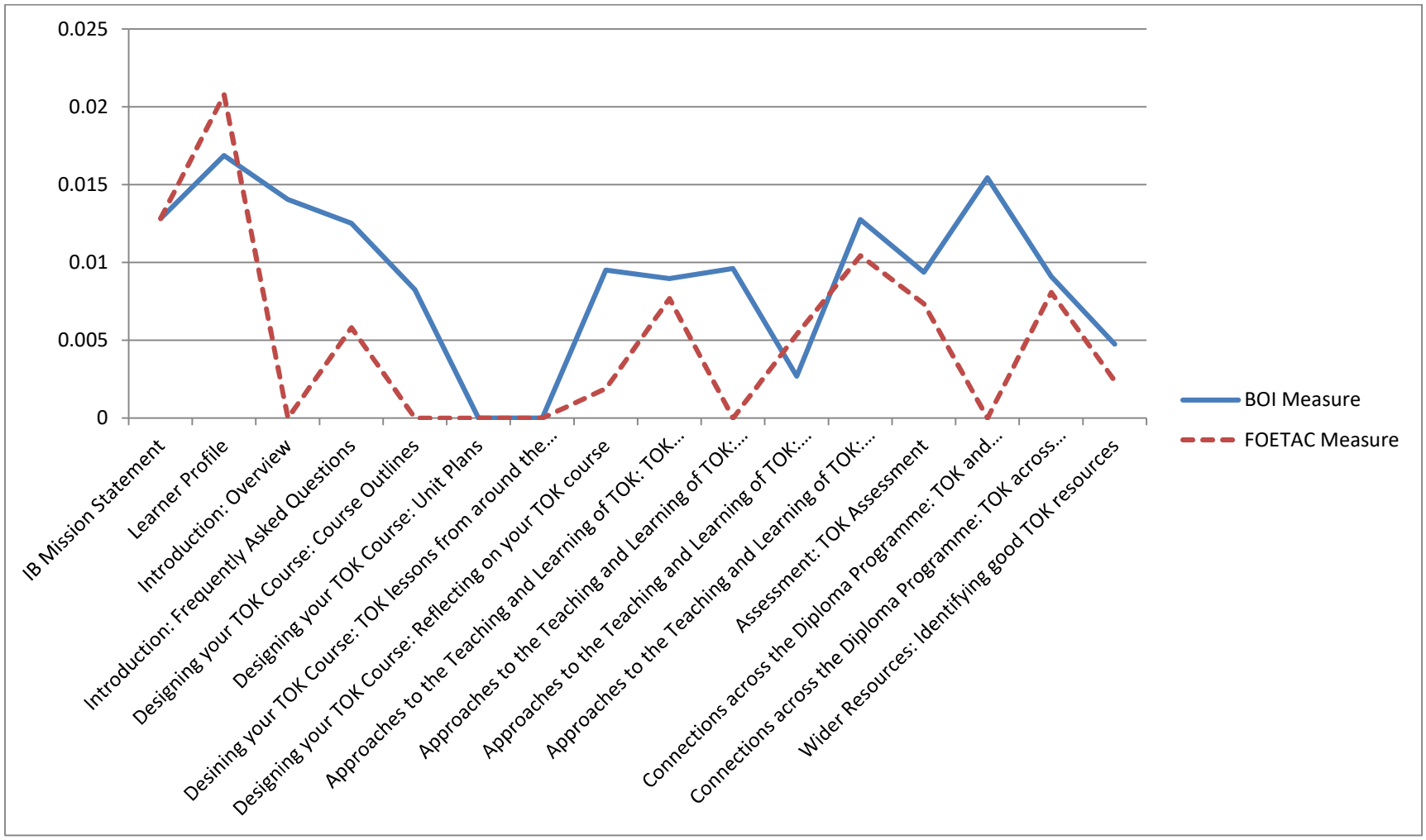
7.2 DP: Theory of Knowledge Teacher Support Material

DP: Theory of Knowledge Teacher Support Material is a short (27 pages) and new document that supports the TOK guide described above. It has substantive sections addressing "Designing your TOK course", "Approaches to the Teaching and Learning of TOK", and "Connections across the Diploma Programme". The teaching and learning section specifically addresses each ATL skill, one at a time, but does not do the same for the ATT principles. However, there are subsections such as "Teamwork and Collaboration" which indirectly address individual ATT principles.

The first level of mapping (direct references to the ATT and selected principles) shows two references to the phrase "Approaches to Teaching", but no direct references to the titles of either selected principle. The most notably findings from the second level of mapping (use of keywords strongly related to the selected principles) are 30 uses of the word stem "question" and 18 uses of the word stem "collaborat". As the document is short, these numbers show a reasonably high level of integration of some of the keywords related to **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration**.
The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) does not show particularly high levels of BOI or FOETAC Measure in this document. Both measures peak in the preface, and then the FOETAC Measure is slightly below the BOI Measure for the majority of subsequent subsections – falling to 0 on six occasions, compared to only twice for the BOI Measure. This indicates that neither of the selected principles has notably strong indirect integration in this document – but TOK"s emphasis on questions does raise the indirect integration of **Based on Inquiry** above **Focused on Effective Teamwork and Collaboration**.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: Theory of Knowledge Teacher Support Material* has been constructed. This is displayed below.

Figure 43: DP: Theory of Knowledge TSM



7.3 DP: Approaches to Teaching and Learning Teacher Support Material

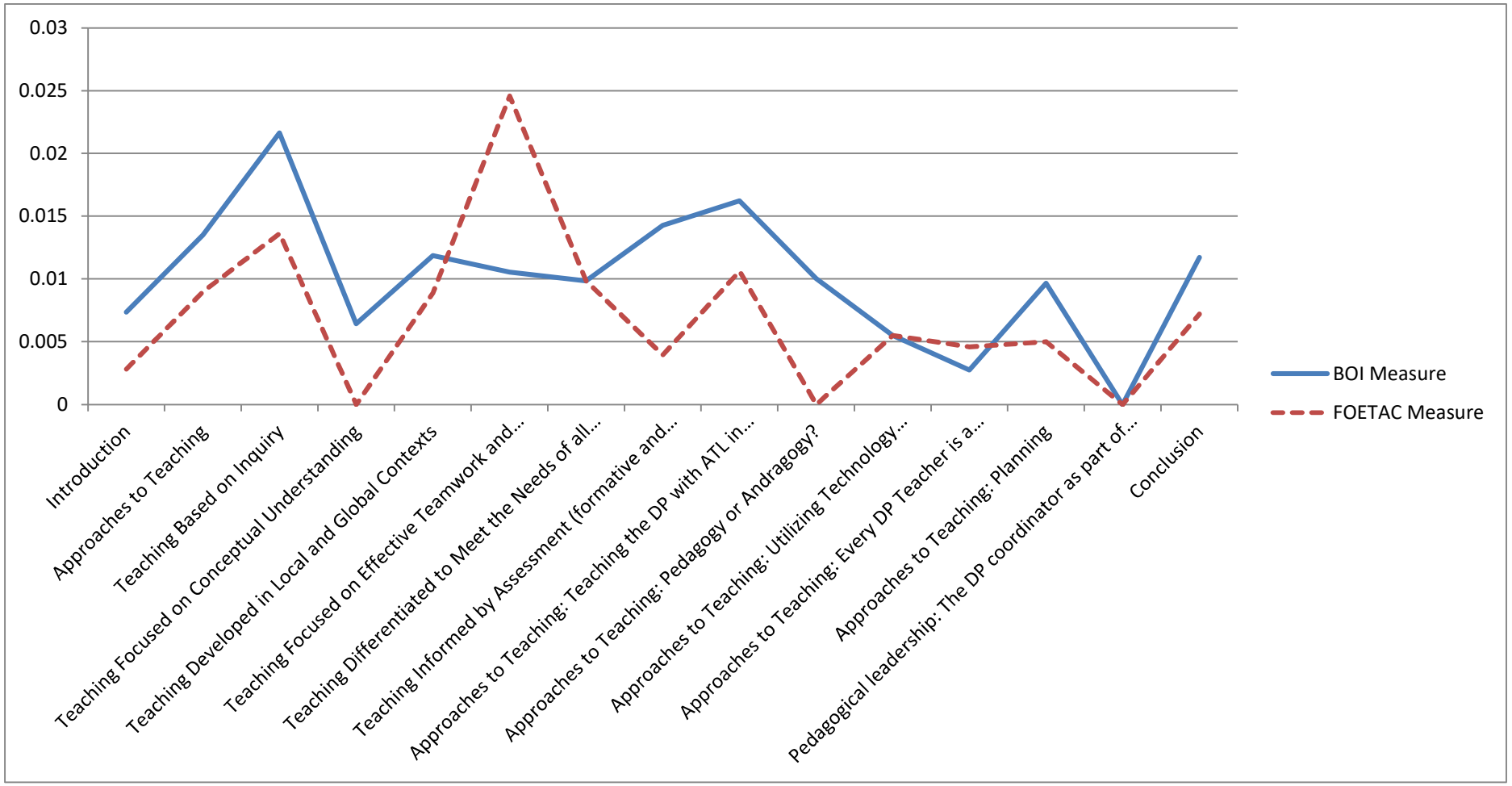
DP: Approaches to Teaching and Learning Teacher Support Material is an html resource including substantive sections addressing each of the ATT principles individually.

The first level of mapping (direct references to the ATT and selected principles) shows 18 uses of the phrase “Approaches to Teaching”, four of “Based on Inquiry”, and two of “Focused on Effective Teamwork and Collaboration”. Of all the audited resources, this has the highest number of direct references to “Based on Inquiry”. This website also demonstrates key references to “inqui”, “question”, “collaborat”, “cooperat” and “team” – with the largest number of hits (49) being for “inqui”. The direct and keyword mapping thus suggests that the principle **Based on Inquiry** may be particularly strongly referenced in this document, and that **Focused on Effective Teamwork and Collaboration** is also substantially present.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows that the BOI measure slightly surpasses the FOETAC measure for the majority of the subsections audited. The main exception to that rule is subsection specifically discussing “Teaching Focused on Effective Teamwork and Collaboration”, which is the highest peak on this chart – reaching a FOETAC measure of nearly 0.025. The peak of the BOI measure is slightly lower than this, in the subsection “Teaching Based on Inquiry”.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *DP: Theory of Knowledge Teacher Support Material* has been constructed. This is displayed below.

Figure 44: DP Approaches to Teaching and Learning TSM



8. CP

8.1 CP: Personal and Professional Skills Guide

CP: Personal and Professional Skills Guide is a slightly older document (published 2015) with 62 pages "intended to support the planning and organization of personal and professional skills, one of the core components of the IB Career-related Programme (CP)".[123] The document contains substantive sections discussing "Personal and Professional Skills", "Course Review", "Programme Evaluation", and "Learning Diversity". The introduction contains a one-page subsection discussing "Approaches to Teaching and Approaches to Learning", though the ATT is not described in detail in this section – in fact the focus is more closely on the IB Learner Profile.

The first level of mapping (direct references to the ATT and selected principles) shows 11 references to the phrase "Approaches to Teaching", and one to each of the phrases "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration". The names of each ATT principle are articulated as a bullet point list in a subsection concerning "Personal and Professional Skills Course Design".[124]

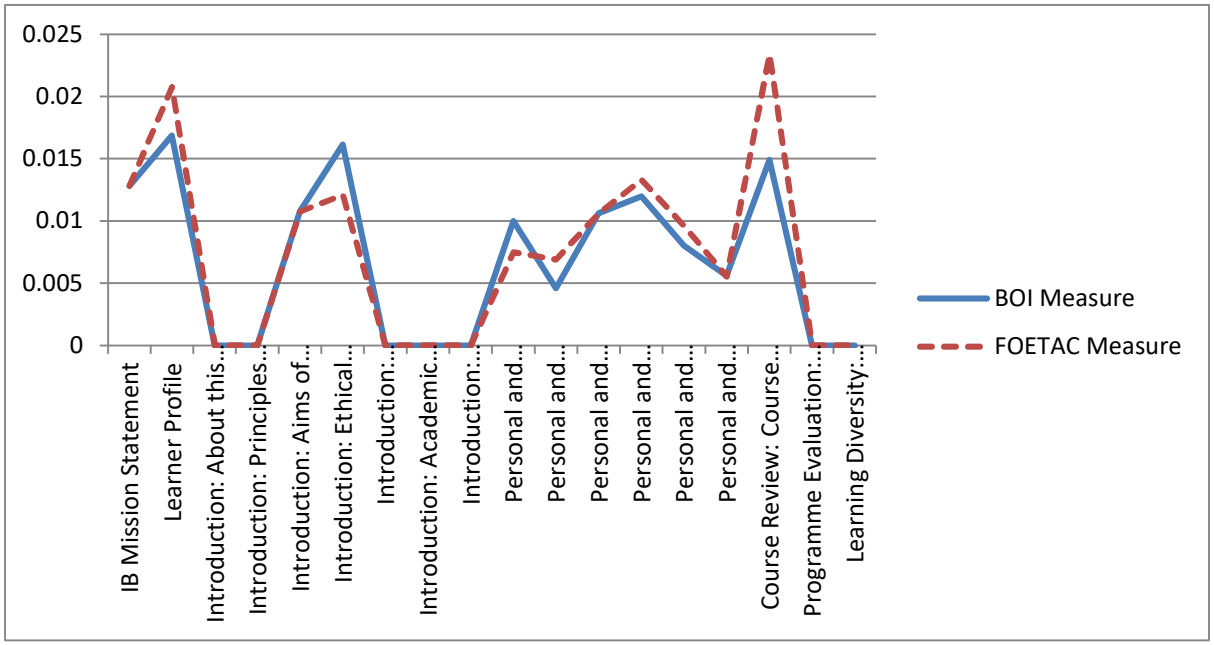
The second level of mapping (use of keywords strongly related to the selected principles) does not show particularly remarkable results, with the two most frequently referenced keywords being 25 uses of the word stem "collaborat" and 19 uses of the word stem "question". Both suggest some integration of keywords related to the selected principles but not a very high degree.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows the BOI and FOETAC Measures following each other fairly closely throughout the document, and demonstrating a number of peaks and troughs. There are seven subsections that feature BOI and FOETAC Measures of 0. The BOI Measure peaks in the preface, but also rises above 0.01 on five occasions. The FOETAC Measure peaks at 0.023 in a subsection addressing "Course Review". The number of sentence-level thematic references shows a nearly equal number of references to all pedagogic themes, with the exception of Flexibility with Disciplines (which appears roughly half as frequently, with 49 references).

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *CP: Personal and Professional Skills Guide* has been constructed. This is displayed below.

[123] CP: Personal and Professional Skills Guide, p. 1.
[124] Ibid., p. 12.

Figure 45: CP: Personal and Professional Skills Guide



8.2 CP: Personal and Professional Skills Teacher Support Material

CP: Personal and Professional Skills Teacher Support Material is unusual for teacher support materials in that it is a longer document (at 117 pages) than the corresponding guide. The document has substantive sections on "Developing the Course", "Approaches to Teaching and Learning in PPS", "Recording and Assessment", and "Assessed Student Work". The Teaching and Learning section does not necessarily use the familiar titles of each of the ATT principles, but does discuss them in different form. For example, an early paragraph states that:

> "The five approaches to learning (thinking skills, social skills, communication skills, self-management skills and research skills) along with the six approaches to teaching (teaching that is inquiry-based, conceptually focused, contextualized, collaborative, differentiated and informed by assessment) encompass the key values and principles that underpin IB pedagogy."

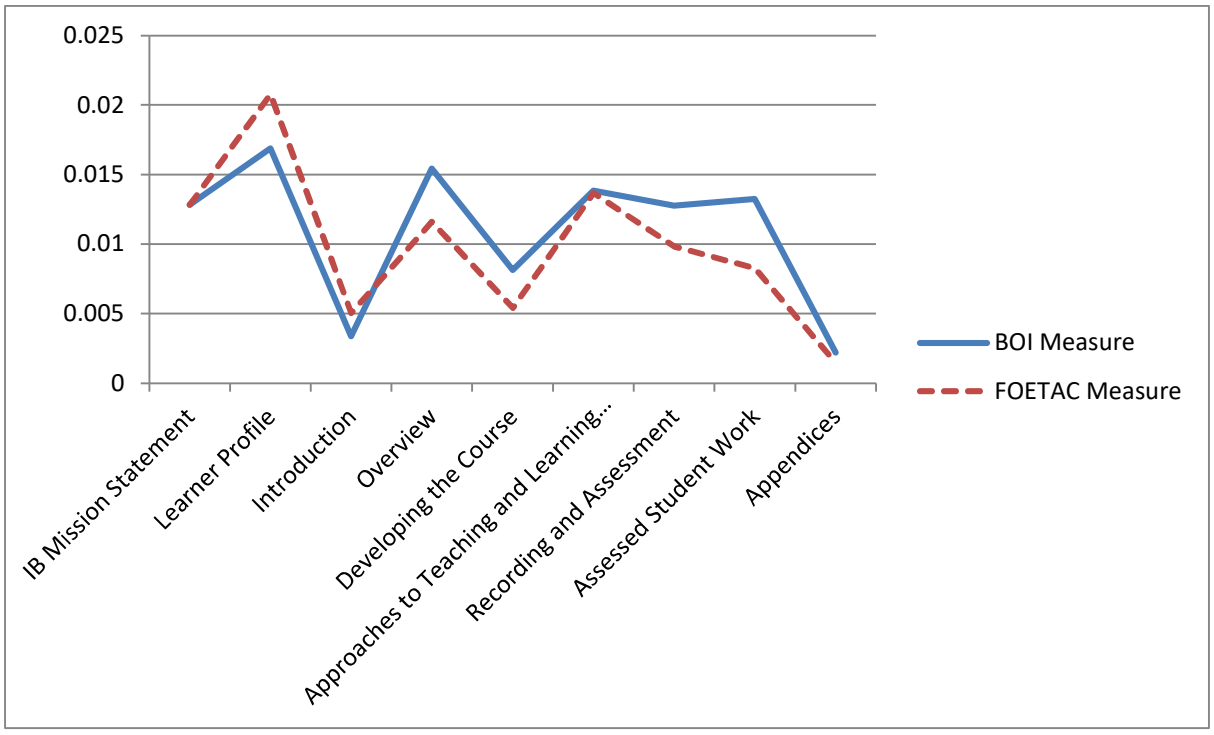
The first level of mapping (direct references to the ATT and selected principles) indeed shows that the titles of each ATT selected principles (i.e. "Based on Inquiry" and "Focused on Effective Teamwork and Collaboration") are not used in this document, but reference is made to "Approaches to Teaching" on seven occasions.

The second level of mapping (use of keywords strongly related to the selected principles) shows 57 uses of the word stem "question", 25 uses of the word stem "collaborat", and a handful of uses of other words related to the selected principles. This is an indication that **Based on Inquiry** may be more effectively indirectly integrated than **Focused on Effective Teamwork and Collaboration** – however, the numbers are not particularly high given the length of the document.

The third level of mapping (indirect references to the selected ATT principles, via the pedagogic themes) shows that the BOI and FOETAC Measures are quite closely linked throughout the document. The FOETAC Measure is higher in the preface but the rest of the document has slightly stronger indirect reference to **Based on Inquiry**. Overall, both measures peak in the preface, and show neither remarkable peaks nor instances of subsections reaching BOI or FOETAC Measures of 0. This is an example of a document in which both **Based on Inquiry** and **Focused on Effective Teamwork and Collaboration** are somewhat indirectly present throughout, but are not integrated to an emphatic degree in any single section. In terms of sentence-level thematic references, Student-Led is the most common, with 393 references, but Process/Cycle (310), and Collaboration (242) are also frequently referenced throughout the document. Overall, the combination of these themes and the BOI and FOETAC Measures illustrate a document that does have a significant number of references to the pedagogic themes in question, but they are relatively evenly distributed, meaning that no individual subsections indirectly reference either selected principle in a particularly emphatic way.

By examining the BOI Measure and FOETAC Measure for each subsection, a graph showing the strength of indirect references to the selected principles through *CP: Personal and Professional Skills Teacher Support Material* has been constructed. This is displayed below.

Figure 46: CP: Personal and Professional Skills TSM

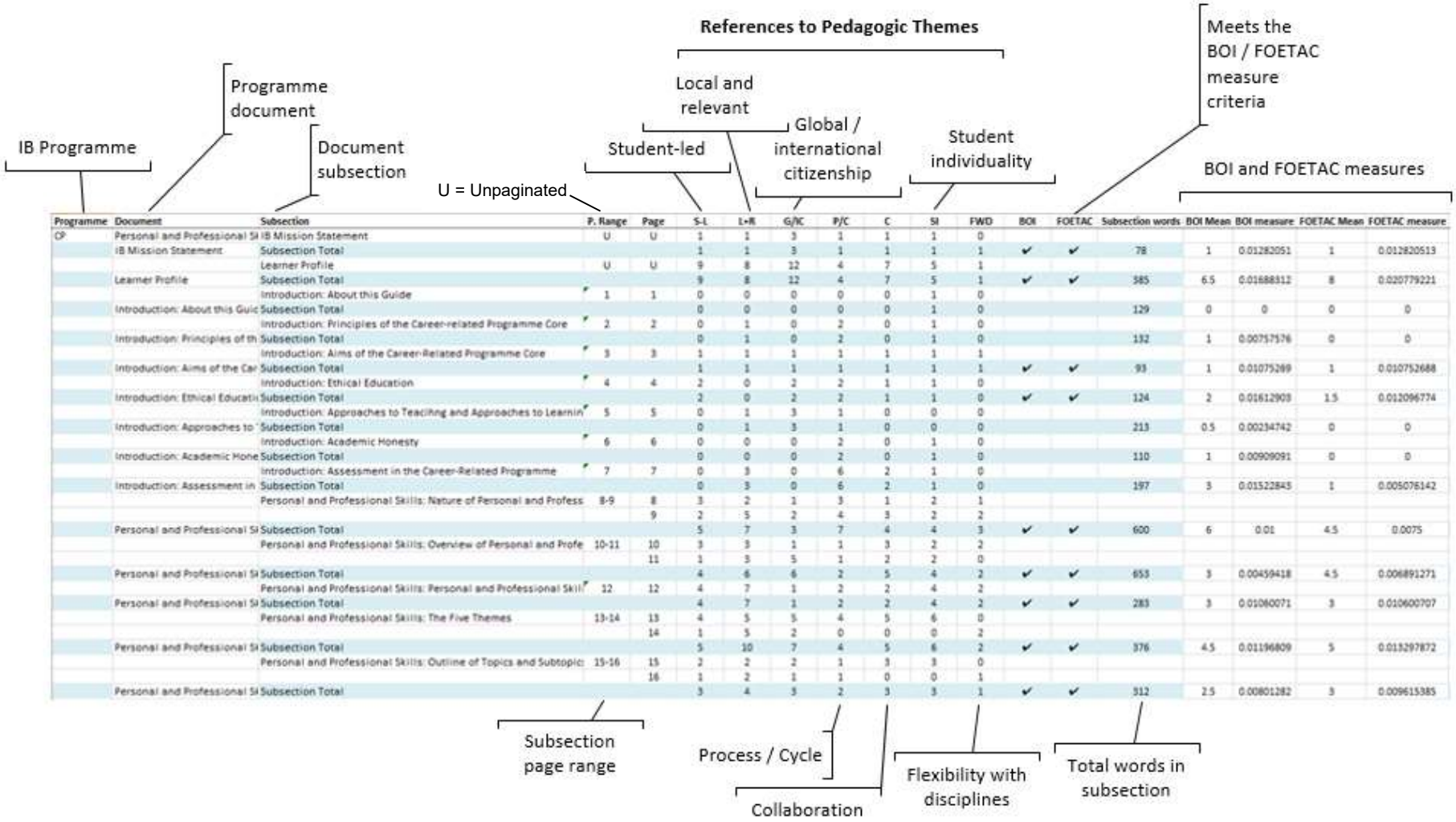


Appendix 8 – Audit Documents Diagram

Cross-programme documents				
What is an IB Education (2019)				
What is an IB Education Teacher Support Material (2019)				
Programme Standards and Practices (2019)				
Programme documents				
	PYP	**MYP**	**DP**	**CP**
	PYP: From Principles into Practice (2018) - PYP: Overview - PYP: Learning and teaching - PYP: The learner - PYP: The learning community	MYP: From Principles into Practice (2017) MYP: Further guidance for developing MYP written curriculum (2014)	DP: From Principles into Practice (2015)	CP: From Principles into Practice (2015)
Core	PYP: Exhibition	MYP: Projects guide (2018) MYP: Projects guide teacher support material (2015)	DP: Theory of knowledge guide (2020) DP: Theory of knowledge teacher support material (2020)	CP: Personal and professional skills guide (2015) CP: Personal and professional skills teacher support material (2017)
Teacher support material	PYP: Developing a programme of inquiry (2018)	MYP: Approaches to learning, inquiry and service teacher support material (2015)	DP: Approaches to teaching and learning (2015)	Refer to DP
Subject area documents				
Mathematics		MYP: Mathematics Guide (2020)	DP: Mathematics: Analysis and Approaches Guide (2019) DP: Mathematics: Analysis and Approaches teacher support material (2020)	Refer to DP
Individuals & Societies		MYP: Individuals and Societies Guide (2019) MYP: Individuals and Societies teacher support material (2015)	DP: History Guide (2019) DP: History teacher Support Material (2019)	

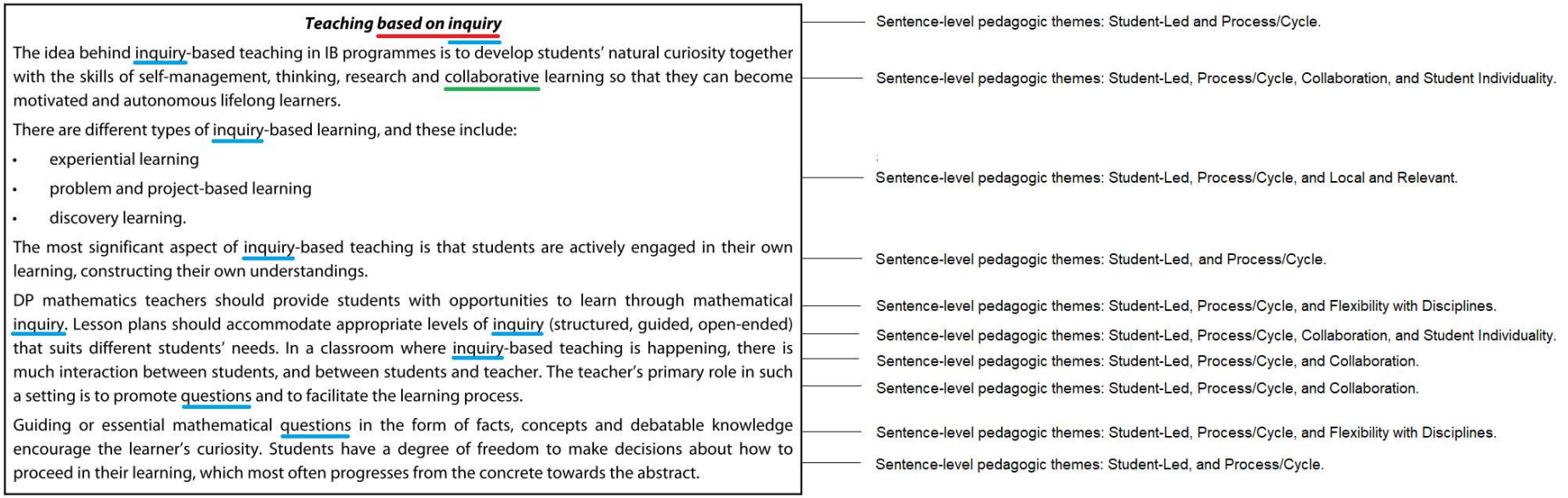
Language B		MYP: Language acquisition guide (2020) MYP: Language acquisition teacher support material (2020)	DP: Language B Guide (2019) DP: Language B teacher support material (2018)	

Appendix 9 – Audit Analysis Sample



Programme	Document	Subsection	P. Range	Page	S-L	L+R	G/IC	P/C	C	SI	FWD	BOI	FOETAC	Subsection words	BOI Mean	BOI measure	FOETAC Mean	FOETAC measure
CP	Personal and Professional Sk	IB Mission Statement	U	U	1	1	3	1	1	1	0							
	IB Mission Statement	Subsection Total			1	1	3	1	1	1	1	✔	✔	78	1	0.01282051	1	0.012820513
		Learner Profile	U	U	9	8	12	4	7	5	1							
	Learner Profile	Subsection Total			9	8	12	4	7	5	1	✔	✔	585	6.5	0.01688312	8	0.020779221
		Introduction: About this Guide	1	1	0	0	0	0	0	1	0							
	Introduction: About this Guic	Subsection Total			0	0	0	0	0	1	0			129	0	0	0	0
		Introduction: Principles of the Career-related Programme Core	2	2	0	1	0	2	0	1	0							
	Introduction: Principles of th	Subsection Total			0	1	0	2	0	1	0			132	1	0.00757576	0	0
		Introduction: Aims of the Career-Related Programme Core	3	3	1	1	1	1	1	1	1							
	Introduction: Aims of the Car	Subsection Total			1	1	1	1	1	1	1	✔	✔	93	1	0.01075269	1	0.010752688
		Introduction: Ethical Education	4	4	2	0	2	2	1	1	0							
	Introduction: Ethical Educati	Subsection Total			2	0	2	2	1	1	0	✔	✔	124	2	0.01612903	1.5	0.012096774
		Introduction: Approaches to Teaching and Approaches to Learnin	5	5	0	1	3	1	0	0	0							
	Introduction: Approaches to	Subsection Total			0	1	3	1	0	0	0			213	0.5	0.00234742	0	0
		Introduction: Academic Honesty	6	6	0	0	0	2	0	1	0							
	Introduction: Academic Hone	Subsection Total			0	0	0	2	0	1	0			110	1	0.00909091	0	0
		Introduction: Assessment in the Career-Related Programme	7	7	0	3	0	6	2	1	0							
	Introduction: Assessment in	Subsection Total			0	3	0	6	2	1	0			197	3	0.01522843	1	0.005076142
		Personal and Professional Skills: Nature of Personal and Profess	8-9	8	3	2	1	3	1	2	1							
				9	2	5	2	4	3	2	2							
	Personal and Professional Sk	Subsection Total			5	7	3	7	4	4	3	✔	✔	600	6	0.01	4.5	0.0075
		Personal and Professional Skills: Overview of Personal and Profe	10-11	10	3	3	1	1	3	2	2							
				11	1	3	5	1	2	2	0							
	Personal and Professional Sk	Subsection Total			4	6	6	2	5	4	2	✔	✔	653	3	0.00459418	4.5	0.006891271
		Personal and Professional Skills: Personal and Professional Skill	12	12	4	7	1	2	2	4	2							
	Personal and Professional Sk	Subsection Total			4	7	1	2	2	4	2	✔	✔	283	3	0.01060071	3	0.010600707
		Personal and Professional Skills: The Five Themes	13-14	13	4	5	5	4	5	6	0							
				14	1	5	2	0	0	0	2							
	Personal and Professional Sk	Subsection Total			5	10	7	4	5	6	2	✔	✔	376	4.5	0.01196809	5	0.013297872
		Personal and Professional Skills: Outline of Topics and Subtopic	15-16	15	2	2	2	1	3	3	0							
				16	1	2	1	1	0	0	1							
	Personal and Professional Sk	Subsection Total			3	4	3	2	3	3	1	✔	✔	312	2.5	0.00801282	3	0.009615385

Appendix 10 – Thematic Referencing Example (pedagogic theme mapping)



Key:

= Direct reference to an ATT principle

= Keyword reference related to Based on Inquiry

= Keyword reference related to Focused on Effective Teamwork and Collaboration

Appendix 11 – Full Breakdown of Direct and Keyword Mapping for all Audited Documents

	"Approaches to Teaching"	*"Based on Inquiry"*	*"Focused on Effective Teamwork and Collaboration"*	*"Inqui"*	*"Question"*	*"Collaborat"*	*"Cooperat"*	*"Team"*
PYP: FPIP	9	0	0	640	109	177	12	60
MYP: FPIP	17	1	1	169	78	72	8	30
DP: FPIP	22	3	3	64	25	79	9	30
CP: FPIP	18	3	3	46	10	59	5	19
MYP: Further guidance for developing MYP written curriculum	0	0	0	7	2	2	0	0
WIAIBE?	6	1	1	10	2	7	2	2
WIAIBE? TSM	11	0	0	12	26	7	2	1
PS&P	25	0	0	17	2	29	1	10
MYP: Projects guide	0	0	0	26	7	13	0	4
MYP: Projects TSM	0	0	0	0	1	0	0	0
DP: Theory of Knowledge Guide	3	1	1	16	122	6	1	1
DP: Theory of Knowledge TSM	2	0	0	2	30	18	1	4
CP: Personal & Professional Skills Guide	11	1	1	2	19	25	1	5
CP: Personal & Professional Skills TSM	7	0	0	8	57	25	1	10
PYP: Developing a programme of inquiry	0	0	0	117	12	12	1	1
MYP: Approaches to learning, inquiry and service	1	0	0	8	1	7	0	0
DP: Approaches to teaching and learning	18	4	2	49	26	31	2	10
MYP: Mathmatics Guide	0	0	0	44	20	5	1	2
DP: Mathematics Analysis & Approaches Guide	10	0	0	22	139	16	1	4
DP: Mathematics Analysis & Approaches TSM	21	2	2	30	47	16	1	7
MYP: Individuals & Societies guide	0	0	0	44	80	6	11	1
MYP: Individuals & Societies TSM	0	0	0	12	5	0	0	0
DP: History Guide	14	0	0	13	95	11	1	2
DP: History TSM	7	2	2	4	15	7	0	2
MYP: Language Aquisition Guide	1	0	0	46	29	6	1	1
MYP: Language Aquisition TSM	0	0	0	39	25	2	1	0
DP: Langage B Guide	14	3	2	18	57	14	0	6
DP: Language B TSM	4	0	0	4	8	5	0	0

Key: Numbers are placed on a heatmap scale