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Enhancing Students' Engagement, Self-Efficacy, and Mathematics Concept Mastery Through the Implementation of the Flipped Classroom Model at Quiver Center Academy

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A B S T R A C T

The COVID-19 pandemic has caused significant disruption in the education sector, forcing schools to shift their learning processes to online platforms. This transition to online learning is widely regarded as the most viable option for distance education. The present research was motivated by observed issues in Grade ten Mathematics, specifically passive student engagement, low self-efficacy, and poor concept mastery during classes conducted via video conferencing. The aim of this study was to improve students' engagement, self-efficacy, and concept mastery in Mathematics through the implementation of the Flipped Classroom Model during the pandemic. This Classroom Action Research was carried out over three learning cycles, with the subjects consisting of five Grade ten students from Quiver Center Academy. Data were collected through observations, surveys, and test assessments. The analysis of data from the three cycles indicated a twenty-nine percent increase in student engagement, a fifty-five percent increase in academic self-efficacy, and a sixteen percent improvement in concept mastery. In conclusion, the implementation of the Flipped Classroom Model effectively enhanced student engagement, self-efficacy, and concept mastery in Grade ten Mathematics at Quiver Center Academy.

INTRODUCTION

The COVID-19 pandemic has caused significant disruptions in the education sector worldwide. One of the most impactful changes has been the shift from traditional face-to-face learning to online platforms, which have become the most viable option for continued education during times of crisis. For schools like Quiver Center Academy (QCA), a classical Christian school in Tangerang that traditionally operated in-person, this transition to an online learning platform was abrupt and urgent. As distance learning has become an unavoidable necessity, it is critical for schools to ensure that online learning can be as effective as in-person education.

At QCA, the sudden shift to online learning in Grade ten Mathematics revealed several challenges. Observations, interviews, and evaluations conducted on five Grade ten students in the online Mathematics class highlighted key issues related to student engagement, self-efficacy, and concept mastery. Many students displayed varying levels of engagement, with a majority exhibiting passive participation in the learning process. Interviews and surveys conducted with these students revealed that approximately sixty percent of them had low levels of self-efficacy, believing that they could not achieve good results in Mathematics due to the limitations of online learning.

In addition, students struggled with applying mathematical concepts, particularly in problem-solving scenarios. They had difficulty answering questions that required conceptual understanding, such as proving theorems. Most students tended to memorize the steps for proofs from textbook examples without truly understanding the underlying concepts. This pattern was further confirmed by their test results, where eighty percent of the students had not mastered the key geometric concepts necessary to prove theorems.

Given these challenges, it is crucial to explore effective methods that can enhance students' engagement, self-efficacy, and concept mastery in online Mathematics learning. One promising approach is the Flipped Classroom Model. This model, which reverses the traditional teaching paradigm by having students first engage with new content outside the classroom (through video lectures or readings) and using class time for active learning, problem-solving, and discussion, has shown potential to increase student involvement and understanding in a variety of subjects, including Mathematics.

This Classroom Action Research aims to investigate the impact of the Flipped Classroom Model on Grade ten students' engagement, self-efficacy, and concept mastery in Mathematics during online learning. The study seeks to answer the following research questions:

1. How does the implementation of the Flipped Classroom Model affect students' engagement in Mathematics online classes?
2. How does the implementation of the Flipped Classroom Model influence students' self-efficacy in Mathematics online classes?
3. How does the implementation of the Flipped Classroom Model affect students' concept mastery in Mathematics online classes?

The theoretical framework for this study is grounded in the concepts of student engagement, self-efficacy, concept mastery, and the Flipped Classroom Model, all of which are critical factors in enhancing the quality and effectiveness of online education in the context of Mathematics learning.

LITERATURE REVIEW

Student Engagement

Research in educational psychology has revealed a strong link between non-cognitive factors and cognitive learning outcomes. Non-cognitive factors include motivation, interest, perseverance, and other personality traits such as attitudes, patterns of thought, feelings, and behaviour (Borghans et al., 2008). Cognitive learning outcomes are typically measured by academic performance, test scores, skill acquisition, and other indicators of students' knowledge, abilities, and competencies.

As a result, the concept of student engagement has emerged as a critical factor influencing academic success. While various definitions of student engagement exist, it generally encompasses emotional, cognitive, and behavioural aspects (Ni et al., 2020). Student engagement refers to a student's active participation in academic activities and their commitment to achieving educational goals (Christenson et al., 2012). From a cognitive perspective, Maroco et al. (2020) define engagement as the effort students invest in learning, understanding, and mastering challenging ideas and complex skills.

In summary, student engagement can be viewed as a student's willingness to participate in academic tasks, demonstrate effort, and work toward mastering knowledge and skills. While certain forms of engagement, such as academic and behavioural engagement, can be directly observed (e.g., homework completion, classroom participation), other aspects, particularly cognitive engagement, are less readily measurable (Reschly et al., 2020).

Self-Efficacy

Self-efficacy refers to a student's belief in their ability to succeed in specific academic tasks or challenges. Hodges (2018) defines it as the belief in one's capability to execute actions required to achieve specific goals. In the academic context, self-efficacy influences whether students will engage with learning tasks, persist through challenges, and ultimately succeed (Reschly, 2020).

Self-efficacy is particularly important in Mathematics, as it affects students' confidence in solving complex problems and mastering abstract concepts. Students with high self-efficacy tend to approach learning tasks with greater persistence and motivation, while those with low self-efficacy may avoid tasks or struggle when faced with difficulties. Self-reported self-efficacy is a key indicator, as it provides insight into the internal mental processes students go through when confronted with a learning challenge (Reschly, 2020).

Concept Mastery

Concept mastery is the deep understanding of fundamental concepts, enabling students to apply these concepts to solve problems, including unfamiliar or novel problems. Drury (2018) argues that students who master a concept can independently apply it in diverse contexts, demonstrating the ability to think critically and analytically.

In Mathematics, particularly Geometry, concept mastery is essential for problem-solving and theorem proving. Mastery means more than rote memorization of formulas or procedures. According to Drury (2018), a concept is mastered when students can represent it in multiple ways, use appropriate mathematical language, and apply it effectively to new problems in unfamiliar situations.

Mathematical concept mastery is typically measured through different levels of cognitive domains, as outlined in Bloom's Revised Taxonomy. These levels include:

1. Knowledge-level domains (remembering and understanding)
2. Application-level domains (applying)
3. Analysis-level domains (analyzing and evaluating)

In this study, concept mastery will be assessed based on students' ability to remember, understand, apply, analyze, and evaluate mathematical concepts, particularly those related to Geometry.

Flipped Classroom Model

The Flipped Classroom Model is a pedagogical approach in which traditional classroom activities are reversed. Bergmann & Sams (2017) explain that, in a flipped classroom, students first engage with instructional content (e.g., through videos or readings) outside of class, typically as pre-class activities. Classroom time is then used for more interactive, higher-order learning activities such as discussions, problem-solving exercises, and collaborative work with teacher guidance.

This model enables students to learn foundational concepts at their own pace before coming to class, where they apply these concepts in more complex tasks under the teacher's supervision. As Bergmann & Sams (2017) note, the flipped classroom focuses on active learning, where class time is used to engage students in analytical and evaluative thinking, applying concepts, and tackling real-world problems.

Research by Utheim & Foldnes (2017) confirms that the Flipped Classroom Model fosters greater self-efficacy by allowing students to prepare for lessons at their own pace and engage with challenging content during class time. This model aligns well with the idea that more complex cognitive tasks, such as analysis, evaluation, and creation, should occur in-class, following the pre-class acquisition of foundational knowledge.

Mathematics Subject

At Quiver Center Academy, a classical Christian school, Mathematics plays a pivotal role in developing students' reasoning and problem-solving skills. The Grade ten Mathematics curriculum focuses on the application of logical reasoning, with an emphasis on formal geometric proofs. In order to succeed in Geometry, students must master foundational concepts, which are then applied to more advanced material in subsequent lessons.

In the classical education model, concept mastery is built incrementally through a systematic review of previously learned material at three levels:

1. Initial reinforcement: New concepts are first introduced and practiced through workbook activities.
2. Integration across subjects: Concepts are reinforced across the curriculum.
3. Cumulative mastery: Mastered material serves as the foundation for more complex learning.

In this context, mastery of Geometry concepts is critical, as it lays the groundwork for further mathematical learning and problem-solving. The use of problem-solving techniques, analytical thinking, and logical argumentation is central to the development of students' mathematical reasoning.

RESEARCH METHOD

This study employs the Classroom Action Research (CAR) method, with the Flipped Classroom Model implemented over three learning cycles. The subjects of this study were five ten grade students at Quiver Center Academy. Data were collected through observations, surveys, and test questions.

Classroom Action Research (CAR) is defined by Wardani (2014) as research conducted by a teacher within their own classroom, driven by self-reflection. The primary aim of this approach is to improve teaching effectiveness and enhance student achievement. In this study, the CAR method was applied to assess the impact of the Flipped Classroom Model on student engagement, self-efficacy, and concept mastery.

The number of cycles applied in the study was determined based on the progression and outcomes of each cycle. After careful assessment, the research was concluded after the third cycle, as the results were deemed to have met the specified criteria for success.

To measure student engagement, an observation form was developed based on four key indicators. Each indicator, along with its observable aspects, is described in Table 1

Table 1. Indicators for Students' Engagement

Code	Indicators	Some Observable Aspects
SE-1	Prepared for class activities	Attendance, homework completion
SE-2	Focused on class activities	Shows on-task behaviours (do the assigned work, listens attentively, responds promptly to direction, track the lesson with their eyes, eliminate distractions)
SE-3	Active participation	Responding to / finding opportunities to participate in class activities
SE-4	Investment in learning	Contribute relevant response in the discussion, asks content-related questions

Students' self-efficacy was measured using a self-reported self-efficacy survey, which aimed to assess the students' confidence in understanding the learning material and their perceived ability to successfully solve problems in the mathematics test. The survey asked students to rate their level of confidence in mastering specific topics and solving related problems.

Concept mastery was evaluated through pre-test and post-test questions designed to assess students' understanding and application of mathematical concepts. The test questions were aligned with Revised Bloom's Taxonomy, which provided the framework for determining the cognitive level of each question. Bloom's Taxonomy categorizes cognitive processes into levels such as remembering, understanding, applying, analyzing, and evaluating, helping to assess different dimensions of concept mastery.

The indicators of concept mastery in this study are shown in Table 2.

Table 2. Indicators for Concept Mastery

Code	Indicators
CM-1	Knowledge-level (Remember and Understand)
CM-2	Application-level (Apply)
CM-3	Analysis-level (Analyze and Evaluate)

The research method applied is qualitative data analysis by describing the research data and quantitative data analysis.

RESULTH AND DISSCUSSION

The implementation of the Flipped Classroom Model to enhance students' engagement, self-efficacy, and concept mastery was conducted over three cycles. Each cycle consisted of four meetings, all held online over a two-week period. Students participated in virtual classes via Google Meet, with each session lasting sixty minutes. During this study, the topics covered included angle relationships and parallel lines, applying parallel lines to polygons, and congruent triangles. Below is an explanation of the classroom action research process.

Cycle 1

The topic for the first cycle of this study was angle relationships and parallels. The objectives for this cycle were for the students to:

1. Define terms related to parallels.
2. Analyze the basic properties of parallels.
3. Analyze special angles formed by parallels.

4. Identify postulates, theorems, and related angles about parallels and transversals.

In this cycle, students were trained to apply concepts of parallels and to create a plan to prove theorems by using their understanding of parallels and related angles.

As part of the pre-class activities, the researcher created three explanation videos with visual representations to explain the basic properties of parallels, as well as the postulates and theorems about parallels, transversals, and related angles.

Students were required to watch these explanation videos, which the researcher uploaded to Ed Puzzle, before attending the online class session. While watching the videos, students needed to answer lower order thinking questions embedded in the Ed Puzzle videos. However, during this cycle, some students did not consistently complete the pre-class activities before the online class sessions.

For the in-class activities, students were supposed to review the material from the pre-class videos by sharing key points of what they learned. They were also encouraged to ask questions or clarify their understanding before working on more challenging exercises. However, no students volunteered to share their thoughts or ask questions. When the researcher asked questions to check for understanding, students generally stayed silent. After a long pause, either Student D or E would volunteer to answer the question.

In one of the activities, students were assigned to determine the truth value of ten statements based on the basic properties of parallels and solve ten proof exercises from the textbook. They were required to justify their answers by explaining their reasoning for each statement. In this cycle, most of the discussions were still led and prompted by the researcher.

Based on observations, Student A, D, and E began to engage more in the lesson through their answers and questions. They were able to collect and correlate relevant concepts and use them strategically to prove specific statements. In contrast, Student B and C were more passive listeners and often distracted, requiring frequent reminders from the researcher to stay focused on the exercises.

At the end of this cycle, before administering a test to assess students' concept mastery, the students filled out a survey to measure their self-efficacy. The results from this cycle were compared to the pre-test data obtained from the preliminary study. The comparison of pre-test and post-test results for each variable in Cycle 1 are presented in Table 3 and Table 4.

Table 3. Pre-Test and Post-Test Results Comparison in Cycle 1

Variable	Student Engagement	Self-Efficacy	Concept Mastery
Pre-Test	52.5	34	56
Post-Test	66.3	54	70.7

Table 4. Pre-Test and Post-Test Results Comparison of Indicator in Cycle 1

Variable	Student Engagement				Self-Efficacy	Concept Mastery		
Indicator	SE-1	SE-2	SE-3	SE-4	-	CM-1	CM-2	CM-3
Pre-Test	55	60	50	45	34	85	45	57.1
Post-Test	63.3	78.3	60	63.3	54	80	78.3	61.4

Based on the data in Table 4, on average, students' engagement scores improved in Cycle 1 across all indicators. However, the increase in engagement scores for Indicator 1, Indicator 3, and Indicator 4 did not meet the target engagement score of seventy-five. This suggests that, on average, Grade ten students need to improve in several areas:

1. Being more prepared for class by completing pre-class activities before the online sessions.
2. Actively participating by contributing their thoughts.
3. Asking or answering questions during in-class discussions.

4. Contributing relevant ideas to the discussion.

On the other hand, the increase in the score for Indicator 2 did reach the target engagement score of seventy-five, indicating that, overall, Grade ten students were focused and engaged in class activities.

Regarding self-efficacy, although the students' scores did not reach the target score of seventy, there was a notable increase from thirty-four to fifty-four. At the beginning of the cycle, all students' self-efficacy scores were below the target. By the end of the cycle, only Student D reached the target score.

As shown in Table 3, at the beginning of the cycle, eighty percent of the class had concept mastery scores below the target score of seventy. By the end of the cycle, Students A, D, and E reached the target score, while Students B and C did not. On average, students' concept mastery in solving knowledge-level and application-level questions met the target score of seventy. However, their mastery in solving analysis-level questions did not reach the target score of seventy. This indicates that, on average, Grade ten students need to improve their higher-order thinking skills to solve mathematical problems that require analysis and evaluation.

In summary, while all the variables in this research showed improvement, none of them fully reached the targeted goals. Therefore, a second cycle of the research is necessary to further address these areas of improvement.

Cycle 2

The topic covered in the second cycle of this study was applying parallels to polygons. The objectives for this cycle were for students to:

Identify and use the properties of polygons (such as consecutive vertices, consecutive sides, and diagonals of a polygon) to prove theorems about polygons.

1. Find the sum of the interior and exterior angles of any polygon.
2. Solve angle-related problems involving polygons.

To support the pre-class activities, the researcher prepared three explanation videos with visual representations to explain the properties of polygons, as well as postulates and theorems related to parallels in polygons.

Students were required to watch these explanation videos, which were uploaded to Ed Puzzle, before attending the online class session. While watching the videos, students needed to answer lower order thinking questions embedded in the videos. In this cycle, only one student failed to consistently complete the pre-class activities before the online session.

For the in-class activities, students were encouraged to ask questions or clarify their understanding before moving on to more challenging exercises. Student D volunteered to share her thoughts and confirmed her understanding of the material.

The in-class exercises involved students finding the required angle measures based on the theorems learned about polygons in the textbook. Throughout this cycle, the discussions were sometimes led and prompted by the researcher, with Students A, D, and E becoming more engaged in the lesson through their answers and questions. Students B and C also made an effort to answer questions a few times.

At the end of this cycle, before administering a test to assess students' concept mastery, students completed a survey to measure their self-efficacy. The assessments on students' engagement, self-efficacy, and concept mastery from this cycle were compared to the pre-test data from the previous cycle. The comparison of the pre-test and post-test results for each variable in Cycle 2 is presented in Table 5 and Table 6.

Table 5. Pre-Test and Post-Test Results Comparison in Cycle 2

Variable	Student Engagement	Self-Efficacy	Concept Mastery
Pre-Test	66.3	54	70.7
Post-Test	80	72	80.7

Table 6. Pre-Test and Post-Test Results Comparison of Indicator in Cycle 2

Variable	Student Engagement				Self-Efficacy	Concept Mastery		
Indicator	SE-1	SE-2	SE-3	SE-4	-	CM-1	CM-2	CM-3
Pre-Test	63.3	78.3	60	63.3	54	80	78.3	61.4
Post-Test	93.3	80	75	71.7	72	95	88.3	70

Based on the data in Table 6, on average, the scores for every indicator of students' engagement, self-efficacy, and concept mastery increased in Cycle 2. Although the engagement score for Indicator 4 did not reach the target score of seventy-five, the overall average engagement score increased from sixty six point three to eighty. This indicates that the research goal for students' engagement has been met. However, Grade ten students still need improvement in contributing relevant thoughts to the class discussions.

In terms of self-efficacy, students reached the target score of seventy, with their self-efficacy increasing from fifty-four to seventy-two. At the beginning of the cycle, only one student's survey response reached the target score. By the end of the cycle, four out of five students reported a self-efficacy score of at least seventy out of one hundred.

Regarding concept mastery, at the beginning of the cycle, forty percent of the class (two out of five students) had concept mastery scores below the target score of seventy. By the end of the cycle, Students A, D, and E maintained their performance above the target score, and Student C reached the target score. Only Student B did not meet the target. On average, students' concept mastery in solving knowledge-level, application-level, and analysis-level questions reached the target concept mastery score of seventy.

Referring to the data presented in Table 5, all variables in this research showed improvement and reached the targeted goals. Therefore, a third cycle of this research was conducted for confirmation.

Cycle 3

The topic covered in the third cycle of this study was Congruent Triangles. The objectives for this cycle were for students to:

1. Explain the properties of congruent triangles.
2. Identify the corresponding parts of triangles
3. Create a step-by-step plan to prove that two triangles are congruent, using the definitions, theorems, and postulates they have learned.

To support the pre-class activities, the researcher prepared three explanation videos covering the characteristics of congruent triangles, postulates, theorems for proving triangle congruence, and the conclusions that can be drawn from congruent triangles.

For the pre-class activities on Ed Puzzle, students followed a step-by-step process to prove theorems about triangles, using a provided proof plan. In this cycle, all students consistently completed the pre-class activities before joining the online class sessions.

During the in-class activities, students worked on challenging problems, creating step-by-step plans to prove the congruence of two right triangles based on various given information. They were required to provide valid reasoning for each step, and then present their proofs. Students A, D, and E took the initiative to drive class discussions. The researcher noticed that once two students began participating in the discussion, the other students joined in as well. The researcher no longer needed to encourage students to answer questions or engage in the discussion, as it had become a natural part of the class.

For knowledge-level and application-level problems, students were able to justify their answers by referring to the corresponding parts given and explaining how these parts fit the postulates or theorems they chose to support their proofs. However, for analysis-level problems, Students B and C still required hints and assistance to solve the problems.

At the final meeting of this cycle, before the researcher administered a test to measure students' concept mastery, students completed a survey to assess their self-efficacy. The results from the cycle were compared to the pre-test data from the previous cycle. The comparison of pre-test and post-test results for each variable in Cycle 3 is presented in Table 7 and Table 8.

Table 7. Pre-Test and Post-Test Results Comparison in Cycle 3

Variable	Student Engagement	Self-Efficacy	Concept Mastery
Pre-Test	80	72	80.7
Post-Test	85.4	84	82

Table 8. Pre-Test and Post-Test Results Comparison of Indicator in Cycle 3

Variable	Student Engagement				Self-Efficacy	Concept Mastery		
Indicator	SE-1	SE-2	SE-3	SE-4	-	CM-1	CM-2	CM-3
Pre-Test	93.3	80	75	71.7	72	95	88.3	70
Post-Test	96.7	83.3	78.3	83.3	84	90	86.7	75.7

Based on Table 8, on average, the scores for every indicator of students' engagement and self-efficacy increased in Cycle 3.

Regarding concept mastery, although there was a slight decrease in scores for Indicators 1 and 2, these scores remained above the target score of seventy. Notably, students' concept mastery in Indicator 3 increased above the target score of seventy. This indicates that, on average, Grade ten students continued to improve in the aspect of higher-order thinking skills, particularly in solving mathematical problems that require analysis and evaluation.

Table 9. Summary of Results on Cycle 1, Cycle 2, and Cycle 3

Variable	Cycle 1	Cycle 2	Cycle 3
Student Engagement	66.3	80	85.4
Self-Efficacy	54	72	84
Concept Mastery	70.7	80.7	82

In summary, as shown in Table 9, all variables in this research consistently improved from Cycle 1 to Cycle 3. The scores in Cycle 3 remained above the targeted goals set for this research. Therefore, Cycle 3 marks the final cycle, as the research goals have been successfully achieved.

CONCLUSION

Based on the problems, results, and discussions in the previous sections, the following conclusions can be drawn for the QCA Grade ten Mathematics online class:

1. Students' Engagement: The level of students' engagement consistently increased with the implementation of the Flipped Classroom Model. Engagement scores rose from sixty-six point three in the first cycle to eighty in the second cycle, and eighty-five point four in the third cycle, with a medium n-gain score of zero point sixty Initially, students were passive

in class activities. However, as the Flipped Classroom Model was implemented, students came to class better prepared with pre-requisite knowledge, which enhanced their cognitive engagement and allowed them to more actively follow the teacher's discussions. By the end of the third cycle, students participated actively in class discussions.
2. Students' Self-Efficacy: There was a noticeable increase in students' self-reported self-efficacy after the Flipped Classroom Model was implemented. The average self-efficacy score of Grade ten students increased from fifty-four in the first cycle to seventy-two in the second cycle, and eighty-four in the third cycle, with a medium n-gain score of zero point sixty-six. This increase in self-efficacy was evident in class, as students became more confident in sharing their thoughts and seeking help when needed, knowing they could grasp the concepts.
3. Students' Mathematics Concept Mastery: The implementation of the Flipped Classroom Model also led to an improvement in students' concept mastery. The average concept mastery score of Grade ten students increased from seventy point seven in the first cycle to eighty point seven in the second cycle, and eighty- two point zero in the third cycle, with a medium n-gain score of zero point thirty-three At the beginning of the first cycle, students struggled to justify their reasoning processes. By the end of the research, students were able to devise plans to prove required statements and explain the significance of each step in constructing their proofs.

In conclusion, the implementation of the Flipped Classroom Model has successfully improved Grade ten students' engagement, academic self-efficacy, and concept mastery in Mathematics at Quiver Center Academy.

Recommendations

For teachers facing similar situations, the Flipped Classroom Model can be considered an effective alternative to improve students' engagement, self-efficacy, and concept mastery. However, it is important to note that the study faced limitations due to a small sample size, which may affect the generalizability of the results. Therefore, the following recommendations are made for future research and practice:

1. Increase the Sample Size: To enhance the representativeness of the results, it is recommended that future studies use a larger sample size, allowing for more robust statistical analysis.
2. Item Analysis on Concept Mastery Tests: Conducting an item analysis on the concept mastery tests would provide insights into specific areas of strength and weakness, helping to further refine teaching strategies and assessments.
3. Cause-and-Effect Analysis: Future studies could explore the cause-and-effect relationships between the implementation of the Flipped Classroom Model and specific student outcomes (e.g., engagement, self-efficacy, concept mastery) to better understand how the model influences learning.

By addressing these recommendations, future research could provide a clearer and more comprehensive understanding of the effectiveness of the Flipped Classroom Model in improving student outcomes

REFERENCES

Bergmann, J., & Sams, A. (2017). *Flipped learning series: flipped learning for elementary instruction.* Wasingthon: The Companion to Flip Your Classroom.

Borghans, L., Duckworth, A. L., Heckman, J. J., & Weel, B. T. (2008). The economics and psychology of personality traits. *Journal of Human Resources, 43*(4), 972–1059. https://doi.org/10.1353/jhr.2008.0017

Christenson, S. L., Reschly, A. L., & Wylie, C. (2012). *Handbook of research on student engagement.* New York: Springer.

Drury, H. (2018). *How to teach mathematics for mastery.* Oxford: Oxford University Press.

Hodges, C. B. (2018). *Self-efficacy in instructional technology contexts.* Springer International Publishing.

Maroco, J., Assuncão, H., Luukkainen, H. H., Lin, S. W., Sit, P. S., Cheung, K. C., Maloa, B., Llic, I. S., Smith, T. J., & Campos, J. A. D. B. (2020). Predictors of academic efficacy and dropout intention in university students: can engagement suppress burnout?. *PLoS ONE*, 1–26. https://doi.org/10.1371/journal.pone.0239816

Ni, X., Shao, X., Geng, Y., Qu, R., Niu, G., & Wang, Y. (2020). Development of the social media engagement scale for adolescents. *Frontiers in Psychology*, *11*, 1–7. http://dx.doi.org/10.3389/fpsyg.2020.00701

Reschly, A. L. (2020). *Student engagement: effective academic, behavioral, cognitive, and affective interventions at school.* Switzerland: Springer.

Utheim, A. T., & Foldnes, N. (2017). A qualitative investigation of student engagement in a flipped classroom. *Teaching in Higher Education*, *23*(3), 307–324. http://dx.doi.org/10.1080/13562517.2017.1379481

Wardani, I. G. (2014). Hakikat penelitian tindakan kelas. In I. G. Wardani (Eds.), *Penelitian tindakan kelas* (pp. 1–36). Jakarta: Universitas Terbuka.