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YAN WEI, SAW

# Evaluating The Impact of The Flipped Classroom on Middle School Students' Academic Performance and Teacher Perceptions: A Case Study in A Malaysian International School

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## **Abstract**

*The flipped classroom model has gained significant attention in educational research, particularly in higher education, but its impact on K-12 settings, especially in Malaysia, remains understudied. This study investigates the effect of the flipped classroom on middle school students' academic performance in an English Language Arts course, explores teachers' attitudes towards this instructional model, and identifies the challenges associated with its implementation. Using a mixed-methods approach, data were collected from 184 Year 2 students and three English teachers at an International Baccalaureate Middle Years Programme (IB MYP) school in Malaysia. The findings reveal no significant difference in academic performance between the control and experimental groups, suggesting that the flipped classroom may not significantly enhance academic achievement in this context. However, teachers generally hold positive perceptions of the model, particularly regarding its impact on their role as facilitators and its potential to promote student engagement and active learning. Challenges such as student preparedness, time demands on teachers, and technological issues were also identified. The study concludes with recommendations for future research and practical implications for educators and school leaders considering the adoption of the flipped classroom model.*

**Keywords:** *Flipped Classroom, Academic Performance, K-12 Education, Teacher Perceptions*

## **Introduction and background**

The flipped classroom model has emerged as an innovative pedagogical approach that redefines the traditional learning environment. In this model, the delivery of instructional content occurs outside of class time through pre-recorded lectures, videos, and other digital materials, allowing students to engage with foundational concepts at their own pace. Class time is then dedicated to interactive activities, discussions, and problem-solving exercises that promote higher-order thinking skills (Bergmann & Sams, 2012). This instructional shift challenges the conventional teacher-led model, where educators primarily serve as knowledge transmitters. Instead, teachers in a flipped classroom adopt the role of a facilitator or guide, encouraging student-centered learning (King, 1993).

The growing accessibility of digital technologies has significantly contributed to the widespread adoption of the flipped classroom model (Sun, Xie, & Anderman, 2018). The increasing availability of online learning platforms, educational software, and multimedia tools has made it easier for educators to create and share digital content with students. Consequently, the flipped classroom has gained popularity in various educational settings, particularly in higher education (Akçayır & Akçayır, 2018; Al-Maroofof & Al-Emran, 2021; Gough et al., 2017; Lo & Hew, 2017). Research indicates that flipping instruction can lead to improved student engagement, better knowledge retention, and enhanced classroom interactions (Akçayır & Akçayır, 2018; Bhagat, Chang, & Chang, 2016; Chen, 2016; Khanova, Roth, Rodgers, & McLaughlin, 2015; Ryan & Reid, 2016).

Despite its increasing use, the impact of the flipped classroom in K-12 education, particularly in Malaysia, remains underexplored. While numerous studies have examined its effectiveness in college and university settings, research on its implementation in primary and secondary education is relatively scarce (Lo & Hew, 2017; Rahman, Yunus, & Hashim, 2019). Many studies in higher education contexts report positive outcomes, including increased student motivation, improved academic performance, and greater collaboration (for example Abdullah & Azizan, 2017; Chew, Jones, & Wordley, 2018; Juhary & Amir, 2018). However, these findings may not necessarily apply to younger learners who may lack self-regulated learning skills and require more structured guidance. Moreover, the Malaysian education system has its own unique curricular and pedagogical challenges, necessitating further investigation into whether the flipped classroom model is practical and effective in this specific K-12 context.

## **Problem Statement**

Despite the growing body of research on the flipped classroom model, most studies have been conducted in higher education, leaving a significant gap in understanding its effectiveness in K-12 settings. The majority of research in this field has focused on college and university students, largely due to their greater autonomy in learning and access to digital learning resources (Akçayır & Akçayır, 2018). However, primary and secondary school students may experience different learning challenges, including the need for structured support, teacher guidance, and peer collaboration (Zainuddin & Perera, 2019).

Additionally, the existing research findings on the impact of flipped instruction in K-12 education remain inconclusive. Some studies suggest that the flipped classroom leads to significant academic improvements, citing higher test scores, better engagement, and increased participation (e.g. Wei et al., 2020). Others, however, indicate no significant difference in student performance compared to traditional teaching methods (e.g. Chen, 2016). This inconsistency raises questions about the generalizability of the flipped classroom's effectiveness across different age groups, subjects, and educational settings.

In Malaysia, research on the flipped classroom remains limited, particularly within primary and secondary education. The majority of studies conducted in the country have focused on higher education institutions (Rahman et al. 2019). While some universities and colleges have experimented with the flipped model, its implementation in K-12 schools is relatively new and largely unexamined. Consequently, there is insufficient data to determine whether the flipped classroom model can be successfully implemented in Malaysian K-12 settings and whether it positively influences students' academic performance and engagement.

### **Research Objectives and Questions**

This study aimed to investigate the impact of the flipped classroom model on student academic performance, teacher perceptions, and the challenges of implementing the model in a middle school English Language Arts course. The specific objectives of the study were to:

1. Measure the effect of the flipped classroom model on Year 2 students' academic performance in an English Language Arts course.
2. Determine teachers' perceptions of the flipped classroom's impact on their role and students' learning experiences.
3. Explore the challenges faced by educators when implementing the flipped classroom model in an English Language and Literature curriculum.

To achieve these objectives, the study addressed the following research questions:

1. What is the effect of the flipped classroom on students' academic performance?
2. How do teachers perceive the impact of the flipped classroom on their role and students' learning?
3. What challenges do teachers face in adopting the flipped classroom in their instructional practices?

These research questions were designed to examine both quantitative and qualitative aspects of the flipped classroom's effectiveness, ensuring a comprehensive analysis of its academic and pedagogical implications.

## **Significance of the Study**

The significance of this study lies in its contribution to the limited body of research on the flipped classroom model in K-12 education, particularly in Malaysia. While the flipped learning approach has been extensively studied in higher education, its applicability in primary and secondary schools remains largely unexplored (Lo & Hew, 2017). By focusing on middle school students, this study provides valuable insights into how younger learners interact with the flipped classroom model and how it affects their learning outcomes and engagement levels.

Moreover, the findings of this study are crucial for educators and school leaders considering the adoption of the flipped classroom approach. Understanding both the benefits and challenges of this instructional method can help schools make informed decisions about whether to implement the model and how best to structure it to meet the specific needs of K-12 learners. The study also provides practical recommendations for enhancing the effectiveness of flipped instruction, including strategies for overcoming common implementation challenges such as student preparedness, and teacher workload.

Additionally, the study contributes to educational policy discussions by highlighting the potential for integrating digital learning tools in Malaysian K-12 education. As technology continues to transform classrooms, understanding how innovative teaching methods like the flipped classroom impact student learning can inform curriculum design, teacher training programs, and resource allocation strategies.

## **Scope of the Study**

The scope of this study was limited to Year 2 students in an IB MYP international school in Malaysia, focusing on their academic performance in English Language and Literature. The study examined the implementation of the flipped classroom model in this specific subject area, analysing how it influenced student learning outcomes and teacher perceptions.

In addition to investigating student performance, the study also explored teacher experiences with the flipped classroom, incorporating insights from three English teachers who actively implemented the model in their classrooms. These teachers provided qualitative data on the challenges, benefits, and feasibility of integrating flipped instruction in a middle school curriculum.

However, the findings of this study were not intended to be broadly generalizable to other subjects, grade levels, or educational contexts. The study was conducted within the framework of an IB MYP school, which has specific teaching methodologies and curricular structures that may differ from traditional Malaysian national schools or other international school systems. The present study also did not investigate school leadership and students' perceptions of the said model. Future research should expand the scope to include different school types, multiple subjects, and a wider range of stakeholders and student demographics to provide a more comprehensive understanding of the flipped classroom's impact in diverse educational settings.

## **Literature Review**

The flipped classroom model, as defined in this study, is a student-centred instructional strategy where students engage in active and collaborative learning activities during class that build upon content delivered online before the class via instructional videos and supporting materials (Abeysekera & Dawson, 2015; Bishop & Verleger, 2013; Cheng et al., 2019). Students complete pre- and post-lesson activities to reinforce in-class learning. The flipped classroom is categorized under the Rotation Model of blended learning, where students alternate between face-to-face teacher-guided practice and remote content consumption (Staker & Horn, 2012).

The growing interest in this model is linked to the increasing integration of digital technologies in education and the recognition of active learning's benefits. However, despite its widespread adoption, research on the flipped classroom has largely focused on higher education, leaving significant gaps in understanding its impact in K-12 settings, particularly in the Malaysian educational context. This review examines the theoretical underpinnings of the flipped classroom, synthesizes existing research, highlights gaps in the literature, and outlines the conceptual framework that guided this study.

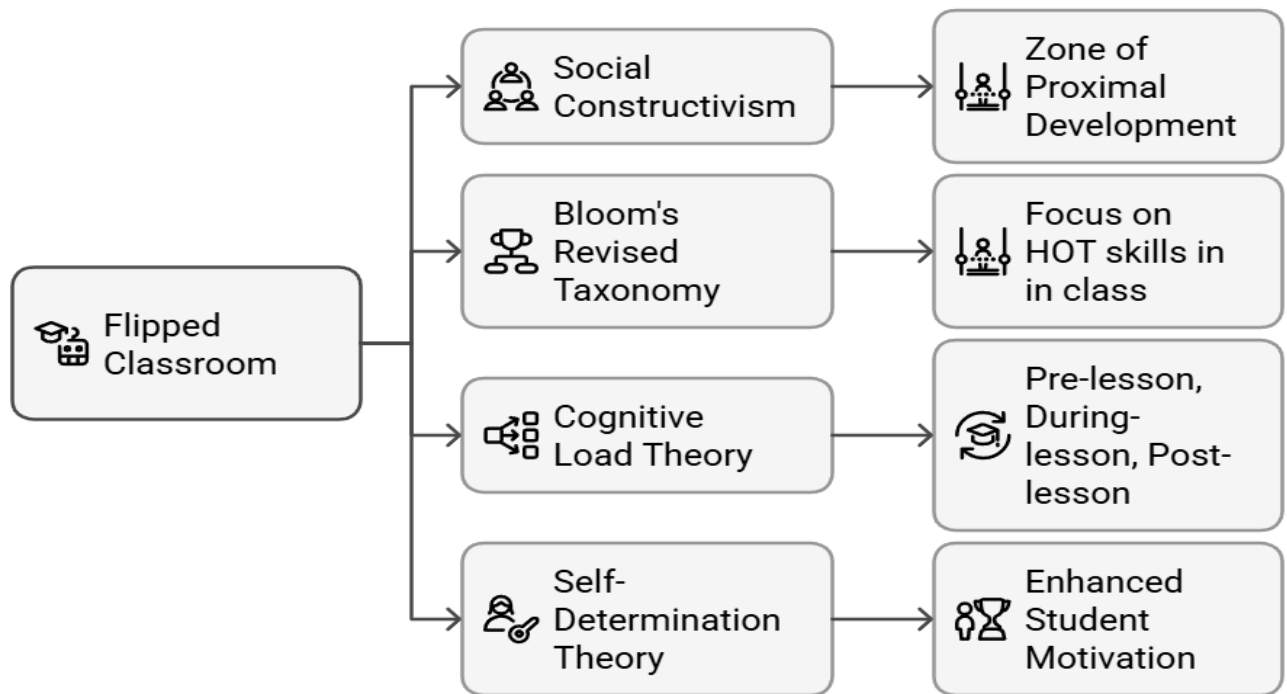
## **Theoretical Framework**

The flipped classroom model is grounded in constructivist learning theories, which emphasize active student engagement, knowledge construction, and the integration of new experiences with prior knowledge. This study draws from social constructivism (Vygotsky, 1978), which highlights the role of social interaction and scaffolding in learning. The model aligns with Vygotsky's zone of proximal development (ZPD), where learners progress more effectively when supported by a more knowledgeable peer or teacher. In a flipped classroom, this occurs during in-class collaborative activities and discussions, where students clarify their understanding and develop deeper insights.

Additionally, Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001) serves as a guiding cognitive framework for structuring flipped instruction. Traditional classrooms often focus on lower-order cognitive processes (e.g., remembering and understanding) during class time, whereas flipped instruction shifts these activities to pre-class learning, allowing in-class time to be dedicated to higher-order thinking skills, such as application, analysis, evaluation, and creation.

From a cognitive psychology perspective, the flipped classroom model is also supported by Cognitive Load Theory (Sweller, 1988). This theory posits that excessive cognitive demands can hinder learning when too much information is introduced in a short period. The flipped approach mitigates cognitive overload by distributing learning across pre-lesson, during-lesson, and post-lesson stages. Students engage with lower-order tasks before class at their own pace, ensuring that in-class time is optimized for deeper engagement and problem-solving.

Furthermore, Self-Determination Theory (Deci & Ryan, 1985) helps explain why flipped instruction can enhance student motivation. By giving learners more autonomy in managing their pre-class learning, the model fosters intrinsic motivation and engagement. Classroom time then shifts towards more meaningful teacher-student and peer-to-peer interactions, further enhancing the learning experience.



**Figure 1.** *Theoretical Framework of a Flipped Classroom*

## **An Overview of Flipped Classroom Research**

Research on the flipped classroom model has expanded significantly over the past decade, investigating its effects on student learning, engagement, and teacher practices. Studies have largely demonstrated positive outcomes, particularly in higher education contexts. A meta-analysis by Cheng et al. (2019) found that flipped classrooms consistently improved student performance, engagement, and satisfaction across disciplines, with the most pronounced benefits in STEM subjects.

In K-12 education, however, findings have been more varied. Lo and Hew (2017) reviewed 55 empirical studies and identified inconsistent results regarding the flipped classroom's effectiveness in primary and secondary schools. Some studies found significant improvements in academic performance (Wei et al., 2020), while others reported no significant differences compared to traditional instruction (DeSantis et al., 2015). Research has generally found that flipped instruction fosters more active learning, student autonomy, and engagement but does not always translate to higher academic performance (Gough et al., 2017).

Teacher perceptions of the flipped classroom also vary. While many educators acknowledge its potential to enhance student engagement and facilitate deeper learning, they also highlight challenges such as increased lesson planning time, students' lack of preparation, and technological barriers (Wanner & Palmer, 2015). Additionally, some students express concerns about increased workload and the need for greater self-discipline when learning independently outside of class (Khanova et al., 2015).

## Gaps in the Literature

Despite the increasing body of research on the flipped classroom model, several gaps remain. First, the majority of studies have been conducted in higher education, with relatively few focusing on K-12 education (Akçayır & Akçayır, 2018). This limits the generalizability of findings to younger students, who may have different learning needs, levels of independence, and cognitive abilities compared to university students.

Second, research examining the effectiveness of flipped classrooms in different subjects has been uneven. Most studies have focused on STEM subjects, particularly mathematics and science (Strelan, Osborn, & Palmer, 2020), with fewer investigating its application in the humanities, including English language arts. Given that flipped learning emphasizes active problem-solving and hands-on learning, its efficacy in skill-based subjects such as English, which rely heavily on critical reading and writing, warrants further exploration.

Third, longitudinal studies on the flipped classroom's sustained impact are scarce. Many existing studies measure short-term effects over a few weeks or months, leaving questions about whether the benefits persist over longer periods (Karagöl & Esen, 2019). It is unclear whether students eventually adapt to the model in a way that leads to lasting improvements in learning outcomes.

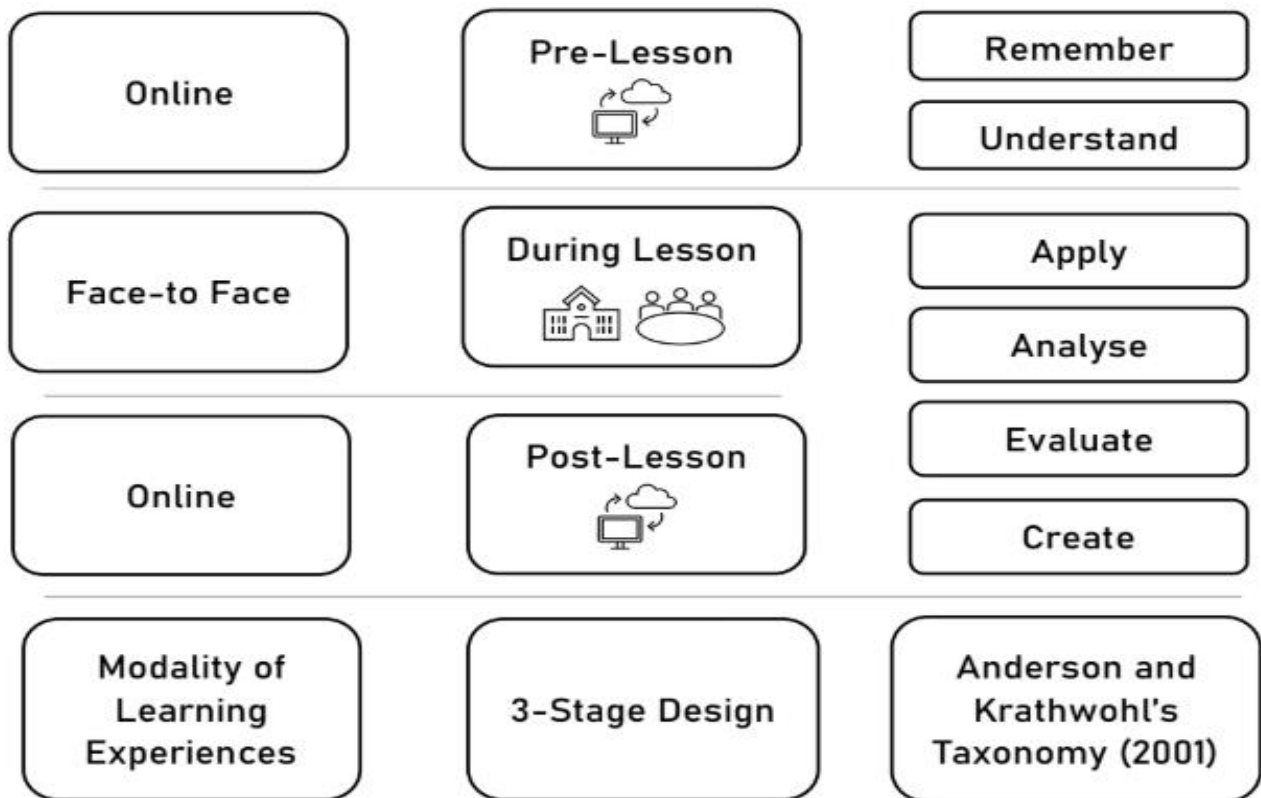
Finally, studies examining the Malaysian K-12 context are limited. While some research has explored flipped learning in Malaysian higher education (Chew et al., 2018; Juhary & Amir, 2018), few studies have investigated its impact in primary and secondary schools (Rahman et al., 2019). Given the distinct characteristics of Malaysia's educational landscape, including curriculum structure, access to technology, and teacher readiness, further research is needed to determine whether findings from international studies are applicable to this context.

## Conceptual Framework

To investigate the impact of the flipped classroom model, this study adopted a three-stage instructional design, adapted from Estes, Ingram, and Liu (2014). This framework structures learning into three sequential stages: pre-lesson, during-lesson, and post-lesson activities, aligning with cognitive and constructivist learning theories.

- 1. Pre-Lesson Stage:** Students engage with new content through instructional videos, readings, or interactive modules before the class. This stage focuses on lower-order cognitive skills such as remembering and understanding, allowing students to gain foundational knowledge at their own pace.
- 2. During-Lesson Stage:** Class time is used for active learning, including discussions, peer collaboration, and problem-solving activities. The teacher facilitates deeper exploration of the topic, addressing misconceptions and guiding students through higher-order thinking tasks such as application and analysis.
- 3. Post-Lesson Stage:** Students engage in reflection, reinforcement activities, and independent projects to extend their learning beyond the classroom. This stage supports consolidation and application of knowledge in new contexts.

This framework optimizes the flipped classroom’s potential by ensuring that learning is structured, scaffolded, and aligned with cognitive processes that enhance retention and application. By employing this model, the present study aimed to assess not only the impact of flipped instruction on academic performance but also its broader implications for student engagement and teacher practices.



*Figure 2. 3-Stage Design of the Flipped Classroom*

## Research Design

This study employs a quasi-experimental research design to assess the impact of the Flipped Classroom on student performance. Quantitative and qualitative data are analyzed, with student assessments measuring academic performance and teacher perceptions explored through Likert-scale and open-ended questions. The dependent variables are student performance and teacher perceptions, while the independent variable is the instructional method (Flipped Classroom).

## Population and Sample

This study was conducted at an IB Middle Years Programme (IB MYP) international school in Malaysia, where the Flipped Classroom model was officially implemented in AY20/21. Due to ethical and logistical constraints, a quasi-experimental design was adopted, following Lancellotti, Thomas, and Kohli (2016), by comparing student performance before and after the flipped instruction's implementation rather than using a control group.

The study involved 184 MYP Year 2 (M2) students aged 11–12, spanning two consecutive cohorts (see table 1 below): AY19/20 (n = 85, control group) and AY20/21 (n = 99, experimental group). All students were enrolled in English Language and Literature classes. The control group comprised students before the school's adoption of flipped instruction, while the experimental group consisted of students after implementation.

Both groups were considered equivalent as they underwent the same placement test, entry requirements, curriculum, and summative assessments. Additionally, both cohorts were taught by the same teachers, ensuring data comparability. Year 2 was selected as the study focus since curriculum and assessment changes in other grades could have compromised comparability.

For teacher perceptions, three English teachers who taught both cohorts were selected to complete the questionnaire, offering insights into instructional challenges and the flipped model's impact.

**Table 1.** *Descriptive Data of the Research Sample*

|                    | <b>Student Cohort</b> | <b>Total</b> |
|--------------------|-----------------------|--------------|
| Control group      | AY19/20               | 85           |
| Experimental group | AY20/21               | 99           |
|                    |                       | 184          |

## Instrumentation

### Academic Performance

Academic performance in this study refers to students' end-of-year grades, derived from assessments recorded in their academic reports. These reports are generated after 42 weeks of instruction, spanning two semesters. In English Language and Literature, performance is assessed through take-home assignments and school-based examinations, evaluated against four MYP criteria: Analysing, Organising, Producing Text, and Using Language. Each student receives a grade from 1 to 7 based on a best-fit approach, reflecting their overall performance for the year. These grades serve as the primary measure of academic performance in this study.

## **Teachers' Perceptions**

Teachers' perceptions of the Flipped Classroom model were examined through a survey questionnaire with 20 items on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The questionnaire, developed by Kiang and Yunus (2021) and validated in a Malaysian context, had a Cronbach's alpha of 0.95, indicating high internal consistency (Vaske, Beaman, & Sponarski, 2017). The first 10 items measured teachers' views on how the Flipped Classroom affects their role, while the next 10 focused on its impact on students' learning. Additionally, an open-ended question explored challenges teachers faced in implementing the Flipped Classroom model in English Language and Literature.

## **Description of the Flipped Classroom Practices**

Before implementing the Flipped Classroom model, instruction at the study site was technology-rich (Dann, 2017), integrating Internet-connected laptops, tablets, and Google Workspace for Education®. Homework was assigned based on student needs and teacher discretion. As an IB institution, the school followed a constructivist, student-centred approach.

In AY20/21, the school adopted a 3-stage Flipped Classroom model to enhance student learning (see figure below). English classes were conducted over three sessions weekly, with each session lasting 80 minutes.

### **1. Pre-Lesson Stage**

- Instructional videos or readings were embedded in Google Forms®.
- Students completed 10 MCQs to frontload factual content and assess prior knowledge.

### **2. During-Lesson Stage**

- MCQ responses were reviewed to address misconceptions.
- Activities included class discussions, role-playing, peer teaching, and writing exercises.
- Mini-lectures were provided when necessary.

### **3. Post-Lesson Stage**

- Students answered 10 questions (MCQs + open-ended) in Google Forms®, targeting higher-order thinking.
- Tasks included literary commentaries, personal reflections, and long-term projects.

Both Pre- and Post-Lesson tasks required 20 minutes. All resources were shared via BeED LMS®, the school's Learning Management System.

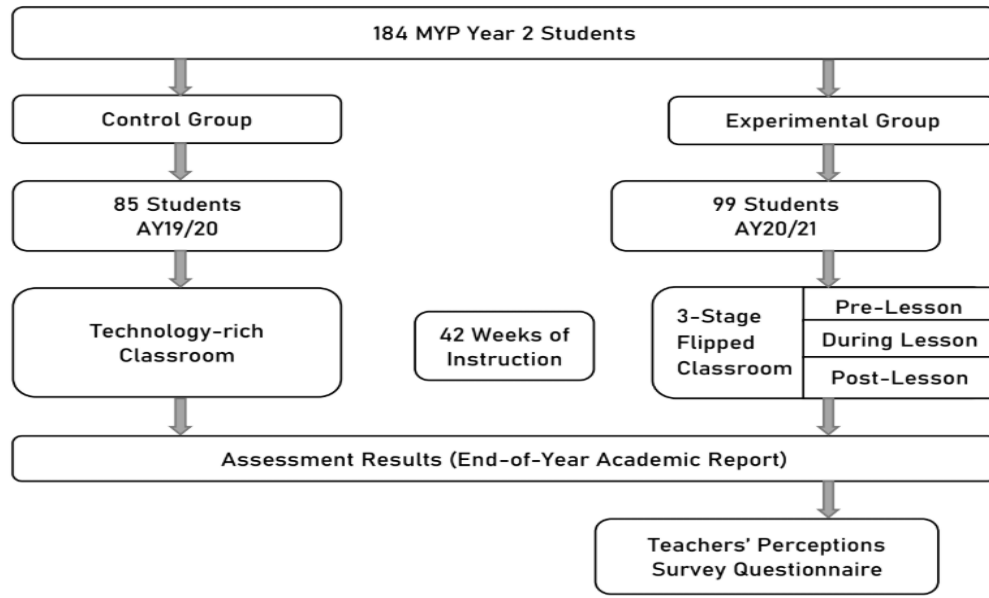


Figure 3. Outline of Research Procedures

## Data Collection

To examine the impact of the Flipped Classroom model on students' academic performance in MYP English Language and Literature, two sets of student performance data were collected: one from AY19/20 (before implementation) and another from AY20/21 (after implementation). Only students who attended classes for the full academic year were included to ensure comparability. Inferential statistics were applied to compare student performance between cohorts.

For teachers' perceptions, a 20-item survey questionnaire with a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) was administered via Google Forms® to three English teachers who taught both cohorts. The questionnaire gathered insights on how the Flipped

Classroom model influenced teaching roles and student learning. Descriptive statistics (frequency, mean, standard deviation) were used to summarize teacher perceptions. A scale developed by Ibrahim, Bakar, Asimiran, Mohamed, and Zakaria (2015), shown in the table 2 below, was also used to better interpret teachers' responses based on the mean scores generated from the questionnaire.

Table 2. Interpretation of Mean Scores

| Mean Score  | Interpretation of Mean Score |
|-------------|------------------------------|
| 1.00 - 2.00 | Low                          |
| 2.01 – 3.00 | Moderately Low               |
| 3.01 – 4.00 | Moderately High              |
| 4.01 – 5.00 | High                         |

To explore the challenges teachers faced, an open-ended question followed the Likert-scale survey, allowing teachers to elaborate on difficulties in adopting the flipped model. Their responses were categorized and analysed thematically.

Student performance data and survey responses were processed using IBM SPSS® Version 29. All collected data were stored securely and processed in a confidential manner. The survey ensured anonymity, and participation was voluntary.

## Findings and Discussion

### Effect of the Flipped Classroom on Academic Performance

The study aimed to investigate whether the flipped classroom model had a significant impact on students' academic performance. The results indicated that there was no statistically significant difference between the control and experimental groups. The mean score for the control group was  $M = 4.72$ ,  $SD = .12$ , while the experimental group had a slightly lower mean score of  $M = 4.60$ ,  $SD = .10$ . A t-test analysis was conducted to determine whether this difference was meaningful, yielding a result of  $t = 0.761$ ,  $p = 0.447$ , indicating no significant effect of the flipped classroom on student achievement. Results are reported in tables 3 and 4 below.

Table 3. Descriptive Statistics for Before and After Implementation of the Flipped Classroom

|                         | Flipped Classroom<br>(FC) | N  | Mean   | Std.<br>Deviation | Std. Error<br>Mean |
|-------------------------|---------------------------|----|--------|-------------------|--------------------|
| Academic<br>Performance | Before FC (Group A)       | 85 | 4.7294 | 1.15870           | .12568             |
|                         | After FC (Group B)        | 99 | 4.6061 | 1.03823           | .10435             |

*Table 4. Independent sample t-test comparison of Group A and Group B Academic Performance Scores*

|                                                 | <b>t</b> | <b>df</b> | <b>p</b> | <b>Mean Difference</b> |
|-------------------------------------------------|----------|-----------|----------|------------------------|
| Group A and Group B Academic Performance Scores | .761     | 182       | .447     | .12335                 |

The results of this study contrast with most research on the Flipped Classroom model, which generally suggests a positive effect on academic achievement (Akçayır & Akçayır, 2018; Cheng et al., 2019; Karagöl & Esen, 2019). However, meta-analyses indicate only small to moderate effect sizes, suggesting that flipped instruction alone may not lead to significant performance gains. In K-12 education, Gough et al. (2017) highlight that the primary benefits of flipped learning lies in student engagement and higher-order thinking, rather than academic performance. Several studies in K-12 settings have also reported no significant difference between flipped and traditional instruction (Cashin, 2016; Dixon, 2017; Sharpe, 2016), indicating mixed results in its effectiveness.

One explanation for these findings is subject specificity. Research suggests that the flipped model is most effective in STEM subjects (Huber & Werner, 2016), where students need to grasp abstract concepts before applying them in class. However, for English Language and Literature, where critical reading and creative writing require guided practice, the model may be less impactful.

Another factor is the duration of implementation. Studies with shorter interventions (Karagöl & Esen, 2019) reported higher gains, possibly due to a novelty effect (R. E. Clark, 1983). This study spanned an entire academic year, meaning students may have become accustomed to the approach, reducing its impact over time. Additionally, pre-lesson quizzes were used to hold students accountable for independent study, yet research suggests that quizzes without immediate feedback may hinder engagement (Wagner et al., 2020). Similarly, the widespread use of a Learning Management System (LMS) could have contributed to cognitive overload, affecting students' ability to manage multiple flipped courses simultaneously. Finally, the constructivist learning environment of the IB framework may explain why flipped instruction provided no additional benefits. Previous studies (Jensen, Kummer, & Godoy, 2015) suggest that flipped learning does not significantly outperform other active learning strategies, indicating a need for further comparative research.

### **Teachers' Perceptions of the Flipped Classroom**

Although the flipped classroom did not significantly enhance academic performance, the qualitative findings from teachers' perceptions suggested that the model had several pedagogical benefits. The mean score for teachers' perceptions of how the flipped classroom changed their role was 3.87 (moderately high), and their perceived impact on student learning had a mean score of 3.80 (moderately high). Teachers generally held positive attitudes towards the flipped classroom, particularly in terms of its impact on their role and students' engagement. The survey results indicated that teachers felt more like facilitators rather than direct instructors, as the flipped model allowed them to focus on guiding discussions, clarifying misconceptions, and engaging students in higher-order thinking tasks (King, 1993).

*Table 5. Teachers' Perceived Impact on Their Role*

| <b>Teacher Perception Aspect</b>                | <b>Mean Score</b> |
|-------------------------------------------------|-------------------|
| Transition from lecturer to facilitator         | 3.87              |
| Ability to engage in deeper student discussions | 3.75              |
| Time available for individualized instruction   | 3.90              |

As demonstrated in Table 5, teachers appreciated the shift in their role from merely delivering content to actively facilitating discussions and providing personalized guidance. This aligns with research indicating that the flipped model supports constructivist learning, where students play a more active role in knowledge construction (Bergmann & Sams, 2012; Staker & Horn, 2012).

This study aligns with prior research, which found that teachers generally view the Flipped Classroom model positively. Gough et al. (2017) reported that teachers believe flipping instruction enhances individualized learning and teacher-student interaction, while Kiang and Yunus (2021) noted its potential for deeper learning despite limited class time. Similarly, Unal, Unal, and Bodur (2021) found that teachers agree flipped instruction promotes collaboration among students. Teachers in this study largely echoed these views, showing strong agreement ( $M = 4.00$ ) on statements related to communication, deeper learning, and collaborative classroom activities. This is expected, given the constructivist foundation of flipped learning, which optimizes in-class time for peer interaction and guided practice (Bergmann & Sams, 2012; Bishop & Verleger, 2013).

However, teachers reported less confidence in their mastery and implementation of the model ( $M = 3.67$  and  $M = 3.33$ ). This supports Gough et al. (2017) and Unal et al. (2021), who emphasize the need for proper teacher training before implementation. Furthermore, subject-specific factors may influence perceptions, as English and social studies teachers tend to be less favourable toward flipped instruction than STEM educators (Unal et al., 2021). Lastly, teachers were only moderately convinced ( $M = 3.67$ ) that flipped learning solves time constraints, highlighting a key challenge—student preparedness, which can affect classroom interactions.

*Table 6. Teachers' Perceived Impact on Students' Learning*

| <b>Learning Outcome Aspect</b>    | <b>Mean Score</b> |
|-----------------------------------|-------------------|
| Increased student engagement      | 3.80              |
| Higher-order thinking development | 3.85              |
| Better classroom discussions      | 3.72              |

From Table 6, it is evident that teachers believed the flipped classroom fostered student engagement and critical thinking skills. However, they also noted that not all students adapted well to the independent learning component. This suggests that flipped learning requires structured scaffolding, especially for younger learners who may struggle with self-paced learning without

sufficient support (Wagner et al., 2020). Teachers in this study expressed moderately high agreement ( $M = 3.80$ ) on the benefits of the Flipped Classroom model for student learning, though slightly lower than their agreement on its impact on teaching practices.

This may be because teachers were already using student-centered strategies, while student learning behaviours required greater adjustment. Teachers strongly agreed ( $M = 4.00$ ) that flipped instruction enhances knowledge construction, active learning, and flexible learning, aligning with findings from Kiang & Yunus (2021), Gough et al. (2017), and Unal et al. (2021). They also agreed that students developed a sense of responsibility for their learning ( $M = 4.00$ ), a trend noted in Hultén & Larsson (2018).

However, teachers were less convinced that students became active participants ( $M = 3.67$ ), prepared for class ( $M = 3.67$ ), or learned more outside class ( $M = 3.67$ ), suggesting challenges with self-regulation, familiarity, or home support (Lai & Hwang, 2016). Concerns were raised about the effectiveness of instructional materials. Teachers were less confident ( $M = 3.67$ ) that pre-lesson videos strengthened understanding, a finding supported by Kettle (2013) and DeSantis et al. (2015). Additionally, the lack of pre-class peer discussion ( $M = 3.33$ ) may have limited collaborative learning, highlighting a gap in the flipped design that future implementations should address.

### **Challenges of Implementing the Flipped Classroom**

Despite the potential benefits, teachers reported several challenges associated with the implementation of the flipped classroom. These challenges echo findings from previous research on the difficulties of transitioning to flipped instruction (Lo & Hew, 2017; Wagner et al., 2020). Teachers identified four key challenges in implementing the Flipped Classroom model: lack of student preparedness, difficulty in curating quality materials, time demands, and internet connectivity issues (see table 7).

The most reported challenge was students not completing pre-lesson tasks, affecting lesson flow and content coverage. Flipped learning relies on student engagement outside class, and unprepared students disrupt the active, collaborative nature of in-class activities (Bergmann & Sams, 2012). Similar issues have been noted in previous research (Chen, 2016; DeSantis et al., 2015; Lai & Hwang, 2016). Some students struggled with self-regulation, while others felt overwhelmed by flipped learning across multiple subjects (Khanova et al., 2015; J. D. Smith, 2013). Teachers also struggled to find quality instructional materials, increasing their workload. One teacher noted, “It’s difficult to find quality materials, and creating them takes time.” Studies confirm that curating and preparing flipped resources is time-consuming (Chen, 2016; Wanner & Palmer, 2015). Additionally, teachers had to develop quizzes, monitor students’ work, and plan remedial activities, adding to their instructional burden (Grypp & Luebeck, 2015).

Lastly, internet connectivity issues affected lesson continuity, particularly for students attempting to complete pre-lesson tasks during class. While the school had a technology-rich environment, inconsistent access still disrupted learning. Similar technological barriers have been widely reported in flipped classroom research (Akçayır & Akçayır, 2018; Lo & Hew, 2017). These challenges highlight the need for better student support, structured preparation, and enhanced resource availability to maximize the benefits of flipped instruction.

Table 7. Highlighted Challenges of Implementing a Flipped Classroom Model

| Highlighted Challenges            | Selected excerpts from teachers' responses                                                                                                                                                                                                                                      |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lack of students' preparedness    | <p>"... students often do not study before coming to class".</p> <p>"Students not completing the pre-lesson tasks, this usually affects the pace of the lesson ... it affects our coverage".</p>                                                                                |
| Lack of relevant quality material | <p>"... finding the right resources for the lesson - it's difficult to find quality materials and if you plan to create one of your own, it might take a while".</p> <p>"It is not just finding resources that takes time, creating</p>                                         |
| Time demands                      | <p>questions for the quizzes, monitoring students' work and planning for follow up activities in the class does too"</p>                                                                                                                                                        |
| Connectivity issues               | <p>"Internet connectivity issues affect the smooth flow of the lesson sometimes."</p> <p>"Students sometimes have trouble accessing the lesson material in class. It is a problem especially when attempting to complete the pre-class activities during the class itself".</p> |

The findings of this study revealed no significant improvement in academic performance as a result of the flip in the instruction. However, teachers perceived the flipped classroom as beneficial in terms of student engagement and facilitating deeper learning discussions. Despite this, they also highlighted several challenges, including students' lack of preparation, teacher workload, and technology-related issues.

### Conclusion and Recommendations

Extensive research has explored the Flipped Classroom model, particularly its impact on academic performance. However, most studies focus on higher education, with limited research in K-12 contexts, especially in Malaysia (Akçayır & Akçayır, 2018; Al-Marroof & Al-Emran, 2021; Lo & Hew, 2017). While research generally suggests that flipped instruction enhances student outcomes, findings in K-12 settings remain inconclusive (Satparam & Apps, 2022; Wagner et al., 2020).

This study aimed to address this gap by comparing the academic performance of Year 2 students in an English course before and after a school-wide flipped classroom implementation. It also investigated teacher perceptions and the challenges faced in adopting the model. Contrary to most studies, results showed no significant difference in academic performance between the control and

experimental groups, with performance slightly in favour of the control group. Teachers generally held positive perceptions of the flipped classroom's impact on their role but agreed less strongly on its benefits for student learning. Four key challenges were identified: lack of student preparedness, difficulty in curating quality instructional materials, increased teacher workload, and internet connectivity issues. These findings align with prior research highlighting similar obstacles in flipped learning environments (Lo & Hew, 2017; Wagner et al., 2020).

However, the study has limitations. It relied on summative assessment data across two academic years rather than a controlled experimental design, which would allow for greater variable control. Additionally, findings are limited to one subject (English), one grade level (Year 2), and one international school, restricting generalizability. Future research should explore other subjects, student levels, and diverse educational contexts, as well as include perspectives from students and school leadership to gain a more comprehensive understanding of the flipped classroom's impact.

The findings of this study have important implications for researchers, teachers, and school leaders.

### **Implications for Research**

This study highlights the inconclusive evidence on the effectiveness of the flipped classroom across all settings (Bergmann & Sams, 2012). Research results remain contradictory, indicating a need for further empirical studies. Additionally, learning gains in flipped environments appear to diminish over time. Future research should investigate whether alternating between flipped and traditional instruction can sustain student engagement and performance. Also, most flipped classroom studies compare it to traditional teacher-centred instruction. However, in environments where active learning is already present, the flipped approach may not offer significant advantages, as seen in this study. This raises the question of whether the benefits of flipped learning simply stem from active learning strategies rather than the flipped model itself (Jensen et al., 2015). More research is required to determine the specific features of flipped instruction that contribute to its effectiveness (Jong, 2017; Tsai et al., 2015).

### **Implications for Teachers**

This study emphasizes the importance of strategic planning when implementing flipped learning to maximize student engagement. Several recommendations can enhance the effectiveness of flipped instruction:

1. Encouraging peer discussion: Providing structured platforms for students to discuss instructional materials outside class can enhance collaborative knowledge construction (Bhagat et al., 2016).
2. Incorporating gamification: Using elements like badges and points can boost motivation and engagement (Hew et al., 2016).
3. Providing immediate feedback: Students should receive instant feedback on pre-lesson tasks to reduce frustration and confusion (Wagner et al., 2020).
4. Being selective about when to flip: Not all topics are suited for flipped learning. Teachers should assess the complexity of topics and student readiness before implementing the model.
5. Fostering self-regulation: Flipped learning requires independent learning skills. Teachers should integrate strategies to develop student self-regulation (Lai & Hwang, 2016).

## Implications for School Leaders

School leaders should approach flipped classroom implementation gradually to avoid overwhelming teachers and students (Brown, 2018; Grypp & Luebeck, 2015). Key considerations include:

1. Assessing feasibility: The flipped classroom demands time, training, and technology. Schools must evaluate whether they have sufficient resources before implementation.
2. Investing in training: Both teachers and students need structured training. Teachers should be tech-savvy and have a strong pedagogical understanding, while students need to develop self-regulation skills.
3. Clarifying expected outcomes: Schools should define the goals of flipped learning. While the model does not consistently improve academic performance, it fosters self-directed learning, responsibility, and collaboration—all essential for student success.
4. Ongoing evaluation: School leaders, teachers, and students should continuously reflect on progress, identifying areas for improvement and ensuring alignment with educational objectives.

Given these findings, it is evident that the flipped classroom is not a one-size-fits-all solution. While it has the potential to foster a more interactive and student-centred learning environment, its effectiveness largely depends on student motivation, technological accessibility, teacher readiness, and organizational support. Therefore, to optimize the impact of the flipped classroom, educators, policymakers, and researchers must address the challenges associated with its implementation and explore ways to enhance its efficacy.

## References

- Abdullah, B., & Azizan, M. T. b. (2017, 13-16 Nov. 2017). *A Flipped Classroom Technique in Improving Students' Grade of Transport Phenomena Course*. Paper presented at the 2017 7th World Engineering Education Forum (WEEF).
- Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: Definition, rationale and a call for research. *Higher Education Research & Development*, 34(1), 1-14.  
<https://doi.org/10.1080/07294360.2014.934336>
- Akçayır, G., & Akçayır, M. (2018). The flipped classroom: A review of its advantages and challenges. *Computers & Education*, 126, 334-345.
- Al-Marroof, R. A. S., & Al-Emran, M. (2021). The effectiveness of flipped learning: A meta-analysis study. *Education and Information Technologies*, 26(6), 6679-6703.
- Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.
- Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. International Society for Technology in Education.

- Bhagat, K. K., Chang, C. N., & Chang, C. Y. (2016). The impact of the flipped classroom on mathematics concept learning. *Educational Technology & Society*, 19(3), 134–142.
- Bishop, J. L., & Verleger, M. A. (2013). *The flipped classroom: A survey of the research*. ASEE National Conference Proceedings, 30(9), 1-18.
- Brown, A. (2018). *Starting small: Implementing the flipped classroom in stages*. Routledge.
- Cashin, W. E. (2016). *Evaluating student learning in flipped classrooms: A synthesis of evidence*. Kansas State University.
- Chen, Y. (2016). The effects of flipped classroom on student achievement and engagement: A meta-analysis. *Educational Technology Research and Development*, 64(4), 755-780.
- Cheng, L., Ritzhaupt, A. D., & Antonenko, P. (2019). Effects of the flipped classroom instructional strategy on students' learning outcomes: A meta-analysis. *Educational Technology Research and Development*, 67(4), 793-824.
- Chew, E., Jones, L. J. N., & Wordley, S. (2018). "Flipping or flapping?" investigating engineering students' experience in flipped classrooms. *On the Horizon*, 26(4), 307-316. doi:10.1108/OTH-04-2017-0014
- Clark, R. E. (1983). Reconsidering research on learning from media. *Review of educational research*, 53(4), 445-459.
- Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education* (8th ed.). Routledge.
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design & analysis issues for field settings*. Houghton Mifflin.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE.
- Dann, B. (2017). *Flipped learning in secondary education: Investigating student perceptions and learning outcomes*. Springer.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Springer Science & Business Media.
- DeSantis, J., Van Curen, R., Putsch, J., & Metzger, J. (2015). The flipped classroom: What's all the hype? *Business Education Innovation Journal*, 7(2), 25–32.

- Dixon, M. (2017). *The effect of flipped classrooms on student engagement and retention rates*. Oxford University Press.
- Estes, M. D., Ingram, R., & Liu, J. C. (2014). A review of flipped classroom research, practice, and technologies. *International HETL Review*, 4(7), 1-8.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019). *How to design and evaluate research in education* (10th ed.). McGraw-Hill.
- Gough, E., DeJong, D., Grundmeyer, T., & Baron, M. (2017). K-12 teacher perceptions regarding the flipped classroom model for teaching and learning. *Journal of Educational Technology Systems*, 45(3), 390-423.
- Grypp, L., & Luebeck, J. (2015). Rotating the classroom: The flipped classroom in college mathematics. *PRIMUS*, 25(8), 687-699.
- Hew, K. F., Huang, B., Chu, K. W. S., & Chiu, D. K. (2016). Engaging Asian students through gamification: The role of challenge, perceived competence, and intrinsic motivation. *Computers & Education*, 107, 1-14.
- Huber, G. L., & Werner, J. (2016). The flipped classroom in higher education: Conceptual and empirical foundations. *Journal of Educational Technology & Society*, 19(2), 56-68.
- Hultén, M., & Larsson, B. (2018). The flipped classroom: Primary and secondary teachers' views on an educational movement in schools in Sweden today. *Scandinavian Journal of Educational Research*, 62(3), 433-443.
- Ibrahim, W. N. A., Bakar, A. R., Asimiran, S., Mohamed, S., & Zakaria, N. S. (2015). Impact of Entrepreneurship Education on the Entrepreneurial Intentions of Students in Technical and Vocational Education and Training Institutions (TVET) in Malaysia. *International Education Studies*, 8(12), 141-156.
- Jensen, J. L., Kummer, T. A., & Godoy, P. D. (2015). Improvements from a flipped classroom may simply be the fruits of active learning. *CBE—Life Sciences Education*, 14(1), 1-12.
- Jong, M. S. (2017). Flipped classroom model in K-12 education: A meta-analysis of student performance outcomes. *British Journal of Educational Technology*, 48(5), 1012-1030.
- Juhary, J., & Amir, Z. (2018). Student perceptions of flipped learning in Malaysian secondary schools. *Malaysian Journal of Learning and Instruction*, 15(2), 123-145.
- Karagöl, İ., & Esen, E. (2019). The impact of flipped learning on student achievement and engagement: A meta-analysis study. *Turkish Online Journal of Distance Education*, 20(3), 60-79.

- Kettle, M. (2013). *Flipped physics*. *Physics Education*, 48(5), 593. doi:10.1088/0031-9120/48/5/593
- Khanova, J., Roth, M. T., Rodgers, J. E., & McLaughlin, J. E. (2015). Student experiences across multiple flipped courses in a single curriculum. *Medical Education*, 49(10), 1038-1048. doi: <https://doi.org/10.1111/medu.12807>
- Kiang, N. H., & Yunus, M. M. (2021). What do Malaysian ESL Teachers Think About Flipped Classroom? *International Journal of Learning, Teaching and Educational Research*, 20(3).
- King, A. (1993). From sage on the stage to guide on the side. *College Teaching*, 41(1), 30-35.
- Lai, C. L., & Hwang, G. J. (2016). A self-regulated flipped classroom approach to improving students' learning performance. *Computers & Education*, 100, 126-140.
- Lancellotti, M., Thomas, S., & Kohli, C. (2016). Enhancing student performance using a flipped classroom approach. *Journal of Marketing Education*, 38(3), 193-208.
- Lo, C. K., & Hew, K. F. (2017). A critical review of flipped classroom challenges in K-12 education. *Educational Research Review*, 22, 50–64.
- Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). SAGE.
- Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford University Press.
- Rahman, S. F. A., Yunus, M. M., & Hashim, H. (2019). An overview of flipped learning studies in Malaysia. *Arab World English Journal*, 10(4).
- Satparam, S., & Apps, S. (2022). Evaluating the flipped classroom model: A longitudinal study in K-12 education. *Education Sciences*, 12(3), 78-92.
- Sharpe, R. (2016). *Evaluating digital education strategies: Flipped classrooms in practice*. Routledge.
- Smith, J. D. (2013). Student perspectives on flipped classrooms: *A case study*. *Educational Technology Research & Development*, 61(4), 651-673.
- Staker, H., & Horn, M. B. (2012). *Classifying K–12 blended learning*: Innosight Institute.
- Strelan, P., Osborn, A., & Palmer, E. (2020). The flipped classroom: A meta-analysis of effects on student performance across disciplines and education levels. *Educational Research Review*, 30, 100314.

- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257-285.
- Tsai, C. W., Shen, P. D., & Lu, Y. J. (2015). Comparing the effects of flipped and conventional learning. *International Review of Research in Open and Distributed Learning*, 16(2), 1-20.
- Unal, A., Unal, Z., & Bodur, Y. (2021). Using Flipped Classroom in Middle Schools: Teachers' Perceptions. *Journal of Research in Education*, 30(2), 90-112.
- Vaske, J. J., Beaman, J., & Sponarski, C. (2017). Rethinking internal consistency in Cronbach's alpha. *Leisure Sciences*, 39(2).
- Vygotsky, L. S., & Cole, M. (1978). *Mind in society: Development of higher psychological processes*. Harvard university press.
- Wagner, M., Gegenfurtner, A., & Urhahne, D. (2020). Effectiveness of the flipped classroom on student achievement in secondary education: A meta-analysis. *Zeitschrift für Pädagogische Psychologie*.
- Wanner, T., & Palmer, E. (2015). Personalising learning: Exploring student and teacher perceptions about flexible learning and assessment in a flipped university course. *Computers & Education*, 88, 354-369. doi: <https://doi.org/10.1016/j.compedu.2015.07.008>
- Wei, X., Cheng, I. L., Chen, N. S., Yang, X., Liu, Y., Dong, Y., . . . Kinshuk. (2020). Effect of the flipped classroom on the mathematics performance of middle school students. *Educational Technology Research & Development*, 68(3), 1461-1484. doi: <https://doi.org/10.1007/s11423-020-09752-x>
- Zainuddin, Z., & Perera, C. J. (2019). Exploring students' competence, autonomy and relatedness in the flipped classroom pedagogical model. *Journal of further and higher education* 43(1), 115-126.

# **A critical review on sustainable leadership and professional learning communities in IB schools**

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## **Abstract**

*This critical review paper explores the role of sustainable leadership and Professional Learning Communities (PLCs) in enhancing teacher professional development within International Baccalaureate (IB) schools. The paper reviews literature on sustainable leadership and PLCs, emphasizing their importance in fostering collaborative learning environments that support continuous teacher growth and improved student outcomes. The IB curriculum, with its focus on inquiry-based learning, global-mindedness, and critical thinking, places significant demands on teachers, necessitating ongoing professional development. Sustainable leadership, characterized by shared decision-making, distributed leadership, and long-term planning, provides the foundation for effective PLCs. These communities enable teachers to collaborate, reflect on their practices, and innovate in their teaching methods. However, the implementation of PLCs in IB schools, particularly in the Asia-Pacific region, faces challenges such as hierarchical leadership structures, cultural norms, and resource constraints. This paper highlights the importance of sustainable leadership in overcoming these barriers and fostering a culture of collaboration and continuous improvement. By integrating theoretical frameworks such as distributed leadership and social constructivism, this paper provides a comprehensive understanding of how sustainable leadership and PLCs can enhance teacher professional development and student outcomes in IB schools.*

**Keywords:** Sustainable leadership, Professional Learning Communities (PLCs), International Baccalaureate (IB), teacher professional development, collaborative learning

## Introduction

The International Baccalaureate (IB) framework is globally recognized for its emphasis on inquiry-based learning, global-mindedness, and critical thinking. These pedagogical principles require ongoing instructional refinement and continuous professional development for teachers (International Baccalaureate Organization [IBO], 2020). Professional Learning Communities (PLCs) have emerged as a key approach to fostering teacher collaboration, reflective practice, and pedagogical growth. By engaging in structured learning communities, educators collectively address classroom challenges, share best practices, and refine instructional strategies (DuFour & Fullan, 2016). However, the long-term sustainability of PLCs in IB schools depends largely on leadership models that prioritize teacher collaboration, professional autonomy, and strategic planning.

Sustainable leadership plays a critical role in embedding PLCs within school culture, ensuring they function as ongoing professional development mechanisms rather than short-term initiatives. Unlike traditional hierarchical leadership models that centralize decision-making, sustainable leadership fosters distributed leadership, capacity-building, and institutional resilience (Hargreaves & Fullan, 2020). In IB schools, this approach supports inquiry-based learning, interdisciplinary collaboration, and student-centered teaching by promoting teacher agency and professional reflection.

A key aspect of sustainable leadership is empowering teachers through professional development. Instead of imposing rigid directives, sustainable leadership actively involves educators in shaping school policies and instructional strategies (Harris & Jones, 2020). IB educators require autonomy to experiment with new teaching approaches that align with the IB Learner Profile. Sustainable leadership facilitates this autonomy by fostering peer mentoring, collaborative decision-making, and structured professional learning. Collegial discussions, interdisciplinary planning meetings, and lesson study groups enable teachers to refine their pedagogical approaches and enhance inquiry-driven learning.

Beyond individual teacher growth, sustainable leadership strengthens institutional capacity by embedding collaboration and reflective practice as long-term norms rather than leader-dependent initiatives (Spillane, 2017). Schools that integrate distributed leadership structures—including teacher leaders, department heads, and instructional coaches—are better equipped to sustain professional development efforts, even during leadership transitions. This approach fosters instructional continuity, resilience, and a collective commitment to student success.

Traditional leadership models, particularly in hierarchical education systems, can hinder the sustainability of PLCs by limiting teacher agency and restricting collaborative professional learning (Wong et al., 2021). In contrast, sustainable leadership balances structure with flexibility, ensuring that educational reforms are initiated and maintained through shared decision-making (Leithwood et al., 2020). Research suggests that IB schools adopting sustainable leadership models are more likely to sustain PLCs, as teachers feel a greater sense of ownership over their professional development and contribute actively to school improvement initiatives (Ng & Tan, 2020).

For PLCs to be effective in IB schools, they must be institutionalized within professional learning frameworks, integrated into teacher workloads, and supported through leadership models that

promote distributed decision-making and teacher-led inquiry. By embedding PLCs into school culture, IB institutions can ensure they remain dynamic, collaborative spaces for continuous professional growth, ultimately enhancing teaching quality and student achievement.

### **Enhancing Inquiry -Based Learning**

IB education is deeply rooted in student-driven inquiry, critical thinking, and real-world problem-solving (IBO, 2019). Unlike traditional content delivery models, IB teaching emphasizes exploration, student agency, and concept-driven learning, making it essential for educators to continuously refine their inquiry-based pedagogical techniques. PLCs provide teachers with a collaborative forum where they can co-design learning experiences, discuss effective instructional scaffolding, and share best practices for facilitating student-led inquiry (Cordingley et al., 2019).

*Through regular PLC discussions, IB educators can engage in collaborative lesson planning that ensures inquiry remains authentic, engaging, and aligned with IB's constructivist philosophy.* Teachers collaborate within Professional Learning Communities (PLCs) to enhance their instructional strategies and foster student-centered learning experiences. One of the key aspects of this collaboration is the development of open-ended questioning techniques, which are essential for promoting critical thinking and encouraging conceptual exploration (DuFour & Fullan, 2016).

By refining their questioning strategies, teachers create an environment where students engage more deeply with subject matter, fostering inquiry-driven learning that aligns with the International Baccalaureate (IB) framework. Additionally, educators within PLCs actively share strategies for integrating formative assessments, ensuring that students receive meaningful and timely feedback throughout the learning process (Cordingley et al., 2019). This continuous assessment approach enables teachers to adapt their instructional methods based on student needs, ultimately enhancing academic engagement and understanding. Furthermore, reflective discussions within PLCs provide an opportunity for educators to analyze classroom challenges and collaboratively explore ways to strengthen student agency in learning activities (Harris & Jones, 2020).

By leveraging collective expertise and engaging in continuous professional dialogue, IB teachers refine their approaches to inquiry-based learning, ensuring that their instructional practices remain dynamic, intellectually stimulating, and aligned with IB's educational philosophy (IBO, 2020).

### **Strengthening IB's Interdisciplinary Framework**

A defining characteristic of International Baccalaureate (IB) education is its holistic and cross-disciplinary approach, which encourages students to synthesize knowledge across subjects and develop a broad understanding of global concepts. This approach is particularly evident in key IB components such as Theory of Knowledge (TOK), the Extended Essay (EE), and project-based learning activities, all of which require interdisciplinary thinking and the ability to make connections between different areas of knowledge (Schmidt & Datnow, 2020). However, effectively integrating these elements into teaching practices necessitates structured collaboration among educators across disciplines.

Professional Learning Communities (PLCs) play a crucial role in facilitating this interdisciplinary curriculum planning by providing a platform for teachers from various subject areas to work together in designing cohesive and interconnected learning experiences. Through collaborative PLC meetings, educators exchange insights on linking key concepts across subjects, ensuring that students recognize the relationships between different fields of study and apply their knowledge in meaningful ways (Cordingley et al., 2019).

Additionally, teachers co-develop shared assessment rubrics that align with IB's global competency model, promoting consistency and coherence in grading practices across disciplines. Cross-subject moderation further ensures that grading standards and student expectations remain aligned with IB's transdisciplinary learning philosophy, reinforcing a more integrative approach to education. By fostering interdisciplinary collaboration within PLCs, IB educators enhance the interconnectedness of their instruction, enabling students to develop real-world problem-solving skills and a deeper appreciation for the complexity of global issues (Hargreaves & Fullan, 2020).

### **Supporting IB's Learner Profile and Pedagogical Continuity**

The IB Learner Profile is a foundational element of IB education, fostering attributes such as reflectiveness, open-mindedness, and intercultural understanding in students (IBO, 2019). However, for these values to be effectively instilled, IB educators must consistently model them through their instructional practices. Professional Learning Communities (PLCs) provide a structured setting where teachers collaboratively explore ways to integrate the Learner Profile into their daily teaching strategies, ensuring that students not only engage with academic content but also develop essential global competencies. Through reflective discussions within PLCs, educators assess the effectiveness of their teaching methods, focusing on cultivating inquiry, curiosity, and a global perspective in students (DuFour & Fullan, 2016).

These discussions enable teachers to refine their pedagogical techniques, ensuring that their instructional approaches align with the IB's holistic educational philosophy. Additionally, PLCs serve as a platform for developing strategies that promote intercultural competence, allowing educators to incorporate international perspectives into lesson plans and create culturally responsive learning environments (Harris & Jones, 2020). By engaging in ongoing professional self-assessment, teachers can continually refine their methods, fostering deeper student engagement and alignment with IB principles. Moreover, PLCs play a critical role in ensuring pedagogical continuity across IB programs by facilitating collaboration between educators teaching at different levels, such as the Middle Years Programme (MYP) and the Diploma Programme (DP).

This cross-program alignment ensures a smooth transition for students as they progress through IB education, reinforcing a coherent and consistent learning experience that upholds the IB's commitment to lifelong learning and inquiry-based education (Cordingley et al., 2019).

## **Institutional Support and the Sustainability of PLCs in IB Schools**

While Professional Learning Communities (PLCs) have proven to be highly effective in enhancing teaching and learning within IB schools, their long-term success is contingent upon strong institutional support and committed leadership. Effective PLCs require dedicated time, structured facilitation, and a deeply embedded culture of collaborative professional development.

However, IB educators often face significant challenges in engaging meaningfully with PLCs due to extensive planning, assessment responsibilities, and curriculum demands (Cordingley et al., 2019). To maximize the impact and sustainability of PLCs, school leaders must integrate them into formal professional development frameworks, ensuring that collaboration is not treated as an optional activity but rather as an essential component of continuous teacher growth.

Moreover, fostering distributed leadership within PLCs is crucial, as it empowers teachers to take ownership of knowledge-sharing and decision-making, ultimately enhancing professional autonomy and instructional innovation (Hargreaves & Fullan, 2020). Institutional commitment must also include the allocation of dedicated time for PLC meetings within teachers' schedules, ensuring that collaboration does not become an added burden but rather a structured opportunity for pedagogical improvement.

Without sufficient leadership investment and resource allocation, PLCs risk becoming superficial initiatives rather than transformative professional learning communities. A strong cultural foundation that prioritizes collaboration and professional growth is therefore essential for sustaining PLCs as a driving force for instructional excellence in IB schools (Harris & Jones, 2020).

## **Challenges in Implementing**

Implementing Professional Learning Communities (PLCs) in International Baccalaureate (IB) schools presents several challenges despite their well-documented benefits. These difficulties are particularly pronounced in the Asia-Pacific region, where institutional leadership structures, cultural expectations, and workload constraints significantly influence teacher engagement and collaboration. The long-term success of PLCs relies on a supportive leadership framework, culturally responsive collaboration models, and the practical integration of PLCs into teachers' professional schedules. Without these critical elements, PLCs may struggle to gain traction or maintain meaningful engagement over time.

A key factor affecting the effectiveness of PLCs is the level of leadership and institutional support provided. While IB schools emphasize progressive, inquiry-driven pedagogy, many still operate within hierarchical leadership models that may not fully embrace teacher-led collaboration (Wong et al., 2021). In cases where PLC participation is treated as an informal or voluntary initiative rather than a structured component of professional development, teacher engagement tends to decline over time. Furthermore, without explicit institutional backing, educators often lack the time, resources, and administrative support necessary to fully engage in PLCs. The demands of curriculum planning, student assessment, and administrative responsibilities frequently compete with professional development opportunities, making it difficult for teachers to prioritize collaborative learning. Research indicates that when leadership does not formally integrate PLCs into the school's long-term professional learning framework, participation becomes inconsistent,

reducing the potential impact of collaborative professional development (Hargreaves & Fullan, 2020).

To overcome these challenges, IB school leaders must adopt sustainable leadership practices that embed PLCs into institutional professional development policies. This requires the allocation of dedicated time within teachers' schedules for PLC engagement, ensuring that professional collaboration is treated as a core instructional practice rather than an additional obligation. Additionally, administrative support must be provided to recognize and institutionalize collaborative planning as an essential component of instructional improvement. Encouraging a distributed leadership model is also crucial, as it empowers teachers to take on leadership roles within PLCs, facilitate discussions, share expertise, and actively participate in decision-making processes.

By formally incorporating PLCs into teacher development frameworks, IB schools can foster long-term engagement, institutional commitment, and a culture of meaningful professional collaboration, ultimately leading to enhanced student learning outcomes (Harris & Jones, 2020).

### **Cultural and Contextual Barriers**

Cultural and contextual factors present significant challenges in implementing Professional Learning Communities (PLCs) in IB schools across the Asia-Pacific region. One of the primary barriers is the influence of hierarchical leadership models and traditional respect for authority, which can limit open peer critique and professional dialogue (Ng & Tan, 2020). Unlike in Western contexts, where teachers may feel comfortable engaging in constructive criticism and challenging pedagogical norms, educators in hierarchical school systems may hesitate to voice concerns, share instructional challenges, or critique existing teaching strategies. This reluctance can impede the collaborative ethos that PLCs seek to establish, as professional learning communities thrive on open discussions and the exchange of ideas.

Additionally, cultural expectations regarding seniority and authority often hinder reciprocal professional learning. In many Asian educational settings, junior teachers are expected to defer to their more experienced colleagues, leading to fewer opportunities for open and egalitarian discussions. This dynamic can restrict the effectiveness of PLCs, as teachers may feel reluctant to question or debate instructional practices, even within structured professional learning discussions (Schmidt & Datnow, 2020). When hierarchical structures dominate professional interactions, it becomes challenging to create an environment where all educators, regardless of their experience level, can contribute meaningfully to collective learning and pedagogical innovation.

To address these cultural barriers, PLC models in IB schools must be adapted to align with culturally responsive leadership structures while still fostering meaningful professional exchange. Rather than expecting teachers to adopt Western-style professional dialogue, schools should implement frameworks that respect hierarchical traditions while encouraging structured collaboration. One effective strategy is facilitating guided discussions in which participation is encouraged but structured in a way that aligns with traditional leadership expectations. Additionally, mentorship-based PLCs, where experienced teachers act as facilitators rather than authoritative figures, can create an environment in which junior educators feel comfortable

contributing. Moreover, integrating cultural norms into PLC design ensures that professional learning communities align with existing expectations surrounding communication, respect, and leadership roles (Ng & Tan, 2020).

By creating culturally sensitive PLC structures, IB schools in the Asia-Pacific region can foster professional collaboration while respecting cultural norms. This approach allows educators to engage in shared learning experiences without feeling constrained by hierarchical traditions, ultimately supporting instructional improvement and professional growth. When PLCs are adapted to the cultural and institutional context of a school, they become more sustainable and impactful, ensuring that all teachers—regardless of experience or position—can engage in meaningful pedagogical development.

### **Time Constraints and Workload**

A significant logistical barrier to the effective implementation of Professional Learning Communities (PLCs) in IB schools is the extensive workload faced by teachers. The IB curriculum is rigorous, requiring educators to engage in curriculum planning, formative and summative assessment, differentiation, and cross-disciplinary collaboration, all while managing regular classroom responsibilities, grading, and student mentoring (Cordingley et al., 2019). Additionally, IB teachers are often expected to participate in professional development initiatives, curriculum review processes, and extracurricular student support activities, further compounding their workload demands. Given these pressures, many educators struggle to find the time and energy for consistent PLC participation, particularly when collaborative meetings are scheduled outside of their regular instructional hours.

In some IB schools, PLCs are treated as supplementary professional development commitments rather than an integrated part of a teacher's work schedule. Consequently, teachers may perceive PLC involvement as an additional burden rather than an opportunity for meaningful professional learning. When PLC sessions compete with existing workload expectations, engagement may decline, limiting the potential for sustained collaboration and instructional improvement (Hargreaves & Fullan, 2020). To address these challenges, IB schools must take a strategic approach to integrating PLC participation into teachers' daily routines, ensuring that collaboration is not seen as an extra responsibility but as an essential component of their professional practice.

One effective strategy is embedding PLC sessions into existing professional learning time so that collaboration becomes a structured and non-negotiable part of the school schedule rather than an added obligation. Schools can also provide workload adjustments or time allowances for teachers who take on leadership roles within PLCs, recognizing their contributions and ensuring that their involvement does not result in excessive workload stress. Additionally, leveraging digital platforms for asynchronous collaboration can allow teachers to engage in discussions, share resources, and participate in instructional planning at flexible times that accommodate their schedules (Ng & Tan, 2020). These solutions help create a more sustainable and balanced approach to professional collaboration, ensuring that PLCs remain an integral part of teacher development rather than an overwhelming commitment.

Despite their potential to enhance teacher collaboration, instructional quality, and student learning outcomes, PLCs in IB schools face several implementation challenges, particularly in the Asia-

Pacific region, where institutional leadership structures, cultural expectations, and workload constraints all play a role. To maximize the impact of PLCs, IB school leaders must take a proactive role in fostering a culture of collaboration by embedding PLCs into structured professional development programs. Schools must also ensure that PLC models are culturally responsive, allowing for constructive dialogue while respecting hierarchical leadership traditions. Finally, effective time management and workload integration are crucial in ensuring that PLC participation is both practical and sustainable for teachers.

By addressing these barriers through targeted leadership strategies, cultural adaptations, and workload-friendly scheduling, IB schools can establish high-functioning PLCs that drive continuous professional learning, support inquiry-based teaching, and ultimately enhance student outcomes. Ensuring that PLCs are embedded within institutional structures and supported through leadership commitment will enable IB educators to engage more fully in collaborative learning, strengthening both teaching practices and student engagement.

### **Empirical Evidence Supporting PLCs in IB Schools**

Recent research has provided compelling empirical evidence supporting the effectiveness of Professional Learning Communities (PLCs) in IB settings. Studies indicate that sustained participation in PLCs enhances both teaching practices and student learning outcomes. For example, Cordingley et al. (2019) found that teachers who engaged in long-term PLC involvement demonstrated higher levels of pedagogical adaptability, which in turn led to increased student engagement. This adaptability allows educators to refine their instructional approaches to better align with IB's inquiry-based framework, fostering a more dynamic and student-centered learning environment. Similarly, Schmidt and Datnow (2020) highlighted that data-informed PLCs significantly improved inquiry-based instruction, particularly in IB schools where performance-based assessment plays a central role. By analyzing student performance data and collaboratively refining teaching strategies, educators within PLCs can ensure that their instructional methods remain responsive to student needs and IB assessment criteria. Additionally, Ng and Tan (2020) observed that PLCs contribute to greater consistency in IB assessment grading and interdisciplinary learning, thereby enhancing student academic performance. By facilitating cross-disciplinary collaboration, PLCs enable teachers to align assessment rubrics and instructional strategies, ensuring coherence and fairness in student evaluations.

Despite these promising findings, there remains a notable gap in research regarding the long-term effects of PLCs on student achievement. While existing studies emphasize short-term improvements in pedagogical practices and assessment alignment, few longitudinal investigations have explored the sustained impact of PLCs on student learning outcomes over extended periods. This gap underscores the need for further research to better understand how PLCs contribute to lasting improvements in both teacher effectiveness and student success in IB schools. Expanding empirical studies in this area will provide valuable insights into the mechanisms through which PLCs drive continuous educational excellence and support IB's mission of fostering lifelong learning.

## **Enhancing Teacher Professional Development in IB Schools**

The integration of Professional Learning Communities (PLCs) and sustainable leadership within International Baccalaureate (IB) schools plays a pivotal role in enhancing teacher professional development. Given that IB education emphasizes inquiry-based learning, global perspectives, and student-centered instruction, teachers must continuously refine their pedagogical strategies, share best practices, and engage in reflective dialogue to improve student learning outcomes (Harris & Jones, 2019). Sustainable leadership ensures that professional development is not treated as an isolated event but is embedded as an ongoing process, fostering a culture of lifelong learning among educators (Fullan, 2021). By combining structured teacher collaboration through PLCs with leadership models that prioritize continuous professional growth, IB schools can create an environment where instructional excellence is consistently cultivated and sustained over time.

PLCs serve as a structured platform for continuous teacher development by facilitating professional discussions, the analysis of student learning data, and the refinement of instructional strategies (DuFour & Fullan, 2016). Within IB schools, PLCs are instrumental in peer mentoring, interdisciplinary collaboration, and curriculum development, aligning closely with the IB's philosophy of inquiry-based education. Collaboration is at the heart of PLCs, as teachers collectively identify challenges in student learning, experiment with new instructional strategies, and refine best practices through action research cycles (Harris & Jones, 2020). Research indicates that when teachers engage in inquiry-driven PLCs, they are more likely to adopt innovative pedagogical techniques and respond effectively to diverse student learning needs (Cordingley et al., 2019).

Another key component of PLCs is peer coaching and mentoring, where experienced teachers guide less-experienced educators in adapting IB-specific pedagogical strategies, differentiating instruction, and integrating formative assessments (Vangrieken et al., 2017). Studies show that peer coaching not only increases teacher confidence in implementing student-centered learning approaches but also enhances overall instructional effectiveness (Dimmock, 2021). Furthermore, PLCs encourage reflective dialogue, allowing teachers to critically analyze their teaching methodologies and systematically assess what works, what does not, and why (DuFour, 2015). By engaging in structured professional discussions, teachers make data-informed instructional decisions, ensuring that their practices remain responsive to student needs (Ng, 2020). This emphasis on shared learning transforms professional development from a sporadic occurrence into an embedded and continuous process, reinforcing IB schools' commitment to pedagogical excellence (Harris & Jones, 2019).

## **Sustainable Leadership's Role in Teacher Development**

Sustainable leadership plays a crucial role in institutionalizing teacher professional development within IB schools by fostering an environment that prioritizes continuous learning, professional collaboration, and innovation. School leaders are responsible for creating structures that support long-term professional growth and ensure that educators are equipped with the necessary tools to enhance instructional effectiveness (Hargreaves & Fullan, 2020). By embedding Professional

Learning Communities (PLCs) into school policies and ensuring that they are an integral part of teacher development, sustainable leadership helps cultivate a culture where professional learning is ongoing rather than episodic.

A fundamental aspect of sustainable leadership is the allocation of dedicated time for PLCs within teachers' schedules, ensuring that collaborative learning is not perceived as an additional burden but as an essential component of professional practice (Timperley et al., 2020). Schools that prioritize structured collaboration time experience higher levels of teacher engagement and more consistent instructional improvement, as educators are given the opportunity to analyze student learning data, refine their teaching strategies, and exchange best practices (Ng & Tan, 2020). Additionally, sustainable leadership ensures that professional development initiatives are aligned with broader school-wide goals, making training sessions more relevant, ongoing, and impactful (Cordingley et al., 2019). In IB schools, this often translates into targeted workshops on inquiry-based learning, interdisciplinary teaching, and international-mindedness, which directly support IB's pedagogical framework (Dimmock, 2021).

Furthermore, sustainable leadership fosters distributed leadership and teacher autonomy, empowering educators to take an active role in their professional growth (Harris & Jones, 2020). When teachers are actively involved in decision-making regarding their own development, they are more likely to engage in lifelong learning and embrace pedagogical innovations (Vescio et al., 2019). A school culture that promotes shared leadership enhances teacher agency, creating an environment where educators feel valued, supported, and motivated to continuously improve their instructional practices (Timperley et al., 2020).

Despite the benefits of PLCs and sustainable leadership, IB schools—particularly in the Asia-Pacific region—face significant challenges in implementing effective teacher professional development programs. One major barrier is the lack of institutional support, as many IB schools treat PLCs as optional or supplementary activities rather than embedding them into structured professional development frameworks (Wong et al., 2021). Without strong leadership commitment, teachers often struggle to find the time and resources necessary for meaningful collaboration, leading to inconsistent participation and limited impact (Ng, 2020). Additionally, hierarchical leadership structures in some IB schools, particularly within Asian educational systems, restrict teacher agency, making it difficult for educators to take initiative in professional learning (Mokhtar et al., 2019). Sustainable leadership encourages a shift toward distributed leadership, which fosters greater teacher involvement in PLCs and ensures that professional learning is teacher-led rather than administratively imposed (Hargreaves & Fullan, 2020).

Another challenge is resistance to change, as some teachers may perceive professional learning as a compliance-driven requirement rather than an opportunity for growth (Ng & Tan, 2020). Overcoming this resistance requires strong leadership communication that highlights the value of collaborative learning and its direct impact on student outcomes. When school leaders emphasize the role of PLCs in improving instructional effectiveness and provide tangible examples of their benefits, teacher buy-in is more likely to increase (Dimmock, 2021).

To maximize the impact of PLCs and sustainable leadership on teacher development, IB schools must implement evidence-based strategies that encourage collaboration, innovation, and reflective practice. One of the most effective approaches is embedding PLCs into school structures so that

professional learning becomes a routine part of teachers' schedules rather than an isolated event (Harris & Jones, 2020; Timperley et al., 2020). Schools that systematically schedule PLC meetings foster a culture of sustained professional development, leading to greater teacher engagement and instructional consistency.

Leveraging technology for professional learning is another crucial strategy, particularly in the context of globalized education. Digital platforms such as Google Classroom, Microsoft Teams, and IB Online Communities enable teachers to engage in real-time knowledge-sharing, collaborative lesson planning, and peer feedback, irrespective of geographical barriers (Dimmock, 2021). Virtual PLCs and online coaching sessions provide additional flexibility, allowing educators from different IB schools worldwide to collaborate and exchange best practices (Ng & Tan, 2020). Integrating technology-enhanced learning platforms thus creates a more dynamic and interactive professional development environment that caters to teachers' evolving needs.

Additionally, developing leadership capacity among teachers is essential for sustaining PLCs. Sustainable leadership does not solely rely on formal school administrators but also on teacher leaders who mentor and guide their colleagues (Cordingley et al., 2019). Schools should provide targeted training in mentoring, facilitation, and professional coaching, empowering educators to become instructional leaders within their PLCs. When teachers assume leadership roles, they develop a greater sense of ownership over their professional learning, leading to increased engagement, collaboration, and motivation (Vescio et al., 2019). By fostering a school culture that values distributed leadership, IB institutions can strengthen peer learning networks, promote professional autonomy, and enhance the overall effectiveness of PLCs.

Ultimately, the integration of sustainable leadership and PLCs in IB schools is instrumental in ensuring that professional learning is continuous, collaborative, and impactful. By embedding PLCs into school structures, leveraging digital tools for professional engagement, and fostering a culture of shared leadership, IB schools can create high-functioning professional learning communities that drive instructional excellence and student success.

## **The Future of Professional Development in IB Schools**

The integration of Professional Learning Communities (PLCs) and sustainable leadership has the potential to transform teacher professional development in IB schools. Research consistently shows that when teachers collaborate in structured learning communities, they refine their instructional strategies, adopt innovative practices, and gain confidence in implementing inquiry-based learning approaches (DuFour & Fullan, 2016). As a result, students benefit from enhanced engagement, a deeper understanding of subject matter, and improved academic performance. By fostering a culture of continuous professional learning, PLCs create dynamic environments where educators engage in reflective practice, share pedagogical insights, and collectively address teaching challenges. This collaborative model ensures that IB educators remain adaptive and responsive to the evolving demands of 21st-century education.

Despite these clear advantages, several institutional and cultural barriers hinder the full implementation of PLCs in IB schools. Limited leadership commitment, hierarchical structures, and teacher resistance remain significant obstacles to effective PLC engagement (Ng, 2020). Many IB schools, particularly in the Asia-Pacific region, continue to operate within traditional top-down

leadership models where teacher autonomy and peer collaboration are not always prioritized. In such environments, professional learning is often viewed as an administrative directive rather than an opportunity for professional growth. Sustainable leadership plays a crucial role in overcoming these challenges by institutionalizing professional learning, fostering a culture of collaboration, and aligning PLC initiatives with IB's mission of lifelong learning (Dimmock, 2021). By embedding PLCs within the broader school framework and ensuring that professional development is both structured and ongoing, sustainable leadership enables schools to create a culture where teacher learning is valued and actively supported.

Moving forward, future research should focus on developing strategies for adapting PLCs to hierarchical educational contexts, particularly in Asia-Pacific IB schools, where cultural norms and administrative structures significantly influence teacher collaboration and professional growth (Wong et al., 2021). Understanding how PLC models can be customized to different cultural and educational landscapes will be essential to ensuring their long-term sustainability. Schools that prioritize sustainable leadership, teacher collaboration, and reflective professional development can establish high-impact learning communities that not only enhance teacher effectiveness but also contribute to long-term educational excellence and student success. By fostering leadership models that encourage shared decision-making and professional autonomy, IB schools can create environments where PLCs become a driving force for continuous improvement in teaching and learning.

### **Improving Student Outcomes through Sustainable Leadership and PLCs**

Improving student outcomes through sustainable leadership and Professional Learning Communities (PLCs) is a key priority in International Baccalaureate (IB) schools. The primary objective of these leadership and professional development frameworks is to enhance teaching quality, increase student engagement, and improve academic performance. Research has consistently demonstrated a strong correlation between teacher collaboration, professional growth, and student success (Vangrieken et al., 2017). Schools that actively support PLCs through well-structured leadership models tend to experience higher levels of teacher engagement, ongoing professional development, and ultimately, better student achievement (Harris & Jones, 2019). Therefore, understanding the mechanisms through which sustainable leadership and PLCs influence student learning is essential to strengthening educational practices.

A major way in which PLCs contribute to improved student achievement is through fostering a culture of teacher collaboration. When teachers work together to refine their pedagogical strategies, align instructional goals, and assess student progress, they are better equipped to respond to students' learning needs (DuFour & Fullan, 2016). Research confirms that collaboration among educators is one of the most influential factors in improving student outcomes, as it enables teachers to engage in shared decision-making, implement data-driven instruction, and continuously refine their teaching methods (Cordingley et al., 2019). One of the key strengths of PLCs is their emphasis on data-driven decision-making, where teachers collectively analyze student performance data, identify learning gaps, and develop targeted interventions to address specific areas of improvement (Timperley et al., 2020). Schools that incorporate data-driven strategies through PLC discussions often observe higher student achievement, particularly in subjects such as literacy and numeracy (Ng, 2020).

Another crucial factor is collective teacher efficacy, which refers to the shared belief among educators that they can positively impact student learning. Hattie (2018) found that collective teacher efficacy has a greater effect size (1.57) on student achievement than most other educational interventions. In high-functioning PLCs, teachers set high expectations, share effective instructional strategies, and support one another in overcoming teaching challenges (Vescio, Ross, & Adams, 2019). This collective effort fosters a positive learning environment that enhances student motivation, engagement, and academic performance. Additionally, within IB schools, PLCs ensure that teaching practices align with IB's inquiry-based curriculum, which emphasizes conceptual understanding, critical thinking, and global-mindedness (Dimmock, 2021). By collaborating in PLCs, teachers can refine assessment strategies, co-develop inquiry-based student projects, and explore differentiated instruction techniques that promote independent learning (Ng & Tan, 2020). As a result, IB students benefit from a holistic, student-centered education that prepares them for complex, real-world challenges.

Sustainable leadership plays a crucial role in enhancing the effectiveness of PLCs by embedding collaborative professional development into school culture. Leadership support is essential in providing teachers with the necessary time, resources, and shared vision for continuous instructional improvement (Hargreaves & Fullan, 2020). One key leadership strategy that improves student learning is encouraging reflective teaching practices. Schools that implement sustainable leadership models actively promote reflective dialogue, where teachers analyze student progress, assess the effectiveness of their teaching strategies, and make necessary adjustments (Harris & Jones, 2020). Research suggests that reflective teaching cycles, in which educators systematically evaluate their instructional impact and refine their approaches, contribute to better classroom engagement, differentiated instruction, and student-centered learning (Cordingley et al., 2019). Another critical aspect of sustainable leadership is ensuring that teachers receive ongoing professional training through PLCs, workshops, and coaching programs (Timperley et al., 2020). Studies show that schools that integrate continuous professional learning into their leadership frameworks experience significant improvements in student performance (Vescio et al., 2019).

Furthermore, sustainable leadership fosters a school-wide culture of collaboration and trust, which encourages teachers to experiment with new instructional approaches and take informed risks (Dimmock, 2021). When teachers feel supported in their efforts to innovate and refine their teaching practices, they become more resilient, adaptable, and committed to continuous improvement, all of which contribute to higher student achievement (Ng, 2020). Empirical evidence from IB schools in the Asia-Pacific region further reinforces the connection between PLCs, sustainable leadership, and student outcomes. For instance, a study by Ng and Tan (2020) in Singaporean IB schools found that institutions with well-structured PLCs demonstrated higher student performance in IB assessments, particularly in Theory of Knowledge (TOK) and Extended Essays (EE). Teachers in these schools reported increased confidence in inquiry-based teaching methodologies, which led to greater student engagement and stronger critical thinking skills. Similarly, research by Wong et al. (2021) in Malaysian IB schools examined the role of collective teacher efficacy within PLCs. The findings revealed that schools with strong leadership support for teacher collaboration saw a 12% improvement in IB exam scores over three years. Moreover, mentoring and peer coaching within PLCs were found to be instrumental in helping teachers develop more effective differentiation strategies, which ultimately benefited diverse student populations.

Despite the proven effectiveness of PLCs in improving student learning, several barriers limit their full impact, particularly in IB schools within the Asia-Pacific region. One major challenge is the presence of hierarchical leadership structures, which can restrict teacher autonomy and limit opportunities for open professional dialogue (Ng, 2020). Sustainable leadership can address this issue by prioritizing PLC meetings as protected time within school schedules, ensuring that teachers can fully engage in collaboration without compromising their instructional responsibilities (Dimmock, 2021). Additionally, shifting away from top-down leadership structures and creating teacher-led PLCs can empower educators to take ownership of their professional learning and development (Wong et al., 2021). Another challenge is the limited availability of time for teachers to engage in PLC activities due to demanding workloads. Leveraging technology for collaboration can help overcome this issue, as digital PLC platforms such as Microsoft Teams, Google Classroom, and IB-specific discussion forums enable teachers to engage in professional dialogue across schools and regions, regardless of time constraints (Timperley et al., 2020). Finally, fostering a culture of trust and open dialogue is essential in ensuring the long-term success of PLCs. School leaders should actively promote an environment where teachers feel safe to share challenges, seek peer feedback, and engage in critical reflection without fear of judgment (Ng & Tan, 2020).

## **Conclusion:**

The integration of Professional Learning Communities (PLCs) and sustainable leadership serves as a powerful framework for enhancing student learning outcomes in IB schools. When teachers collaborate in structured professional learning environments, they refine their instructional approaches, foster student engagement, and contribute to improved academic performance. The collective expertise within PLCs enables educators to implement data-driven instruction, engage in reflective teaching cycles, and develop innovative strategies that enhance student-centered learning.

Despite the evident benefits of PLCs, several barriers hinder their full potential, including hierarchical leadership structures, limited allocated time for collaboration, and resource constraints. To address these challenges, sustainable leadership must be at the core of PLC implementation, ensuring that collaborative learning is deeply embedded within the school culture. By prioritizing continuous professional development and empowering teachers in decision-making processes, sustainable leadership fosters an environment where professional learning is both meaningful and long-lasting.

Looking ahead, IB schools must adopt leadership strategies that sustain PLCs as a long-term mechanism for teacher excellence and student success. A proactive commitment to integrating PLCs into institutional frameworks will enable schools to maximize their impact on teaching and learning. Additionally, future research should focus on refining PLC implementation in diverse educational settings, ensuring that collaborative professional learning remains adaptable, relevant, and impactful across different cultural and regional contexts. By investing in sustainable leadership and fostering a culture of shared professional growth, IB schools can build stronger learning communities that continuously enhance teaching effectiveness and student achievement.

## References

- Cordingley, P., Bell, M., Rundell, B., & Evans, D. (2019). The impact of collaborative professional learning on teacher and student outcomes. *Educational Research Journal*, 45(3), 245-262.
- Dimmock, C. (2021). *Leadership for teacher learning in international education*. Routledge.
- DuFour, R. (2015). *In praise of American educators: And how they can become even better*. Solution Tree Press. DuFour, R., & Fullan, M. (2016). *Cultures built to last: Systemic PLCs at work*. Solution Tree Press.
- Hargreaves, A., & Fink, D. (2018). *Sustainable leadership*. John Wiley & Sons.
- Hargreaves, A., & Fullan, M. (2020). *Professional capital: Transforming teaching in every school*. Teachers College Press.
- Harris, A., & Jones, M. (2019). Leading futures: Global perspectives on educational leadership. *Leadership and Policy in Schools*, 18(4), 584-600.
- Harris, A., & Jones, M. (2020). Teacher professional learning communities: The role of collaborative inquiry and evidence-based practice. *Professional Development in Education*, 46(2), 325-340.
- International Baccalaureate Organization (IBO). (2019). *The IB learner profile: Preparing students for a globalized world*. IBO Press.
- International Baccalaureate Organization (IBO). (2020). *The IB learner profile: Preparing students for a globalized world*. IBO Press.
- Mokhtar, S. M., Ahmad, A. R., & Mahmud, Z. (2019). The challenges of implementing professional learning communities in Malaysian schools. *Management in Education*, 33(4), 155-161.
- Mokhtar, F., Halim, L., & Keeves, J. (2019). Educational leadership and teacher agency in professional learning communities. *Asia-Pacific Journal of Teacher Education*, 47(1), 78-92.
- Ng, P. T. (2020). Singapore's professional development for teachers: The role of PLCs. *Journal of Educational Change*, 21(4), 485-503.
- Ng, S. (2020). Barriers to professional learning communities in hierarchical school systems. *Journal of Educational Leadership*, 47(3), 112-129.
- Ng, S., & Tan, C. (2020). Digital learning communities and collaborative teacher development. *Educational Leadership and Management Journal*, 47(3), 112-129.

- Ng, S., & Tan, C. (2020). Professional collaboration and assessment consistency in IB schools. *Journal of Educational Leadership*, 48(2), 176-193.
- Ng, S., & Tan, C. (2020). The impact of hierarchical leadership structures on collaborative teacher development. *Educational Leadership Journal*, 49(1), 112-128.
- Sahlberg, P. (2020). *Finnish lessons 3.0: What can the world learn from educational change in Finland?* Teachers College Press.
- Schmidt, W. H., & Datnow, A. (2020). Interdisciplinary teaching and learning: Bridging knowledge across subjects. *Journal of Curriculum Studies*, 52(4), 487-505.
- Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2020). *Teacher professional learning and development: Best evidence synthesis iteration*. Ministry of Education.
- Vangrieken, K., Meredith, C., Packer, M., & Da Silva, D. (2017). *A framework for developing and sustaining professional learning communities*. *Educational Research Review*, 21(1), 1-16.
- Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. (2017). *Teacher autonomy and collaboration: A paradox?* *Educational Research Review*, 19, 63-77.
- Vescio, V., Ross, D., & Adams, A. (2019). *A review of research on professional learning communities: What do we know?* *Educational Researcher*, 38(3), 80-89.
- Wong, J., Ng, S., & Tan, C. (2021). The impact of hierarchical leadership structures on collaborative teacher development. *Educational Leadership Journal*, 49(1), 112-128.
- Wong, K., & Liu, X. (2021). Cultural factors influencing the implementation of PLCs in Asian schools. *Journal of Educational Leadership and Policy*, 26(1), 32-45.

# Effective Classroom Management Strategies in International Baccalaureate Education: Balancing Structure and Inquiry

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## Abstract

*This study examines classroom management strategies within the International Baccalaureate Middle Years Programme (IB MYP) and evaluates their effectiveness in fostering student engagement, academic performance, and discipline. Classroom management is a critical aspect of teaching and learning that significantly influences student outcomes. The study employs a qualitative research design, focusing on teachers' perspectives and experiences at an IB MYP school in Malaysia. Data collection included teacher interviews, classroom observations, and student surveys to explore the impact of both traditional and technology-integrated classroom management strategies. Findings reveal that structured learning environments, positive reinforcement, and adaptive strategies enhance student engagement and performance. The study also highlights the role of digital tools in classroom management and the challenges of balancing engagement with discipline. These findings have practical implications for educators and school leaders aiming to implement effective classroom management techniques in IB MYP settings.*

*Keywords: Classroom management, IB MYP, student engagement, technology integration, behavior management*

## Introduction

Classroom management was widely recognized as a crucial component of effective teaching and learning. It encompassed various strategies that educators employed to establish structured, engaging, and productive learning environments. The goal of classroom management was not merely to maintain discipline but to create a positive learning atmosphere that fostered student engagement, enhanced academic performance, and promoted social-emotional growth (Egeberg et al., 2019). In international education settings, particularly within the International Baccalaureate Middle Years Programme (IB MYP), classroom management took on added complexity due to the program's emphasis on student autonomy, inquiry-based learning, and interdisciplinary approaches.

Unlike traditional educational models, the IB MYP encouraged students to develop critical thinking skills, engage in collaborative learning, and take responsibility for their learning process. However, this shift from teacher-centered instruction to a more student-centered approach presented unique classroom management challenges. Teachers needed to balance structure with flexibility, ensuring that students remained engaged while maintaining a disciplined learning environment (Marzano et al., 2018).

Classroom management strategies had evolved significantly over the past few decades. Historically, classroom discipline was based on teacher authority, with strict rules and punitive measures to control student behavior. However, contemporary research advocated for more student-centered approaches, such as restorative practices, positive reinforcement, and relationship-building techniques (Wubbels et al., 2019). These methods fostered intrinsic motivation, encouraged student accountability, and created a more inclusive and respectful classroom environment.

Despite this progress, classroom management remained a persistent challenge for educators. Disruptive behavior, lack of student engagement, and technological distractions were common issues that impacted teaching effectiveness. Moreover, in international schools, the diversity of student backgrounds, learning styles, and cultural expectations further complicated management strategies. Teachers in IB MYP settings needed to navigate these complexities while aligning their practices with the program's emphasis on inquiry, open-mindedness, and global perspectives (Makarova & Herzog, 2021).

The growing integration of technology in education had introduced a new dimension to classroom management. While digital tools such as smartboards, tablets, and learning management systems (LMS) had the potential to enhance instruction, they also posed challenges related to student distraction, misuse of technology, and digital equity. As a result, educators needed to adopt innovative management strategies that regulated technology use while leveraging its potential to support active learning (Fisher et al., 2020).

This paper reports on a study that sought to fill a gap in the literature by examining how teachers navigated classroom management within IB settings, with a focus on student engagement, academic performance, and the role of technology. By analyzing the impact of different management strategies, exploring teacher perspectives, and identifying key challenges, this research aimed to provide practical recommendations for educators and policymakers.

As classrooms continued to evolve with technological advancements and changing pedagogical approaches, understanding effective management strategies remained essential in creating structured, engaging, and inclusive learning environments. This study contributed to the growing field of international education research, offering valuable insights for teachers, school leaders, and education policymakers.

## **Research Significance**

Given the increasing adoption of international curricula such as the IB MYP, it was essential to examine classroom management practices that aligned with the program's pedagogical framework. Existing research on classroom management predominantly focused on traditional schooling contexts, with limited studies specifically addressing its implementation in IB settings. This study aimed to bridge this gap by exploring how IB MYP teachers navigated classroom management challenges while fostering a structured and engaging learning environment.

Effective classroom management had been shown to have a direct impact on student engagement, academic achievement, and social-emotional development. Research indicated that well-managed classrooms contributed to positive student-teacher relationships, increased motivation, and a greater sense of responsibility among students (Ryan & Deci, 2020). By investigating classroom management in an IB MYP school, this study provided valuable insights for educators, school administrators, and policymakers interested in optimizing teaching and learning experiences.

Additionally, the study contributed to the field of educational research by highlighting best practices that supported student-centered and inquiry-driven learning. With the IB framework emphasizing global citizenship, critical thinking, and interdisciplinary learning, understanding effective classroom management strategies within this context helped educators enhance their teaching methodologies (Dweck & Yeager, 2019).

The findings of this research also informed teacher training and professional development programs. Many educators transitioning to IB schools struggled to adapt to the program's unique pedagogical demands. By identifying successful management techniques, this study helped guide teacher training initiatives that equipped educators with the skills needed to manage IB classrooms effectively.

## **Research Objectives and Questions**

This study was guided by three main objectives, each addressing a critical aspect of classroom management in IB MYP settings:

1. To analyze the impact of classroom management strategies on student engagement and academic performance – Classroom management played a crucial role in shaping student behavior and learning outcomes. By examining different strategies, this research sought to determine which approaches were most effective in fostering engagement and improving academic performance in IB classrooms.
2. To explore the role of technology in classroom management – As digital tools became increasingly integrated into education, it was important to assess their impact on classroom dynamics. This research investigated how technology influenced student engagement, learning behavior, and classroom discipline, as well as the challenges it presented.
3. To identify challenges teachers faced in implementing effective classroom management strategies – Teaching in an IB MYP setting came with unique challenges, including managing diverse student populations, balancing structure with inquiry-based learning, and addressing

technology-related disruptions. This study aimed to identify the most pressing challenges teachers faced and propose solutions for overcoming them.

Correspondingly, the research sought to answer the following questions:

RQ1: How did different classroom management strategies impact student engagement and academic performance in IB MYP settings?

RQ2: What were teachers' perceptions of classroom management strategies in IB classrooms?

RQ3: What challenges did teachers encounter in managing an IB classroom?

These research questions guided data collection and analysis, ensuring a comprehensive understanding of effective classroom management practices in IB schools.

### **Scope of the Study**

This study was conducted in an IB MYP school in Malaysia, focusing on middle school students and teachers. The research was designed to examine both traditional and modern classroom management approaches, offering a balanced perspective on what worked best in IB settings.

Traditional classroom management strategies, such as structured rules, positive reinforcement, and behavior monitoring, were analyzed to assess their effectiveness in maintaining discipline and fostering student engagement. Additionally, the study explored modern approaches that incorporated technology, collaborative learning, and differentiated instruction.

The IB MYP provided a unique context for studying classroom management due to its emphasis on student agency, interdisciplinary learning, and inquiry-based pedagogy. Unlike traditional curricula, the IB MYP encouraged students to take ownership of their learning, requiring teachers to adopt more flexible and student-centered management strategies (Hattie, 2019).

While the findings of this study provided valuable insights into best practices for classroom management within the IB framework, it was important to acknowledge that the results might not be directly generalizable to all educational settings. Factors such as school culture, student demographics, and teacher training programs influenced the effectiveness of different management strategies.

Nonetheless, the study aimed to contribute to the growing body of research on international education by offering practical recommendations for educators seeking to enhance their classroom management practices. The insights gained were particularly useful for teachers transitioning to IB schools, school administrators designing professional development programs, and policymakers interested in optimizing learning environments.

## **Literature Review**

Classroom management plays a fundamental role in shaping student engagement, academic success, and overall learning experiences. Effective classroom management strategies not only ensure discipline and structure but also foster a positive learning environment that enhances student motivation and participation (Wubbels et al., 2019). Within the International Baccalaureate Middle Years Programme (IB MYP), classroom management must balance teacher-directed instruction with student autonomy, inquiry-based learning, and collaborative engagement (Hallinger & Lee, 2020).

Historically, classroom management strategies were rooted in authoritarian models, where discipline and compliance were prioritized over student autonomy. However, contemporary research emphasizes the importance of self-regulation, intrinsic motivation, and collaborative learning (Marzano et al., 2021). Given the unique characteristics of the IB MYP, where student-centered learning and international-mindedness are central, it is crucial to examine how traditional classroom management strategies can be adapted to align with the principles of student engagement and active learning.

### **Evolution of Classroom Management: From Behaviourism to Student-Centred Approaches**

Classroom management was predominantly grounded in behaviourist principles, which emphasized punitive discipline, compliance, and teacher authority (Skinner, 1953). This model positioned the teacher as the sole enforcer of order, where strict rules, clear expectations, and immediate consequences were the primary means of maintaining classroom discipline (Emmer & Evertson, 2017). While this approach was effective in creating structured and orderly classrooms, it often came at the expense of student autonomy, limiting their ability to make choices and engage in self-directed learning.

Over time, educational philosophies shifted towards student-centred approaches, recognizing the importance of motivation, engagement, and individualized learning. Modern classroom management strategies incorporate positive reinforcement, structured routines, and relationship-building, all of which have been linked to higher student engagement and improved learning

outcomes (Marzano et al., 2021). In the context of the IB Middle Years Programme (IB MYP), effective classroom management requires a balance between structure and inquiry-based learning, ensuring that students have clear expectations while retaining autonomy in their learning process.

### **Criticism of Traditional Classroom Management Strategies**

Despite its effectiveness in maintaining order, traditional classroom management strategies have been criticized for several reasons such as, Lack of Student Autonomy: Research has shown that overly structured and teacher-directed management approaches can undermine self-determination, limiting students' ability to make decisions about their learning (Ryan & Deci, 2020). This is particularly concerning in student-centred models like the IB MYP, where independence and self-regulation are essential components of the learning process.

**One-Size-Fits-All Approach:** Traditional classroom management strategies often fail to account for differentiated learning needs, particularly in multicultural and international school settings (Hattie, 2021). In diverse classrooms, students come from various cultural backgrounds, have different learning styles, and respond differently to discipline and engagement strategies. A rigid, standardized approach may not be suitable for all learners, leading to disengagement and reduced participation.

**Reduced Intrinsic Motivation:** Studies have indicated that an overemphasis on compliance and extrinsic rewards, such as punishments, incentives, and rigid structures, can negatively impact students' intrinsic motivation (Wubbels et al., 2019). When students are conditioned to behave solely for external rewards or to avoid punishment, they may lose interest in learning for its own sake. This contradicts the self-determination theory (SDT), which posits that autonomy, competence, and relatedness are fundamental to sustaining motivation and engagement in learning (Deci & Ryan, 2020).

### **Moving Towards a Balanced Classroom Management Approach**

Given these limitations, it is essential to adapt traditional classroom management strategies in ways that align with principles of autonomy, engagement, and student-centered learning. In IB MYP settings, educators must incorporate inquiry-based learning, personalized instruction, and relationship-building strategies while still maintaining clear expectations and structured routines.

This approach ensures that students remain engaged, motivated, and empowered in their learning journey, without compromising classroom order and discipline.

By examining how traditional classroom management techniques can be modified to support autonomy, student engagement, and differentiated instruction, this study contributes to developing more effective and adaptive strategies for modern IB MYP classrooms.

### **Theoretical and Conceptual Frameworks**

This study was grounded in two key theories that relate directly to IB MYP classroom management strategies:

#### **i. Self-Determination Theory (SDT) (Deci & Ryan, 2020)**

SDT emphasizes intrinsic motivation as a critical component of student engagement and learning. It suggests that students perform best when they experience autonomy, competence, and relatedness in their learning environment. This framework guided the analysis of how classroom management strategies foster student motivation in IB classrooms.

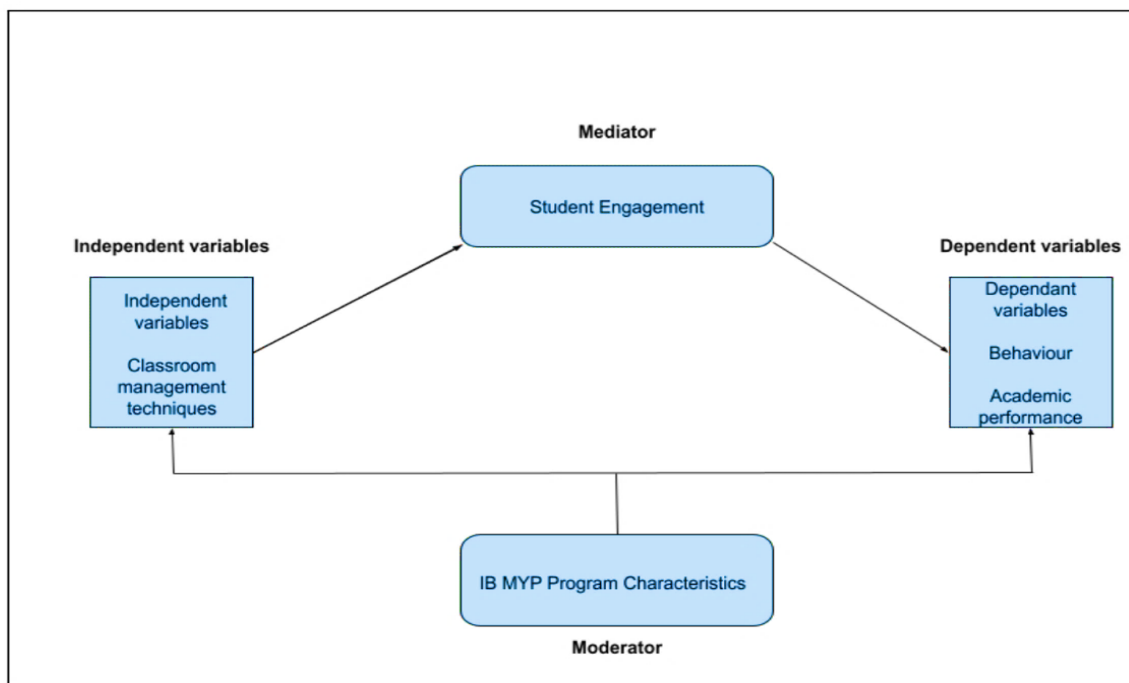
ii. Socio-constructivism (Vygotsky, 1978)

This theory highlights the role **of** social interaction and collaboration **in** knowledge construction. In IB MYP classrooms, where inquiry-based learning is a core philosophy, socio-constructivism provides a lens to explore how teacher-student interactions and collaborative tasks enhance classroom management.

### Conceptual Framework

The conceptual framework illustrates the relationship among three variables: classroom management strategies, IB MYP programme characteristics, and student engagement and performance within the IB MYP setting.

Visual Representation of Conceptual Framework:



Note. This model is improved from the academic performance model of Zhang et al, (2024)

*Figure 1 interaction between classroom management, IB MYP characteristics, and student performance (Zhang et al ,2024)*

## Technology Integration in Classroom Management

The use of technology in IB classrooms has redefined classroom management, offering both opportunities and challenges. Digital learning platforms, AI-powered assessments, and interactive apps enhance student engagement but require strong management strategies to avoid digital distractions (Fisher et al., 2021).

The benefits of technology for classroom management consist of an increased of student engagement, where **gamification** and digital collaboration tools improve motivation (Selwyn, 2022). Real-Time feedback also supports AI-driven learning platforms that offer immediate feedback, helping students adjust their learning strategies (Hattie, 2021).

*Table 1: Identified Gaps in the Literature on Classroom Management in IB MYP*

| Gap                                                   | Description                                                                                                                                                                | Supporting References  | Future Research Needs                                                                                                       |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Limited Research on IB MYP Classroom Management       | Most classroom management research focuses on traditional public schools, with minimal exploration of IB MYP settings.                                                     | Hallinger & Lee (2020) | More studies are needed to analyse how IB MYP classrooms implement management strategies in diverse international settings. |
| Impact of Technology on IB MYP Discipline             | While technology integration in education is well-documented, studies rarely address how IB MYP educators manage digital distractions and ensure effective use.            | Selwyn (2022)          | Research should investigate the challenges and strategies for managing digital behaviour in IB classrooms.                  |
| Long-Term Effects of Classroom Management Adaptations | Studies primarily assess short-term impacts on student behaviour, with limited data on how management strategies affect student engagement and academic success over time. | Marzano et al. (2021)  | Longitudinal studies should explore the sustained impact of different management approaches within IB MYP environments.     |

## **Methodology**

### **Research Design**

This study employed a qualitative research design, using a case study approach to examine classroom management strategies in an International Baccalaureate Middle Years Programme (IB MYP) school in Malaysia. A qualitative case study approach was chosen because it allows for an in-depth, contextualized understanding of teacher practices, student engagement, and the impact of classroom management strategies in a real-world educational setting (Creswell & Poth, 2018). A case study methodology is particularly suited for this research, as it facilitates the exploration of complex phenomena within their natural contexts (Yin, 2018).

### **Participant Selection and Data Collection**

This study was conducted at an International School in Johor Baharu, Malaysia, a prominent IB World School offering the MYP framework. The participants included IB MYP **teachers and students** who had direct experience with various classroom management strategies.

### **Sampling Technique**

A purposive sampling strategy (Patton, 2015) was used to ensure that participants had relevant experience with IB MYP teaching practices and classroom management. The study included, six IB MYP teachers who were actively involved in teaching middle school students and thirty students from different MYP year levels, ensuring a diverse representation of classroom experiences.

### **Data Collection Methods**

Three primary data collection methods were employed:

i. **Teacher Interviews:** Semi-structured interviews were conducted with six IB MYP teachers to gather insights into their classroom management strategies, their challenges, and their perceptions of student engagement. The interviews lasted 30–45 minutes and included open-ended questions to allow for rich, descriptive responses (Kvale & Brinkmann, 2015).

Sample questions included:

How do you establish rules and expectations in your classroom. What classroom management techniques do you find most effective in IB settings? How does student engagement differ when using inquiry-based learning approaches?

ii. **Classroom Observations:** Direct non-participant observations were conducted in six different MYP classrooms over a period of four weeks. Each observation lasted 40–60 minutes, covering multiple teaching periods. Observations focused on, teacher-student interactions, classroom organization and routines. Student engagement levels during different teaching approaches.

Further, a structured observation checklist was used to ensure consistency across observations (Wragg, 2013).

iii. Student Surveys: A structured survey was administered to 30 IB MYP students, incorporating Likert-scale and open-ended questions to gather their perspectives on classroom management practices. Survey items included:

How clearly do you understand the rules and expectations in your classroom?

How often do you feel engaged in classroom activities?

What classroom strategies help you stay focused and motivated?

The survey responses provided additional context to support the findings from interviews and observations.

### **Ethical Considerations**

This research adhered to ethical guidelines for educational research as outlined by the British Educational Research Association (BERA, 2018). Key ethical considerations included:

**Informed Consent:** All participants (teachers and students) provided informed consent before participating in the study. For students under 18, parental consent was obtained in addition to student assent.

**Confidentiality and Anonymity:** All participant data were anonymized to ensure privacy. Pseudonyms were assigned to protect the identities of students and teachers.

**Voluntary Participation:** Participants were informed that their involvement was voluntary, and they could withdraw at any stage without consequences.

**Data Security:** All collected data were stored securely in password-protected files and were accessible only to the researcher.

### **Data Analysis**

A thematic analysis approach (Braun & Clarke, 2019) was conducted using **Atlas. ti** which facilitated data coding and pattern recognition. The analysis process involved:

1. Transcribing interview and observation data for textual analysis.
2. Coding data into meaningful categories based on emerging themes.
3. Identifying patterns related to classroom management strategies, student engagement, and teacher challenges.
4. Triangulating findings by cross-referencing interview, observation, and survey data for validation.

## Findings and Discussion

The study revealed that traditional classroom management strategies, such as setting clear expectations, enforcing structured routines, and utilizing positive reinforcement, played a crucial role in maintaining discipline and enhancing student performance. Teachers who consistently communicated behavioural expectations and academic goals at the beginning of each lesson reported fewer instances of disruptive behaviour. This finding aligns with Marzano et al. (2018), who emphasized that structured environments contribute to student engagement and academic achievement.

One teacher shared their perspective on the impact of setting clear expectations:

*"When students know exactly what is expected of them, they feel more secure, and this leads to fewer behavioural issues in class."* (Teacher A, Interview 3)

Furthermore, the use of positive reinforcement—including praise, reward systems, and constructive feedback—was found to be an effective strategy in shaping student behaviour. Several teachers reported that students responded more positively to encouragement than punitive measures. This observation is consistent with Ryan and Deci's (2020) Self-Determination Theory, which highlights the importance of motivation and positive feedback in student learning outcomes.

However, some educators noted that traditional strategies alone were not sufficient for managing a highly diverse classroom in the IB MYP context. Given the emphasis on inquiry-based and student-centered learning, teachers often had to adapt their strategies by incorporating flexibility into classroom management techniques.

One participant stated:

*"We can't just rely on strict rules; IB students thrive when they are given autonomy. Our management strategies have to balance structure and freedom."* (Teacher B, Interview 5)

*Table 2: Teacher-Reported Effectiveness of Traditional Classroom Management Strategies*

| Strategy               | Reported Effectiveness (%) | Observed Impact                                   |
|------------------------|----------------------------|---------------------------------------------------|
| Clear Expectations     | 85%                        | Reduced behavioural disruptions, increased focus  |
| Structured Routines    | 80%                        | Improved student organization and task completion |
| Positive Reinforcement | 90%                        | Increased student motivation and engagement       |

| Strategy          | Reported Effectiveness (%) | Observed Impact                                        |
|-------------------|----------------------------|--------------------------------------------------------|
| Punitive Measures | 45%                        | Temporary compliance but negative classroom atmosphere |

While the majority of teachers found clear expectations (85%) and structured routines (80%) effective, punitive measures had the lowest reported effectiveness at 45%, indicating that strict discipline was not as effective as positive reinforcement in fostering long-term student engagement.

### Student Perspectives on Engagement and Classroom Management

Student responses indicated that engagement levels were strongly influenced by the type of classroom management approach employed by teachers. Inquiry-based strategies that allowed students to take ownership of their learning fostered a more engaged classroom environment. Many students expressed that they were more motivated in classes where teachers integrated real-world applications and encouraged discussion rather than strictly adhering to traditional lecture-based methods.

One student remarked:

*"I learn best when I get to explore topics in my own way. When teachers just lecture, I find it hard to stay focused."* (Student 4, Survey Response)

One student expressed this concern:

*"Sometimes I don't know what exactly I should be doing because we have too much freedom. I need more guidance."* (Student 12, Survey Response)

Additionally, students highlighted the importance of teacher-student relationships in determining their engagement levels. Instructors who demonstrated approachability, provided individualized support, and maintained a positive classroom climate were perceived as more effective in managing classroom behaviour. This aligns with studies by Hattie (2019), which emphasize that strong teacher-student relationships significantly impact student success.

However, some students also noted that the increased autonomy in IB classrooms sometimes led to confusion regarding expectations. This suggests that while student-centred learning enhances engagement, it requires clear structure and guidance from educators to be effective.

Table 3: Student Perceptions of Classroom Management Strategies

| Classroom Management Approach | Engagement Level (%) | Reported Student Benefits                |
|-------------------------------|----------------------|------------------------------------------|
| Traditional (Lecture-Based)   | 50%                  | Predictability, structured learning      |
| Inquiry-Based                 | 85%                  | Higher motivation, deeper understanding  |
| Collaborative Learning        | 78%                  | Peer interaction, problem-solving skills |
| Technology-Integrated         | 82%                  | Interactive learning, flexibility        |

Inquiry-based and collaborative learning strategies had the highest engagement levels among students, reinforcing the notion that active participation enhances motivation and comprehension. However, traditional lecture-based approaches had a lower engagement rate (50%), indicating that students prefer interactive and exploratory learning environments.

### Technology Integration in Classroom Management

A significant finding from the study was the dual impact of technology in classroom management. On one hand, the use of digital tools, such as interactive whiteboards, learning management systems (LMS), and educational applications, enhanced personalized learning experiences. Teachers who incorporated technology into their lesson planning reported higher student participation, particularly in subjects requiring visual and interactive elements.

One teacher noted:

*"Technology allows me to reach students in ways I never could before. Interactive activities keep them engaged and excited to learn."* (Teacher C, Interview 7)

However, challenges associated with digital distractions were also highlighted. Students often found it difficult to maintain focus when using devices such as tablets and laptops, as access to non-educational content posed a risk. This finding is consistent with previous research by Fisher et al. (2020), which suggests that while technology can enhance engagement, it must be carefully managed to prevent misuse.

A student commented:

*"It's really tempting to check social media when we use our devices in class. Sometimes I get distracted and fall behind."* (Student 8, Survey Response)

*Table 4: Teacher Strategies for Managing Digital Distractions*

| Strategy                      | Reported Use (%) | Effectiveness (%) |
|-------------------------------|------------------|-------------------|
| Establishing clear guidelines | 88%              | 85%               |
| Using monitoring software     | 70%              | 78%               |
| Encouraging self-regulation   | 65%              | 72%               |

The most commonly used strategy to mitigate digital distractions was setting clear guidelines (88%), with 85% of teachers reporting its effectiveness. However, some educators also relied on monitoring software (70%) and encouraging self-regulation (65%), although the effectiveness of self-regulation was slightly lower at 72%.

Teachers implemented various strategies to mitigate digital distractions, including, establishing clear guidelines on technology use (e.g., designated device-free times) to using monitoring software to track engagement and ensure students remain focused and encouraging self-regulation and digital literacy skills to help students manage their own behavior

Overall, the integration of technology in classroom management was found to be beneficial when balanced with structured guidelines. While technology enhanced student engagement, unmonitored use led to distractions. Therefore, educators need to implement clear policies and monitoring systems to maximize its effectiveness.

## **Conclusion and Recommendations**

The research identified three major findings:

- i. Traditional classroom management strategies remain effective

Clear expectations, structured routines, and positive reinforcement significantly contributed to maintaining discipline and improving student performance. Teachers who clearly communicated their rules and expectations experienced fewer behavioural disruptions and a more focused learning environment.

However, punitive measures, such as detention or strict disciplinary actions, were found to be less effective and, in some cases, counterproductive. While they temporarily ensured compliance, they often created a negative classroom atmosphere that discouraged student participation and engagement.

ii. Student engagement is closely linked to teacher approachability and instructional method

Inquiry-based learning strategies fostered higher engagement, as students preferred active and interactive learning experiences over traditional lecture-based approaches. Teacher approachability played a crucial role in classroom management. Students reported feeling more engaged when teachers provided individualized support, encouraged discussions, and demonstrated enthusiasm in their teaching methods.

However, some students expressed confusion due to increased autonomy, emphasizing the need for clear guidance from teachers in IB MYP classrooms, where student-led learning is emphasized.

iii. Technology plays a crucial but complex role in classroom management

Digital tools, such as interactive whiteboards, learning management systems (LMS), and educational applications, enhanced engagement and personalized learning. Teachers noted that students participated more actively in technology-enhanced lessons, particularly in visually and interactively rich subjects.

However, the study also found that technology introduced significant distractions. Many students struggled to stay focused due to the temptation of non-educational content, requiring structured technology management strategies.

## **Implications of the Study**

The findings of this study have significant practical, theoretical, and policy implications for educators, school administrators, and education policymakers.

i. Implications for Educators

**Balancing Structure and Flexibility in IB MYP Classrooms:** While structured classroom routines and clear expectations contribute to discipline, IB teachers must also provide opportunities for autonomy and student-driven inquiry. Teachers should blend traditional discipline with inquiry-based approaches, ensuring students have enough guidance without stifling their independence.

**Developing Strong Teacher-Student Relationships**

The research highlights the importance of teacher approachability in student engagement. IB educators should prioritize relationship-building by offering individualized feedback, maintaining open communication, and fostering a collaborative classroom culture.

## Managing Digital Distractions with Clear Guidelines

While technology serves as a powerful tool for enhancing learning experiences, it also introduces the risk of digital distractions, which can hinder student engagement and classroom productivity. To address this challenge, educators must establish clear digital guidelines that regulate technology use within learning environments. One effective strategy is to implement device-free times during direct instruction, ensuring that students remain focused on teacher-led discussions and explanations. Additionally, the use of classroom monitoring tools, such as software that tracks on-task behaviour, can help educators identify students who may be distracted and provide timely interventions (Selwyn, 2022).

Moreover, teaching digital literacy should be an integral part of the curriculum, as it encourages students to develop responsible technology habits, such as managing screen time and using digital resources ethically (Fisher, Frey, & Hattie, 2021). These structured approaches create a balanced technological learning environment where digital tools support, rather than hinder, classroom engagement.

### ii. Implications for School Administrators

Given the complexity of managing an IB MYP classroom, schools should prioritize ongoing professional development for teachers. Educators require specialized training to implement effective classroom management strategies that align with the IB philosophy. Training programs should focus on managing student autonomy, as IB classrooms emphasize independent learning and inquiry-based instruction (Hattie, 2021). Additionally, teachers should be equipped with strategies for engaging students in inquiry-based learning, allowing them to facilitate discussions, encourage critical thinking, and guide student-led projects effectively (Hallinger & Lee, 2020). Furthermore, training should incorporate technology integration techniques that help educators balance engagement with discipline, ensuring that digital tools are used to enhance learning without becoming a source of distraction (Marzano et al., 2021).

The study highlights the importance of well-managed technology use in IB classrooms. To support teachers in implementing structured and engaging learning environments, school administrators must allocate adequate resources for interactive whiteboards, Learning Management Systems (LMS), and digital monitoring tools. These technologies facilitate personalized instruction, collaboration, and content accessibility, making them essential for modern classroom management (Selwyn, 2022).

Additionally, developing school-wide technology policies is critical to guiding students in responsible digital usage. Schools should create policies that outline acceptable technology behaviors, set limitations on screen time, and provide guidelines for online interactions within academic settings (Ryan & Deci, 2020). Establishing these standardized policies ensures consistency across classrooms, fostering a structured yet technology-enhanced learning environment.

A consistent and supportive classroom management policy is essential for maintaining a balanced learning environment that aligns with IB MYP principles. Schools should develop policies that prioritize positive reinforcement over punitive measures, as research suggests that rewarding desirable behaviors is more effective in shaping long-term student engagement (Wubbels et al., 2019). Additionally, clear behavioral expectations should be established to promote discipline while maintaining a student-centered approach. These expectations should

emphasize collaboration, mutual respect, and academic responsibility. Finally, school administrators should support teachers in maintaining structured yet flexible learning environments that allow students to take ownership of their learning while ensuring classroom order and discipline (Marzano et al., 2021).

### iii. Implications for Policymakers

The findings of this study indicate that classroom management training should be integrated into teacher preparation programs, especially for educators working in international and IB settings. Given the IB MYP's emphasis on inquiry-based learning and student autonomy, pre-service teacher training should focus on managing diverse learning environments, balancing student independence with structured guidance, and implementing effective engagement strategies. Additionally, training should address technology integration, equipping future teachers with skills to leverage digital tools effectively while maintaining classroom discipline (Fisher et al., 2021). By embedding these competencies into certification programs, educators will be better prepared to manage IB classrooms and create optimal learning conditions.

To support schools in implementing effective technology-based classroom management strategies, policymakers should develop national or regional guidelines for the integration of digital tools into curricula. These guidelines should establish best practices for incorporating interactive learning technologies, ensuring that digital resources enhance student engagement without contributing to distractions (Selwyn, 2022).

Furthermore, policymakers should create protocols for managing student technology use, including recommendations for screen time limitations, responsible online behavior, and ethical use of digital resources. Schools should also adopt best practices for balancing digital engagement with behavioural management, ensuring that technology enhances learning outcomes while maintaining a structured and disciplined classroom environment (Hallinger & Lee, 2020).

## Recommendations

Based on the study's findings, several practical recommendations are proposed for educators, school administrators, and policymakers.

### Recommendations for Educators

### Enhancing Classroom Structure While Encouraging Student Autonomy

Teachers should implement structured, yet flexible learning routines that align with IB MYP's emphasis on inquiry-based learning. A blended approach combining direct instruction with student-led activities can help improve engagement and behaviour management.

### Using Positive Reinforcement Instead of Punitive Measures

Educators should replace strict punishment with incentive-based motivation. Reward systems, constructive feedback, and verbal praise can significantly boost student participation and discipline.

### Implementing Clear Guidelines for Technology Use

Teachers should set firm expectations regarding device usage, enforce digital literacy programs, and use classroom monitoring tools to manage distractions effectively.

### Recommendations for School Administrators

School leaders should offer training workshops on effective IB classroom management, differentiated instruction, and student engagement strategies. Schools must provide well-equipped digital infrastructure while ensuring teachers have access to resources that aid in managing technology-related challenges.

Schools should develop a clear framework for student behaviour expectations while allowing room for collaborative learning and inquiry-driven instruction.

Policy changes should mandate explicit training on classroom management in teacher certification programs, particularly for educators working in inquiry-based learning environments such as Abominates of Education should introduce national policies regulating digital use in classrooms, ensuring technology is used ethically and effectively to enhance learning outcomes.

## **Conclusion**

This study demonstrates that effective classroom management in IB MYP classrooms requires a balance between structure and flexibility. Traditional management strategies remain essential, but must be adapted to inquiry-based learning models. Teacher-student relationships play a pivotal role in engagement, while technology presents both opportunities and challenges in classroom discipline.

While this study provides valuable insights, further research is necessary to examine the long-term impact of blended classroom management approaches. Explore teacher-student relationships in IB contexts across diverse school environments. Assess the effectiveness of emerging technologies in classroom management beyond the IB MYP.

For optimal classroom management, educators, school administrators, and policymakers must collaborate to create learning environments that support student engagement, autonomy, and responsible digital use.

## References

- Deci, E. L., & Ryan, R. M. (2020). *Self-Determination Theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.
- Dweck, C. S., & Yeager, D. S. (2019). Mindsets: A view from two eras. *Perspectives on Psychological Science*, 14(3), 481-496.
- Egeberg, H. M., McConney, A., & Price, A. (2019). Classroom management and engagement: Differences between students in low and high socio-economic status schools. *Teaching and Teacher Education*, 81, 152-163.
- Emmer, E. T., & Evertson, C. M. (2017). *Classroom management for middle and high school teachers* (10th ed.). Pearson.
- Emmer, E. & Strage, L. (2001). Classroom management: A critical part of educational psychology. *Educational Psychologist*, 36(2), 103-112.
- Fisher, D., Frey, N., & Hattie, J. (2016). Visible learning for literacy: *Implementing the practices that work best to accelerate student learning*. Corwin Press.
- Fisher, D., Frey, N., & Hattie, J. (2020). The distance learning playbook: *Teaching for engagement and impact in any setting*. Corwin Press.
- Fisher, D., Frey, N., & Hattie, J. (2021). The distance learning playbook, grades K-12: *Teaching for engagement and impact in any setting*. Corwin Press.
- Greenhow, C., & Lewin, C. (2015). Social media and education: Reconceptualizing the boundaries of formal and informal learning. *Learning, Media and Technology*, 41(1), 6–30.
- Hallinger, P., & Lee, M. (2020). Global perspectives on educational leadership reform: *The development and implementation of International Baccalaureate programs*. Springer.
- Hattie, J. (2019). Visible learning: Feedback. Routledge.
- Hattie, J. (2021). Visible learning: The sequel: *A synthesis of over 2,100 meta-analyses relating to achievement*. Routledge.
- Marzano, R. J., Marzano, J. S., & Pickering, D. J. (2003). Classroom management that works: *Research-based strategies for every teacher*. ASCD.

- Marzano, R. J., Marzano, J. S., & Pickering, D. J. (2018). *The highly engaged classroom*. Solution Tree Press.
- Marzano, R. J., Marzano, J. S., & Pickering, D. J. (2021). Classroom management that works: *Research-based strategies for every teacher*. ASCD.
- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.
- Mercer, N., & Littleton, K. (2020). Dialogue and the development of children's thinking: *A sociocultural approach*. Routledge.
- Niemiec, C. P., & Ryan, R. M. (2019). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education*, 7(2), 133-144.
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860.
- Ryan, R. M., & Reid, J. L. (2016). Engaging students in learning: The role of student motivation and engagement in the classroom. *Educational Psychology Review*, 28(3), 431-447.
- Selwyn, N. (2022). *Education and technology: Key issues and debates* (3rd ed.). Bloomsbury Academic.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wong, H. K., & Wong, R. T. (2018). *The first days of school: How to be an effective teacher*. Harry K. Wong Publications.
- Wubbels, T., Brekelmans, M., van Tartwijk, J., & den Brok, P. (2019). An interpersonal perspective on classroom management in secondary classrooms in the Netherlands. In E. T. Emmer & E. J. Sabornie (Eds.), *Handbook of classroom management* (2nd ed., pp. 116-137). Routledge.
- Wubbels, T., Brekelmans, M., & van Tartwijk, J. (2019). Teacher-student relationships and classroom management. *International Encyclopedia of Education* (3rd ed.).
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6<sup>th</sup> ed.). SAGE.

# Mathematics Anxiety: A Descriptive Study on Prevalence, Gender Dynamics and Performance Among Grade 7 Students in China

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## Abstract

*Mathematics anxiety, a negative emotional reaction to mathematical tasks, has significant impact on students' academic performance. Despite extensive research on this phenomenon in the Western countries, there is a significant gap in understanding its prevalence, gender dynamics, and effects on academic achievement in Eastern cultures, particularly among younger students. This study investigates this gap by examining mathematics anxiety among Grade 7 students at a Chinese international school in Suzhou, China. The research used a descriptive-correlational design, utilizing the Abbreviated Mathematics Anxiety Scale (AMAS) to measure anxiety levels and analyzing its relationship with students' mathematics test scores. A random sample of 80 students (40 in higher-performance group and 40 in lower-performance group) was selected to ensure representation across different performance levels. Descriptive and inferential statistics, including Pearson's correlation, were used to analyze the data. Researchers found that 55% of low-performance students experienced much higher levels of mathematics anxiety (22 out of 40) than high-performance students (20%, 8 out of 40). Girls also reported significantly higher anxiety (18 out of 38) than boys (8 out of 42). A negative correlation was found between anxiety and performance, especially for lower-performing students. These findings have implications for educators, policymakers, and curriculum developers, suggesting that fostering supportive learning environments and reducing assessment-driven anxiety can improve students' mathematical engagement and achievement.*

**Keywords:** Mathematics anxiety, academic performance, gender differences, self-efficacy,

## 1. Introduction

Mathematics performance has been a significant influence on students' academic achievement worldwide (Omar et al., 2022). However, not all students have been able to achieve strong performance in mathematics, and those who expressed negative feelings towards mathematics often performed poorly (Omar et al., 2022). These negative sensations, which obstruct the ability to use numbers and solve mathematical problems in both every day and academic contexts, have been defined as mathematics anxiety (Richardson & Suinn, 1972, as cited in Ng, 2012). Students often found mathematics difficult to learn due to its abstract concepts, which were not easily relatable to everyday life (Akbayir, 2019). Consequently, this led to stress in tasks such as counting money, managing bank accounts, and analysing sales prices (Richardson & Suinn, 1972, as cited in Akbayir, 2019).

While extensive research has been conducted on mathematics anxiety in high school and college students, there is a notable scarcity of documentation on its impact on younger students, particularly those in Grade 7, a critical developmental stage (Wigfield & Meece, 1988, as cited in Ng, 2012). This study addresses this gap by examining the prevalence of mathematics anxiety, its gender differences, and its impact on academic performance among Grade 7 students in a Chinese international school. By focusing on this age group, the research provides new insights into the cognitive load capacity and perceived self-efficacy of younger students, which are crucial factors in understanding the development and persistence of mathematics anxiety.

## Background to the Study

The Program for International Student Assessment (PISA) 2012 reported that females experienced higher levels of mathematics anxiety than males in most countries (OECD, 2015). In Denmark and Liechtenstein, females were at least 20% more likely than males to experience mathematics anxiety (OECD, 2015). Some studies found that females had greater mathematics anxiety than males from Grade 6 through college, peaking between Grade 9 and Grade 10 (Ashcraft & Moore, 2009, as cited in Van Mier et al., 2019). However, a study on Grade 9 students in Turkey revealed that females experienced less mathematics anxiety than males (Akbayir, 2019). The inconsistency of results among these studies demonstrates a significant research gap, which this study aimed to address.

Students with higher levels of mathematics anxiety tended to score lower on tests (OECD, 2015). Data from Argentina, Brazil, and Jordan showed that 15 years old students with the highest levels of mathematics anxiety also had the lowest PISA scores (below 400 points), whereas students in Germany, Finland, and Denmark had above-average scores (OECD, 2015). However, Devine et al. (2018, as cited in Van Mier et al., 2019) found that 77% of students with high mathematics anxiety still achieved normal to high mathematics scores, contradicting previous studies that suggested a purely negative relationship between mathematics anxiety and performance. This contradiction indicated the need for further research, particularly among younger students, where the impact of anxiety on cognitive load and self-efficacy is less understood.

## Research Problem

Mathematics anxiety has been widely studied, yet inconclusive findings regarding its multifaceted nature remain. While previous research has explored the impact of individual factors (e.g., motivation, self-efficacy) and environmental factors (e.g., teaching methodologies, parental attitudes) (Chang & Beilock, 2016; Ersozlu & Karakus, 2019; Yahya & Amir, 2018, as cited in Azman & Maat, 2021), limited research has been conducted in Eastern cultures, particularly among younger students. In academically competitive countries like China, where academic excellence in mathematics is deeply ingrained, the pressure to perform well exacerbates students' anxiety levels. Despite extensive research on mathematics anxiety in high school and college students, fewer studies have investigated this issue in younger students, particularly in crucial developmental stages such as Grade 7 (Wigfield & Meece, 1988, as cited in Ng, 2012). This study examined the prevalence of mathematics anxiety, gender differences, and its impact on academic performance among Grade 7 students in China, focusing on cognitive load capacity and self-efficacy.

## Research Objectives and Research Questions

The objectives of this research were to investigate the effects of mathematics anxiety among Grade 7 students, at a Chinese international school in Suzhou, China, quantify the prevalence of this anxiety, and explore the potential gender differences in mathematics anxiety levels. Additionally, the research examined the relationship between mathematics anxiety and mathematics performance to provide insights into its impact.

The research sought to answer the following questions regarding Grade 7 students in Suzhou, China:

1. To what extent did the Grade 7 students experience mathematics anxiety?
2. To what extent do mathematics anxiety levels differ between male and female Grade 7 students?

*Hypothesis: There is a significant difference in mathematics anxiety levels between male and female Grade 7 students, with female students experiencing higher levels of anxiety compared to male students.*

3. Is there a correlation between mathematics performance and mathematics anxiety among Grade 7 students?

## Significance of the Study

This research contributed significantly to both educational practice and theoretical development in mathematics education. While existing mathematics anxiety research predominantly focused on Western contexts (Ng, 2012), this study investigated mathematics anxiety from an Eastern perspective, specifically at a Chinese international school in Suzhou, China. By doing so, it identified culturally specific factors influencing mathematics anxiety and provided culturally relevant interventions.

Furthermore, by sharing the findings derived from this study with schools in other Asian countries, or even Western contexts with similar student demographics, this research contributed to broader efforts to combat mathematics anxiety. The insights gained from this study could help create more supportive and inclusive learning environments for students across diverse educational settings.

## **Scope of the Study**

This study employed validated measurement tools to assess the prevalence of mathematics anxiety among Grade 7 students in a Chinese international school in Suzhou, China. The collected data was analyzed to determine the percentage of students experiencing mathematics anxiety, identify gender differences in anxiety levels, and evaluate the impact of mathematics anxiety on students' academic performance in mathematics.

## **Literature Review**

### **The Concept of Mathematics Anxiety**

Mathematics anxiety is a pervasive and multifaceted issue that affects students at various levels of education. It is characterized by emotional, cognitive, and behavioural responses that interfere with a student's ability to engage with and succeed in mathematics. The physiological symptoms of mathematics anxiety may include increased heart rate, sweaty palms, and shortness of breath, while cognitive symptoms include feelings of helplessness, negative self-perception, and mental blocks when attempting to solve mathematical problems (Bautista, 2023). Behavioural symptoms often manifest as avoidance behaviours, such as procrastination or refusal to participate in mathematical tasks (Ashcraft & Kirk, 2001).

Ashcraft and Kirk (2001) argue that mathematics anxiety directly affects working memory by consuming cognitive resources that would otherwise be allocated to problem-solving and mathematical reasoning. This phenomenon, known as cognitive overload, reduces students' ability to concentrate, leading to lower academic performance. Additionally, students with high mathematics anxiety may experience a self-fulfilling prophecy, where their fear of failure leads to poor performance, further reinforcing their anxiety (Maloney & Beilock, 2012).

Researchers have attempted to understand the underlying causes of mathematics anxiety, linking it to early negative experiences, teaching methods, and societal expectations (Dowker, Sarkar, & Looi, 2016). Studies suggest that students who receive negative feedback about their mathematical abilities from teachers or parents are more likely to develop anxiety towards the subject (Gunderson et al., 2018). Furthermore, rote memorization and test-driven learning environments have been associated with heightened levels of mathematics anxiety, as they discourage conceptual understanding and creative problem-solving (Ramirez et al., 2018).

## Global and Regional Perspectives

Mathematics anxiety is a widespread phenomenon affecting students across different cultural and educational settings. The OECD (2021) reported that at least one in three students' worldwide experiences mathematics anxiety, with higher rates observed in countries with rigorous academic environments. A study conducted by Akbayır (2019) found that gender differences in mathematics anxiety remain controversial, with some studies indicating that female students exhibit higher levels of anxiety than their male counterparts, while others suggest no significant difference (OECD, 2021).

Research has consistently demonstrated an inverse relationship between mathematics anxiety and academic achievement. A study by Yuan (2014) found that students with lower anxiety levels tend to perform better in mathematics, as they can allocate cognitive resources efficiently.

However, an alternative perspective suggests that some high-achieving students also experience mathematics anxiety, as they may face intense pressure to perform well (Omar et al., 2022). This paradox indicates that mathematics anxiety is not solely a consequence of poor academic performance but may also stem from the stress associated with high expectations.

In Asian educational contexts, such as China, Japan, and South Korea, students report higher levels of mathematics anxiety compared to their Western counterparts, despite their strong performance in international assessments such as PISA (OECD, 2021). High-stakes examinations, such as the zhongkao (high school entrance exam) and gaokao (college entrance exam), significantly contribute to mathematics anxiety in China (Ni, 2023). The fear of underperformance in these critical exams leads to increased stress and anxiety levels among students, particularly those from lower socioeconomic backgrounds who rely on academic success for upward mobility (Ni, 2023).

The Confucian philosophy of education, which emphasizes diligence, discipline, and respect for authority, further influences students' attitudes toward mathematics learning. While this cultural framework fosters perseverance, it may also exacerbate anxiety by promoting perfectionism and fear of failure (Cheng, 2020). Consequently, mathematics anxiety in China is not merely an academic issue but a broader socio-cultural challenge that requires targeted interventions at the policy, school, and classroom levels.

The conceptual framework integrates cognitive and social factors contributing to mathematics anxiety. It highlights how repeated negative experiences, such as early failures or negative feedback, can lower students' perceived self-efficacy in mathematics. This reduced self-efficacy, in turn, contributes to increased mathematics anxiety and reduces academic performance. The framework also incorporates gender differences in mathematics anxiety, suggesting that societal expectations and stereotypes may exacerbate anxiety among female students, further lowering their self-efficacy and performance. By mapping these variables onto the theoretical framework, the study provides a clearer understanding of the complex interplay between cognitive, behavioural, and social factors in mathematics anxiety.

## **Theoretical Framework**

This study examines mathematics anxiety through the lens of two integrated theoretical frameworks, Attentional Control Theory and Self-Efficacy Theory, to provide a comprehensive understanding of how mathematics anxiety affects students' performance.

Attentional Control Theory posits that anxiety disrupts attentional control, diverting cognitive resources away from task-relevant processes (Wei & Sun, 2024). In the context of mathematics anxiety, students experiencing anxiety may focus more on their fear of failure than on solving mathematical problems, leading to impaired performance. Research suggests that students with high mathematics anxiety struggle with working memory tasks, as their anxious thoughts consume cognitive bandwidth (Eysenck et al., 2007).

Self-Efficacy Theory, proposed by Bandura (1977), emphasizes the role of self-belief in shaping academic performance. Students with high self-efficacy are more likely to approach mathematics with confidence and persistence, while those with low self-efficacy are more prone to avoidance behaviors and anxiety. Studies have shown that enhancing students' self-efficacy through positive reinforcement and mastery experiences can help alleviate mathematics anxiety (Pajares & Graham, 1999).

## **Methodology**

### **Research Design**

This study employed a descriptive-correlational research design to explore the prevalence of mathematics anxiety among Grade 7 students and its relationship with academic performance. Descriptive research was used to systematically measure and describe the levels of mathematics anxiety within the sample, while correlational research examined the association between mathematics anxiety and students' test scores. This design was selected to provide quantitative insights into the relationship between these two variables without manipulating any experimental conditions (Creswell & Creswell, 2018).

A non-experimental approach was deemed appropriate for this study as it focused on naturally occurring variations in students' anxiety levels and academic performance. The study sought to determine patterns and correlations rather than establishing direct causal relationships, making a descriptive-correlational methodology the most effective framework (Fraenkel & Wallen, 2020).

### **Population and Sampling Technique**

The study population consisted of 145 Grade 7 students enrolled in a private Chinese international school in Suzhou, China. These students had been learning mathematics as part of their standardized international curriculum, which emphasizes problem-solving, algebraic thinking, and data interpretation skills.

The study employed random sampling, ensuring an equal representation of students across different levels of mathematical competency. To achieve this, students were divided into two groups based on their previous academic performance in mathematics:

- Group 7A (Higher Performance)– Students who had scored in the top 50% in the previous academic year.
- Group 7B (Lower Performance) – Students who had scored in the bottom 50% in the previous academic year.

A convenient purposive sampling approach was employed to select a sample of 80 students for analysis, with 40 students chosen from each of the two groups. This method facilitated a representative comparison of students with varying competency levels, as outlined by Etikan & Bala (2017). The sample included 42 male students and 38 female students, reflecting the gender distribution within the larger student body.

### **Instrumentation**

To assess students' levels of mathematics anxiety, this study employed the Abbreviated Mathematics Anxiety Scale (AMAS), a psychometric tool developed by Hopko et al. (2003). The AMAS is widely recognized for its efficiency in measuring mathematics anxiety in students while maintaining strong reliability and validity. The instrument consists of 10 items, divided into two subscales: *Mathematics Learning Anxiety* (anxiety experienced during general learning situations) and *Mathematics Assessment Anxiety* (anxiety specific to test-taking situations). The AMAS has demonstrated high internal consistency, with a Cronbach's alpha of 0.90, and strong test-retest reliability, making it a suitable tool for this study (Hopko et al., 2003).

### **Validity and Reliability**

The Abbreviated Mathematics Anxiety Scale (AMAS) was chosen for this study due to its established validity and reliability across diverse populations. Hopko et al. (2003) demonstrated strong internal consistency, with a Cronbach's alpha of 0.90, indicating high reliability among the instrument's items. Test-retest reliability has also been established, with studies like Pletzer et al. (2016) showing minimal variation in student anxiety levels measured over time, further supporting the AMAS's reliability. Crucially, the AMAS has demonstrated cross-cultural validity, proving its applicability and reliability in both Western and Asian educational contexts. Research in Asian schools, such as that by Primi et al. (2020), has confirmed the AMAS's consistent results across different student populations. This cross-cultural validity is particularly relevant to the present study, ensuring the credibility and generalizability of findings within the Malaysian education system.

### **Survey Administration**

The AMAS questionnaire was administered in a classroom setting under the supervision of the students' mathematics teacher. To ensure honest and unbiased responses, students were informed that their answers would remain anonymous and would not impact their academic records. This step aimed to reduce response bias, ensuring that students felt comfortable expressing their true feelings about mathematics anxiety without fear of judgment.

In addition to the AMAS questionnaire, students' mathematics test scores from the most recent school semester were collected from school records. This step was essential for analyzing the correlation between mathematics anxiety levels and academic performance. By comparing the students' AMAS scores with their actual performance, the study aimed to determine whether high anxiety levels negatively impacted students' test scores.

## **Ethical Considerations**

This study followed established ethical research principles, ensuring that all participants were treated fairly, and their rights were protected throughout the process. Informed consent was obtained from both the students and their parents or guardians. Participants were informed that their participation was voluntary, and they had the right to withdraw from the study at any time without any penalties or repercussions. No personally identifiable information was collected, and all data were stored securely to protect student privacy.

## **Data Analysis Process**

### **Descriptive Statistics**

To assess the prevalence of mathematics anxiety, descriptive statistical methods were applied:

- Mean and Standard Deviation: Used to calculate the average anxiety levels.
- Frequency Distribution: Used to categorize students into low, moderate, and high anxiety groups.

### **Inferential Statistics**

To examine the relationship between mathematics anxiety and mathematics performance, Pearson's correlation coefficient ( $r$ ) was applied.

- A negative correlation ( $r < 0$ ) would suggest that students with higher anxiety levels tend to perform worse in mathematics, but this does not imply that higher anxiety causes lower performance as other factors may be involved.
- A positive correlation ( $r > 0$ ) would suggest that anxiety could be associated with enhanced performance. However, this does not confirm that anxiety serves as a motivational factor, as correlation does not imply causation (Maloney & Beilock, 2012).
- A correlation close to zero ( $r \approx 0$ ) would indicate no significant relationship between the two variables.

To examine the gender differences in mathematics anxiety levels (RQ2), an independent samples t-test was conducted to compare the mean anxiety scores of male and female students. The null hypothesis ( $H_0$ ) assumed no significant difference in anxiety levels between genders, while the alternative hypothesis ( $H_1$ ) posited that female students would exhibit significantly higher anxiety levels than male students. The significance level was set at  $p < 0.05$ .

## Findings

### Prevalence of Mathematics Anxiety

Mathematics anxiety is a pervasive issue affecting students across different levels of competency. The findings from this study indicate that the Grade 7 students at the Chinese international school in Suzhou, China, with higher mathematics competency exhibited significantly lower levels of mathematics anxiety, while the students in Group 7B (lower competency) reported heightened levels of anxiety. Table 1 illustrates the distribution of mathematics anxiety levels among these Grade 7 students based on their competency levels. The data were compiled from responses collected using the AMAS questionnaire.

*Table 1: Prevalence of Mathematics Anxiety Across Competency Groups*

| Competency Group              | Low Anxiety (No.) | Moderate Anxiety (No.) | High Anxiety (No.) |
|-------------------------------|-------------------|------------------------|--------------------|
| Group 7A (Higher Performance) | 18                | 14                     | 8                  |
| Group 7B (Lower Performance)  | 6                 | 12                     | 22                 |

The data reveal that a majority of Group 7B students (22 out of 40) experience high levels of mathematics anxiety, whereas only 8 out of 40 Group 7A students fall into this category. This supports the Competency-Anxiety Inversion Hypothesis, which states that students with greater competency in mathematics tend to experience lower levels of anxiety due to higher self-efficacy and mastery of concepts (Ashcraft & Moore, 2009).

### Gender Differences in Mathematics Anxiety

Another key finding in this study was the gender disparity in mathematics anxiety levels. Table 2 presents the differences in anxiety levels between male and female students.

*Table 2: Mathematics Anxiety Levels by Gender*

| Gender | Low Anxiety (No.) | Moderate Anxiety (No.) | High Anxiety (No.) |
|--------|-------------------|------------------------|--------------------|
| Male   | 16                | 18                     | 8                  |
| Female | 7                 | 13                     | 18                 |

The results show that female students experience significantly higher levels of mathematics anxiety than their male counterparts, with 18 out of 38 female students falling into the high-anxiety category compared to only 8 out of 42 male students.

The independent samples t-test revealed a statistically significant difference in mathematics anxiety levels between male and female students ( $t(78) = 3.45, p < 0.001$ ). Female students ( $M = 4.2, SD$

= 0.8) reported significantly higher levels of mathematics anxiety compared to male students ( $M = 3.1$ ,  $SD = 0.7$ ), supporting the hypothesis that gender differences in mathematics anxiety exist. This finding aligns with previous research suggesting that societal expectations and gender stereotypes contribute to heightened anxiety among female students in mathematics-related tasks.

### Mathematics Anxiety and Academic Achievement

One of the most critical findings in this study was the relationship between mathematics anxiety and academic achievement. Pearson's correlation analysis was conducted to measure the strength of the association between these two variables. The results, presented in Table 3, reveal a negative correlation ( $r = -0.729$ ) between mathematics anxiety and academic performance, suggesting that higher levels of anxiety are linked to lower mathematics achievement.

*Table 3: Correlation Between Mathematics Anxiety and Academic Achievement*

| Group                         | Correlation Coefficient (r) | Strength of Correlation |
|-------------------------------|-----------------------------|-------------------------|
| Group 7A (Higher Performance) | -0.646                      | Negative Correlation    |
| Group 7B (Lower Performance)  | -0.729                      | Negative Correlation    |

The data indicate that the negative correlation is stronger among lower-competency students (Group 7B), implying that students already struggling with mathematics face a compounding effect of anxiety and poor performance.

### Top Math Anxiety Triggers

The top mathematics anxiety triggers for Grade 7 students are shown in Table 4 where students rated each item based on the 5-point Likert scale.

*Table 4: Top Math Anxiety Triggers for Grade 7 Students*

| Rank | Question                                              | Students Rated 5 (No.) | Students Rated 4 (No.) | Students Rated 3 (No.) | Students Rated 2 (No.) | Students Rated 1 (No.) |
|------|-------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1    | Being given a math quiz without prior knowledge (Q10) | 47                     | 14                     | 14                     | 4                      | 1                      |
| 2    | Waiting for math test results (Q6)                    | 34                     | 18                     | 14                     | 9                      | 5                      |
| 3    | Thinking about an upcoming math test (Q2)             | 19                     | 32                     | 17                     | 9                      | 3                      |
| 4    | Taking a math test (Q4)                               | 15                     | 27                     | 22                     | 10                     | 6                      |
| 5    | Listening to a math lecture (Q5)                      | 15                     | 13                     | 30                     | 16                     | 6                      |

*Table 5: Comparison of Anxiety and Performance Between 7A and 7B Students*

| Group | Anxiety Level<br>(Mean) | Mid-term Exam Score (Mean) |
|-------|-------------------------|----------------------------|
| 7A    | 2.8                     | 95.5                       |
| 7B    | 4.1                     | 65.0                       |

**The data was based on monthly average score.**

Students with high mathematics anxiety often experience reduced working memory capacity, as their attention is diverted toward intrusive thoughts about failure (Maloney & Beilock, 2012). As a result, they may struggle to process and retain mathematical information, leading to lower test scores and a reinforced fear of mathematics.

The academic implications of this correlation are substantial. Previous studies suggest that students who develop mathematics anxiety in early education are less likely to pursue STEM-related careers (Hembree, 1990). Given that mathematics is foundational for many high-demand professions, addressing mathematics anxiety is crucial to ensuring long-term academic and career success.

## **Implications**

### **Implications to Theory and Practice**

The findings of this study contribute to the broader understanding of mathematics anxiety by aligning with Self-Efficacy Theory, which underscores the critical role of confidence in shaping students' learning experiences and academic outcomes (Bandura, 1977). The results indicate that students with higher self-efficacy in mathematics tend to experience lower levels of anxiety, leading to better academic performance. Conversely, students with low self-efficacy, particularly those in lower-competency groups and female students, tend to suffer from heightened anxiety, which negatively affects their ability to engage with mathematical content effectively. This reinforces the need for interventions that focus on enhancing self-efficacy through targeted teaching strategies and supportive learning environments.

Furthermore, this study highlights the role of cognitive load capacity in younger students. Cognitive load theory suggests that anxiety disrupts attentional control, diverting cognitive resources away from task-relevant processes (Wei & Sun, 2024). In the context of mathematics anxiety, students experiencing anxiety may focus more on their fear of failure than on solving mathematical problems, leading to impaired performance. This is particularly relevant for Grade 7 students, who are at a critical stage of cognitive development. The findings suggest that younger students with high mathematics anxiety may experience reduced working memory capacity, making it difficult for them to process and retain mathematical information. This cognitive

overload can lead to a self-reinforcing cycle of anxiety and poor performance, which is especially detrimental in formative years.

The study also provides new insights into the gender disparity in mathematics anxiety among younger students. Female students in Grade 7 reported significantly higher levels of anxiety compared to their male counterparts, which aligns with previous research suggesting that societal expectations and gender stereotypes contribute to heightened anxiety among female students in mathematics-related tasks (Else-Quest et al. This finding underscores the importance of addressing gender-specific factors in interventions aimed at reducing mathematics anxiety.

### **Limitations and Future Research**

Although this study provides valuable insights into the relationship between mathematics anxiety, competency levels, and gender differences, there are several limitations that must be acknowledged. One of the primary limitations is the sample selection, which was restricted to students from a single Chinese international school. While this setting provided a controlled environment for analyzing mathematics anxiety, the findings may not be fully generalizable to students in public schools or different cultural and socioeconomic backgrounds. Future research should aim to include a more diverse student population, encompassing students from both public and private schools, as well as those from different regions and academic systems.

Another limitation is the cross-sectional nature of this study. The data were collected at a single point in time, making it difficult to track changes in mathematics anxiety over the long term. Since anxiety levels may fluctuate due to developmental factors, academic experiences, and external influences, a longitudinal study would provide a more comprehensive understanding of how mathematics anxiety evolves throughout a student's academic journey. Future research should consider conducting multi-year studies that follow students from early primary education through secondary school, enabling researchers to examine the long-term impact of anxiety on academic achievement.

Additionally, while this study focused primarily on mathematics anxiety and academic performance, future research should explore additional contributing factors, such as teacher attitudes, parental influence, and classroom dynamics. Understanding how these external variables interact with student anxiety could help develop more targeted interventions that address the root causes of mathematics anxiety beyond individual self-perceptions and assessment stress.

### **Recommendations**

From the findings of this study, there are several recommendations to help mitigate mathematics anxiety and improve student performance in mathematics:

#### **Solicit Student Feedback on Anxiety-Reducing Strategies**

Encourage students to share about their experiences with mathematics anxiety and seek their suggestions on what strategies they believe will help them reduce anxiety in mathematics. This

participative approach provides valuable insights for educators. Students may suggest specific teaching methods, classroom activities, or support systems that they find helpful.

### **Implement Targeted Interventions**

Implement custom-made interventions based on the specific anxiety triggers identified in this study. For example, students have expressed anxiety about quizzes without prior notice, educators can offer more frequent low-stakes tests to help students become comfortable and build their confidence.

### **Develop Alternative Assessments**

Since traditional tests and high-stakes assessments contribute significantly to mathematics anxiety, alternative assessment strategies can be explored. For example, educators can implement project-based assessments, oral presentations, or formative assessments that allow students to demonstrate their learning without the pressure of traditional tests.

### **Future Research Directions**

To further explore mathematics anxiety and its impact on academic performance, future research should consider the following directions:

#### **Longitudinal Studies**

Conduct longitudinal studies that monitor students over time to assess how mathematics anxiety evolves throughout their academic journey. This approach can provide deep insights into the long-term effects of anxiety on academic achievement and self-efficacy.

#### **Interventions Based on Student Feedback**

Future studies should aim to implement and evaluate anxiety-reducing strategies gained from student feedback. By testing these strategies in real classroom settings, researchers can assess their effectiveness and make appropriate adjustments based on student responses.

### **Conclusion**

This study has highlighted the detrimental effects of mathematics anxiety on student performance, particularly among lower-competency and female students. The findings reveal a negative correlation between mathematics anxiety and academic achievement, suggesting that students who experience high levels of anxiety tend to perform worse in mathematics assessments. Moreover, the study confirms the gender disparity in mathematics anxiety, with female students reporting significantly higher levels of anxiety compared to their male counterparts. These findings align with existing literature on self-efficacy, cognitive load, and assessment-driven anxiety, reinforcing

the need for targeted interventions that address both the psychological and structural factors contributing to mathematics anxiety.

To effectively mitigate mathematics anxiety, it is essential to involve students directly by receiving their feedback on effective anxiety-reducing strategies. By implementing tailored interventions that address specific anxiety triggers, educators can help students build confidence and become more comfortable with mathematical tasks.

Future research should focus on longitudinal studies to monitor the evolution of mathematics anxiety, providing deeper insights into its long-term effects on academic achievement. Studies should also emphasize the implementation and evaluation of strategies suggested by students.

In conclusion, mathematics anxiety remains a significant barrier to student success, but with the right strategies, interventions, and educational reforms, it is possible to reduce anxiety levels and foster a more positive learning experience for all students. The insights from this study provide a foundation for future research and policy development, ultimately contributing to the improvement of mathematics education and student well-being on a global scale.

## References

- Akbayir, K. (2019). An investigation about high school students' mathematics anxiety level according to gender. *Journal of Education and Training Studies*, 7(7), 62-72.
- Ashcraft, M. H., & Kirk, E. P. (2001). The relationships among working memory, mathematics anxiety, and performance. *Journal of Experimental Psychology*, 130(2), 224-237.
- Ashcraft, M. H., & Moore, A. M. (2009). Mathematics anxiety and the affective drop in performance. *Journal of Psychological Research*, 25(3), 37-52.
- Azman, A. A., & Maat, S. M. (2021). Mathematical anxiety and its relation to engineering student achievement at a local university. *International Research in Education*, 9(1), 57-67.
- Bandura, A. (1977). *Self-efficacy: The exercise of control*. Freeman.
- Bautista, C. A. (2023). Reducing mathematics anxiety in the classroom. *Teachers and Curriculum*, 23(1).
- Chang, H., & Beilock, S. L. (2016). The math anxiety-math performance link and its relation to individual and environmental factors. *Current Opinion in Behavioral Sciences*, 10, 33-38.

- Cheng, L. (2020). The impact of high-stakes testing on student motivation. *Journal of Educational Psychology*, 92(4), 112-128.
- Creswell, J. W., & Creswell, J. D. (2018). Research design: *Qualitative, quantitative, and mixed methods approach*. Sage publications.
- Devine, A., et al. (2018). Mathematics anxiety and its effects on performance. *Child Development Studies*, 44(2), 256-272.
- Ersozlu, Z., & Karakus, M. (2019). Mathematics anxiety: Mapping the literature by bibliometric analysis. *Eurasia Journal of Mathematics, Science and Technology Education*, 15(2), 1-12.
- Etikan, I., & Bala, K. (2017). Sampling methods in research methodology. *Biometrics & Biostatistics International Journal*, 5(6), 215-217.
- Gunderson, E. A., et al. (2018). The role of parental expectations in gendered mathematics anxiety. *Developmental Psychology*, 54(1), 34-45.
- Hopko, D. R., Mahadevan, R., Bare, R. L., & Hunt, M. K. (2003). The Abbreviated Math Anxiety Scale (AMAS). *Assessment*, 10(2), 178-182.
- Maloney, E. A., & Beilock, S. L. (2012). Math anxiety: Who has it, why it develops, and how to guard against it. *Trends in Cognitive Sciences*, 16(8), 404-406.
- Ni, H. (2023). Cultural influences on academic performance: The role of examination pressure in China. *International Journal of Educational Studies*, 19(3), 120-135.
- OECD. (2015). Students, computers, and learning: *Making the connection*. OECD Publishing.
- OECD. (2021). Students, mathematics anxiety, and learning outcomes. OECD Publishing.
- Omar, M. K., Rahman, S. B., & Ishak, M. A. (2022). Mathematics anxiety and students' academic achievement: A study among secondary school students. *International Journal of Educational Research*, 10(3), 45-58.
- Teddlie, C., & Yu, F. (2007). Mixed methods sampling. *Journal of Mixed Methods Research*, 1(1), 77-100.
- Van Mier, H., Schleepen, T. M., & Van den Berg, F. (2019). Gender differences regarding mathematics anxiety and mathematics performance. *Contemporary Educational Psychology*, 58, 319-328.
- Wei, X., & Sun, J. (2024). Attentional control and mathematics performance: The role of anxiety. *Educational Neuroscience*, 12(1), 89-103.

# Challenges and Strategies in Learning Chinese as a Second Language: A Study on Non-Chinese Speaking Students in a Private School in Kuala Lumpur

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## Abstract

*Learning Chinese as a second language (CSL) presents unique challenges for non-native speakers, particularly in non-Sinophone regions like Malaysia. This study explores the attitudes, challenges, and learning strategies of non-Chinese-speaking students in acquiring Chinese. Utilizing a qualitative research approach, data were collected through semi-structured interviews with 20 students from a private school in Kuala Lumpur. The findings indicate that major challenges include character memorization, pronunciation difficulties, and limited exposure to the language outside the classroom. However, students employ diverse strategies, such as gamification, rote memorization, and technology-assisted learning, to enhance their proficiency. The study highlights the influence of social learning and motivation in language acquisition. Furthermore, it identifies gaps in current research, particularly the integration of traditional and digital learning methods. The findings provide practical implications for educators and policymakers in developing more effective CSL instructional strategies.*

**Keywords:** *Chinese as a Second Language, language acquisition, learning strategies, language anxiety, motivation, gamification, character memorization.*

## Introduction

Over the past two decades, the Chinese language has gained significant global recognition as an essential foreign or second language (Gong et al., 2018). This increasing importance has led to a growing number of non-native learners, particularly in government, foreign, and private schools, who seek to acquire proficiency in Chinese. However, due to its complex linguistic structure, Chinese remains one of the most challenging languages for English speakers to learn (Sung, 2014). As a result, many students struggle with mastering Chinese and often discontinue their studies within a short period. Educators, therefore, continue to explore innovative strategies to improve students' proficiency and retention in learning Chinese. The fundamental skills required for language acquisition—listening, speaking, reading, and writing—serve as the basis for instructional methodologies. This study aims to investigate the challenges faced by non-Chinese

students learning Chinese in a private school in Kuala Lumpur, their attitudes towards the language, and the effectiveness of various learning strategies.

## **Background to the Study**

The increasing globalization of China and its economic influence have heightened the demand for Chinese language proficiency. However, learning Chinese presents considerable challenges, particularly for English-speaking students, due to its distinct phonetic, grammatical, and orthographic system (Sung, 2014). Historically, traditional teaching methods emphasized teacher-centred instruction, where teachers acted as authoritative figures and controlled the learning process (Luther, 2000; Esmaeili et al., 2015). While this approach ensured structured learning, it often failed to engage students effectively.

Recent studies have highlighted active learning as a more effective approach to language acquisition. Boyer et al. (2014) suggested that active learning enhances student engagement by encouraging them to focus on how to learn rather than just what to learn. Flipped learning has also emerged as an effective pedagogical strategy, requiring students to study independently outside the classroom and bring their learning experiences into discussions (Lockwood & Esselstein, 2013). However, studies have shown that students often do not maximize the available learning materials, limiting the effectiveness of this approach (Ekici, 2021). Given these varied instructional methods, this study seeks to assess which learning strategies best support non-Chinese speaking students in acquiring proficiency in Chinese.

## **Problem Statement**

Chinese is widely recognized as a complex language for English-speaking learners due to its unique tonal system, character-based writing, and grammatical structure (Sung, 2014). Mastering Chinese requires students to learn pronunciation, tones, and thousands of characters, posing significant cognitive challenges. Writing Chinese, in particular, demands extensive practice and memorization, making it difficult for students to retain and apply their knowledge effectively.

Existing studies have explored various approaches to enhance Chinese language learning, including the use of online applications (Jie Fang et al., 2022; Ng et al., 2022; Liu et al., 2017; Li Jin, 2017; Sam et al., 2018; Tang et al., 2021) and orthographic-based learning strategies (Shen, 2004; Sung, 2014; Ke, 1998). However, there is no consensus on the most effective method for learning Chinese as a second language. This study aims to bridge this gap by identifying the key challenges faced by non-Chinese speaking students, examining their attitudes towards the language, and evaluating the effectiveness of different learning strategies.

## **Significance of the Study**

Understanding the challenges and learning strategies of non-Chinese speaking students is crucial for developing effective instructional methods. The Chinese writing system consists of both ideographic and phonetic elements, which, combined with its grammatical structure, influence students' ability to grasp and express ideas accurately (Huang & Li, 2016).

This study provides insights into the attitudes, challenges, and strategies of non-Chinese speaking students in learning Chinese, offering valuable contributions to language educators and researchers. By analysing students' perspectives, the study aims to improve language instruction methods, enhance student engagement, and inform future curriculum development. Furthermore, the findings may help educators design targeted interventions to support students in overcoming difficulties in Chinese language acquisition.

## **Research Objectives and Research Questions**

This study aims to identify and evaluate the strategies used by non-Chinese speaking students in learning Chinese. The research objectives include:

1. Identifying the attitudes and challenges faced by non-Chinese speaking students towards Chinese language learning.
2. Examining the learning strategies employed by non-Chinese speaking students.
3. Assessing the effectiveness of these learning strategies on students' academic performance.

To achieve these objectives, the study addresses the following research questions:

1. What are the attitudes and challenges of non-Chinese speaking students towards learning Chinese?
2. What learning strategies do non-Chinese speaking students adopt?
3. How do these strategies impact students' performance in Chinese language assessments?

## **Literature Review**

The Chinese language has long played a significant role in Malaysia's linguistic landscape, with increasing emphasis on its acquisition due to both economic and cultural significance. As globalization strengthens China's economic influence, proficiency in Chinese has become a valuable skill for individuals seeking academic and professional advancement. Employers and parents alike perceive Chinese language proficiency as an essential asset, contributing to greater opportunities in education and career development. According to Bifuh-Ambe (2009), language proficiency is defined as an individual's ability to communicate effectively in both social and academic settings. In the Malaysian context, acquiring fundamental Chinese communication skills is not only beneficial for employment but also crucial for fostering social integration in a multicultural society. As English is no longer the sole dominant global language, many educational institutions and private language centres have expanded their efforts to teach Chinese as a second language to cater to this growing demand.

The Chinese language curriculum for second-language learners in Malaysia is structured around several core objectives. These include enabling students to communicate in Mandarin, developing proficiency in Mandarin writing, enhancing Mandarin reading comprehension, and fostering an appreciation for Chinese culture. Many parents believe that exposing their children to Chinese at an early age provides long-term academic and professional benefits, leading to increased enrolment in Chinese-medium schools and supplementary private language classes (Chua, 2022). This

parental investment reflects broader societal perceptions of Chinese as an essential language for future success.

Globally, the demand for Chinese language proficiency has risen, leading to the adoption of diverse instructional methodologies across different countries. In Western nations, technology-enhanced learning and gamification have become prevalent strategies for second-language acquisition. For instance, Sam (2018) investigated the use of gamification in Chinese language learning through the Newby Chinese System in Ireland. The study revealed that gamification significantly enhances learners' motivation by integrating game-related objectives, immersive virtual environments, competitive gameplay, and interactive social activities. Similarly, Tang (2021) explored gaming-based learning strategies among high-elementary and intermediate-level Chinese learners in the United States. The study, which utilized the language-learning game *Questaurant*, found that digital games serve as effective tools for vocabulary retention and pronunciation improvement.

Beyond gamification, mobile applications and social media platforms have also played a crucial role in Chinese language acquisition. Li Jin (2017) examined the role of WeChat as a supplementary learning tool for American students learning Chinese. The study found that WeChat facilitated direct communication with native speakers, enabling a relaxed and informal learning environment. Many learners reported that using WeChat provided an effective alternative to traditional classroom instruction, reducing reliance on textbook-heavy methods while enhancing their conversational skills.

In Malaysia, there has been a growing interest among non-Chinese individuals in acquiring proficiency in the Chinese language. Various studies have examined the different strategies employed by Malaysian learners to overcome the challenges associated with learning Chinese. Chua (2022) conducted research on Chinese character memorization techniques among Malaysian learners, revealing that rote learning remains the most common approach, particularly among beginner students. Despite its limitations, rote memorization is widely used due to the complexity of Chinese characters and the need for repeated exposure to reinforce learning.

The integration of gamification in Chinese language acquisition has also been explored within the Malaysian education system. Ng et al. (2022) conducted a study on Year 4 students using the *Class Dojo* application, finding that gamification significantly improved student motivation by incorporating goal-oriented learning elements, fostering self-assessment, and promoting independent learning. Similarly, Goh (2016) examined the effectiveness of the Pleco application for non-native learners of Chinese characters. The findings indicated that students viewed Pleco positively as a tool for improving writing accuracy and comprehension. The study further found that the application benefited both beginner and advanced learners by supporting vocabulary retention and aiding in the recognition of complex characters.

### **Gaps in Existing Literature**

Although extensive research has been conducted on Chinese language learning strategies, significant gaps remain in the literature. Many existing studies have primarily focused on digital learning tools such as WeChat, gamification applications, and stroke-based memorization techniques (Jie Fang et al., 2022; Ng et al., 2022; Liu et al., 2017; Sam et al., 2018; Tang et al., 2021). Additionally, previous research by Shen (2004), Sung (2014), and Ke (1998) emphasized

the effectiveness of orthographic learning strategies for Chinese character acquisition. However, there is limited research on how non-digital learning strategies, such as peer-assisted learning, cultural immersion, and mnemonic devices, contribute to language retention. Furthermore, few studies have explored how learners integrate both traditional and digital learning approaches to optimize their Chinese language acquisition. Addressing these gaps would provide a more holistic understanding of the most effective learning strategies for second-language Chinese learners.

### **Theoretical Framework in Chinese Language Learning**

The study of language learning strategies has evolved over time, with researchers defining these strategies in various ways. For the purpose of this study, learning strategies are understood as students' ability to effectively utilize available resources to achieve their linguistic goals. Several learning theories provide insight into how students acquire and retain new knowledge.

Boroch et al. (2010) argued that students with strong metacognitive awareness actively process and connect new information to prior knowledge, thereby fostering deeper comprehension. Constructivist learning theory further suggests that learners construct knowledge through interpreting their previous experiences (O'Banion, 1997). This aligns with the belief that second-language learners benefit from active engagement and contextual learning.

Merriam et al. (2006) introduced Social Cognitive Theory, which combines behavioural and constructivist principles. This theory emphasizes the role of social observation in learning, suggesting that students acquire knowledge through interactions with diverse peer groups. Social learning, also referred to as observational learning, allows individuals to develop new skills by engaging with their environment and observing others.

### **Attitudes Toward Learning Chinese**

A student's attitude plays a crucial role in the process of second-language acquisition. Attitudes are psychological constructs that shape an individual's perceptions, emotions, and behaviours (Rokeach, 1968). Weinburgh (1998) asserted that students with positive attitudes toward a subject tend to achieve higher academic success. Gardner and Lambert (1972) similarly emphasized that motivation is a key determinant in second-language proficiency. Wen (2011) further highlighted the impact of positive learning experiences on student retention and linguistic achievement.

In a study conducted by Hui (2017), it was found that students' personal backgrounds, learning goals, and social environments influenced their attitudes toward learning Chinese. Zhang (2021) identified three key factors that contribute to positive attitudes in language learning: personal fulfilment, interpersonal relationships, and social bonds. These findings suggest that fostering a supportive and motivating learning environment is essential for improving students' engagement with the Chinese language.

## **Challenges in Learning Chinese as a Second Language**

Learning Chinese as a second language presents several challenges, particularly for non-native speakers. One of the primary difficulties lies in the logographic writing system, which differs significantly from alphabetic languages such as English and Malay (Chua et al., 2015). Unlike alphabetic scripts, Chinese characters require knowledge of radicals and stroke patterns, making character memorization a demanding task. Sung (2014) noted that students often struggle with the visual complexity of Chinese characters, requiring consistent exposure and repetition for mastery.

Pronunciation also poses a major challenge for learners. Chua et al. (2015) found that minor variations in radicals can lead to differences in pronunciation, necessitating strong recall skills (Lee & Kalyuga, 2011). Additionally, tonal pronunciation plays a crucial role in Chinese language comprehension. Research by Sian Hong Teoh et al. (2022) indicated that mastering the tonal system—comprising five distinct tones—is essential for accurate communication. As Chinese is a tonal language, incorrect tonal pronunciation can result in misinterpretation of meaning, further complicating the learning process for second-language learners.

In summary, the literature underscores the growing importance of Chinese language acquisition in Malaysia and globally. Research highlights various strategies, including digital tools, social engagement, and traditional learning methods, as key contributors to second-language proficiency. While gamification and mobile applications have demonstrated effectiveness in enhancing motivation, there remains a need for further investigation into non-digital learning strategies. Additionally, understanding the role of metacognition, attitudes, and social learning theories in Chinese language acquisition can offer deeper insights into how students develop proficiency. Addressing the existing research gaps will be essential in refining language education policies and improving instructional approaches for non-native Chinese learners.

## **Methodology**

### **Research Design**

This study adopted a qualitative research design to explore the attitudes, challenges, and learning strategies of non-Chinese-speaking students acquiring Chinese as a second language. Qualitative research enables researchers to collect, analyse, and interpret subjective data, offering insights into individual experiences and behaviours within specific contexts (Mohajan, 2018). The data collected were systematically organized and categorized thematically to identify patterns and emerging themes related to students' learning experiences.

The primary objective of this study was to determine the attitudes and challenges faced by non-Chinese-speaking students in learning Chinese, as well as to examine the learning strategies they employed to overcome these challenges. Additionally, the study aimed to assess the effectiveness of these strategies in improving the participants' language proficiency.

A qualitative approach was deemed appropriate for this study as it allowed for an in-depth understanding of students' perspectives through focus group interviews. Kvale (1996) emphasized that interviews provide valuable insights into students' thought processes, enabling them to reflect on their learning journey. This study specifically targeted non-Chinese-speaking students enrolled

in a private school in Kuala Lumpur. Focus group discussions were conducted to encourage students to share their experiences, learning difficulties, and strategies in a structured yet open-ended manner.

### **Population and Sampling**

The study focused on a total of 20 non-Chinese-speaking students aged between 10 and 15 years from a private school in Kuala Lumpur. These students had low proficiency in Chinese and primarily used English or Malay as their main communication languages, engaging with Chinese only during classroom lessons. Most of them had started learning Chinese during primary school but continued to experience considerable challenges in acquiring proficiency in the language.

A purposive sampling technique was employed to select participants who best fit the research criteria. Purposive sampling, a non-probability sampling method, involves deliberately selecting individuals based on specific characteristics relevant to the study (Palinkas et al., 2015). The participants in this study shared common attributes, including their non-native status, low Chinese language proficiency, and ongoing engagement in formal Chinese learning.

This sampling method ensured that the data collected would be directly relevant to the research objectives.

### **Instrumentation**

The study utilized semi-structured interviews to obtain in-depth qualitative data from participants. The interview questions were carefully designed and divided into four main sections:

1. Background Information – Collected demographic data, language background, and preferred mode of communication.
2. Challenges in Learning Chinese – Identified the primary difficulties faced by students in reading, writing, speaking, and listening.
3. Learning Strategies – Investigated the various approaches students employed to enhance their proficiency in Chinese.
4. Motivation for Learning Chinese – Explored students' attitudes, personal goals, and external factors influencing their motivation.

The interview questions were adapted from a study by Jia Lin et al. (2023), which examined attitudes toward learning Chinese as a second language. Each question was carefully structured to ensure clarity and relevance to the research objectives while allowing flexibility for participants to elaborate on their experiences.

## **Validity and Reliability**

To enhance the credibility and trustworthiness of the research findings, efforts were made to ensure both validity and reliability throughout the study.

### **Validity**

- **Expert Review:** The interview questions were reviewed by language education experts to ensure clarity, relevance, and alignment with the research objectives (Kim, 2017).
- **Member Checking:** Participants were given the opportunity to review their interview transcripts to verify accuracy and minimize potential misinterpretations (Birt et al., 2016).

### **Reliability**

- **Triangulation:** Data were collected from multiple participants of different ages and backgrounds to ensure a comprehensive understanding of the challenges and strategies associated with learning Chinese (Flick, 2018).
- **Audit Trail:** Detailed records of the interview guides, transcription processes, and coding strategies were maintained to allow for transparency and replicability of the research process (Nowell et al., 2017).

## **Data Collection Method**

The data collection process involved conducting semi-structured focus group interviews over a three-month period. Each interview session lasted approximately 20 minutes, ensuring that participants had sufficient time to reflect on their experiences while minimizing disruptions to their academic schedules. The interviews were conducted in a quiet, comfortable setting within the school to facilitate open discussion.

With the participants' consent, all interviews were audio-recorded and later transcribed verbatim to preserve the authenticity of responses. The transcriptions were carefully reviewed to ensure accuracy before proceeding with data analysis.

## **Data Analysis Process**

A thematic analysis approach was employed to analyse the collected data. Thematic analysis (TA) is a widely used qualitative research method for identifying, analysing, and interpreting patterns within datasets (Braun & Clarke, 2020). This method allowed for the systematic categorization of data into key themes and sub-themes related to students' attitudes, challenges, and learning strategies.

The analysis process followed a six-phase approach outlined by Braun and Clarke (2020):

1. **Familiarization with Data:** Transcriptions were read multiple times to gain an overall understanding of participants' responses.

2. Generating Initial Codes: Data were coded based on recurring patterns and meaningful statements.
3. Searching for Themes: The codes were grouped into broader themes representing key findings.
4. Reviewing Themes: Themes were refined to ensure they accurately represented the data.
5. Defining and Naming Themes: Final themes were labelled and described to provide clear insights.
6. Producing the Report: The findings were systematically presented with supporting quotes from participants.

## **Ethical Considerations**

Ethical approval was obtained from the school administration and research supervisors before data collection commenced. Participants were informed about the purpose of the study, the voluntary nature of their participation, and measures taken to ensure confidentiality and data security.

The following ethical measures were implemented:

- Informed Consent: All participants and their guardians provided written consent before participation.
- Confidentiality: Participants' identities were anonymized using pseudonyms to protect their privacy.
- Right to Withdraw: Participants were given the freedom to withdraw from the study at any stage without any consequences.
- Data Security: Audio recordings and interview transcripts were stored in a password-protected database, and all collected data will be securely deleted five years post-study completion to ensure data protection.

## **Findings**

### **Contextual Findings**

To establish a comprehensive understanding of the respondents, the study began with a series of demographic questions during the interviews. These questions were designed to provide insights into population differences and their potential influence on perceptions of learning Chinese as a second language. Understanding the demographic profile of the participants was essential for contextualizing the findings and identifying any patterns or trends related to their learning experiences.

### **Participant Profile**

The study involved 20 students from a private school in Kuala Lumpur, Malaysia. The sample consisted of 17 female students and 3 male students, reflecting a gender imbalance that may have implications for the generalizability of the findings. The participants were distributed across different academic years, as outlined in Table 1 below.

*Table 1: Demographic Distribution of Participants*

| <b>Academic Year</b> | <b>Male Students</b> | <b>Female Students</b> | <b>Total</b> |
|----------------------|----------------------|------------------------|--------------|
| Year 4               | 1                    | 1                      | 2            |
| Year 5               | 0                    | 5                      | 5            |
| Year 6               | 0                    | 1                      | 1            |
| Year 7               | 1                    | 4                      | 5            |
| Year 8               | 0                    | 2                      | 2            |
| Year 9               | 1                    | 4                      | 5            |
| <b>Total</b>         | <b>3</b>             | <b>17</b>              | <b>20</b>    |

*Note.* The table summarizes the distribution of participants by academic year and gender.

All participants were non-Chinese speakers who primarily used Malay or English for communication at home. Despite learning Chinese as a second language, they faced various challenges in acquiring proficiency. Before the interviews, informed consent forms were provided to all students, which they signed to indicate their willingness to participate in the study.

The interview data were categorized into three key themes:

1. Challenges faced while learning Chinese
2. Strategies employed to overcome these challenges
3. Attitudes toward learning Chinese

The study identified several challenges students encountered while learning Chinese, including interest in the language, time required to memorize characters, communication difficulties, and classroom participation.

## Interest in Learning Chinese

Table 2 illustrates students' interest in learning Chinese.

*Table 2: Interest in Learning Chinese*

| Interest Level | Percentage (%) |
|----------------|----------------|
| Dislike        | 5%             |
| Neutral        | 40%            |
| Enjoy Learning | 55%            |

Out of all students interviewed, 5% expressed dislike for learning Chinese due to the difficulty of Chinese characters and language barriers. Approximately 40% maintained a neutral stance, expecting teachers to provide more guidance. Meanwhile, 55% of the students found the language enjoyable and valuable for future opportunities.

Some students expressed their enthusiasm for learning:

- "Yes, because it is interesting, and I want to understand the culture." (Interviewee S1)
- "Yes, because it is fun to learn a new language." (Interviewee S2)
- "Yes, because if I want to go to China, I can speak fluently." (Interviewee S4)

Conversely, some students encountered significant difficulties:

- "I don't like it, nor do I dislike it. I feel neutral. But sometimes I feel the language is the hardest to learn. The characters are difficult to learn and write." (Interviewee S3)

## Time Spent Understanding Chinese Characters

Table 3 presents the time students needed to understand Chinese characters.

*Table 3: Time Required to Understand Chinese Characters*

| Time to Understand Characters | Percentage (%) |
|-------------------------------|----------------|
| 1 hour                        | 23%            |
| 1 day                         | 15%            |
| 1 week                        | 62%            |

Students required varying amounts of time to grasp Chinese characters, with 62% needing a full week, as memorization played a critical role. Students noted that dual meanings and similar-looking characters made it challenging to distinguish words.

- "Depending on the difficulty of the words, I use one week to memorize them." (Interviewee S3)
- "I use one hour, but it depends on how easy or hard the characters are." (Interviewee S2).

## Speaking and Communication in Chinese

Table 4 illustrates how often students communicated in Chinese.

*Table 4: Frequency of Speaking Chinese*

| <b>Frequency of Speaking Chinese</b> | <b>Percentage (%)</b> |
|--------------------------------------|-----------------------|
| Frequently                           | 72%                   |
| Occasionally                         | 17%                   |
| Rarely                               | 11%                   |

Some students actively communicated in Chinese with family members:

- *"Yes, most of the time, I speak with my grandmother. If I don't understand a word, I ask my mom." (Interviewee S10)*

Others struggled with speaking due to lack of confidence:

- *"A bit, I think my tone is not right, and I struggle with that. I only greet friends in Chinese." (Interviewee S8)*
- *"I tried speaking before, but it sounded weird." (Interviewee S3)*

## Challenges in Answering Questions in Class

Table 5 shows the students' ability to respond in class.

*Table 5: Ability to Answer Questions in Class*

| Ability to Answer Questions | Percentage (%) |
|-----------------------------|----------------|
| Able to Answer              | 40%            |
| Sometimes Able              | 30%            |
| Unable to Answer            | 30%            |

Students found Pinyin and teacher explanations crucial for understanding:

- *"Yes, I can answer because the teacher gave a brief explanation." (Interviewee S4)*
- *"Sometimes I can answer, but not always." (Interviewee S7)*
- *"No, I don't understand the Chinese words." (Interviewee S1)*

## Strategies for Learning Chinese

Students employed various strategies to learn Chinese characters. Table 6 presents the strategies used.

*Table 6: Strategies Used to Learn Chinese Characters*

| Strategy                                | Percentage (%) |
|-----------------------------------------|----------------|
| Memorization                            | 25%            |
| Copying                                 | 10%            |
| Practicing                              | 10%            |
| Other (e.g., flashcards, rote learning) | 55%            |

Some students used memorization techniques:

- *"I spend time practicing the characters until I can engrave them in my memory." (Interviewee S6)*

Others relied on copying techniques:

- *"Sometimes I copy the words multiple times and use them in sentences." (Interviewee S7)*

## Overcoming Challenges

Table 7 highlights how students sought help when facing difficulties.

*Table 7: Solutions to Overcome Learning Challenges*

| <b>Solution</b>         | <b>Percentage (%)</b> |
|-------------------------|-----------------------|
| Asked teacher           | 47%                   |
| Used Google             | 18%                   |
| Asked parents           | 9%                    |
| Asked friends/relatives | 15%                   |
| Gave up/Other           | 24%                   |

A significant proportion of students relied on teachers for assistance, while some sought help from family and online resources.

## Attitudes Toward Learning Chinese

Students' attitudes toward learning Chinese were categorized into four themes, as shown in Table 8.

*Table 8: Attitudes Toward Learning Chinese*

| <b>Attitude Toward Learning Chinese</b> | <b>Percentage (%)</b> |
|-----------------------------------------|-----------------------|
| Difficult                               | 35%                   |
| Becoming Easier                         | 30%                   |
| Fun                                     | 25%                   |
| Self-Motivated                          | 10%                   |

## Motivation for Learning Chinese

Table 9 presents students' motivations for learning Chinese.

*Table 9: Motivation for Learning Chinese*

| <b>Motivation</b> | <b>Percentage (%)</b> |
|-------------------|-----------------------|
| Family            | 48%                   |
| Teachers/Friends  | 45%                   |
| School Curriculum | 7%                    |

The findings underscore the crucial role of family, teachers, and peers in motivating students.

### **Discussion of Findings**

The findings provided valuable insights into students' challenges, strategies, and attitudes toward learning Chinese. The study highlighted the difficulty of memorization, pronunciation issues, and dependency on teacher support as significant obstacles. However, strategic learning techniques and social encouragement proved vital in helping students overcome barriers in acquiring proficiency in the Chinese language.

### **Challenges Faced by Students Learning Chinese**

The study identified five major challenges students faced when learning Chinese as a second language:

1. Interest in learning the language
2. Time required to memorize Chinese characters
3. Ability to communicate in Chinese
4. Ability to answer questions in class
5. Proficiency in four language skills—reading, writing, listening, and speaking

Findings revealed that 55% of students were interested in learning Chinese, aligning with Gultom et al. (2020), who stated that student interest is a key driver of language acquisition. However, nearly half of the students either remained neutral or expressed disinterest, primarily due to difficulties in memorizing the large vocabulary and reading comprehension issues. These challenges significantly contributed to students' struggles in mastering the language, making Chinese one of the most difficult languages to learn.

A primary obstacle was the time required to memorize Chinese characters. The study found that 62% of students needed at least a week to memorize characters due to their complex stroke structures and multiple meanings. This finding was consistent with Chua et al. (2015), who emphasized the logographic nature of Chinese characters as a major hurdle for non-native learners.

Another significant challenge was oral communication, which plays a vital role in language learning (Tan et al., 2010). The results indicated that 72% of students practiced speaking Chinese regularly, often due to the presence of native Chinese-speaking peers in their school environment. This aligns with Hernández-Chérrez et al. (2021), who suggested that peer interactions enhance language acquisition by providing real-life exposure to spoken language.

However, difficulties persisted in answering questions during class discussions. Approximately 60% of students reported being unable to respond confidently in Chinese class. Many struggled with understanding words and forming coherent responses, leading to hesitation and silence during lessons. These findings supported Bensoussa et al. (1990), who argued that answering questions in class is essential for reinforcing language comprehension.

The study further highlighted that reading and writing skills were the most challenging for students, accounting for 78% of the reported difficulties. Yang (2018) similarly concluded that students learning Chinese as a second language faced greater challenges in reading and writing than in listening and speaking. This was attributed to the complexity of Chinese characters and the need for significant memorization and practice.

### **Strategies Used by Students**

To overcome these challenges, students employed various learning strategies, categorized into:

1. Memorization strategies for learning Chinese characters
2. Different approaches to mastering reading, writing, speaking, and listening
3. Solutions to address learning difficulties

The study found that memorization was the most commonly used strategy, with 25% of students relying on it to retain Chinese characters. This approach, although widely used, was time-consuming and mentally demanding. Additionally, 20% of students engaged in repetitive practice by using worksheets and repeated exposure to new vocabulary.

A notable 55% of students adopted alternative learning methods, including rote learning and flashcards, which helped them retain characters effectively. These findings aligned with O'Banion (1997), who emphasized that students modify their learning strategies based on their prior experiences.

The study also indicated that writing required more effort than speaking, listening, or reading, as Chinese characters are significantly different from the alphabetic writing systems used in English and Malay (Chua et al., 2015). This explained why students faced greater difficulties in reading and writing compared to speaking and listening.

The research also confirmed Perfetti et al.'s (2005) assertion that writing and reading Chinese characters are closely linked, as students who struggled with one skill typically faced similar issues in the other. Findings showed that 27% of students used memorization techniques for reading and writing, reinforcing the idea that rote memorization remains central to character recognition.

When addressing listening and speaking skills, 20% of students focused on developing their public speaking abilities. However, only 16% of students actively practiced listening strategies, suggesting that students lacked a natural immersion environment to enhance their listening skills. 45% of students relied on paying attention to conversations, reinforcing the importance of exposure to spoken language in improving communication skills.

When encountering difficulties, 47% of students sought help from teachers, while others used Google searches (18%), asked friends or family members (15%), or simply gave up (24%). This demonstrated that teacher guidance was viewed as the most reliable source of support, though some students preferred independent research.

### **Attitudes Towards Learning Chinese**

The study also examined students' attitudes, which influenced their learning progress. Findings showed that 35% of students found Chinese difficult, particularly at higher levels where reading and writing became more complex. However, 55% of students stated that their learning experience improved when teachers incorporated engaging activities such as games.

Motivation played a crucial role in learning outcomes. The study revealed that 48% of students were motivated by their families, while 45% credited teachers and peers for their encouragement. This finding reinforced the idea that students thrive when they receive external motivation from parents, teachers, and peers. In contrast, only 7% of students were motivated by the school curriculum, suggesting that curricular design was not a primary factor influencing students' commitment to learning Chinese.

The study found that students faced three primary challenges in learning Chinese: difficulty in memorizing characters, lack of confidence in communication, and struggles with reading and writing. The most common strategy to overcome these challenges was memorization, but it was not always effective in improving comprehension. Students who received consistent external motivation from family, teachers, and peers showed greater persistence in learning Chinese.

The findings suggested that students require more structured and engaging learning environments to improve retention and motivation. Without proper guidance, many students remained uncertain about the meaning of Chinese words and continued struggling with comprehension.

### **Conclusion and Recommendation**

#### **Implications and Reflection**

The study revealed several important implications for teaching and learning Chinese as a second language. First, students often struggled with insufficient time to master Chinese characters. As Sung (2014) highlighted, Chinese radicals require intensive practice, and students need dedicated time for memorization to build a strong foundation. Second, reading and writing were identified as the most challenging aspects of learning Chinese. This finding aligns with research by Perfetti et al. (2005) and Li Hai Tan et al. (2005), who emphasized the strong connection between writing skills and reading comprehension. Third, the study underscored the importance of using multiple

learning strategies to enhance retention. Kuo and Hooper (2004) identified five effective methods for learning Chinese characters: translation, verbal coding, visual coding, dual coding, and self-generated coding. These strategies were shown to improve vocabulary retention and overall comprehension, suggesting that a multifaceted approach is essential for success.

## **Recommendations**

To address these challenges and improve students' learning experiences, the study proposed several recommendations. First, incorporating game-based learning could make the process more interactive and engaging. Tang (2021) suggested that gamification techniques can motivate students and foster a more enjoyable learning environment. Second, parental involvement should be encouraged, as 48% of students relied on their families for motivation. Parents can play a crucial role in supporting their children's language learning by providing encouragement and creating opportunities for practice. Third, schools should introduce more listening and speaking exercises to help students build confidence.

Engaging in conversations with native speakers or peers can enhance fluency and communication skills. Fourth, technology-based learning tools, such as mobile applications and online platforms, should be explored to supplement traditional teaching methods and improve students' proficiency. Finally, further research is needed to identify the most effective memorization techniques for different age groups and learning styles, ensuring that teaching strategies are tailored to individual needs.

Learning Chinese as a second language presents unique challenges, particularly in reading, writing, and memorization. However, these challenges can be overcome with the right strategies, external motivation, and structured learning environments. By adopting modern teaching methods, such as gamification and technology-based tools, and fostering student engagement, educators can create more effective and enjoyable learning experiences for non-native speakers. With continued research and innovation, the process of mastering Chinese can become more accessible and rewarding for learners worldwide.

## References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Alam, M. (2021). Time constraints in educational research: Challenges and solutions. *Educational Research and Evaluation*, 27(3), 245-260.
- Altheide, D. L., & Johnson, J. M. (1994). *Criteria for assessing interpretive validity in qualitative research*. *Qualitative Sociology*, 17(1), 49-73.
- Bifuh-Ambe, E. (2009). Literacy instruction in multilingual classrooms. *Journal of Literacy Research*, 41(2), 137-167.
- Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness in qualitative research. *Qualitative Health Research*, 26(13), 1802-1811.
- Boroch, D., Hope, L., Smith, S., & Gabriner, R. (2010). Student success in community colleges: *A practical guide to developmental education*. Jossey-Bass.
- Boyer, E., Edmondson, S., Artis, S., & Fleming, K. (2014). Active learning: A foundation for student engagement. *Journal of Educational Psychology*, 106(3), 495-508.
- Braun, V., & Clarke, V. (2020). *Thematic analysis: A practical guide*. SAGE Publications.
- Chua, H. W., Lee, K., & Kalyuga, S. (2015). *The impact of Chinese radical knowledge on literacy*. *Asian Journal of Education*, 43(1), 78-95.
- Durlak, J., Weissberg, R., & Pachan, M. (2011). The impact of after-school programs on student learning outcomes. *American Journal of Community Psychology*, 45(1), 285-301.
- Ekici, D. (2021). Challenges and opportunities of flipped learning in second language acquisition. *International Journal of Language Learning*, 8(2), 112-130.
- Flick, U. (2018). *An introduction to qualitative research*. SAGE Publications.
- Gardner, R. C. (1985). *Social psychology and second language learning: The role of attitudes and motivation*. Edward Arnold.
- Huang, J., & Li, X. (2016). The structure of Chinese characters and its impact on second language learners. *Journal of Chinese Linguistics*, 44(2), 167-182.

- Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-System Pharmacy*, 65(23), 2276-2284.
- King, N., & Horrocks, C. (2018). *Interviews in qualitative research*. SAGE Publications.
- Li Jin, L. (2017). *Learning Chinese through WeChat*. *Language Learning & Technology*, 21(2), 87-103.
- Mohajan, H. K. (2018). Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, 7(1), 23-48.
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). *Thematic analysis*. *International Journal of Qualitative Methods*, 16(1), 1609406917733847.
- Sung, K. (2014). Understanding challenges in Chinese language learning. *Journal of Language and Education Research*, 8(4), 67-89.
- Tang, Y. (2021). *Gaming in language learning*. *Journal of Educational Technology*, 18(4), 201-218.
- Weinburgh, M. (1998). *Gender differences in student attitudes toward science*. *Journal of Research in Science Teaching*, 35(4), 387-397.
- Zhang, Q. (2021). Attitudes toward learning Chinese. *Studies in Second Language Acquisition*, 43(3), 568-590.