Tampere University of Applied Sciences

Inclusive Playful Learning

A realistic means of adapting the role of the teacher and framework to improve playful learning for students with Executive Dysfunction

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ABSTRACT

Playful Learning is widely and uncritically used as a panacea to current issues in education such as student disengagement, disenchantment, stress, and anxiety. It is also being used as a pedagogy, to encourage creativity and experimentation, to contribute to what may be considered a 21st century education.

Playful Learning has numerous definitions ranging from “meaningful, joyful, engaging, iterative and socially interactive” through to the succinct “Choice, Wonder and Delight”. Regardless of definition, playful learning appears to assume that all students have the necessary executive functioning skills to access the learning opportunities and that playful learning is thus inherently inclusive.

It is widely accepted that some learners, such as those who have ADHD or Dyslexia, need regularity and consistency. This comes with structured learning experiences that give academic scaffolds to provide a firm footing, where students’ own executive functioning abilities are lacking.

The objective of this study was to explore the commonalities between Learning Through Play, student inclusion needs and IB ATL skills to identify elements of Learning Through Play that work for students with different needs.

Outcomes of conventional playful learning for middle school students are essentially thinking, communication and social skills. The study therefore explored how the IB Approaches To Learning (ATL) skills for Middle Years Programme (MYP) framework could be used to provide a more structured approach to Playful Learning and still achieve the same outcomes.

The study briefly reviewed the IB MYP ATL skills framework (including teaching activities) for thinking, communication and social skills and compared these with Playful Learning principles. The aim of this was to identify commonalities. The study then reviewed these identified commonalities in the light of established needs to be inclusive of all students.

The key findings are that the IB MYP ATL skills framework combined with playful learning opportunities allow for vertical and horizontal articulation that supports students with executive function issues. The outcomes of this study, termed Inclusive Playful Learning (IPL), are recommendations that may be used by teachers and curriculum designers. This is done in terms of reuse of existing systems and does not impose unrealistic financial constraints on mainstream education.

Key words: inclusive playful learning, learning through play, executive function, inclusion

CONTENTS

ABBREVIATIONS

SpLD	Specific Learning Differences
DD	Developmental Dyslexia
ADHD	Attention Deficit Hyperactivity Disorder
LTP	Learning Through Play
EF	Executive Function
ED	Executive Dysfunction
ATL	Approaches To Learning
IB	International Baccalaureate
TAMK	Tampere University of Applied Sciences
LF	Lego Foundation
IPL	Inclusive Playful Learning

1 INTRODUCTION

1.1 Background

Since the Salamanca Declaration of 1992, it has been the stated intent of 94 governments to reform ordinary schools such that education was accessible to all children. It could now be argued that inclusion has become a political football. Alan Hodkinson (Hodkinson, 2011) describes how in the United Kingdom, the inclusion agenda was hijacked by the government to subjugate population minorities. In Denmark, inclusion in schools has been declared a failed experiment. Weirsøe (Weirsøe, 2021) argued this to be due to the lack of resources, knowledge and know-how combined with competing economic and educational priorities.
Because of the inclusion agenda, children with Specific Learning Differences (SpLD) or neurodevelopmental disorders joined the mainstream - perhaps without basis in educational theory. Their presence has challenged teachers to develop new pedagogies to meet their specific needs.

Research into neurobiology has expanded significantly in the last decade and so has our understanding of learning conditions such as Developmental Dyslexia (DD) and neurodevelopmental disorders such as Attention Deficit Hyperactivity Disorder (ADHD). As a result of the advances, we now have a better understanding of what works in the learning environment for students with ADHD and DD. This work groups the two conditions together for their commonality in terms of Executive Dysfunction (ED).
Learning Through Play (LTP) has been propounded as one way to promote Inclusion (Felekidou et al., 2018) (Parker et al., 2022).

1.2 Defining Play

Over a century ago, John Dewey (Beatty, 2017) identified play as central to a child's development. Later, Vygotsky (Vygotsky et al., 1978) noted that play is influential on child development in growing speech, language, cognition, self-awareness, and self-regulation.

Despite many attempts to define what play is, its definition remains subjective and diffuse.

Although researchers generally agree that play is a natural process observed not just in humans but also in the animal world (Zosh et al., 2017) (Passion Jun, 2019), even the eminent, Jaak Panksepp (Panksepp, 2012, p. 352 in Stephens, 2020, p. 162), neuroscientist, psychologist, and psychobiologist, struggled to define what play is, ‘It is hard to define play, but you know it when you see it’.

This work does not seek to define play and uses the terms learning through play and playful learning interchangeably. The author notes the limitation of language and cultural dimensions in any definition. In English we may play a game, play with another or, even, play truant. In contrast, these words follow a different structure in Danish, the author’s native language. We “spiller” a game, or “leger” with another child or “pjekker” to play truant. In Danish, the word ‘leg’ is typically reserved for child-like free play. As play becomes rules based (such as a board game), the term ‘spil’ is used.

This work simply defines play as an approach, not a curriculum. It uses the term Inclusive Playful Learning (IPL) to define playful learning that has been adapted by utilising the recommendations this work proposes.

1.3 Objective

The objective of this research is to evaluate if a playful pedagogy can become more inclusive towards students with ED and so improve inclusion of neurodivergent students. This work has been defined to allow practical implementation and thus use and improve existing systems and methodologies, not to create financially unrealistic new ethos.

This includes suggesting that curriculum aims, such as those found in the International Baccalaureate (IB) Middle Years Programme (MYP) Approaches To Learning (ATL) framework may be articulated horizontally and vertically by adopting a LTP pedagogy. This work aims to demonstrate that desired outcomes of LTP are compatible with learning objectives in the ATL skills framework.

The author suggests the four most important stakeholders for this work to be:

Those affected by Executive Dysfunction. Students and parents of students with DD or ADHD might consider a play-based classroom a more accommodating environment towards students who struggle in traditional classrooms. It is important, however, that they really consider whether the specific play-based classroom can meet the needs of students with ED.

Educational stakeholders. Schools' and educators' interest in LTP as a pedagogy is growing. Project Zero (Harvard Graduate School of Education) has been researching the Pedagogy of Play since 2015 and offers online courses and teacher resources in the subject. Likewise, University of Cambridge focuses on LTP through its research group, Play in Education, Development and Learning. Similarly, there are now several academic journals devoted to the study of play. This includes Play and American Journal of Play. Schools and educators are increasingly looking to LTP to engage students in the classroom.

The organisations, foundations and companies that promote LTP. There are several organisations, foundations and companies that have play at their core and promote play in a learning context. This includes organisations such as Lego Foundation (LF) and Lego Education.

LF funds LTP research projects at Cambridge University and Harvard Graduate School of Education. Through its research, LF has propounded five key characteristics of play: Meaningful, joyful, engaging, iterative and socially interactive. In April 2022, LF launched Play For All which is a 20 million US Dollar fund to foster innovation in supporting neurodivergence in children (Lego Foundation, 2022). In collaboration with LF, UNICEF also promotes LTP in its educational resources for schools in developing economies and in conflict zones.

International Baccalaureate (IB). There are several reasons why the IB holds a considerable stake in this research.

Firstly, IB developed the ATL skills in the beginning of the 2000s.

Secondly, the IB promotes LTP in its PYP curriculum and refers to international studies to demonstrate the efficacy of play in achieving PYP learning objectives (Morrissey et al., 2014).

Thirdly, despite John Dewey's commitment to having play in the curriculum, stating that play is the work of children, play has historically had a bad reputation as being unserious, informal and the antithesis of learning. To resolve this, scholars have suggested that the word 'play' is interchanged with the word 'inquiry' (Parker et al., 2022). Youngquist (Youngquist & Pataray-Ching, 2004) suggested making play more compatible with formal school settings by calling it inquiry and reserving the word 'play' for activities outside of school. The IB aims to implement inquiry-based teaching and learning into all four programmes and all subjects.

Finally, IB considers mental well-being of its students a primary concern of the IB (Heinonen, 2022).

LTP can be considered an important tool in creating an environment with focus on well-being and thrivingness.

In Primary school contexts, LTP has been demonstrated to support the development of social and emotional skills (Welding, 2022) (Parker et al., 2022). Play-based learning is also considered useful in developing resilience in students because it teaches uncertainty (Zosh et al., 2017) (IB Community Blog, 2016).

In older students, play-based learning with its focus on fun, has been shown to contribute to a less stressful environment (Johnston et al., 2023).

1.4 Research questions

The research question of this work is defined as

How can the methodology of LTP be integrated with the MYP IB ATL skills to make learning more inclusive for students with ED?

This leads to four sub questions which are:

A. What is considered good teaching practice for students with Dyslexia and ADHD?
B. Is Learning Through Play inherently inclusive?
C. What parts of the IB MYP ATL skills are considered LTP?
D. What parts of the IB MYP ATL skills are LTP and good teaching practice for students with Executive Dysfunction?

1.5 Context

One backdrop for this work is the growing body of research on neurodiversity. Studies are increasingly questioning assumptions about neuro-normativity, intending to demonstrate that neurodevelopmental disorders are merely non-pathological neuro differences (Rosqvist et al., 2020). Increased recognition that people with variations in behaviours due to neurodivergence have much to offer organisations and society contributes to a growing willingness by teachers and employers to question their own long-held assumptions about inclusion.

At the same time, approximately 12 to 15% of the population are thought to have DD and 35 to 40 % of those also have ADHD (Bikic et al., 2018).

Lego and LF are both committed to creating a diverse and inclusive workplace. Despite this, neither one mentions neurodiversity in their inclusion policies.

Play-based pedagogies have gained more credibility in the slipstream of Covid-19. LTP is increasingly viewed as a way for children and families to reconnect and recover after stresses brought on by Covid-19 (Nieto et al., 2021).

1.6 Scope of research

The scope of this research is limited to students in middle years with DD or ADHD leading to Executive Dysfunction (ED) issues. It is considered that the recommendations of scaffolding play to support specific student need, will not change significantly with student age.

This research is limited to the IB ATL skills framework for Middle Years Programme (MYP). It was found to be a comprehensive framework and is prolific with nearly two million students enrolled in one of the four IB programmes worldwide.

The limited nature of this work has not allowed other frameworks to be exemplified, although there appear no inherent obstacles to incorporation into a range of frameworks.

Much of this research will focus on the work of the LF. In 2022, LF donated 3181 million Danish Kroner to 97 partners to further Learning Through Play (Lego Foundation, 2022). Partners include esteemed organisations such as UNICEF, Cambridge University and Harvard Graduate School of Education, and this makes its work both prolific and leading.

2 LEARNING THEORIES

In this chapter, the theoretical framework behind the concepts that are being brought together for comparative analysis, are outlined.

2.1 Inclusion theories

The idea of education for all was first formalised on the world stage when in Salamanca in 1994, 92 governments and 25 agencies agreed to a statement calling for inclusive education to be the norm and adopted a new framework for action (*The UNESCO Salamanca Statement,* 2020).
Building further on this foundation, the UN's 4th sustainable development goal is to ensure inclusive and equitable quality education for all.
For the purposes of this work, inclusion in education is defined as school demographics that reflect the diversity in the wider community that school serves (Crossley & Hewitt, 2021).

2.2 Dyslexia theories

There is general agreement that DD is a genetic, brain-based condition (Attention-Deficit/Hyperactivity Disorder (AD/HD) and Dyslexia 2020) (Berninger & Wolf, 2016). Gone are the days, when it was thought to be an eye-condition and subsequently fixed using a special pair of glasses.
There is, however, still much debate on how to accurately define DD. Elliott (Elliott, 2020) argues that the term Dyslexia has been misused because of a lack of clarity around the condition, resulting in a situation of poor and disparate provision for dyslexics. It is still not known where the centre of Dyslexia is located in the brain and recent findings have suggested that it is more prolific than only one place (Attention-Deficit/Hyperactivity Disorder (AD/HD) and Dyslexia 2020).
For the purposes of this work, DD is defined as a neurological condition affecting 12 to 15% of the population to varying extent and in a range of ways. It is hereditary and is predominantly an auditory condition with some visual elements and often presents in combination with working memory issues.

These issues can make it difficult for dyslexics to recall word sounds and meanings while the auditory elements make it difficult to hear the phonemes and blended sounds (Lonergan et al., 2019). There is high comorbidity with other neurological conditions such as ADHD, Dyscalculia and Dyspraxia. In short, dyslexics are just wired differently.

In addition, dyslexics often present with difficulty switching attention, working memory and goal-directed behaviour, making ED a shared deficit with ADHD (Moura et al., 2014) (Lonergan et al., 2019) (*Attention-Deficit/Hyperactivity Disorder (AD/HD) and Dyslexia* 2020).

Figure 1 (p.13) below shows a summary of possible DD symptoms.

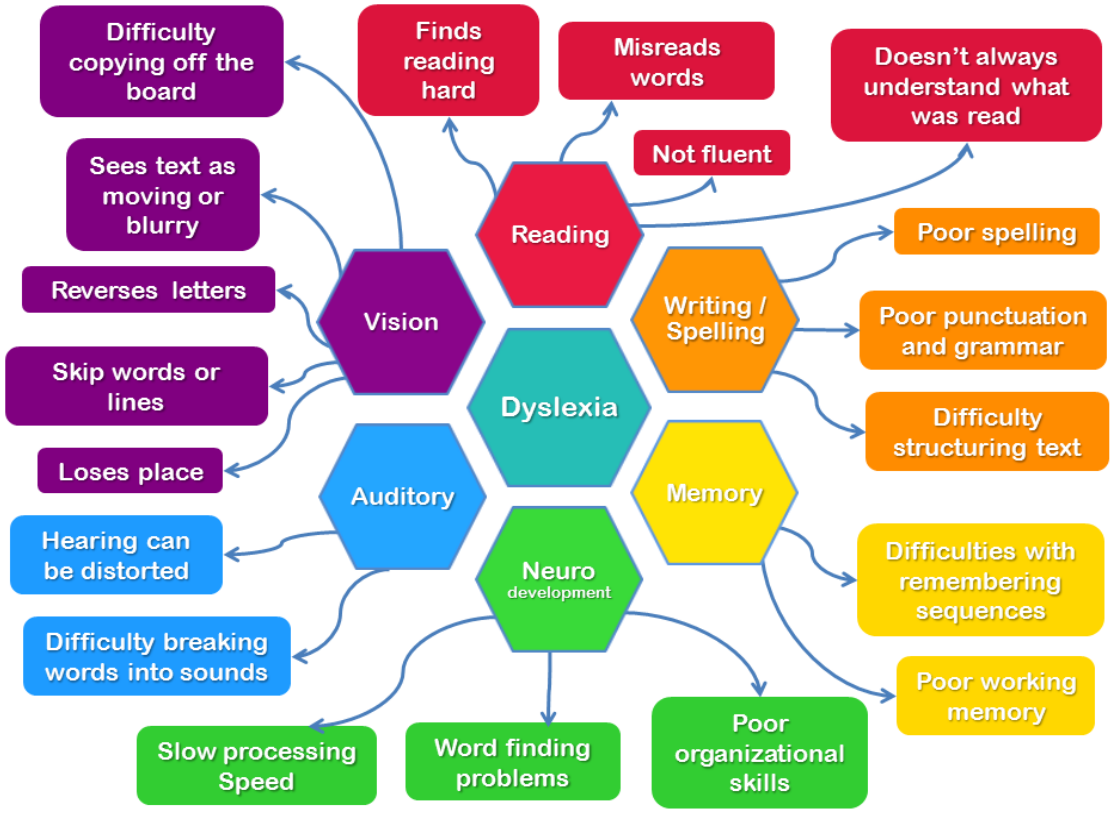

FIGURE 1. Possible symptoms of Developmental Dyslexia (Dyslexia Gold, 2023).

2.3 Attention Deficit Hyperactivity Disorder Theories

James McGough (McGough, 2014) asserts that ADHD is a hereditary neurodevelopmental disorder which, in the past, was thought to only affect children but we now see an increasing number of adults also fitting the criteria. Possible symptoms include inattention, hyper-activity and impulsivity and a higher risk of mental disorders such as depression and anxiety.

ADHD impacts a range of domains in life such as academic success, social skills, career success, personal relationships, parenting, safety and general health. ADHD is one of the most scientifically validated psychiatric disorders (McGough, 2014). ADHD students are more likely to experience academic challenges and generally achieve lower grades than that of peers (Gibbs, 2023). It affects 2-5% of the population and the core symptoms, usually present before the age of 12, often persist throughout adult life (Shire, 2018).

Related conditions include Oppositional Defiant Disorder, Conduct Disorder, learning disorders, Autism, anxiety, depression, Tourette's and sleep problems (Shire, 2018).

Attention and Executive Function (EF) are the areas mostly affected by ADHD although only half of the students present with ED (Bikic et al., 2018). While studies tentatively show that cognitive training can help ADHD students improve Working Memory and EF, many ADHD sufferers still opt for pharmacological solutions (Bikic et al., 2018).

2.4. Executive Function theories

Despite a lack of consensus on the term, EF is generally used for referring to a set of higher order cognitive processes (Suchy, 2009). The three main areas of EF are Working Memory, Cognitive Flexibility, and Inhibitory Control. EF subskills are used for higher-order thinking tasks such as planning, organising, goal setting (choose goals, avoid non-goal directed behaviour, engage in goal-consistent behaviour), problem-solving and self-evaluation (Gist, 2019). Much research shows that improving EF in ADHD students also improves academic performance (Gist, 2019). EF processes are widely considered to take place in the prefrontal cortex (Takeuchi et al., 2013).

2.5 Learning Through Play theories

Theories about LTP are, roughly, divided into three domains; human development, neurodevelopment and pedagogy. The Play Continuum is one pedagogical theory of the levels of play that we may engage in.

2.5.1 Learning Through Play as a function of human development

The first domain is the philosophical approach to LTP and its function in human development. Proponents of constructivist learning theories such as Dewey, Piaget, Vygotsky and Mead highlight the developmental importance of play in the cognitive, emotional and motor development of children (Hoorn, 2015).

2.5.2 Learning Through Play as a neuro-developmental catalyst

Vandervert (Vandervert, 2017) asserts that play strengthens cerebellum responses and trains humans in cognitive, affective and motor responses.
According to Stephens (Stephens, 2020) Johan Huizinga coined the phrase *Homo Ludens* in 1938 and highlighted links between play and culture, which, in turn, was considered a neurobiological phenomenon. Liu (Liu et al., 2017) states that neurological development, as a result of engaging in LTP, does not only strengthen individual regions in the brain, but is a holistic workout for the brain and strengthens the interconnectedness between the different regions. It has, however, been asserted that our current understanding of play and neurodevelopment is a result of research in animals and adults but not children (Liu et al., 2017).

2.5.3 Learning Through Play as a pedagogical approach

The final domain is that of LTP as a pedagogical approach.
Scholars have proposed that LTP can be used as a pedagogical tool that helps teenagers stay motivated for learning (Staempfli, 2007). Another study suggests that playful teens are better equipped to handle some types of stress (Staempfli, 2007).

LF have defined LTP to be experiences which for the students are 1. Actively engaging 2. Joyful 3. Iterative 4. Meaningful 5. Socially interactive (Parker et al., 2022).

Project Zero concurs in this definition and further defines the pedagogical approach in various school contexts as below. The flowers in Figure 2 (below) are indicators that are used as planning tools for teachers.

FIGURE 2. Indicators of Playful Learning from schools in Denmark (top left), South Africa (top right), The United States (bottom left), Columbia (bottom right) (Mardell et al. 2023, p. 51).

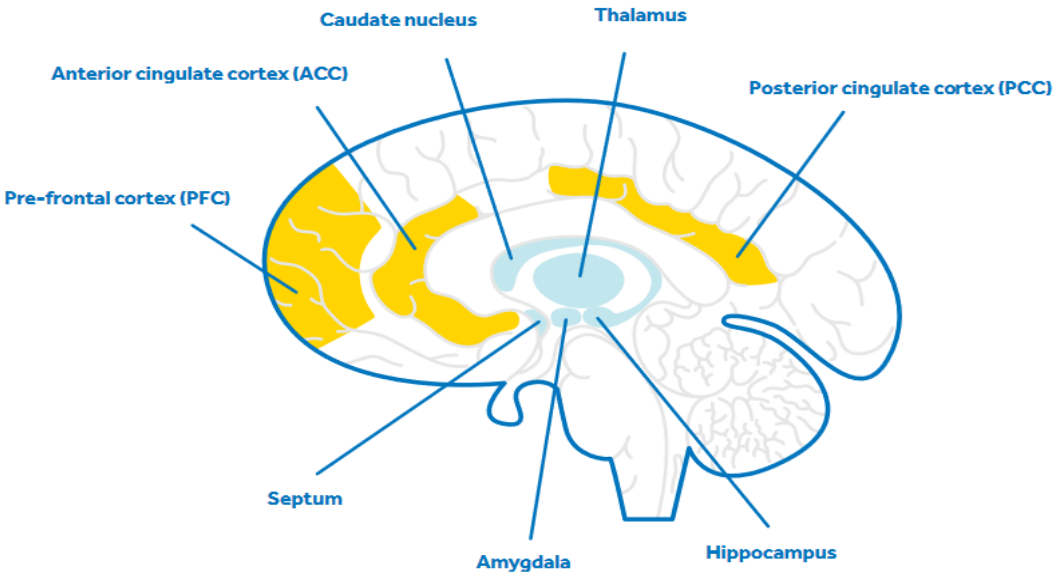

FIGURE 3. Medical view of the brain and areas related to the five characteristics of LTP (Liu et al. 2017, p.5).

Liu (Liu et al., 2017) states that the five characteristics of LTP impact the brain in the following areas with the prefrontal cortex being the largest, single area affected.

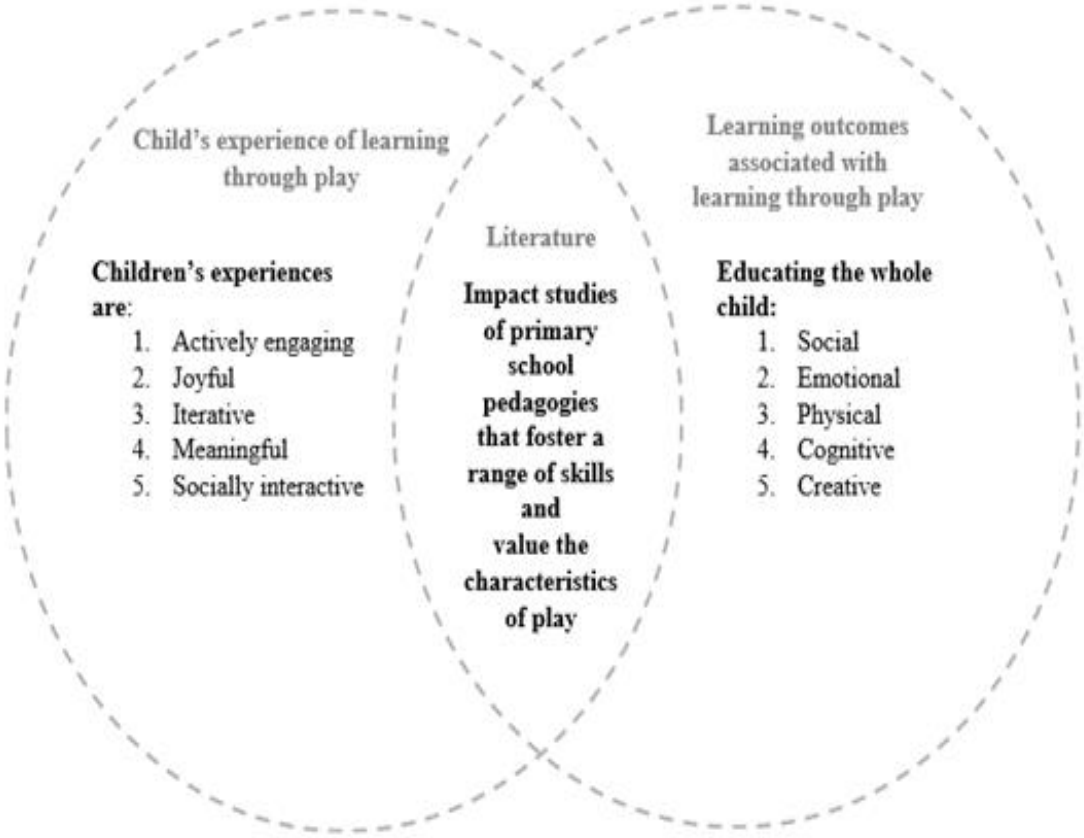

FIGURE 4. Conceptualization of learning through play for literature analysis (Parker et al., 2022, p. 4).

Parker (Parker et al., 2022) proposes that LTP is not just one pedagogy but an amalgamation of many, leading to holistic learning outcomes such as those in the righthand circle that do not intersect the left; social, emotional, physical, cognitive and creative learning outcomes in Figure 4 (above).

2.5.4 The Play Continuum

Play is not just play - there are grades of play and a range of approaches to facilitating play. Some argue for a very limited role for adults in children's play experiences whereas others argue for a supportive role for adults (Zosh et al., 2017). By way of example, Pyle (Pyle and Danniels, 2017) specify a continuum of: Free play, Inquiry Play, Collaborative Play, Playful Learning and Learning Through Games as can be seen in Figure 5 (p. 19).

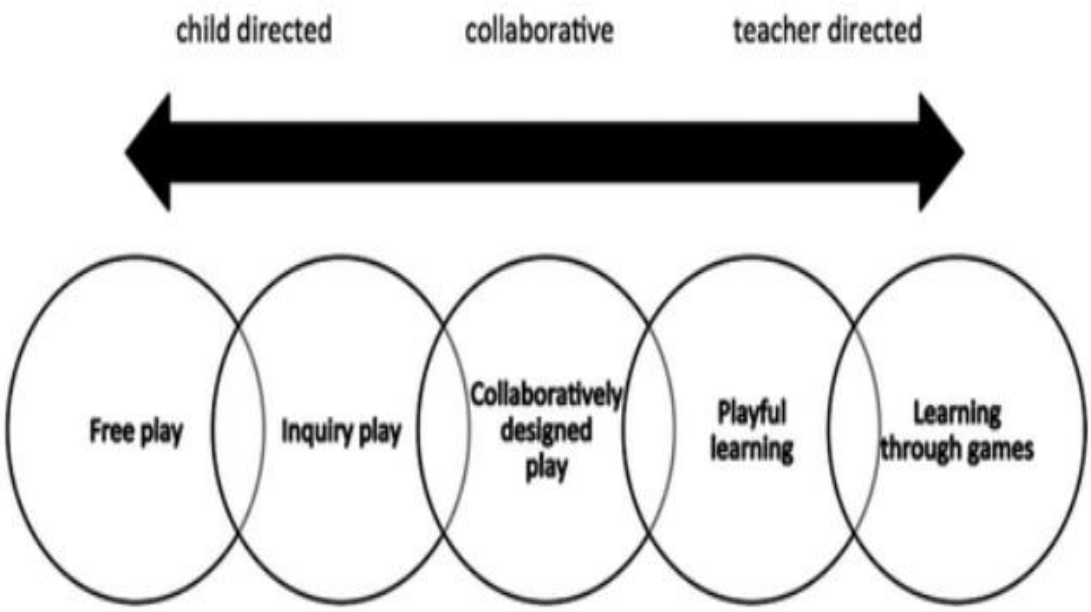

FIGURE 5. A continuum of Play-Based Learning (Pyle and Danniels, 2017, p.282).

Further to this, Nesbitt (Nesbitt et al., 2023) concluded that Guided Play is superior to Free Play if there is a curricular goal in mind. While there is a plethora of offerings as to what the characteristics of play are, it is in this work assumed that the most thoroughly researched theory of characteristics of play is that offered by LF. They specify that Playful Learning sits along a continuum in which play changes depending on the level of adult intervention and adult imposed structure as can be seen in Figure 6 (p.20). They insist, however, that ‘learning through play can happen through Free Play and when adults or aspects of the environment structure the play situation towards a particular learning goal’ (Zosh et al., 2017).

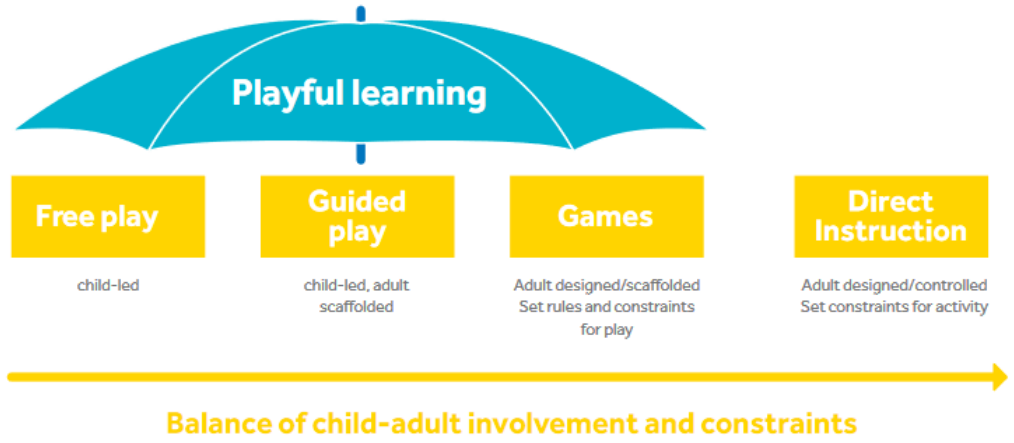

FIGURE 6. Continuum of play (Zosh et al., 2017, p.13)

Parker (Parker et al., 2022), also of Lego Foundation, suggested that teachers adjust their approach to meet the needs of their learners. Finally, Johnstone (Johnstone, 2022) propounded that the role of the teacher shifts along a continuum of power to play.

2.6 IB Approaches to Learning theories.

ATL skills are skills that are deliberately and systematically taught in the IB curriculum. They are not formally assessed although many schools do give feedback on student progress.

The ATL skills fall into five common skill categories and ten skill clusters:

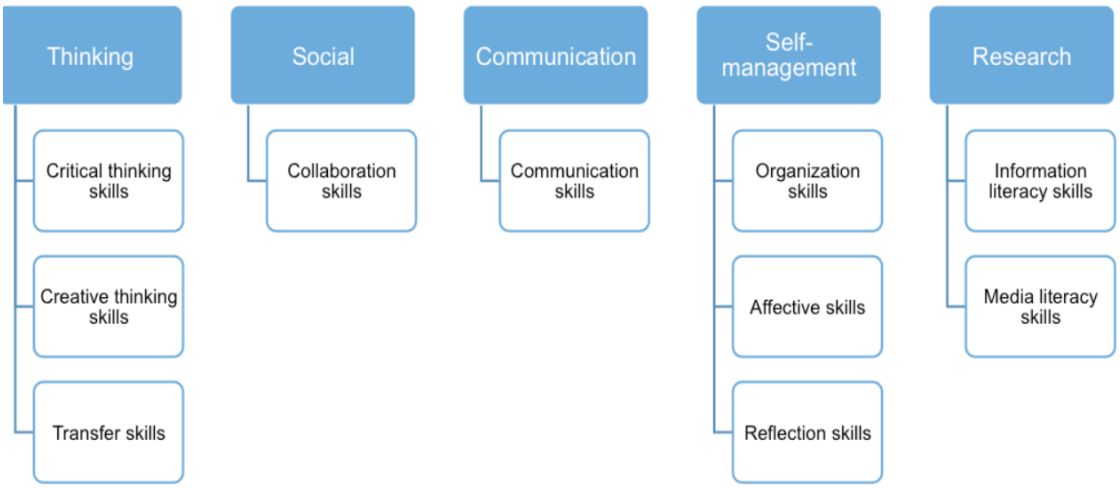

FIGURE 7. IB ATL skills (International Baccalaureate Organisation, n.d.)

The ATLs were conceived for Ways of Knowing in Diploma Programme's Theory of Knowledge as part of a drive to streamline the approaches of the initial three different IB programmes despite them being developed for different purposes and by different people (Nicholson, 2018). Taking inspiration from the Primary Years Programme transdisciplinary skills, the ATL skills were later rolled out across all programmes.

Today, ATL sits at the core of each of the programmes and in this way reaches across the IB continuum. This reinforces the concept of 'learning to learn' which was initially promulgated by the IB in the 1980s. As evident from Figure 8 (below), the ATL skills programme sits as the first of the four concentric circles indicating its importance in the IB programme.

FIGURE 8. The IB curriculum models across all four programmes (International Baccalaureate Organisation, n.d.).

The IB encourages schools and teachers to ensure that ATL skills are planned for and embedded into the curriculum both vertically and horizontally (International Baccalaureate Organization, 2023).

To the IB, ATL skills are central because they help students become resilient, self-regulated learners who can set learning goals, ask good questions, reflect on their own learning and adapt their own learning process (International Baccalaureate Organization, n.d.) (Zimmerman and Schunk, 2011).

3 METHODOLOGY

The following chapter describes the choice of methodology and philosophy for this research.

The methodology is used to answer the main research question: How can the methodology of LTP be integrated with the MYP IB ATL skills to make learning more inclusive for students with ED?

Following Saunders' Research Onion allows for a structured methodology and guides the decisions to be made in the process (Jansen, 2023).

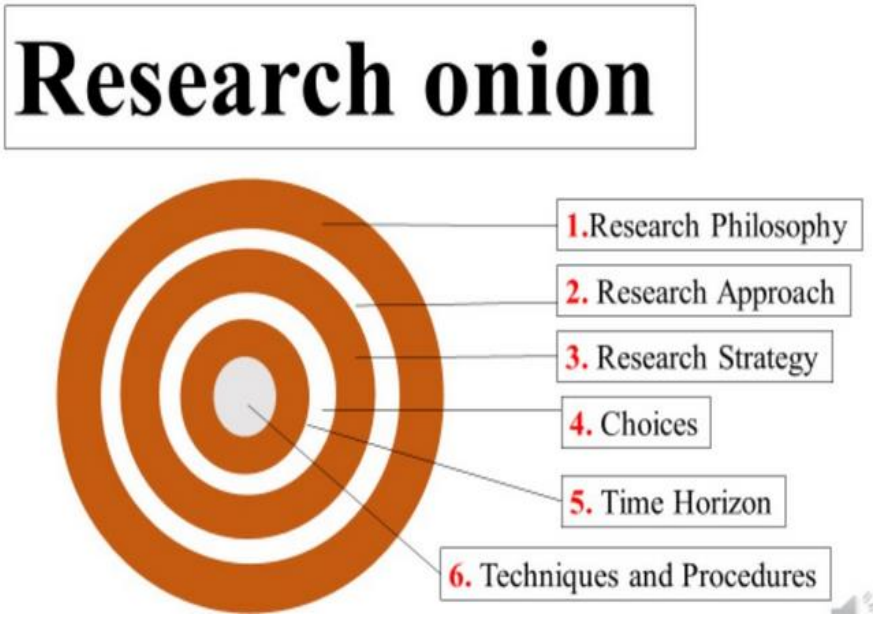

FIGURE 9. Saunders' Research Onion (Research World, 2022).

3.1 Research philosophy

Of the four worldviews (Positivist, Pragmatist, Interpretivist and Critical theory) the research philosophy in this work is interpretivist as defined by Jansen (Jansen, 2023). The first literature review uses data that is predominantly medical (and scientifically derived). However, the majority of information used in the second review is essentially subjective and so must be interpreted to facilitate comparison. Because of this combination of information, it may also be argued that the research philosophy is pragmatic. As outlined in 1.2 Defining Play (p. 7), the nature of play is, however, a supremely subjective experience and without clear-cut definition and so it is reasonable to claim that the research philosophy underpinning and informing this work is interpretivist. A possible further development of this project i.e., establishing a LTP pedagogy for inclusive needs may be well suited for a pragmatist approach.

3.2 Research Approach

There are two classic ways of arriving at a conclusion: deductive and inductive. In the inductive approach, the researchers start from conclusions that are specific and narrow and work towards a general conclusion. In deductive reasoning, the knowledge develops from a general rule to a specific conclusion (Butte College, 2019). The author believed a better approach for this work was the abductive form of reasoning in which knowledge is incomplete at the outset and moves to the likeliest explanation (Butte College, 2019). This seems a suitable approach because this research is not intended to produce a new theory but merely recommendations. While the literature reviews are extensive, the sources are varied in purpose and diffuse in their content.

3.3 Research strategy

This development project will lead to identifying commonalities between, what in broad terms can be considered, two different pedagogies and suggest ways that these commonalities can be expanded upon. This requires a strategy of innovation such as outlined by Moilanen (Moilanen et al., 2022), in Figure 10 (below).

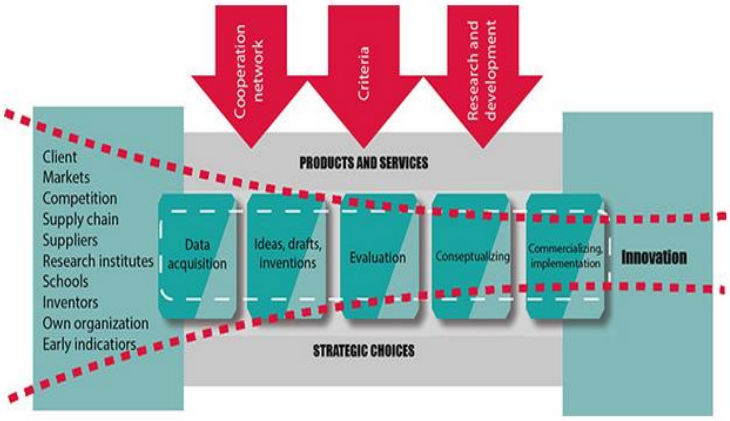

FIGURE 10. Innovation Research model (Moilanen et al., 2022).

While innovation research is often thought of as belonging to the world of business and product development, it also facilitates the development of ideas for furthering general practice such as is relevant for this project. The Stages of Innovation Research gives structure to the project by supporting the research process and development of design.

There are five stages to innovation research according to Moilanen (Moilanen et al., 2022).

- Data acquisition and analysis
- Generating and searching for ideas (initiatives and inventions)
- Evaluating ideas and selecting ideas for further processing
- Conceptualising and deciding on the preliminary solution and further development.
- Commercialising or implementation

3.3.1 Data acquisition and analysis

This stage is by far the largest and most time-consuming part of this project.

There are two main research approaches; qualitative and quantitative.

The latter is used for investigating relationships between defined variables. By contrast, qualitative research approaches afford the researcher a lens to undertake a closer look at the complexities of the human experience (Creswell & Creswell, 2017).

This methodology will make use of qualitative research by way of a document analysis. Moilanen (Moilanen et al., 2022) describe document analysis as a way to draw inferences from sources. A document analysis would therefore ascertain the best practice in teaching learners with ED as stipulated by professionals and researchers and reviewed by peers. It would also establish a general understanding of the characteristics of a LTP pedagogy.

According to Moilanen (Moilanen et al., 2022), the stages in document analysis are:

- Data collection and preparation
- Reducing
- Identifying recurring structures
- Interpretation and critical examination.

The research was conducted in two systematic literature reviews. The first was to establish best practice in teaching ED learners and was conducted in the following order as shown in Figure 11 (p.26).

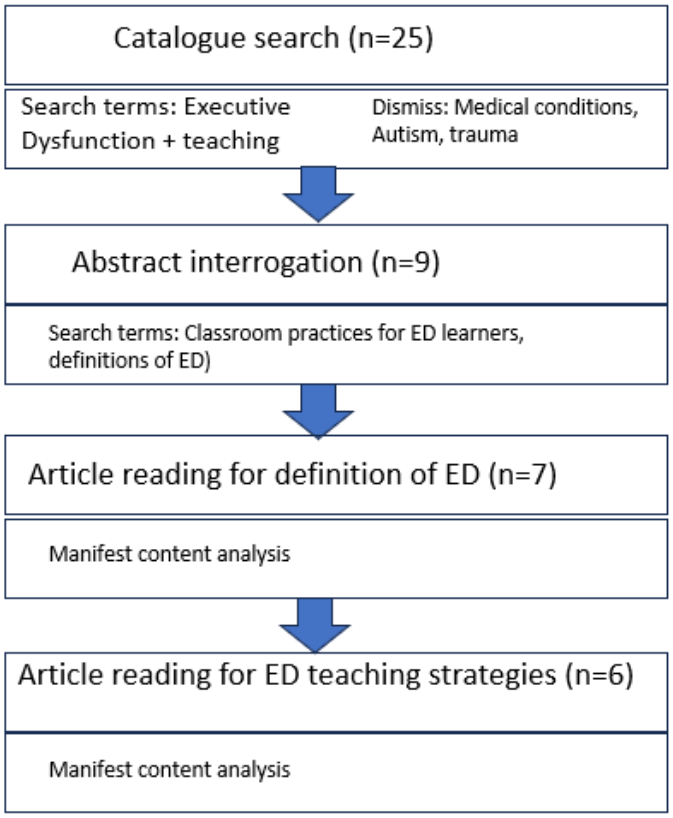

FIGURE 11. Process of first systematic literature review.

Recurring structures were eliminated during the catalogue search.

For the second literature review, to determine characteristics of a Learning Through Play classroom, the following process was used as document analysis.

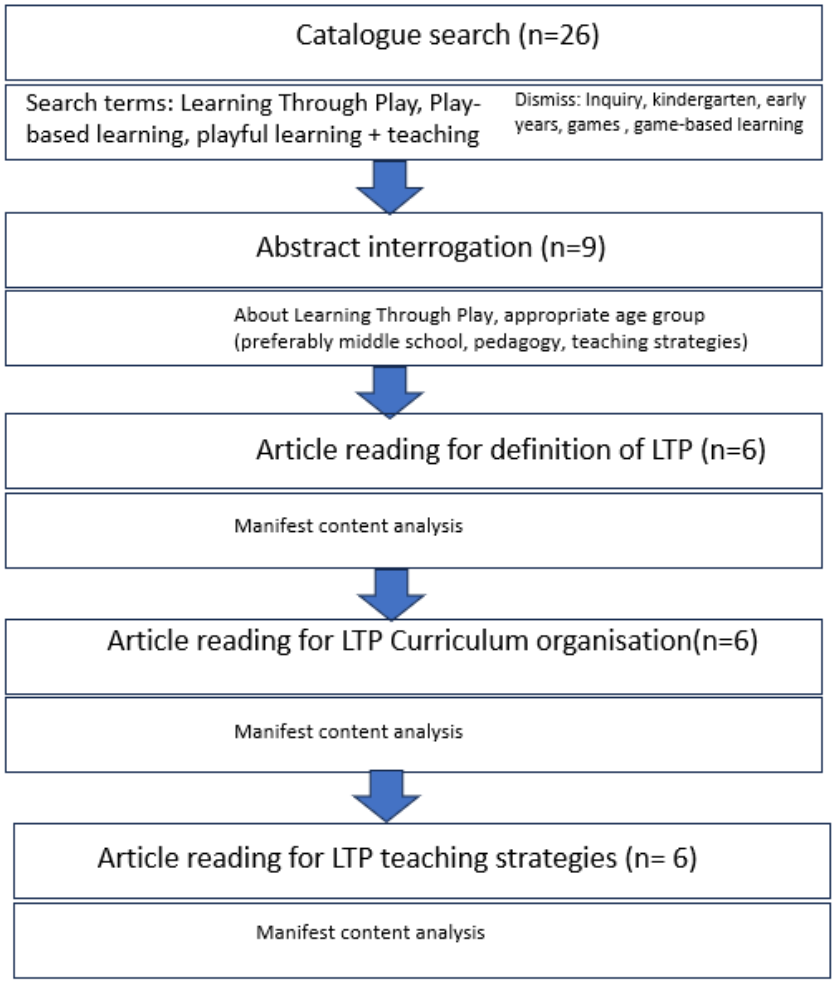

FIGURE 12. Process of second systematic literature review. Recurring structures were eliminated during the catalogue search.

3.3.2 Generating and searching for ideas (initiatives and inventions)

As a piece of innovative research, the process of searching and generating ideas is essential. In the case of this work, this process has taken place through extensive professional experience and from working with ED learners in LTP classrooms. The IB skills framework is a natural choice on account of its developed profile.

3.3.3 Evaluating ideas and selecting ideas for further processing.

It is important to evaluate the efficacy of ideas against the criteria of the desired end result which, in this case, are teaching activities that are accessible to ED learners.

3.3.4 Conceptualising and deciding on the preliminary solution and further development.

Experience in teaching, especially of ED students via IB MYP curriculum had defined a clear problem to the author. This work's literature searches looked at comparison of characteristics focusing solely on commonalities and not differences between pedagogies. Subsequent research looked for teaching activities that could allow a playful yet structured skills curriculum framework.

3.3.5 Commercialising or implementation

As suggested in 6.3 Suggestions for further research (p.42) the findings in this paper may be further developed into a practical study of developing the recommendations into a framework, after the necessary research to validate that the IB is the most suitable option. Whilst it has been noted the neurological effects of play have not been studied on children, this would not limit further practical work that merely makes LTP more accessible.

3.4 Methodological choices

Proceeding to the next section of the onion in Figure 9 (p.22), the author makes decisions about the types of data that are required for the completion of the study. There are three different options for data types: Mono, mixed and multi-method. As the terms suggest, both mixed and multi-method use

a range of approaches (Jansen, 2023). For the purpose of this research however, only one type of data is used (peer reviewed articles). While still a document analysis (qualitative approach), the research will also include a smaller search through IB documentation on ATL skills and it may therefore be argued that this is a mixed method.

3.5 Time horizon

The fifth layer in the onion is about time. According to Saunders' Onion there are two different time approaches for sampling: Longitudinal and cross sectional (Jansen, 2023). Knowledge of Executive Function and Dysfunction is a result of a surge in psychiatric research in the past decade. Saunders' Onion Theory suggests that either a snapshot of the most recent work should be used or the entire continuum is analysed. It is noted that the data is temporally bunched in this case, so our analysis is weighted to more recent times. Understanding of LTP and IB ATL skills have accumulated over time and often in response to proposed ideas by other researchers and practitioners. This makes this study require a longitudinal horizon.

3.6 Techniques and procedures.

The inner layer of Saunders' Onion is both practical and specific. Highly specific decisions are made about data collection methods, data analysis techniques and sampling strategies, unlike other layers that are more philosophical and diffuse (Jansen, 2023).

3.6.1 Data and collection

For answering the first two research sub questions:
A. Is Learning Through Play inherently inclusive?
B. What is considered good teaching practice for students with Dyslexia and ADHD?
it is necessary to consult both academic work and practitioners' experience and understanding of working with ED learners. There are two main data sources

available for this which are peer-reviewed articles and online materials available through interest organisations such as British Dyslexia Association. In the interest of rigour, only peer-reviewed journals supplied through Andor (Tampere University of Applied Sciences library collection and catalogues) would be the used.

3.6.2 Data analysis

A systematic review of the available articles was considered optimal. The diffuse nature of the topic of LTP and teaching strategies meant that an interpretation and categorization of findings would be necessary. Thus, bias required to be considered and analysed.

4 RESULTS AND ANALYSIS

This chapter presents the findings from two systematic literature reviews and a further analysis via Set Theory of the review outcomes.
The aim of the first literature review is to establish what is considered appropriate pedagogy for teaching students with ED. The aim of the second literature review is to establish general principles of LTP. The aim of the Set Theory is used to determine commonalities and dissimilarities between teaching for ED learners and LTP.

4.1 Analysis of ED teaching strategies.

Of the six relevant articles found during the first literature review, five of the articles concurred that EF is a set of higher cognitive skills practised through the prefrontal cortex, thus agreeing with the definition given in 2.4 Executive Functioning theories (Page 14) (Appendix 2 for full results).

TABLE 1. Outcome of systematic literature review to identify teaching strategies for ED learners. The most frequently occurring recommendations are highlighted in bold.

	INDIVIDUAL ORGANISATION				TEACHING													
Teaching Strategies for ED	**Student planners**	**Planned goals - regularly reviewed**	Managed time frames	Strategy training	Repetition of taught material	**Skills practice**	**Established classroom and instructional routines**	**Carefully managed and chunked lesson materials**	Reading tasks broken down	Reading organisers	Thinking organisers	Writing organisers	Warm-ups	Carefully managed classroom with seating plan	Concrete learning experiences	Frequent and positive teacher feedback	Acadmic priming
Cooper-Kahn, J., Foster, M., & Cooper-Kahn, J. (2013)	X	X			X	X	X	X	X	X	X		X	X		X	
Willis, J. (2007)	X	X			X	X	X							X	X	X	X
Childers, A. S. (2020)	X	X	X	X		X											
El-Sheikh, S. (2010)							X	X	X	X	X	X	X				
Daley, D., Birchwood, J.	X	X	X	X	X	X	X	X									
Hodgkinson, T., & Parks, S. (2016)	X	X			X	X		X	X	X	X	X	X			X	X
	5	**5**	2	2	4	**5**	4	4	3	3	3	2	3	2	1	3	2

The review of the six relevant articles, show that authors recommend the following teaching strategies for students with ED.

- Lesson content is to be chunked into **smaller tasks** and **explicitly** and concisely communicated.
- ED students' **time is to be managed by the teacher** and chunked into segments.
- **Learning-to-learn skills** and strategies are to be explicitly taught and often practised.
- Students use planners to keep track of the **given goals and tasks** which are regularly reviewed with an adult.
- Students are to be given **thinking, reading and writing frameworks** to help them get started and stay on task.
- Classroom interactions are carefully managed by the teacher through **established routines, seating plans and explicit task instructions.**
- Learners are given **frequent positive feedback**.

In summary, authors on ED concur with Gist (2019) and Takeuchi et al. (2013) that learners with compromised ED need a highly structured and managed approach to lessons with a strong focus on goal setting and skills development.

4.2 Analysis of Learning Through Play characteristics.

This was a more substantial review and the results have therefore been separated into two sets of results: Curriculum characteristics and teaching characteristics (the lessons, the teacher, the student).

4.2.1 Results analysis, second literature review (Curriculum characteristics).

TABLE 2. First outcome of second systematic literature review to show authors' perspectives on LTP curriculum. The most frequently mentioned recommendations are highlighted in bold (Appendix 3 for full results).

Curriulum characteristics	Experimental curriculum	Teachers as inquirers	**Whole-school approach**	Holistic	**Focus on skills development**	Evidence-based	Culture-based	Future-oriented	Teacher-led	Both teacher and student-led	Open-ended	Individualised curriculum	Curriculum is fun	Curriculum encourages imagination	Games	**Joyful**	Meaningful	Socially interactive	Iterative	Actively engaging	**Independence**
Mardell, B., Lynneth Solis, S., & Bray, O. (2019).	X	X					X				X					X					X
Nesbitt, K. T., Blinkoff, E., Golinkoff, R. M., & Hirsh-Pasek, K. (2023).					X	X	X			X						X	X	X	X	X	
Paterson, A. (2020).			X						X												
Johnstone, A. (2022).			X	X	X						X	X				X					
Boehm, S., & Franklin, L. (2023).													X	X	X						X
Parker, R., Thomsen, B. S., & Berry, A. (2022).			X	X	X			X		X		X				X	X	X	X	X	X
	1	1	**3**	2	**3**	1	1	1	1	2	2	2	1	1	1	**4**	2	2	2	2	**3**

A systematic literature review to determine the general characteristics of LTP produced six relevant articles. Authors suggest the following general principles of a LTP curriculum:

- The curriculum must be a part of a **whole-school approach**.
- The most significant curriculum aims are **skills development.**
- The curriculum should give rise to **joy.**
- The curriculum should provide opportunities for students to d**evelop independence.**
- The curriculum should be **open-ended and flexible.**
- The curriculum should be both **teacher- and student-led.**
- The curriculum should be **meaningful and engaging.**

In summary, a LTP curriculum focuses on skills more than knowledge. It promotes students to become independent and be active in making decisions about the curriculum and their own learning. Learners are encouraged to feel joy, meaning and engagement through the curriculum.

4.2.2 Results analysis, second literature review (Teaching characteristics).

TABLE 3. Second outcome of systematic literature review to determine characteristics of LTP.

	Lessons							Teacher									Students	
Lessons, the teacher and the student in LTP curriculum	Lessons are fun	Lessons are active	Lessons are reflective	Lessons are collaborative	Lessons are open-ended and flexible	Lessons are inquiry-led	Non-distractive environments	Teachers model learning	Teachers give positive feedback	Teachers scaffold learning	Role of teacher shifts	Teachers individually challenge each student	Teachers promote student agency	Teachers use a range of pedagogies	Teachers plan and structure lessons	Teachers coach	Students share and connect knowledge	Students identify their own learning goals
Nesbitt, K. T., Blinkoff,	X		X	X		X	X	X	X			X				X	X	X
Paterson, A. (2020).													X		X			
Johnstone, A. (2022).											X	X	X					
Boehm, S., & Franklin,	X				X												X	
Parker, R., Thomsen, B. S., & Berry, A. (2022).		X		X	X	X		X		X	X	X	X	X	X		X	X
	3	1	1	2	**3**	**3**	1	2	1	2	2	**3**	**4**	1	2	2	**3**	**3**

A systematic literature review to determine the general characteristics of LTP produced six relevant articles. Authors suggest the following general characteristics of LTP lessons, teachers, and learners:

- Lessons are **fun.**
- Lessons are **inquiry-led.**
- Lessons are **open-ended and flexible.**
- Teachers **challenge each student** individually.
- Lessons promote **student agency.**
- Students **transfer knowledge.**
- Students identify their **own learning goals.**
- **Teacher's role changes** according to need.
- Lessons are **planned and structured.**
- Teacher gives **frequent positive feedback.**

In summary, according to LTP authors, lessons are structured but open to change, as considered appropriate by the teacher.
Similarly, the role of teacher changes with the demands of the lesson and the nature of the play and learning.
Lessons are inquiry-led, and students identify their own learning goals, with the aid of the teacher as a coach.
Lessons are fun and active and encourage knowledge transfer.

4.3 Analysis of Executive Dysfunction teaching characteristics with Learning Through Play curriculum characteristics.

Making such a comparison is challenging because not all articles are written for the same purpose and terms may therefore be used differently depending on the contexts.
Using a Venn-diagram to compare information in Tables 1 and 2 (p. 31 and 32) gives the following commonalities.

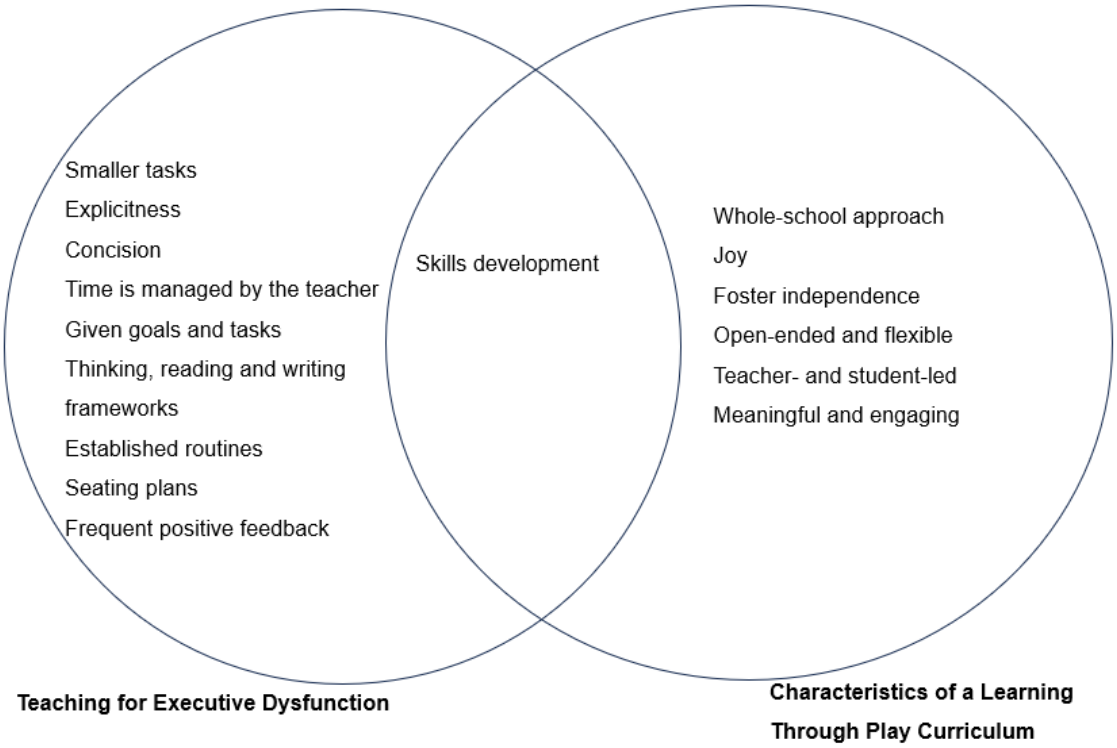

FIGURE 13. Venn diagram to show commonalities between suggested teaching strategies for ED learners and a LTP curriculum.

Teaching strategies for ED learners are just that, and not necessarily suggestions for curriculum articulation. It is worth noting that the issues of comparison between LTP curriculum and teaching strategies for ED learners is an uneven but necessary comparison. Assuming a separate curriculum for learners with ED would be the opposite of inclusion.

It is therefore important to focus on similarities and in this case, the analysis gives one clear-cut and significant similarity. Curriculum aims for both an ED curriculum and an LTP curriculum are skills development.

There appear also to be differences in approaches such as emotional expectation. One such example is that of LTP words such as ‘joy’ and ‘fun’. While most authors on the topic of LTP concur, that learning should be fun and joyful, authors on ED would presumably agree with this as opposed to learning being miserable and dull. ED authors possibly do not presume the emotional states of learners because, as Mohammed (Mohammed, 2022) propose, emotional responses are to some extent regulated by EF thinking skills and are therefore less predictable than in non-ED learners.

4.4 Analysis of Executive Dysfunction teaching characteristics with LTP teaching characteristics.

Using a Venn-diagram to compare information in Tables 1 and 3 gives the following commonalities.

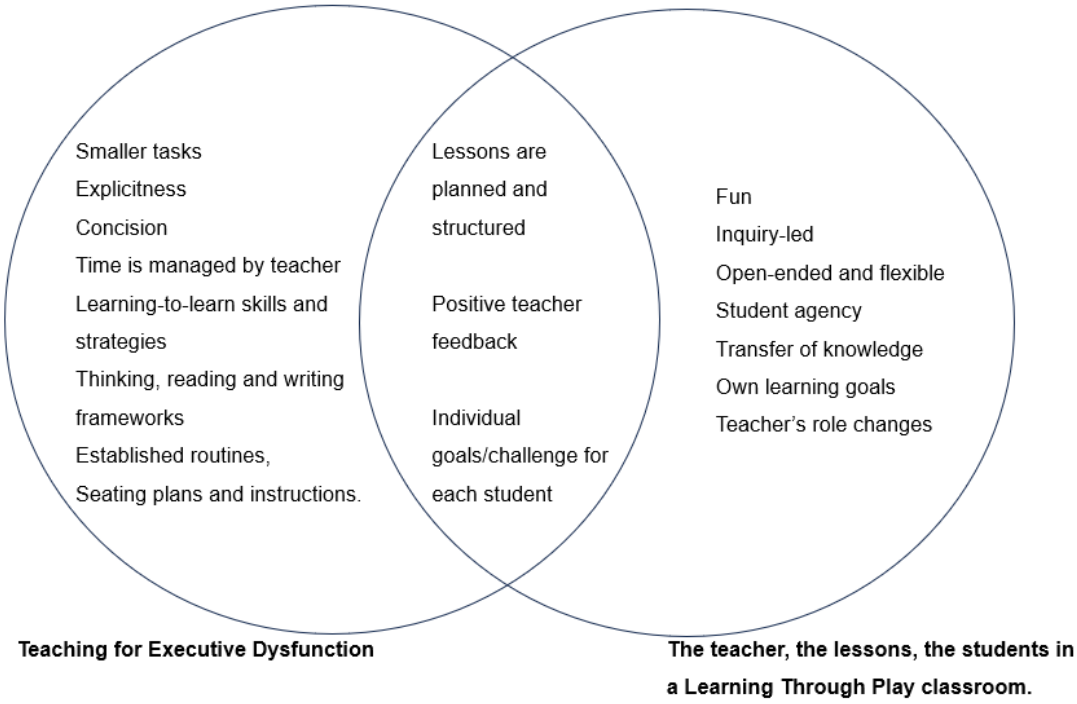

FIGURE 14. Venn diagram to show commonalities between suggested teaching strategies for ED learners and LTP pedagogy.

This second analysis is perhaps an easier comparison because both sets of statements relate more to pedagogy than curriculum articulation.

It demonstrates that there are several commonalities between ED and LTP pedagogies. Authors on ED and LTP concur that lessons should be planned and structured. They also agree that teachers use positive feedback to support and coach students.

One final commonality is goal setting. The authors of LTP propose that learners set their own goals and targets for their learning. Authors on ED agree with learners being given explicit goals, targets and strategies but stipulate that teachers be in charge of goal-setting.

It would be remiss to not also mention that there are aspects of the two approaches that are different. One such example is that authors writing on ED

teaching concur that ED learners require a significant amount of teacher-given structure. LTP lessons can be open-ended and flexible whereas for ED learners, unpredictability can be stressful and upsetting.

In summary, with emphasis on commonalities, it becomes clear that teaching for ED learners and LTP are not mutually exclusive. On the contrary, there are significant commonalities which are:

- Focus on skills development.
- Goal setting
- Positive teacher feedback
- Lessons are planned and structured.

5 APPROACHES FOR EXECUTIVE DYSFUNCTION LEARNERS IN THE PLAYFUL CLASSROOM

This work suggests that a curriculum that is both structured and playful could be inclusive for ED learners.

LF defines play as learning experiences that are joyful, iterative, meaningful, socially interactive, and actively engaging. As pointed out by Liu (Liu et al., 2017) in Figure 3 (p.17), students experience these five characteristics predominantly through the prefrontal cortex. This is also where EF is thought to be located (Takeuchi et al., 2013) (Hodgkinson & Parks, 2016) (El-Sheikh, 2010). While it is beyond the scope of this work to compare neurofunctions between ED and non-ED learners, it is, however, reasonable to question whether these play characteristics can reasonably be expected of ED learners in the LTP classroom. Until evidence is available to confirm or contradict this, it is important to focus on congruence between the three educational structures.

A comparison of the three different approaches in Figure 15 (p.38) shows significant commonalities where the three approaches overlap as propounded by LF and other authors. These are generally considered to be learning skills, thinking skills, social skills and self-management skills. Additionally, both the IB and LF aim to produce lifelong learners who can self-regulate. Similarly, five of six authors on ED stipulate skills development - and in particular learning skills, as essential teaching for ED learners, as demonstrated in Table 1 (p. 31).

It has been noted that play is a diffuse term and thus the outcome of this work could be discursive. To try to formalise the work we use Set Theory. This allows IPL (the modifications made to LTP to incorporate ED learners) to be formally defined, in terms of subsets (⊆) and equal sets (=) (Zabbal, 2008).

IPL ⊆ The total of LTP

IPL = IB ATL skills ∩ LTP ∩ teaching for ED

IPL ⊆ specific learning skills in Figure 15 (p. 38)

It is suggested (but not studied) in this work that no skill opposes IPL, so we expect

IPL = learning skills

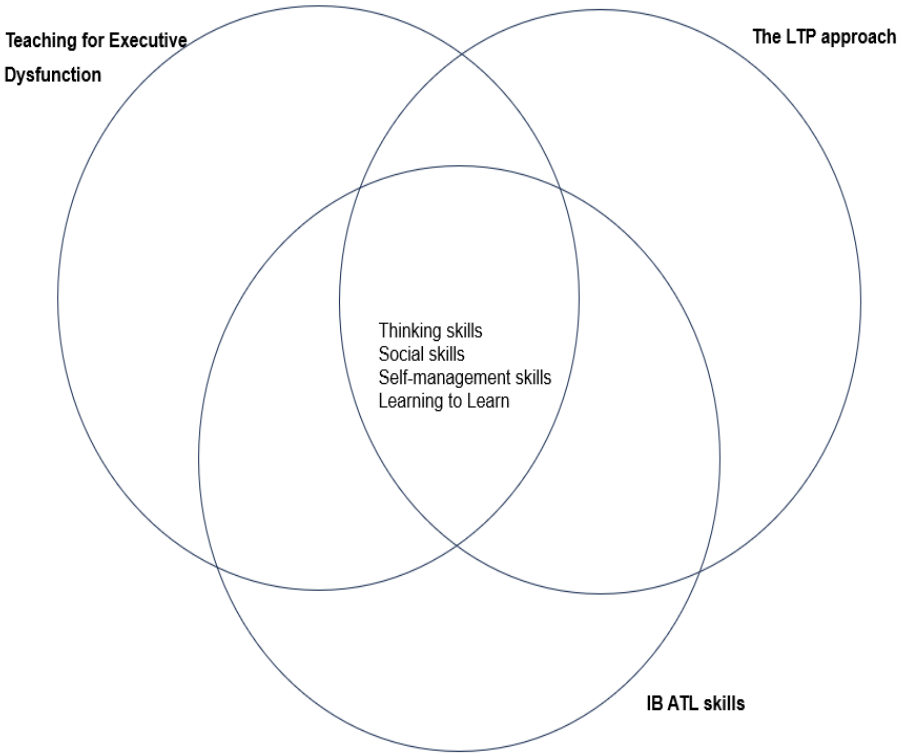

FIGURE 15. The intersection of educational aims of; IB ATL skills ∩ LTP ∩ teaching for ED, illustrating commonalities.

Results from the first literature review indicate that all included authors on ED call for ED learners to have structure imposed by the teacher. While it is inarguably the ultimate aim of all teachers to facilitate independence in their learners, the skills related to being an independent learner are part of EF and are more slowly developed, if at all, in students with ED (Cooper-Kahn & Foster, 2014) and ED learners may subsequently require more structure.

It therefore appears that the way forward for teachers of ED learners in the LTP classroom, is to offer teacher directed LTP, as described by the Play Continuum proposed by Pyle (Pyle and Danniels, 2017). This was later endorsed by Zosh (Zosh et al., 2018) thus expanding their original definition of the LTP continuum to also include more adult directed activities in Figure 6 (p. 20).

The IB ATL skills framework offers such an approach.
Not only does it have a skills focus, but the framework also allows for both horizontal and vertical articulation as its own curriculum aim and as integrated across subjects. There are various benefits of this in terms of inclusion.

- It facilitates planning and collaboration around the curriculum.
- When the plan is shared with school stakeholders, it allows other adults to plan support ahead of the skills being taught.
- It facilitates academic priming, which is useful for ED students.
- It allows for differentiation planning such as an open-ended lesson for some students and a fixed set of playful activities for students who need this.

Additionally, as has been demonstrated by Educational Technology companies such as toddleLearn, the ATL skills can be taught in a playful manner. One example of this is ‘Act it out’ by toddleLearn (Appendix 1) (Abdallah et al., n.d.). The ATL activity is heavily guided by the teacher and tasks are chunked into clear steps. It is playful on account of the requirement to act and pretend. For ED learners, it may be advisable to pre-select a video to remove any anxiety related to having to choose and to base any questions on previously taught skills, so learners are primed and familiar.

6 DISCUSSION

This work has not aimed to disprove LTP for any segment of students, despite the limitations that unstructured learning (play) has for students with ED.

6.1 Limitations of study

Finding sources related to middle school only was challenging and it was therefore necessary to also consider work related to primary school. As far as possible, work specifically related to Early Years and Kindergarten were excluded on account of the need for different pedagogical approaches required for younger and older learners. Similarly, many articles were not directly related to the topic and so were studied for their incidental claims on LTP.

Interpretation of sources may have given rise to researcher's bias.
As with many things related to studying play, there seems to be little consensus on semantics. It is therefore necessary to select, interpret and categorise authors' claims. For example, statements that can be considered a fundamental part of teaching (example given; teachers must be well-trained) were discounted.
Also, statements were interpreted and categorised in order to show similarity of thought amongst authors. For example, one author stated that lessons ought to be deliberately slow. This was interpreted as 'open-ended' so that it was easily grouped together with a similar, previously occurring statement. Also, Mardell (Mardell et al., 2023) claimed that play is fluid and unpredictable. That too was interpreted and categorised as open-ended. While this is essentially subjective, it is necessary because of the diffuseness of play and the many interpretations available.

The sources may be biased towards the understanding of LTP as propounded by LF. Despite a systematic search for other publications on the topic, the LF remains prolific and dominant in the area of LTP.
The second literature review produced six articles of which half are written by authors with a connection with the LF. As LTP grows in popularity as a pedagogy, we may expect the number of independent, topical articles to rise.

6.2 Practical and ethical issues

Research ethics is essential in the production of this master's thesis.
The following considerations have been addressed in the production of this work:
Informed consent is of paramount importance in a piece of research. It was, however, not necessary to obtain consent from any participants as this research is entirely literature based. As far as possible, peer-reviewed articles were used at all times, where consent is predefined.
Confidentiality of participants is important particularly when sensitive information is being shared. With no participants in this study, this is not a concern. No sensitive information related to any named entities has been shared.
Any research data was stored securely on a password accessed laptop and not an internet-based drive or cloud to ensure secure access to information.
Data handling and analysis was undertaken as transparently as possible. Bias has been declared, as has any potential conflicts of interest.
Authorship and ownership of ideas is particularly important due to the nature of this research. Both have been diligently acknowledged to avoid plagiarism.
To allow proper evaluation of this work, the author attempts to define their probable bias. The author is a European middle-aged woman who has worked extensively in IB schools and well-funded international schools. The author declares that she has work (and thus financial) links with IB and Harvard Graduate School of Education. The thesis commissioner of this project (as is TAMK practice) is Chair of Learning Through Play at LF.

6.3 Suggestions for future research

The author notes that the majority of funding and research into LTP is dependant on a single company. From a perspective of academic rigour this may not be optimal.

There is scope for further investigating the commonalities between what happens in an IB classroom and a LTP classroom.

This may, in turn, be further developed into a curriculum framework.

It would also be relevant to investigate resources such as the RePlay Teachers' Observation toolkit developed by Play and Learning in Children's Eyes which is developed by LF and an international consortium of universities (Play and Learning in Children's Eyes, 2022). Research may focus on using the ATL skills framework to create a version of the RePlay teacher observation toolkit for middle school contexts.

Frameworks other than IB could be evaluated in a similar manner to this work, which may show a more optimal framework to allow LTP to be adapted by IPL.

7. CONCLUSION

This thesis studied the main question: How can the methodology of LTP be integrated with MYP ATL skills to make learning more inclusive for students with ED?

To answer this question, two systematic literature reviews were undertaken, the results of which were comparatively analysed against each other and against educational aims and practices of IB ATL skills.

To answer the main research question, the four sub-questions will be answered first.

A. What is considered good teaching practice for students with Dyslexia and ADHD?

The first systematic literature review demonstrated that students with DD and ADHD who have Executive Dysfunction issues, as defined in the theoretical framework, typically require a highly structured and teacher-managed approach to lessons with a strong focus on goal setting, repetition, and skills development.

B. Is Learning Through Play inherently inclusive?

The two systematic literature reviews demonstrated that when LTP comprises classroom activities that sit on the left side of the Play Continuum there may be insufficient teacher-instruction. The left side of the continuum in Figure 6 (p.20) consists of child-led activities, and this may exclude learners who do not have sufficiently developed executive functioning skills to direct their own learning.

C. What parts of the IB MYP ATL skills are considered LTP?

Through the second literature review and research on the IB ATL skills, it was established that the most significant commonality between ATL skills and LTP is the focus on holistic skills development. Both systems specify learning to learn skills, thinking skills, social skills, and self-management skills as educational aims. Additionally, both are committed to producing lifelong learners.

D. What parts of the IB MYP ATL skills are LTP and good teaching practice for students with Executive Dysfunction?

Similarly, to Question C, the outcomes of literature reviews were compared for commonalities between ED teaching and LTP and the outcomes of this were then compared with educational aims for IB ATL skills. The findings show that all three structures have educational aims such as holistic skills development and learning to learn skills in common.

In conclusion, LTP is not entirely inclusive of students with certain needs when it is child-led and open-ended as illustrated by the Play Continuum (Zosh et al., 2017). Students with ADHD and DD who have compromised EF, struggle to apply the higher-order cognitive skills that are required of Free Play and Guided Play in an educational setting. For example, making a choice between five activities can be overwhelming to students who struggle to evaluate and select and is, subsequently, a stress factor. Similarly, for such students, switching attention between two activities is difficult and therefore requires that the lesson follows the programme and does not change course mid-way such as might happen in an inquiry-led classroom.

It is, however, possible to make playful learning structured and therefore even more inclusive to students with these needs. The IB ATL skills framework is one example of activities that can be articulated horizontally and vertically and therefore allows for a structured approach to having a playful curriculum. Two examples of a playful ATL skills lesson has been supplied (Appendix 1) thus demonstrating that a structured approach does not have to compromise the LTP experience and can still foster the ultimate aim of holistic skills development. It would perhaps be useful to expand the Continuum of play according to Zosh (Zosh et al., 2017) in Figure 6 (p. 20) to give a wider continuum such as that proposed by Pyle (Pyle and Danniels, 2017) in Figure 5 (p.19).

It has been discussed that inclusion policies have been highly political and that ED students have been taught with existing systems and methodologies primarily for economic reasons, without proper theoretical basis. ED education often being seen as burden with many international private schools refusing or limiting ED student intake. This study. which defines ILP, suggest that true inclusion into existing systems is not only possible but preferred. The changes are neither onerous nor costly but defined by focus on specific aspects. Focusing on commonality (defining specific aspects to have greater importance) may allow greater efficiency and reduce costs overall.

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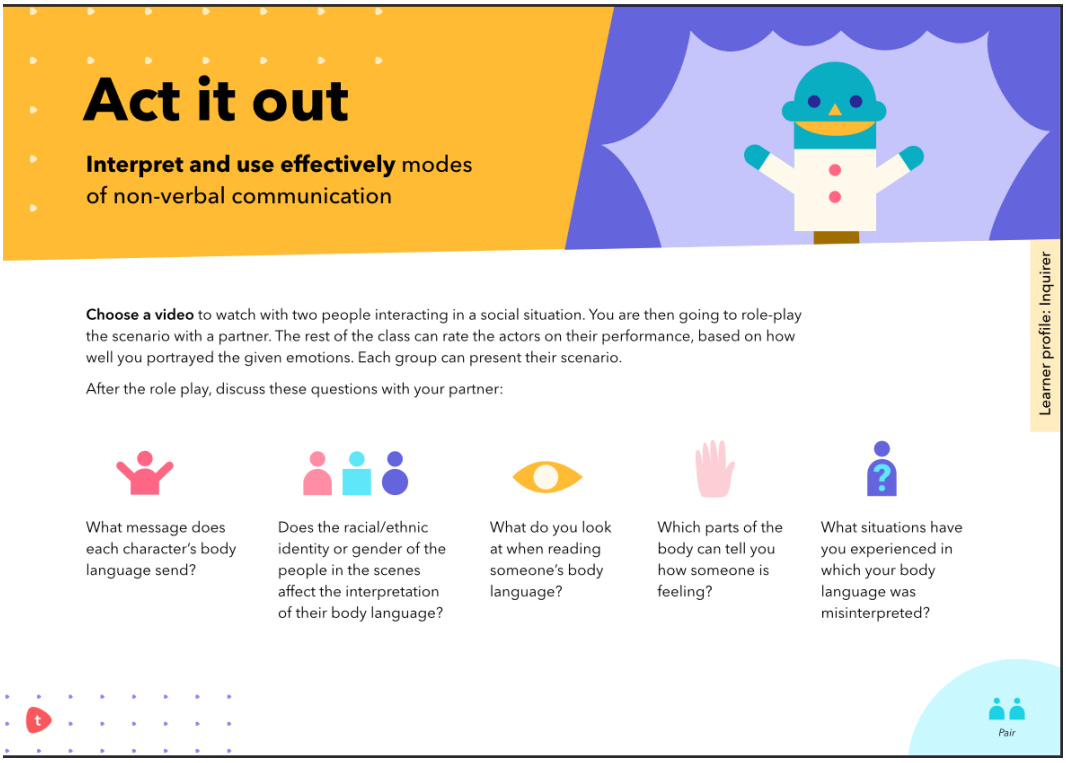
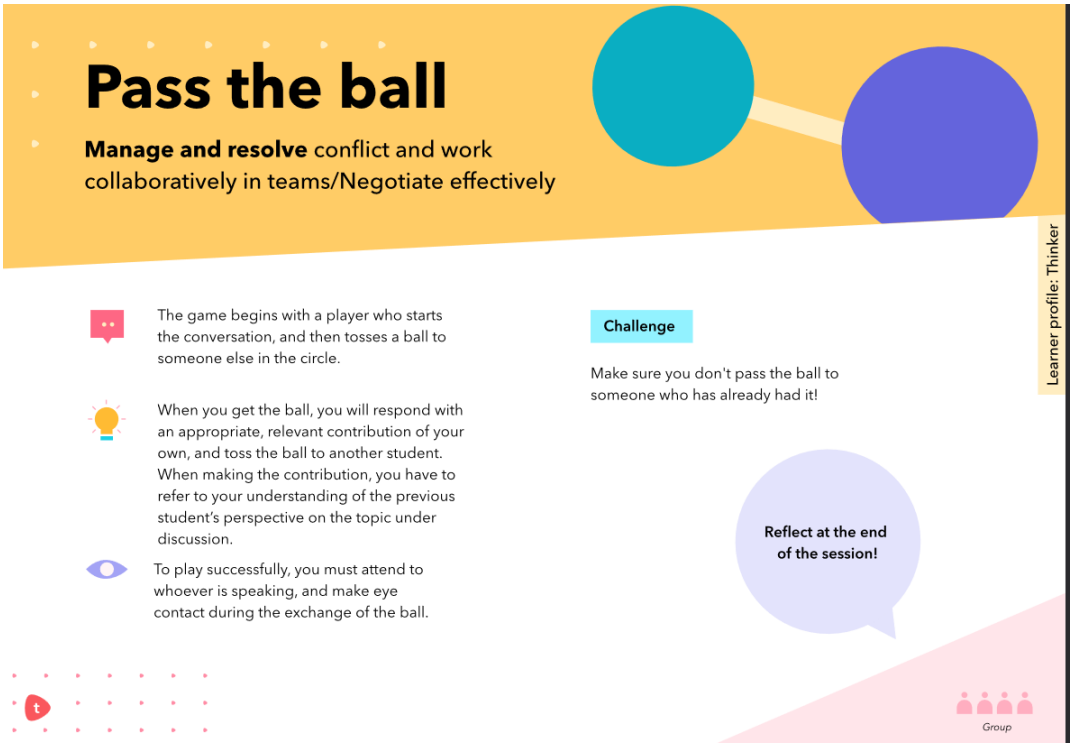
APPENDICES

Appendix 1. Two examples of structured and playful learning activities promoting respectively communication and social skills (Abdallah et al., n.d.).





Appendix 2: Results from first literature review; characteristics of teaching for ED learners.

	Definition of ED	Pedagogy
Cooper-Kahn, J., Foster, M., & Cooper-Kahn, J. (2013). *Boosting executive skills in the classroom : A practical guide for educators*.	Describes ED as being difficulty with a cluster of skills. Is not a diagnosis A continuum of a range of skills	Student planners for the day and used in every lesson Daily weekly reviews of planner with adult Repetition Teacher's positive mindset towards mistakes Students to be given time to develop mastery Managed time frames Positive feedback (four to one) Many established classroom routines - including instructional routines Brief, succinct non-distracting lesson materials - presented in manageable chunks

		Classroom to be purposefully organised Reading tasks broken down into manageable chunks and accompanied by thinking organisers Organisers for writing. Warm-up practice for writing Warm-ups for automaticity
Keenan, L. et al. “Executive Functioning in the Classroom: Primary School Teachers’ Experiences of Neuropsychological Issues and Reports	Executive functioning (EF) is an umbrella term encompassing several goal-directed, higher-order cognitive skills that can be distinguished from one another yet remain inter-related (Lepach, Pauls, & Petermann, 2015). *From <https://www-sciencedirect-com.libproxy.tuni.fi/science/article/pii/S0742051X18321504>*	NA
Bita, N. (2023, Aug 25). Old-school teaching styles make struggling students successful.	Not relevant	Not relevant
Willis, J. (2007). *Brain-friendly strategies for the inclusion classroom*.	NA	Carefully thought through seating - preferably at the front

		and near the teacher Concrete, personally relevant repetitive learning tasks Individualised realistic challenge Carefully planned goals - set out in goal planners Routine Academic priming Learning logs Frequent teacher feedback
Childers, A. S. (2020). *Embedding Executive Function Skills into the General Curriculum as a Way to Prepare Students for the 21st Century: A Case Study in Building Capacity in Educators*	trouble with planning, attention, behaviour regulation, inhibition, organization, and shifting focus	academic planner focus on lessons related to materials management, time management and planning, study strategies, goal setting, decision-making and problem-solving, and learning strategies.
El-Sheikh, S. (2010). *Children with executive function deficits:*	EDF is a disability relating to the planning, sequencing, initiating and time management of tasks. EDF deficits typically manifest themselves in the form of difficulty organizing thoughts,	Embed structure Variety of task Short tasks

Improving focus and time on task Results of a small scale empirical study	initiating tasks, transitioning between tasks, and sustaining focus on the pertinent parts of a task. P 9	
Bayly, D. J. (2023). *The Relationship Between Children's Free Play Activities and Executive Function*	Not given	Not given
Daley, D., Birchwood, J. ADHD and academic performance: Why does ADHD impact on academic performance and what can be done to support ADHD children in the classroom?	EF) deficits – experienced by ADHD individuals include response inhibition (Barkley 1997) and working memory (Tannock 1998). Indeed, Barkley (1997) suggests that while poor response inhibition is the core deficit in ADHD, it subsequently gives rise to other EF deficiencies, such as cognitive flexibility, planning and fluency.	Manipulations include reducing task length, dividing tasks into sub-units, giving explicit instructions, and modifying the delivery or modality of instruction according to the pupil's learning style Individual goals for classwork completion Specific skill teaching Succinct communication Strategy training
Hodgkinson, T., & Parks, S.	Impulse control Working memory	Daily planners

(2016). Teachers as Air Traffic Controllers: Helping Adolescents Navigate the Unfriendly Skies of Executive Functioning.	Planning/organisation Cognitive shift Task initiation/planning	Cleat expectations Students given starters by the teacher Memory practice Chunked work Written down directions for completing work Academic priming Frequent feedback from the teacher to manage impulse control Skills practice

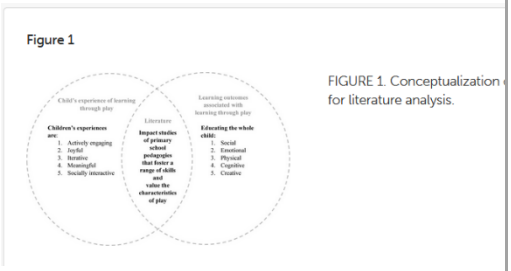
Appendix 3: Results from second literature; characteristics of LTP.

	What is LTP?	**Curriculum organisation**	**Teaching strategies**
Mardell, B., Lynneth Solis, S., & Bray, O. (2019). The state of play in school: defining and promoting playful learning in formal education settings. International Journal of Play, 8(3), 232–236.	**LTP are classroom activities that are:** • joyful • engaged, • meaningful • iterative • social interaction Adult intervention is a continuum **Play is:** • Fluid • Unpredictable • Anti-authority • Chaotic • Messy • Loud • Not constrained by time limits The purpose of Learning through play is to develop a broad set of skills, including basic literacies and critical and creative thinking.	Teachers must experiment To support this, teachers should be organised into teacher inquiry groups.	Teaching should promote: choice empowerment curosity wonder, enjoyment delight Adult intervention is a continuum **Play is:** Fluid Unpredictable Anti-authority Chaotic Messy Loud Not constrained by time limits
Nesbitt, K. T., Blinkoff, E., Golinkoff, R. M., & Hirsh-Pasek, K. (2023). Making schools work: An equation	Play is a continuum from *free play* to *guided play* to *playful instruction.* The purpose of LTP is to build collaboration and communication with others, critical thinking and creative innovation, and building confidence to take calculated risks	Curricula must facilitate active and engaged learning that is meaningful, socially interactive, iterative, and joyful.	Guided or active playful pedagogical approach Deep, transferable understanding develops through an active

for active playful learning. *Theory Into Practice*, *62*(2), 141–154. Academic Search Ultimate.		Guided play is superior to free play if there is a curricular goal in mind. Three-part equation of (1) cultural values, (2) the science of *how* children learn, and (3) the knowledge of *what* children need to learn to succeed in life. This will require professional developme nt and classroom design that reinforces: Cultural values in the community The science of how children learn. The science of what children need to know (the 6 Cs below) collaboratio n and communicat ion with	process of inquiry Students must be agents of own learning Practice, application, and discussion of what we learn, questioning , exploring, elaboration, and reflection allows transfer of knowledge to new contexts Modelling of learning by teachers Regular opportunitie s for active learning Supporting students through positive feedback. Reduced distractions such as background noise and classroom clutter The right amount of challenge and support

		others, critical thinking and creative innovation, and building confidence to take calculated risks	Connect learning to past experiences Collaboration with peers and teachers, Hypothesis testing and investigations Scaffolds Fun
Paterson, A. (2020). The play paradox: A systematic literature review of play-based pedagogy applied in the classroom. *Educational & Child Psychology*, *37*(4), 96–114. Academic Search Ultimate.	General disagreement as to what learning though play is	Teacher-led instruction is an essential component of the curriculum in classrooms, even when using PBP. Teachers must be trained Play-based curriculum is a school-wide approach	Teacher-led instruction essential Pupils and teachers to co-construct learning environments.
Johnstone, A. (2022). An Inquiry into Teachers' Implementation of Play-Based Learning Aligned Approaches within Senior Primary	Play-based learning (PBL) Inclusive Play and exploration Intentional teaching to scaffold the processes of inquiry, curiosity, and reflection.	The curriculum offers Individualised, open-ended and purposefully framed opportunities to play Learning is individualised	Encourage choice and agency Role of teacher shifts along the Play v power continuum when teacher deems it necessary (need and activity).

Classes. *Kairaranga, 23*(1), 17-34.		The curriculum aims to develop social and emotional skills in addition to well-being enthusiasm, independence, problem solving inclusion PBL requires a school-wide approach	Teachers use observations to determine their own role and student needs
Boehm, S., & Franklin, L. (2023). The Case for Playful Pedagogy in the High School English Classroom. *English Journal, 112*(3), 51-56.	Playful pedagogy prioritizes openness, flexibility, and creativity, The playful pedagogy can be resistance to the status quo	Incorporate: Humor Games Student choice Imagination	Slowness and deliberate pauses Responsiveness and flexibility, Open-ended tasks and allowing time to indulge in varying ideas and concepts Balance among serious topics, challenging literacy tasks, and humorous activities Encourage students to feel comfortable and open

			Invite students to use their imagination Encourage students to try novel approaches to familiar literacy tasks. Give many choices in how assignments can be presented. Sharing of ideas that did not always seem directly related to the day's learning objectives
Parker, R., Thomsen, B. S., & Berry, A. (2022). Learning Through Play at School : A Framework for Policy and Practice. Frontiers in Education (Lausanne), 7(2022).	 LTP is holistic Learning through play is a complex process that requires a *blend* of teacher-guided, student-led, and teacher-directed practices LTP can be partial, fleeting and superficial Learning through play is when: 1. Children develop holistic skills by interacting with people, objects and representations in actively engaging, joyful, iterative,	A curriculum that promotes: Student engagement Inclusion Holistic skills development The development of independent learners Decision-making skills Executive function skills	LTP is a blend of 8 pedagogies Active learning Collaborative and cooperative learning Experiential learning Guided discovery learning Inquiry-based learning Problem-based learning Project-based learning

	meaningful and socially interactive experiences 2. Experiences are designed and facilitated to make effective use of available resources and integrate child-led, teacher-guided, and teacher-led opportunities . Teachers foster following skills: • Cognitive • Social • Emotional • Creative • Physical	Planning skills Social skills Emotional skills Creative skills A curriculum that is: Joyful Meaningful Socially interactive Actively engaging Iterative. Play is a spectrum involving child-directed activity, adult-guided and adult-directed activity. Effective playful pedagogies cover: Depth not breadth Multidimensional and integrated assessment Allows for some flexibility in implementation Features of playful curriculum design are:	Montessori education Teachers design activities that build on learners' experiences, knowledge and learning needs, include long and short-term goals, are evidence-based, are well planned and structured, combine facilitation types, and foster higher order thinking and skills Teachers use essential strategies, understand their learners,

		Activities and questions that are relevant and meaningful for children in that they integrate concepts and skills from the curriculum with children's interests and experiences. Requires a whole-school approach.	scaffold learning, adjust their approach to meet the needs of their learners, and act as learners' mentors or guides. often frame by discussions about prior knowledge of the topic at the outset and include opportunities for reflection in groups co-create classroom rules with learners pose open-ended questions encourage knowled

			ge sharing monitor discussions provide hints and guiding questions coach give feedback, worked examples, and models Students make authentic and genuine choices about their learning ask teachers questions and offer opinions or reflections have freedom of movement within the classroom to interact with teachers, peers and materials as appropriate have time to overcome “false starts” and

			“failures” when task choices need revisiting or groups reformed make authentic and genuine choices in combinatio n with other instructional strategies are guided by teachers to make decisions about learning are guided by teachers to make choices involving carefully planned, managed and rigorously assessed tasks learn choice-making skills gradually and experientiall y