MOTIVATIONAL VARIABLES AND ACADEMIC PERFORMANCE OF EDUCATIONAL RESEARCH COURSE STUDENTS

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**ABSTRACT**

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| **Aims:** This study aimed to determine the levels of motivational variables employed by Education students and their relationship with their academic performance in Research courses. **Study design:** This research used a descriptive-correlational quantitative design. **Place and Duration of Study:** The study was conducted at one of the higher institutions in Ozamiz City during the AY 2023-2024. **Methodology:** This quantitative study employed a descriptive-correlational research design. Using the survey questionnaire, this study described the levels of motivational variables such as intrinsic motivation, extrinsic motivation, task value, and self-efficacy, and the academic performance of Education students. This study is correlational, as it examined whether a significant relationship exists between these variables and students' academic performance. The respondents' academic performance was assessed in this study through the calculation of their average weighted mean grades. **Results:** The results showed that Education students demonstrated high levels of motivation, including intrinsic motivation (x̄ = 3.00), extrinsic motivation (x̄ = 2.67), task value motivation (x̄ = 3.10), and self-efficacy (x̄ = 2.91). The respondents’ academic performance was found to be above average. Among the motivational variables, self-efficacy and task value showed a significant relationship with the respondents’ academic performance, whereas no significant relationship was observed between intrinsic and extrinsic variables and academic performance.**Conclusion:** Although Education students were highly motivated both internally and externally in the Research course, it did not guarantee an impact on their academic performance. Therefore, further research is needed to identify the motivational variables that influence academic performance. |

*Keywords: level of motivation variables, academic performance, research course, education students*

**1. INTRODUCTION**

Motivation serves as the driving force that propels individuals to strive for their goals, whether in school, at home, or in personal matters (Kendra, 2023). In other words, motivation compels them to take action, make efforts, and persist in their pursuits. Having no motivation hinders their ability to achieve their goals, as they lack the determination to overcome challenges and problems (Mauliya et al., 2020). For example, some students who need motivation face challenges in their everyday academic tasks and strive for good grades, particularly in subjects that require a significant amount of their time.

One of the college courses that students struggle with is research. Trimmer (2001) stated that the research course presents unexpected difficulties and problems, as it requires students to engage in critical thinking, extensive reading, data analysis, and the creation of numerous scholarly writings. The research course makes it difficult for them to achieve good grades and meet the demands of the research course. It consumes a significant amount of their time to complete it, as it requires a clear understanding, determination, and effort to determine what needs to be done. İlker and Demirhan (2013) stated that even the most proficient students are unable to learn if they are not motivated to learn.

Motivated students are much more likely to achieve their full potential, as motivation is a fundamental ingredient for success. It stimulates the desire in individuals to take action, driving them to achieve their goals and complete tasks in their daily lives. In terms of academic performance, motivation refers to the internal or external factors that drive their academic pursuits, according to Gbollie and Keamu (2017). Furthermore, they stated that the nature of motivation and learning strategy use is crucial to improving students' learning outcomes.

Many studies worldwide have explored the relationship between motivation and students' academic performance, and investigations of this relationship in Philippine education have remained scarce (Sabanal et al., 2023). Also, in the Philippines, limited studies have been conducted on the motivational variables used by education students in research courses. Thus, this quantitative study aimed to determine the motivational variables of Education students and their relationship with their academic performance in Research courses.

**2. REVIEW OF RELATED LITERATURE**

## **2.1 Motivation**

## Motivation is a complex aspect of human psychology that influences how people approach a task, their feelings and thoughts about it, and their perseverance through it (Bakar, 2014). Motivation also plays a significant role in education, guiding both students and teachers to achieve desirable outcomes (Shrestha, 2020). Khalid et al. (2023) noted that motivation drives students to achieve their goals and serves as a force that influences their behavior in a given situation. This is why motivation is referred to as “the reasons underlying the behavior” (Guay et al., 2010)..

According to Davidovitch and Dorot (2022), motivation is defined as the concept that explains the reasons behind actions. It is an individual's attributes that take action and perform certain behaviors. Furthermore, Grew (2017) noted that motivation is an individual’s desire to invest resources in the pursuit of an activity and the desired behavior. This means that the concept of motivation encompasses the urges, motives, and actions of the individual and their response to a need, involving various actions to achieve their desired goals. According to Feist et al. (2015), motivation is defined as "the urge to move towards one’s goals, to accomplish tasks.” A process by which a person’s efforts are energized, directed, and sustained to achieve a goal (Robbins, 2014). Motivation is concerned with the strength and direction of behavior, as well as the factors that influence people to behave in specific ways.

In the realm of education, motivation is defined as the characteristic that describes how much the students are interested in achieving and accomplishing the goals (Beck, 2021). Cook and Artino (2016) also added that motivation drives the students to initiate and maintain their academic performance. As such, numerous studies have examined the connection between academic performance and student motivation, with results highlighting how motivation fosters academic achievement. One example of this is the research study by Pelaccia et al. (2017), which found a relationship between students’ academic achievements and success, as well as their motivation. It also concluded that the higher the students' motivation, the higher their academic performance.

Additionally, the study by Schunk and DiBenedetto (2020) found that students who perform better tend to have a high level of motivation. In other words, the more motivated a student is, the more they excel academically, indicating a positive correlation between motivation and academic performance. Further, it is believed that unmotivated students are less likely to achieve their academic goals. As stated in the study of İlker and Demirhan (2013) that without motivation, even the most skillful students could not learn since they were not motivated to learn. Therefore, one of the most important factors in a successful learning process is motivation.

**2.2 Motivational Variables**

Motivation variables are vital in the learning process, as they influence various aspects of academic performance and engagement, including students' engagement, interest, and emotions towards academic subjects. In a learning context, motivation variables are defined as qualities that motivate students to seek out positive changes in their academic performance (Chan, n.d). To produce a positive change, motivation variables in learning must be maintained until the learner exhibits a change that signifies learning has taken place. Kim (2012) mentioned that motivation variables are the qualities that prompt a learner to strive for positive changes in their learning behaviors. Ryan and Deci (2017) stated that motivational variables are the different factors that influence a student’s drive to participate in a specific activity or behavior. It motivates students to persevere in making meaningful changes in their behavior and advancing their understanding and skills. Additionally, Sivrikaya (2019) noted that students' motivational factors positively impact their academic performance; the more motivational factors there are, the higher their academic performance. This means that students with higher motivational variables tend to put more effort into their academic tasks compared to those with lower motivational variables.

This research emphasizes four significant motivational variables: intrinsic motivation, extrinsic motivation, task value, and efficacy. Intrinsic motivation involves inner satisfaction and enjoyment, which is not dependent on external rewards. It is where students are motivated to participate in academic activities by an internal drive, as they are engaged in learning and find the process enjoyable (Chow & Yong, 2013). Conversely, extrinsic motivation emphasizes the need for external rewards to motivate learners to learn. Schunk and DiBenedetto (2020) state that extrinsically motivated students view learning as a means to an end, meaning they prioritize external rewards over the pursuit of meaningful learning. Argadinata and Gunawan (2020) emphasize the importance of valuing students as unique individuals, each with their distinct characteristics. They also emphasize the importance of providing personalized attention to each student.

Furthermore, the concept of self-efficacy rests on an individual's belief in their ability to accomplish and complete a task. As stated by Anam and Stracke (2016), students with higher levels of self-efficacy tend to be more self-regulating and persevere longer when faced with challenges in learning-related tasks. Mouloud (2015) states that individuals with high self-efficacy persist through difficulties, adapt to challenging situations, and view challenges as opportunities for growth rather than problems to avoid. Students with a sense of self-efficacy are more likely to undertake the tasks assigned and persevere in accomplishing them. In task value, the learners’ perception of how significant, engaging, and valuable the tasks are is emphasized. It indicates that task value is a significant variable in determining achievement-related choice behavior, persistence, and effort (Song & Chung, 2020). These motivational variables are linked to students’ beliefs about academic self-concept, self-esteem, and goals, influencing their behavior and achievement in learning (Fernandez et al., 2019).

**2.2.1 Intrinsic Motivation**

Intrinsic motivation is defined as doing an activity because of intrinsic satisfaction rather than because of separable outcomes. When individuals are intrinsically motivated, they are motivated to act because of the pleasure or challenges rather than external incentives, pressures, or rewards (Ryan & Deci, 2000). According to Henry and Lamb (2020), intrinsic motivation characterizes the behaviors pursued for personal fulfillment and inner satisfaction, leading to sustained engagement. Intrinsic motivation focuses on internal satisfaction rather than external rewards. The study by Oclaret (2021) states that intrinsic motivation is an interest or fulfillment in the activity itself, originating from within the person rather than relying on external pressures. In other words, intrinsic motivation occurs when a task is done out of an individual's free choice.

In the context of learning, intrinsic motivation is defined as the internal drive of students to engage in academic tasks because they desire to learn and find the learning process enjoyable (Schiefele, 1991). When learners are intrinsically motivated, they participate in activities driven by their internal interests, characterized by factors such as excitement and happiness (Ryan & Deci, 2000). However, Cherry (2019) explains that intrinsic motivation does not mean that external rewards will not drive a person. Instead, it suggests that external incentives alone are not enough to maintain a person's motivation. Similarly, Li (2021) explains that an intrinsically motivated individual recognizes the benefits of rewards, but these rewards alone are insufficient to sustain their motivation. In other words, regardless of the presence of rewards, the individual will persist in the task as long as they remain interested or committed to it.

Even in the absence of tangible rewards, if the students are motivated intrinsically, they demonstrate a willingness to learn (Chow & Yong, 2013). Additionally, Gagne and Deci (2005) stated that intrinsic demands are satisfied by engaging in the activity itself without receiving any visible rewards. This made the learners aware that they need to learn without tangible incentives. Liu et al. (2022) highlighted that providing immediate external rewards can boost intrinsic motivation, emphasizing the importance of timing in determining the effectiveness of rewards on motivation.

Furthermore, intrinsic motivations drive students to actively participate in learning opportunities because they perceive the task as more enjoyable and interesting. As a result, high levels of effort invested in the learning process and task performance were linked to intrinsic motivation (Patall et al., 2008). Research suggests that students with stronger internal drives are also more persistent in learning (Hardre & Reeve, 2003). Intrinsic motivation drives individuals to participate in academic activities because of the enjoyment, challenge, and uniqueness they offer, rather than for external rewards, gifts, or pressure to do so (Legault, 2016; Deci & Ryan, 2016). Intrinsic motivation has a significant impact on students’ performance, learning perseverance, and productivity (Grant, 2008). Furthermore, studies by Corpus et al. (2009), Law et al. (2012), and Lepper et al. (2005) found a positive correlation between academic accomplishment and intrinsic motivation. As concluded by the study of Akhtar et al. (2017), secondary school teachers' intrinsic motivation is strongly linked to students' academic success, showing how teachers' motivation can influence student performance. Similarly, the study by Augustyniak et al. (2016) revealed that learners with greater intrinsic motivation had better understanding, memory, and overall academic success. This suggests that intrinsic motivation has a positive impact on the academic performance and overall engagement of students.

**2.2.2 Extrinsic Motivation**

Extrinsic motivation is a form of motivation driven by outside forces, one of which is a reward system that encourages students to exert effort in pursuit of a reward. This means completing tasks because rewards are expected afterwards. These external rewards are correlated with the consequences of desired behaviors involved in operant conditioning (Rose, 2014), meaning that a person behaves appropriately due to a reward or consequence (American Psychological Association, 2018).

Extrinsic motivation items consolidate two factors: “tangible rewards” and “intangible rewards.” Tangible rewards, according to a meta-analysis, support a significant positive main effect between monetary rewards and general performance, such as an increase in their allowances or buying things that they have been yearning for a while; it could have been makeups, new phones, or video games (Condly et al., 2008). Tangible rewards tied to performance standards can enhance students' competence and intrinsic motivation, leading to improved learning outcomes (Xiao & Khe, 2023). In contrast, intangible rewards exclude financial considerations and instead utilize words of affirmation to convey appreciation and recognition. They include praise and performance feedback through thank-you cards, Hall of Fame postings, announcements, and newsletters (Armstrong, 2012). These may also include elements such as word praises or fame (Lepper & Greene, 2015). It could also have been through funding a particular project from a specific sports team in school (Amabile & Pratt, 2016). Regardless of the type of rewards they receive, students derive motivation from them, as they perceive that accomplishing something in school would be highly appreciated by their friends and family, and would boost their ego and confidence to achieve more.

Furthermore, extrinsically motivated students excel in school and improve their performance during tasks assigned by their teachers and colleagues, even when these tasks may not be inherently rewarding. It is a valuable and effective tool for encouraging students to continue their work during periods of passion and motivation burnout (Kendra, 2022). Extrinsic motivation can be helpful when students are expected to complete a task they are not fond of, such as lengthy essays, tedious assignments, or time-consuming projects. As for Marsh (1997), “motivation is an external stimulus that follows as a result of a certain response.” Motivation is a crucial factor that encourages people to strive for their best performance goals (Vincent & Kumar, 2019). Hence, extrinsic motivation encompasses any driving forces that stem from the desire to complete a task, enabling the learner to continue learning throughout the process.

**2.2.3. Task Value**

Task value refers to the extent to which students perceive academic activities as beneficial and increasingly valuable to them (Cennet, 2021). When they see value in their work, they gain an increased independence in their learning process, develop better problem-solving skills, and become more organized and dedicated (Carter et al., 2012). According to Quesada-Pallarès et al. (2019), students who perceive their tasks as meaningful exhibit increased engagement and improved academic performance. This finding suggests that acknowledging the significance and relevance of a task can enhance students' motivation and support their educational achievements.

Research suggests that task value is a stronger predictor of academic achievement than intelligence (Steinmayr et al., 2019). This is because students who see value in their learning exhibit a stronger drive to succeed. Eccles and Wigfield (2002) described task value as the motivation behind a student's engagement in an academic task. As such, task value is a key factor in predicting academic success, often surpassing intelligence in its influence (Ricarda et al., 2019). Accordingly, expectations and values significantly influence important academic outcomes, including continued interest, engagement, and ultimately, academic achievement. Similarly, Eccles (2011) argued that students' decisions, choices, and overall academic success are directly linked to their confidence in success and the value they place on their tasks. As Song and Chung (2020) found in their study, task value strongly influences achievement-related choices, persistence, and effort.

Patricia et al. (2019) argued in their study that task value is significant, regardless of cultural differences. They also suggest a direct influence of task value on mastery goals and deep learning approaches. Students who perceive tasks as valuable are more likely to adopt mastery goals, focusing on learning and improvement rather than simply getting good grades. Additionally, when teachers communicate clear and reasonable expectations, offer practical assistance, and encourage student autonomy, it increases the likelihood that students will value the task positively and develop favorable feelings towards it (Assor et al., 2002). Siacor and Ng (2024) explored teachers' perceptions of the role of autonomy support in promoting learners' motivation and participation. Their findings suggest that educators value autonomy support as a means to meet students' psychological needs, thereby enhancing their motivation and engagement.

**2.2.4 Self-efficacy**

Self-efficacy, as defined by Waddington 2023, is a concept that centers on a person’s assessment of their ability to accomplish a task successfully in a particular circumstance. Mookkiah and Prabu (2019) also added a definition of self-efficacy, which is a judgment of one’s abilities to compose and execute the tasks to achieve optimal performance. With these, self-efficacy is the belief in the students’ ability to accomplish tasks given at a specific level. Yokoyama (2019) highlights self-efficacy as a key factor in enhancing academic performance, drawing significant attention in educational psychology due to its influence on successes and failures. Meaning, self-efficacy is regarded as a crucial internal motivational factor, shaped by both personal and environmental influences, which impact students' choices, efforts, persistence, and academic success (Schunk & DiBenedetto, 2010).

Furthermore, self-efficacy beliefs contribute to outstanding performance by enhancing individuals' dedication, effort, and persistence (Pintrich, 2003). Students with high self-efficacy are more persistent in completing academic tasks; consequently, they exhibit a higher level of academic motivation, which in turn leads to improved academic performance. Self-efficacy also contributes to students' academic performance by influencing thought processes, motivation, and behavior (Bandura, 1997). It increases academic achievement indirectly by influencing individual goals, which could influence academic performance by more effort and willingness to accomplish them (Yip & Chung, 2005). Additionally, the research by Alyami et al. (2017) found that self-efficacy has a significant positive impact on students' academic performance. Self-efficacy increases the person’s confidence in his or her ability to perform a behavior (LaMorte, 2016).

**2.3 Academic Performance**

Academic Performance is defined by Pandey et al. (1996, as cited in Mustappha & Zhen, 2022), as "work related to education, such as school assignments," while performance refers to the result of an examination in a subject or a whole course (Lamas, 2015). Academic performance is crucial for students, as it reflects their knowledge, skills, and attitudes, playing a key role in determining future career success (Mappadang et al., 2022). Academic and performance in one setting are a direct assessment indicator of student learning achievement. Its goal is to forecast upcoming educational achievements, recognizing that current performance shapes both present and future aspects of students' lives (Kell et al., 2013). Additionally, it highlights students' natural efficiency and capacity (Hanushek, 2020; Sothan, 2018).

Academic performance is a significant milestone for students, influenced by their openness to change, ability to adapt, make complex decisions, learn from errors, and refine their informed beliefs and decisions (Feldman et al., 2016). It can be assessed through various indicators, such as grade point average (GPA), high school graduation rates, annual standardized assessments, and college admission exams. A student's academic performance was often quantified using a Grade Point Average (GPA) system, which typically ranged from zero to four. Previous researchers (Li et al., 2020; Longobardi et al., 2018; Praetorius et al., 2018; Warwas & Helm, 2018) have assessed the quality of learning.

The Commission on Higher Education issued CMO No. 04, s. 2020, Implementing Guidelines for Flexible Learning, to provide HEIs with guidance during this time of pandemic. Hence, the current discourse on global education brought about by the pandemic shifted in focus and the emergence of new challenges. This warranted new impetus to periodic monitoring/evaluation of progress made, providing emphasis on developing and implementing an evidence-based and dynamic monitoring/evaluation procedure/system to adequately met the demands generated by the new challenges.

 Furthermore, Section 109 of CHED Order No. 40 (s. 2008) outlined the grading criteria, specified that the grading standards for students in the subjects or courses within any degree program must adhere closely to the specified conditions or criteria: (1) Students must receive a final grade that is permanent and reflects their overall performance in the course. There are no temporary grades allowed, such as "incomplete" or "pending".(2)

In case students have failed to take a final examination or submitted an academic requirement for completion of a subject/course and their scholastic performance is not sufficient to merit a final passing grade, an institution might have, consistent with its academic policies, given them a final grade which does not earn any academic credit nor indicate failure, such as "NC" for "No Credit" or "NG" for "No Grade". Such a grade is permanent and cannot subsequently be changed. Provided, however, that where the failure to take the final examination, or to submit the academic requirements, is due to excusable grounds, such as sickness, emergency, or accident, the student might have been given an incomplete mark or "INC." An incomplete grade (INC) has to be resolved within the semester. The school might have offered options like special exams or extra time to complete coursework to help students avoid this. The school needs to make it public whenever it adopts any of the grading and promotion policies mentioned above Section 109 of CHED Order No. 40 (s. 2008).

**2.4 Motivation and Academic Performance**

The impact of motivation on students’ academic achievement have been adequately researched, with various studies demonstrating a positive correlation between motivation and academic performance. Student motivation plays a crucial role in determining academic performance. According to Raza et al. (2022), motivation has a positive impact on academic performance. Students who are motivated tend to be more engaged in their studies and achieve higher academic outcomes, emphasizing the strong connection between motivation and academic success. Furthermore, motivated students often show better attitudes toward learning. Madigan and Kim (2021) explain that these students view challenges and setbacks as chances for development rather than obstacles.

Additionally, motivation affects how students approach and manage tasks and tests. Mandasari (2020) found that highly motivated students are less likely to give up when faced with complex tasks. This persistence contributes to improved long-term academic outcomes. Motivated students are also more effective in allocating their time, allowing them to approach their studies in a structured and disciplined way. Lastly, motivation has a significant impact on students' overall behavior and academic success. Arokiaraj et al. (2024) emphasize that motivation significantly influences students' attitudes and behaviors, which in turn have a substantial impact on their academic achievements.

Recent studies have highlighted the critical connection between motivation and academic performance, revealing its significance across various educational levels and disciplines (Formento-Torres et al., 2023). This relationship is pivotal in education due to its profound impact on the teaching and learning process. Research consistently demonstrates that higher motivation levels are positively linked to improved academic performance, making it essential to understand how motivation drives learning and performance to develop effective educational strategies (Korthagen et al., 2006; Mishra et al., 2020).

Motivation propels change, fostering success and influencing individual personality development within social and cultural contexts (Nevarez & Intriago, 2021). Intrinsic and extrinsic motivation are essential in the learning process, as motivated students establish goals, expand their understanding, and strive to reach their full potential. Thus, incorporating motivational strategies in classrooms promotes engaged learning and increased involvement (Galarza, 2022). Conversely, when students are unmotivated, it often results in poor academic performance, emphasizing the need for classroom environments that inspire enthusiasm and interest (Romero et al., 2020). Academic performance is a key measure of the teaching-learning process, reflecting what students have learned through instructional interventions and the various factors influencing their learning experience (Cajulso & Rivas, 2021).

Therefore, students play a significant role in enhancing their learning and achieving improved academic performance. Studies showed that motivation and learning approaches enhance student success (Moenikia & Zahed-Babelan, 2010; Bulent et al., 2015). Motivation explains the variance in academic performance. It is the reason why an individual behaves in a given situation. A common educational issue is student engagement and their potential for academic excellence (Bramlett et al., 2022). Therefore, achievement is regarded as a key motive driven by the hope for success and the fear of failure.

Al-Sheeb et al. (2019) found that students' attitudes, including motivation, commitment, self-confidence, and agreement with others, significantly contribute to their academic success. Similarly, Ahinful et al. (2019) stated that students' attitudes, including their study habits, class attendance, and learning strategies, significantly impact their academic performance. Supporting these findings, Bakar et al. (2022) concur, concluding that student motivation has a beneficial impact on academic outcomes and is an excellent predictor of students' academic progress, as evidenced by their GPA. Experts believe that implementing motivational strategies is crucial for enhancing students' academic performance. In this study, the relationship between motivational variables and academic performance is measured through the academic performance of students enrolled in an education research course.

**2.5 Research Course**

Research constitutes a noteworthy aspect of any academic program as it empowers students with a considerable degree of autonomy and control over their learning (Nivelle, 2007). Research courses equip students with the essential skills for conducting independent research. These courses typically involve instruction on formulating research questions, gathering and analyzing data, and crafting research proposals and academic papers (Kashmar, 2019). It also allows students to validate, elucidate, pursue, and discover new facets of a subject that captures their interest. Pandey and Mishra (2015) proposed that the term "Research" as a combination of two words, "Re" and "Search," signifying a thorough exploration or activity to acquire fresh knowledge about existing facts. Research could also be characterized as a systematic and methodical exploration for novel and valuable insights into a specific subject (Rajasekar et al., 2013).

Neville (2007) further defined research as an organized, structured, and principled process of inquiry and investigation. Research is a systematic process to discover new knowledge to find answers to a question (Uttarakhand Open University, 2019). It serves the purpose of solving practical problems and advancing knowledge. Research is a compulsory or core course for almost all programs offered by tertiary institutions globally.

Wessels et al. (2018) developed a model that reflects the affective and motivational dispositions necessary to achieve research competence (RC) when navigating challenging situations in the research process. A thorough understanding of the affective domain of research tasks has an impact on how students seek information.

**3. methodology**

3.1 Research Design

This quantitative study employed a descriptive-correlational research design. Using the survey questionnaire, this study described the levels of motivational variables such as intrinsic motivation, extrinsic motivation, task value, and self-efficacy, and the academic performance of Education students. This study is correlational, as it examined whether a significant relationship exists between these variables and students' academic performance. The respondents' academic performance was assessed in this study through the calculation of their average weighted mean grades.

**3.2 Research Respondents**

The respondents of the study were the 59 education students enrolled in a Research course of one of the higher educational institutions in Misamis Occidental for the second semester, Academic Year 2023-2024. The 59 Education students were composed of 13 students from Bachelor of Elementary Education, 19 students from Bachelor of Secondary Education Major in English, 10 students from Bachelor of Secondary Education Major Filipino, 4 students from Bachelor of Secondary Education Major in Social Studies, 2 students from Bachelor of Secondary Education Major in Technology Livelihood Education (TLE), 5 students from Bachelor of Secondary Education Major in Science, 6 students from Bachelor of Secondary Education Major in Physical Education.

**3.3 Instrument of the Study**

The researchers’ survey questionnaires were a combination of researchers’ made and adapted from the Motivated Strategies for Learning Questionnaire (MSLQ), a self-report instrument designed to assess college students’ motivational strategies and their use of different learning strategies for a college course and created and refined by the professors at the University of Michigan (Pintrichet al., 1991). The researchers only adapted the motivation strategies. However, changes in scaling value were made. Instead of using a 7-point Likert scale, the researchers used a 4-point Likert scale. Prior to data collection, the questionnaire underwent a reliability test and was evaluated using Cronbach’s alpha, where values above 0.7 are considered acceptable (George & Mallery, 2003). The findings indicated that the first variable, intrinsic motivation, had a Cronbach’s alpha value of 0.9200, which was interpreted as Excellent. The second variable, extrinsic motivation, had a Cronbach’s alpha value of 0.9248, also interpreted as Excellent. The third variable, task value, had a Cronbach’s alpha value of 0.9554, which was also interpreted as Excellent. The fourth variable, self-efficacy, had a Cronbach’s alpha value of 0.9646, which is likewise interpreted as excellent. The result confirmed that the questionnaire passed the reliability test. The researchers conducted a pilot test of the instrument, utilizing a 4-point Likert scale, with 15 students from other colleges enrolled in a Research course at a higher education institution in Misamis Occidental.

The questionnaire measured the following variables: intrinsic motivation, extrinsic motivation, task value, and self-efficacy. The research questionnaire had 40 items distributed to the following components: 1-10 in intrinsic motivation, 1-10 in extrinsic motivation, 1-10 in task value, and 1-10 in self-efficacy. The respondents were asked to rate the level of motivational variables that they used in a research course using a 4-point Likert scale, in which the respondents indicated their choice on each indicator with 1 as not at all true of me and 4 as very true of me.

3.4 Data Gathering Procedure

The researchers wrote a letter of request to carry out the study. They modified an existing questionnaire and had it reviewed by the professor in charge of the Research course. Following this, they sought permission from the Dean of the College of Education (CTE) to administer the survey to Education students enrolled in the research course.The questionnaire was administered through a survey form. The researchers distributed the survey questionnaire to the identified respondents after obtaining their consent.

To analyze the motivational variables employed, the following scale was used.

 Point Scale Range Verbal Description Verbal Interpretation

 4 3.26-4.00 Very true of me Very Highly Motivated

 3 2.51-3.25 Somewhat true of me Very Motivated

 2 1.76-2.50 Somewhat untrue of me Moderately Motivated

 1 1.00-1.75 Not at all true of me Not Motivated at all

The following scales were utilized to assess the respondents' academic performance.

**Grading Scale Equivalent Letter Grade Verbal Interpretation**

1.0 97-100 A+ Exceptional

1.25 94-96 A Outstanding

1.50 91-93 A- Excellent

1.75 88-90 B+ Above Average

2.00 85-87 B Average

2.25 82-84 B- Below Average

2.50 80-81 C+ Fair

2.75 78-79 C Needs Improvement

3.00 75-77 C- Poor

5.00 Below 75 (failed) F Failed

To understand how education students viewed the motivational variables of the education students enrolled in the research course. This survey was the main way to collect information. To facilitate the gathering of data, the researchers used both Google Forms and survey forms and shared them with their target respondents.

**3.5 Statistical Treatment of Data**

The data were gathered through a combination of researcher-created questionnaires and the Motivated Strategies for Learning Questionnaire (MSLQ). They were statistically analyzed, interpreted, and accurately treated according to the stated research problem using the adapted MSLQ. The weighted mean was used to analyze the level of CTE research, students’ use of motivation variables, and their level of academic performance. Pearson’s correlation coefficient was used to analyze the significant relationship between the motivational variables of the research students and their academic performance.

**4. results and discussion**

**4.1 Motivational Variables in a Research Course**

This study determined the motivational variables such as intrinsic motivation, extrinsic motivation, task value, and self-efficacy employed by Education students and their relationship with their academic performance in a Research course. The top three (3) highest indicators are, “It helps me a lot when my teacher uses the Cebuano/Visayan in explaining difficult topics” (3.75); “I am confident that I understand more the lessons if my teacher uses Cebuano-Visayan in teaching difficult topics” (3.69); and “I can answer the questions of my teacher when he/she explains the topic in Cebuano/Visayan” (3.69). The responses proved positive perceptions among students on the use of Cebuano in explaining difficult topics in the classroom because code-switching contributed to their learning experience. The findings imply that integrating the native language not only enhances comprehension but also boosts students’ confidence and participation in the learning process.

**4.1.1 Intrinsic Motivation**

This motivation refers to the internal drive to perform an activity for its inherent satisfaction or pleasure, rather than for some separable consequences. It is the behavior to pursue for personal fulfillment and inner satisfaction of the activity being provided, leading to sustained engagement of Henry and Lamb (2020).Table 1 presents the survey results regarding the level of intrinsic motivation employed by the Education students in the Research course. Each indicator was assigned a weighted mean score, and the overall general weighted mean was calculated, resulting in 3.00. This result simply indicates that the students were very motivated in taking the Research course. Moreover, it suggests a strong internal drive of the students to engage with materials and academic tasks of the Research Course as shown by almost all of the indicators as ‘very motivated’ response. This also means that Education students rely on their inner satisfaction and interest to engage and academically do well in research-related tasks. As Alambri et al. (2020) stated, students who are motivated intrinsically are more likely to demonstrate deeper engagement in completing research-related tasks.

Among the indicators of Table 1 “In Research class, I prefer course material that arouses my curiosity, even if it is difficult to learn.” got the highest weighted mean of 3.37 with a verbal interpretation of very highly motivated. This implies that the most significant factor driving intrinsic motivation among Education students in Research class is their preferences for challenging and curiosity-provoking materials in the course. This reflects that Education students are more motivated to learn when the materials given by the teachers are engaging enough for them and could enhance their curiosity even if they are difficult. The desire of the students for curiosity-driven learning materials indicates that they value the exploration of complex concepts which foster their deeper motivation and engagement in learning Research. This result aligns with the Self-Determination Theory of Ryan and Deci (1985) which emphasizes that students become more motivated to learn deeply when they are given challenging lessons to make them curious.

Additionally, the study of Ryan and Deci (2000) revealed that students are intrinsically motivated to learn because of the pleasure or challenge that it brings. Likewise, the result also emphasizes the inner curiosity as one of the drivers in their motivation to learn. As contended by Freeman et al., (2014) curiosity-driven learning has been argued to be a fundamental ingredient for efficient education as it makes the students become more persistent when the materials stimulate their curiosity.

On the other hand, the statement “I am motivated to complete research-related activities because I find the activities engaging.” got the lowest rating of 2.81 with the verbal interpretation of very motivated. Although this indicator is still on the ‘very motivated’ verbal interpretation, this indicator receives the lowest weighted mean suggesting that engaging activities are still a factor in motivating students to complete research-tasks. This also means that the tasks employed in research are engaging and motivating for the students. It also reflects that the Research teachers employ learning activities that are engaging for the students to learn. This result is aligned with the research of Fredricks et al. (2004), suggesting that research activities should be engaging for each student like incorporating real-word application as it enhances students' engagement of the research activities. As such, Kahu (2013) emphasizes that students are more engaged in Research tasks when the activities are meaningful and relevant to their personal interests.

**Table 1 Perceived Level of Intrinsic Motivation of Education Students**

|  |  |  |
| --- | --- | --- |
|  **Indicators** | **Weighted Mean** | **Verbal Interpretation** |
| 1. In Research class, I prefer course material that arouses my curiosity, even if it is difficult to learn.
2. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.
3. I work hard in school because I enjoy learning the material and want to understand it better
4. I actively participate in our group research because I find it pleasurable.
5. I actively participate in every research task because it makes me feel satisfied.
6. I find the learning process of the course to be interesting.
7. In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.
8. In a class like this, I prefer course material that really challenges me so I can learn new things.
9. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.
10. I am motivated to complete research-related activities because I find the activities engaging.
 |  3.37 3.12 3.073.002.982.972.952.902.852.81  |  Very Highly MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery Motivated |
| **General Weighted Mean** | **3.00** |  **Very Motivated** |

Legend: 3.26 – 4.00 = Strongly Agree 1.76 – 2.50 = Disagree

2.51 – 3.25 = Agree 1.00 – 1.75 = Strongly Disagree

**4.1.2 Extrinsic Motivation**

This motivation refers to the individual’s driving force to perform an activity or behavior in order to achieve an external outcome, such as rewards, recognition, approval, or avoidance of punishment. This means that extrinsic motivation is influenced by factors outside the individual and is completed because rewards are expected afterward. As defined in the Self-Determination Theory by Ryan and Deci (1985), extrinsic motivation involves students being driven to do something to obtain rewards or avoid punishments. With this, extrinsic motivation focuses on gaining rewards or consequences.

Table 2 presents the survey results regarding the level of extrinsic motivation used by education students in the Research course. It indicates the students generally demonstrate as ‘very motivated’ with a general weighted average of 2.67. This means that Education students are extrinsically motivated in doing their Research-related activities. This motivation may have come from rewards, incentives, and consequences that Education students obtain when they perform well in the Research course.

Table 2 points out the highest indicator, “Receiving praise and positive feedback from teachers and peers encourages me to work harder on my school tasks,” which had an average mean of 3.31 and a verbal interpretation of very highly motivated. This result implies that recognition and positive reinforcement from teachers and peers significantly motivate students to excel academically. Students get their motivation from the praises and feedback from their teachers and peers, which becomes the basis for their academic performance. This could also mean that students want their teachers and peers to recognize their academic performance and the hard work they put into research-related tasks. This result is aligned with the Behaviorist theory proposed by Skinner (1953), which suggests that positive reinforcement strengthens the desired behavior. The praises and recognition of their behavior given by the teacher and peer validate students' efforts, which motivate them to continue performing well.

Likewise, the study by Ryan and Deci (2000) emphasizes that social recognition is supported by students' engagement in learning. Additionally, a meta-analysis found that positive teacher-student relationships help encourage students and are strongly connected to student participation and somewhat connected to their academic achievement (Roorda et al., 2011). When teachers and peers encourage students, they are more likely to participate actively and strive for academic performance.

Furthermore, among the indicators, “I like to get good scores in my research class because it will make my parents buy the things I want.” got the lowest average of 2.15, with the verbal interpretation of moderately motivated. This result indicates that the material rewards from parents have a minimal impact on students' motivation to excel academically. This result also means that Education students do not rely more on the things that their parents give them if they obtain good grades, but rather, they want recognition and praise more. This may have been because the material rewards cause the students to lose interest in the task itself and focus more on obtaining the material incentives. According to Hennessey (2015), material rewards undermine students' motivation to create a shift from earning incentives to mastering research tasks.

Additionally, the study by Kohn (2018) revealed that giving rewards can result in students losing interest in the activity once the reward is no longer available, as they focus solely on obtaining the reward. This suggests that material incentives are not that effective in motivating students, as they not only decrease motivation but also create a need for outside pleasure. This has been shown to lead to an addiction to rewards, constantly looking for that short-term burst of pleasure (Aypay, 2018). Therefore, when parents remove their material incentives for doing Research tasks, students will lose their motivation to perform well academically. Once the rewards are taken away, students often lose their desire to learn (DeLong & Winter, 2002).

**Table 2. Perceived Level of Extrinsic Motivation of Education Students**

|  |  |  |
| --- | --- | --- |
| **Indicators** | **Weighted Mean** | **Verbal Interpretation** |
| 1. Receiving praise and positive feedback from teachers and peers encourages me to work harder on my school tasks.
2. The most important thing for me right now is improving my overall grade point average, so my main concern in the class is getting a good grade.
3. Earning a high grade as a team is what motivates me to do my best in my research course.
4. I want to do well in this class because it is important to show my ability to my family, friends, employer or others.
5. I am motivated to do well to avoid punishment from my parents.
6. If I can, I want to get better grades in

this class than most of the other students.1. I am motivated to do well in research-related activities to receive praise from my parents.
2. I feel more accepted by others when I receive a good grade on a test.
3. I want to do well in research-related activities because a higher grade will lead to an increase in my allowance.
4. I like to get good scores in my research class because it will make my parents buy the things I want.
 | 3.313.093.072.872.682.512.462.332.192.15 | Very Highly Motivated Very MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedModerately MotivatedModerately MotivatedModerately MotivatedModerately Motivated |
| **General Weighted Mean** | **2.67** | **Very Motivated** |

*Legend: 3.26 – 4.00= Very Highly Motivated 1.76 – 2.50 = Moderately Motivated*

*2.51 – 3.25 = Very Motivated 1.0 – 1.75 = Not Motivated at all*

**4.1.3 Task Value**

This motivation refers to the perceived importance, relevance, or worth of a task to a person. In the context of learning, task value influences how students view the tasks or activities they are asked to complete. Table 3 presents the survey results regarding the level of task value employed by the Education students in the Research course. Each indicator was assigned a weighted mean score, and the overall general weighted mean was calculated, resulting in 3.10. This result indicates that the students are very motivated to take the Research course.

Moreover, the results demonstrate that students learn best when they understand the importance of the material they are learning, or when they have a genuine interest in the research course itself, as it benefits them personally and enables them to apply their learning to other courses or real-life problems. This agrees with the claims of McWhaw and Abrami (2001) who said that students who see tasks as important tend to use deeper thinking and learning strategies, as task value also increases engagement in their course and promotes completion and academic success Zhang & Liu, 2019).

Among the indicators of Table 3, I think the course materials in this class are useful for me to learn, with the highest weighted mean of 3.24, with a verbal interpretation of very motivated. This implies the significance it is for learners to see the task as interesting, helpful, and valuable (Eccles & Wigfiel, 2002) to achieve higher scores for their academic performance as it arouses their curiosity in applying what they have learned from the research course to the actual world. It emphasizes the importance of viewing the students academic task beneficial to them as it motivates them to learn passionately for the success of themselves and not for others.

On the other hand, I like the subject matter of this course indicator, which got the lowest rating of 2.88, with the verbal interpretation, very motivated. Although this indicator is still classified as 'very motivated' based on verbal interpretation, it receives the lowest weighted mean, suggesting that students are unlikely to be motivated to learn the research course by heart. As argued by Stern and Tseng (2002), research methods are not an easy subject to teach and not an easy subject to learn, leading students to become discouraged at some point. This result highlights the need for improvement in students' engagement with the research course itself, enabling them to see the brighter picture and purpose of the course, which helps them evaluate the importance of its tasks. When they see value in their learning, they are more motivated to succeed (Eccles & Wigfield, 2002).

**Table 3. Perceived Level of Task Value Employed by Education Students**

|  |  |  |
| --- | --- | --- |
| **Indicators** | **Weighted Mean** | **Verbal Interpretation** |
| 1. I think I will be able to use what I learn in this course in other courses.
2. I think the course materials in this class are useful for me to learn.
3. I believe that the importance of the task affects my choices and success.
4. It is important for me to learn the course materials in this class.
5. I find the topics covered in my research courses to be useful.
6. I am motivated to do well in my research courses because I find it beneficial to me.
7. Understanding the subject matter of this course is very important to me.
8. I am very interested in the content area of this course.
9. The value I place on a task is a better predictor of my academic success than my intelligence.
10. I like the subject matter of this course.
 | 3.243.243.223.203.173.153.122.922.902.88 | Very MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery Motivated |
| **General Weighted Mean** | **3.10** | **Very Motivated** |

Legend: 3.26 – 4.00 = Strongly Agree 1.76 – 2.50 = Disagree

2.51 – 3.25 = Agree 1.00 – 1.75 = Strongly Disagree

**4.1.4 Self Efficacy**

This motivation refers to the belief in one's ability to complete a task. It is the confidence one has in their capabilities, and it plays a crucial role in driving motivation. Table 4 presents the survey results regarding the level of self-efficacy employed by the Education students in the Research course. Each indicator was assigned a weighted mean score, and the overall general weighted mean was calculated, resulting in 2.91. This result simply indicates that the students are very motivated to take the Research course. Moreover, it shows that the students perceive themselves as capable of handling the challenges and requirements of the Research course. This level of self-efficacy likely influences their willingness to engage in research activities, persevere through difficulties, and achieve their academic goals. As Bandura (1997, as cited in Maliha Nasir and Sarwat Iqbal, 2019) stated, a student's belief in one’s ability to complete a task greatly influences their success in achieving it.

Among the indicators in Table 4, I believe that setting goals helps me perform better by putting more effort into achieving them, which yielded the highest weighted mean of 3.22, with a verbal interpretation of 'very motivated'. This suggests that students naturally feel more focused and driven when they have clear goals to work on. The most significant factor driving self-efficacy among Education students in the Research class is their ability to set goals. This finding suggests that goal setting plays a critical role in fostering a sense of purpose and focus, enabling students to direct their efforts effectively toward research-related tasks. Self-efficacy greatly impacts students' use of advanced learning strategies and their ability to apply what they have learned to new situations ([Schunk & DiBenedetto,2021](https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2024.1385442/full#B124)).

On the other hand, *I’m certain I can understand the most difficult materials presented in the readings for this course, which received the lowest rating of 2.68, despite a verbal interpretation of 'very motivated'*. This suggests that while students are willing to try, they may lack confidence in their ability to grasp challenging materials, suggesting that they feel less confident when faced with challenging reading materials in the course. This result highlights a potential area for improvement, as it may indicate a need for additional support in developing students' comprehension skills for complex research materials.

**Table 4. Perceived Level of Self-Efficacy of Education Students**

|  |  |  |
| --- | --- | --- |
| **Indicators** | **Weighted Mean** | **Verbal Interpretation** |
| 1. I think that setting goals helps me perform better by putting more effort into achieving them.
2. I believe that I can successfully complete the research tasks given to me.
3. I am persistent in doing research - related tasks.
4. Considering the difficulty of this course, the teacher, and my skills. I think I will do well in this class.
5. I’m confident I can understand the basic concepts taught in this course.
6. I am confident that I can understand research materials.
7. I’m confident I can do an excellent job on the assignment and tests in this course.
8. I believe I can effectively manage my time and resources to complete research tasks.
9. I’m certain I can master the skills being taught in this class.
10. I’m certain I can understand the most difficult materials presented in the readings for this course.
 | 3.223.033.002.982.972.882.802.782.762.68 | Very MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery MotivatedVery Motivated |
|  **General Weighted Mean** |  **2.91** | **Very Motivated** |

Legend: 3.26 – 4.00= Very Highly Motivated 1.76 – 2.50 = Moderately Motivated

2.51 – 3.25 = Very Motivated 1.0 – 1.75 = Not Motivated at all

**4.2 Level of Academic Performance of the Respondents**

The academic performance of learners is important, as it reflects the outcome of their educational experiences, representing the knowledge, skills, and attitudes they have acquired throughout the semester or quarter. Pandey et al. (1996, as cited in Mustappha and Zheng, 2022), defined academic performance as "work related to education, such as school assignments," while performance refers to the result of an examination in a subject or a whole course. Academic performance is undoubtedly the most important aspect of education. According to Mappadang et al. (2022), academic performance is a key factor in determining the success of learners in their future careers. The dynamics of academic performance take a new form from the basic education grading scales.

The data presented in Table 5 reflect the distribution of the grading scale among Education students in the Research course. The grading scales, ranging from 1.0 (97-100) to (Below 75), with the corresponding percentages, illustrate the academic standing of the respondents. The mean grade of the respondents is 89, indicating their performance as above average, which passes the required grades for the Commission on Higher Education.

The data show that most of the respondents (39%) achieve a grade equivalent of 1.50 (91-93), classified as above average. Additionally, 35% of the Education students earn a grade within the 1.75 (88-90) range. Furthermore, no Education student achieves the highest grade of 1.00 (97-100), and none fails the course. However, a small percentage of Education students (2%) obtain a grading scale of 2.50 (80-81) and 2% of Education students obtain a grading scale of 3.00 (75-77), the minimum passing grade. This highlights that while most Education students perform well in the Research course, a few Education students may have struggled.

This implies that the motivation for students in learning the research course is significant for the improvement of their academic performance, as previous studies confirmed that academic interest is correlated with academic performance (Ahinful et al., 2019; Fallan & Opstad, 2014; Garkaz et al., 2011).

According to Fullarton (2002), research on learning environments show that psychosocial characteristics of classroom learning environments demonstrate incremental validity in predicting student achievement. Thus, learning does not only take place inside the classroom where students and teachers interact. This includes psychosocial characteristics such as self-concept, attitudes, behaviors, intrinsic motivation, and overall student engagement in the learning process. With that in mind, the students’ academic interest in each course is linked to their academic performance (Ahinful et al., 2019)

## **Table 5 Level of the Academic Performance of the Respondents**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grading Scale** | **Equivalent** | **Verbal Interpretation** |  **Number of**  **Students** | **Percentage (%)** |
| 1.01.251.501.752.002.252.502.753.005.00 |  97-10094-9691-9388-9085-8782-8480-8178-7975-77Below 75 (failed) | ExceptionalOutstandingExcellentAbove AverageAverageBelow AverageFairNeeds ImprovementPoor  |  042321271010 | 0739353122020 |
|  |  | **x̄ = 89** **Above Average** | **59** |  **100** |

**4.3 Relationship between Motivational Variables and Academic Performance of Education Students**

Kell et al (2013) stated that academic performance serves as a crucial indicator of students’ learning outcomes and overall success in educational settings. Different motivational factors, such as intrinsic motivation, extrinsic motivation, task value, and self-efficacy, significantly influence students' academic behaviors and performance. Table 5 reveals the academic performance of the respondents, where the mean grade is 89, indicating Education students perform above average in the Research course.

However, understanding what drives this level of achievement requires examining the relationship between motivational variables and academic performance. In Table 6, it can be observed that the relationships between motivational variables and academic performance, including intrinsic and extrinsic motivation, as well as task value, are weak and not statistically significant. In the context of intrinsic motivation, a slightly positive relationship with academic performance can be observed as indicated in the Pearson's r 0.239, and the p-value of 0.069. This relationship is not statistically significant, suggesting that the internal drive to perform tasks for their inherent enjoyment or interest has minimal direct impact on academic success in this context.

Similarly, extrinsic motivation shows a weak positive relationship, with a Pearson's r of 0.170 and a *P*-value of 0.197. This also falls outside the threshold for significance of p-value (*P* > 0.05), indicating that external rewards or pressures, such as grades or recognition, are not strongly correlated with academic performance in this setting.

Task value, which refers to the perceived importance or relevance of a task, exhibits a stronger positive relationship with academic performance, as indicated by a Pearson's r of 0.316. Moreover, a *P*-value of 0.015 indicates that this relationship is statistically significant. This means that students recognize the value of research-related tasks as a predictor of their academic performance.

Additionally, self-efficacy appears to be another significant predictor of academic performance. Self-efficacy also exhibits a strong positive relationship with academic performance, with a Pearson's r of 0.339 and a statistically significant p-value of 0.009 (*P* < 0.05). This highlights that students' belief in their ability to accomplish academic tasks is a critical predictor of their success. Self-efficacy influences key behaviors such as effort, persistence, and resilience, which are essential for achieving academic goals.

In conclusion, a significant relationship exists between self-efficacy, task value, and academic performance. In contrast, intrinsic motivation and extrinsic motivation show weak or slightly positive correlations with academic performance, but do not reach statistical significance, as indicated by a *P*-value lower than 0.05. Table 6 shows the relationship between motivational variables and the academic performance of education students enrolled in a research course.

**Table 6. Relationship between Motivation Variables and Academic Performance**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Pearson's r** |  ***P*-value** | **Interpretations** |
| Academic Performance vs. Intrinsic MotivationAcademic Performance vs. Extrinsic MotivationAcademic Performance vs. Task ValueAcademic Performance vs. Self-efficac**y** | 0.2390.1700.3160.339 |  0.069 0.197 0.015 0.009 | Not SignificantNot SignificantSignificantSignificant |

Legend: P-value <0.05 = significant

**5. Conclusion**

Code-switching is an essential tool that educators use to support multilingual students’ learning processes. It means shifting to the local dialect while explaining mathematical concepts. Although it was found to be affecting the academic performance of students in several studies, in this study, the use of code-switching as a strategy in teaching Mathematics among Grade 4 pupils did not significantly influence their academic performance. There could be other factors that greatly affect grade 4 pupils’ performance in Mathematics.

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Authors hereby declare that AI tools like Grammarly and ChatGPT were used in the editing of this manuscript.

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