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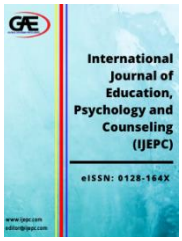

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THE USAGE OF EDMODO SOFTWARE IN THE LEARNING OF MATHEMATICS AND ITS EFFECT TOWARD STUDENT RESILIENCE

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Abstract:

In today's education system, it requires creativity and effective strategy for the teaching and learning system to run smoothly. Not to mention the pandemic happening nowadays requires efforts among the educators to create a new education system that could fulfill the teaching and learning needs. However, the lack of usage and efficiency in implementing online teaching activities in integrating ICT facilities has become a constraint in having a successful online education system. Therefore, more research should be conducted by combining ICT with the implementation of the current education system. In that notion, this research is conducted by studying the use of the Edmodo software in Mathematics learning especially on the effect on student's resilience. The objective of this research is to study the learning scenario and concept in using the Edmodo network platform and explore the development of resilience in the overall context through online mathematics learning using Edmodo. This is qualitative research conducted among 10 form 4 students in Kudat. Findings from this research are self-regulated strategies for using Edmodo systematically in mathematics lessons among students in various adaptation stages. Next, the result of this research also found the effects of using the platform in creating resilience among the students in terms of changes in their behavior by showing commitment and continuous effort. The implications of this research will provide the opportunity for researchers in the future who wish to pursue research in mathematics education from a different perspective especially the combination of ICT facilities. At the same time, this research can be a practical solution in today's challenges in online teaching and learning implementations.

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Mathematics Instructions, Edmodo, ICT, Resilience

Introduction

In the aspect of education, the influence of student psychology plays an important role in ensuring that there is a continuation in the student learning process (Hoogland *et al*., 2018). Each strength and success of the student actually begins from within the student himself which he will express externally through his committed actions in achieving a goal and an objective in learning (Garon-Carrier *et al*., 2016). However, in reality, this situation has failed to be highlighted by educators in the world today. Most education implementations only focus on the efforts to increase progress and achievement in the curriculum (Harris *et al*., 2017).

Whether intentionally or unintentionally, there have been other problems that have caused learning to be unable to be conducted successfully, which is the aspect of learning intrinsically. Intrinsic learning focuses more towards the strength and capability of the student to learn something in a long-period of time even though his faces challenges (Lee & Johnston-Wilder, 2017). It has been proven in several research, where prioritizing curriculum development for student success, has been successfully studied by past scholars and is already implemented by teachers in the classroom. However, learning problems in the classroom continues even though the progress of the world today has entered an era of rapid development and globalizations as a result of the burst of scientific and technological advancement (Baten *et al*., 2019).

In the context of this research, the aim is to observe the effects of the usage of the Edmodo software in learning mathematics towards student resilience. With that, the aim of this research is focused on Form 4 students as the sample to obtain information on their resilience after using the Edmodo software in learning mathematics. Previous studies have been implemented using Edmodo in teaching and learning which produce positive outcomes. In one of the study on English phonology classes using Edmodo as a learning medium proved that using Edmodo influences the fluency in learning phonology courses so they found it easier to apply because it is time-effective, efficient, not oblivious about computers, simplifying learning material, interactive, communicative, expressive, reducing cheating task, recognizing class management and creating reading habit (Dwi Astuti Wahyu Nurhayati, 2019). Research conducted in grammar classes in Sanata Dharma University reveal that through their learning journal, the students' achievement in class is dominated by an A in the end of the semester (Arina Isti'anah, 2017). In another research conducted among teachers using Edmodo in mathematic teaching and learning practice, three themes emerged from the participants' responses on improvement in motivation, empowerment and innovation by enabling innovative and student-centred practices (Trust, 2017).

This effort is actually rarely conducted by teachers as students are only measured through their achievement in final examinations. In essence, the process of learning actually needs to be continuous to ensure that knowledge is successfully attained by the students, thus ensuring that they possess continuous excellence (Tan, 2021).

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Essentially, the concept of resilience is defined as the level of student endurance in performing a learning activity for a subject (Kooken *et al*., 2016).The one thing that is rarely given reasonable attention by teachers in the classroom is the level of student resilience. This is because the trend in today's education, regardless of wherever they are, mostly emphasizes on the teacher's efforts to complete the syllabus and only focus on achievement without taking into account the problem of resilience that occurs within the students and the continuation of learning in a subject of knowledge that they learned (Lai, 2015; Mohamad Hisyam Ismail *et al*., 2015)

Literature Review

Based on the observation from past research conducted by the researcher, it was found that studies on resilience are mostly conducted in the occupation field such as economics, medicine, uniform bodies, and others. However, studies in the education field are rarely conducted and they are only touched in very few contexts; whereas the aspect of resilience is the main core in ensuring progress and continuation in the education field.

When viewing research regarding resilience in teaching and learning mathematics, it can clearly be seen that there is a lack of information that stresses on the field of mathematics learning. There is a research conducted by Huang *et al.* (2019) which consists of students in the United States of America which observes the effects of mathematics efficacy and anxiety in influencing student career choice. Other than that, there is another research (Liu *et al.*, 2018) that studies the role of self-efficacy and positive emotions towards engagement in mathematics learning among students in Beijing, China. In addition, Gao (2020) studies the resources that help student's self-efficacy among high school students in China. A research conducted by Sutter-Brandenberger *et al*. (2018) focuses on the development of self-determined motivation and the relationship between negative emotions, which are anger, anxiety, and boredom, that influence each other negatively in learning mathematics among secondary school students in Switzerland. There is also a study (Grigg *et al*., 2018) about the relationship between efficacy, interest, intention, and achievement within students in learning mathematics among students aged between 12 to 16 years old in Australia. A research finding obtained in Malaysia shows that interest has a significant positive influence among students with low achievement (Yu & Singh, 2016). Besides that, a research conducted by Wong (2019) centres around the relationship between the interest and achievement in learning mathematics in a learning environment that uses technology.

Based on the information from past research conducted by scholars, it was found that there is only a few research conducted regarding mathematics learning that stresses on resilience. If there is any, it only stresses on the low percentage of student resilience. This issue and problem indeed warrants prompt research to be conducted as it is an effort that can help increase student performance and progress as well as ensure the continuation of student achievement especially in mathematics subject.

Purpose of the Study

This research is conducted as an effort to create a new corpus of knowledge by coupling the world of education with the field of psychology to strengthen the education system so that it will continue to strive and succeed. As stated by previous scholars in the education field, the prioritization of the development of student psychology is for students to continue participating in the learning activities in mathematics education. Hence, the aim that the researcher is trying

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to achieve in this research is to come up with the internal and external factors that form student resilience in learning mathematics which can develop continuous success in student achievement on the subject.

Research Objectives

This research is conducted to achieve the following objectives:

i) Observing the scenario and concept of learning using the Edmodo software
ii) Exploring the development of resilience in the internal and external contexts through online learning using the Edmodo software

Research Questions

i) What is the scenario and concept of learning using the Edmodo software
ii) How is the development of resilience in the internal and external contexts through online learning using the Edmodo software

Research Methodology

Basically, this research is conducted by applying the qualitative approach which is employed to form 4 students in Kudat who are learning using the Edmodo software. All of them are selected based on the researcher's observation before, during, and after they have undergone the online learning sessions using the Edmodo software in learning mathematics.

In the context of selecting informants, the researcher performs a sampling to identify 10 students who are assessed in terms of their activeness during a learning session, their productivity when coming up with ideas, and their learning behaviour. Their dynamics start from the beginning when the learning session is conducted until the final process of the online learning session. The justification for using these criteria for the selection of the respondents is to ensure that the main goal of the research conducted by the researcher is achieved.

In the context of data analysis, this research is conducted by applying the following methods:

Observation Method

This method focuses on observing and monitoring the subject that is being studied (Creswell, 2008; Bogdan & Biklen, 2007). In this research, the researcher will write a reflection to collect as much information possible on the elements of resilience shown before, during, and after the learning session is done through the Edmodo software in learning mathematics.

Inductive and Deductive Method

This method is used by the researcher in an effort to directly answer the specific research problem (Corbin & Strauss, 2008), where in the context of this research, the specific problem is on student resilience in mathematics learning. In using this method, the problem is focused on the thinking pattern to highlight matters that are specific and general.

Triangulation Method

The triangulation method is employed by the researcher by making a generalization of the information from the following subject matter:

i) Informant triangulation (focuses on the interview findings obtained from the 10 informants who are the selected students)
ii) Material triangulation (making a material generalization from online learning resources provided by the teacher)

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iii) Method triangulation (in this research, the researcher employs three methods to obtain data which are interview, observation, and through documents)

Research Findings and Discussion

The findings and discussion of this research are done by answering both research objectives specified by the researcher.

First Objective

The scenario and concept of learning development using the Edmodo software in learning mathematics.

Learning Visual Documents by Using the Edmodo Software

In implementing this learning system, the researcher highly stresses on the students' theoretical and practical capability.

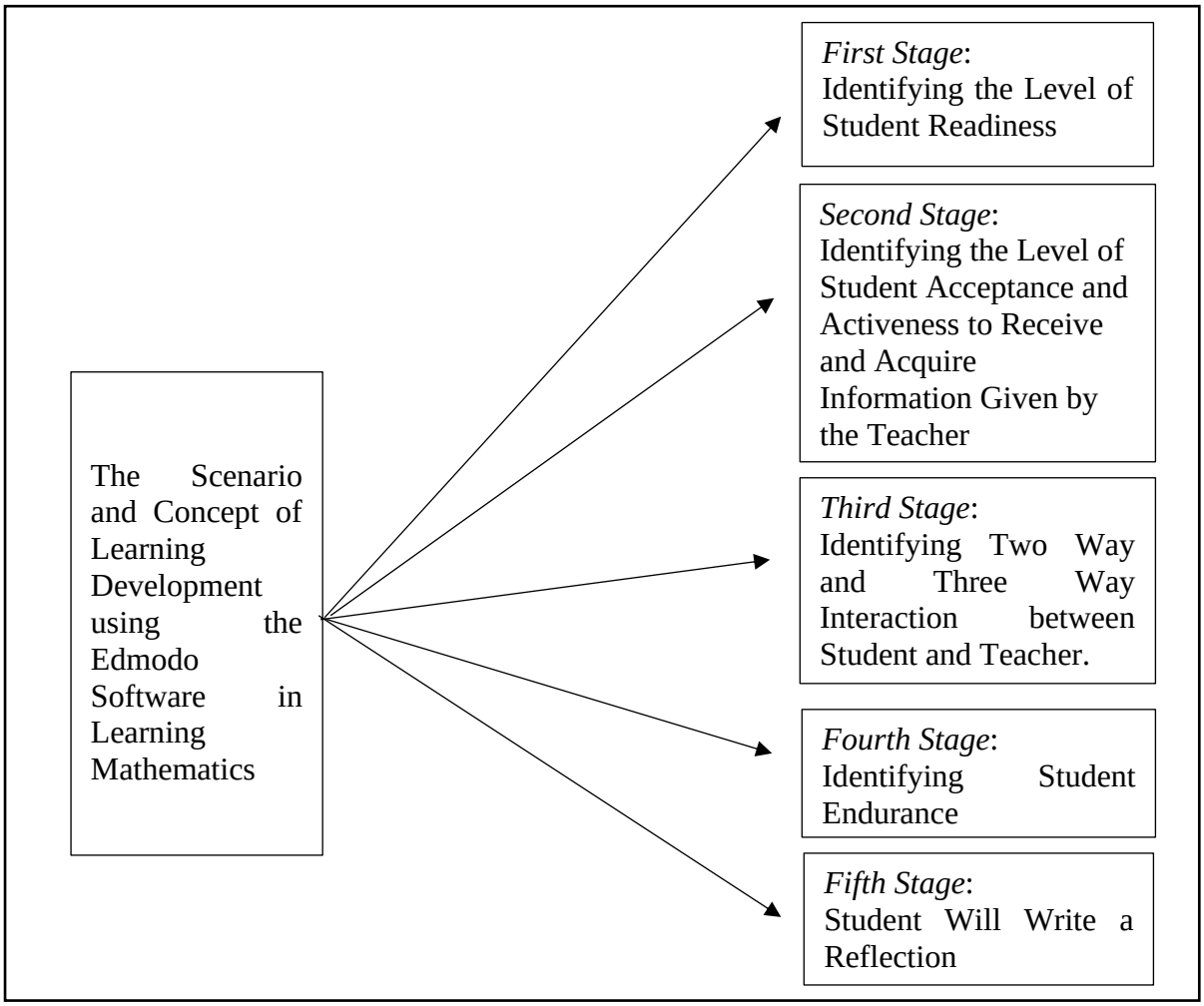

Figure 1: The Scenario and Concept of Learning Development Using Edmodo in Learning Development

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First Stage: Identifying the Level of Student Readiness

At this stage, the students are given information on how to create an account for the mathematics learning session by using the Edmodo software. The students display their resilience towards online learning at this stage, though there are some students who are still unable to master and obtain the lesson via online. However, they still tried their best until they succeed.

Second Stage: Identifying the Level of Student Acceptance and Activeness to Receive and Acquire Information Given by the Teacher

At second stage, the students are given information on how to create an account for the mathematics learning session by using the Edmodo software. The students display their resilience towards online learning at this stage, though there are some students who are still unable to master and obtain the lesson via online. However, they still tried their best until they succeed.

Third Stage: Identifying Two Way and Three Way Interaction between Student and Teacher.

This stage is to observe how far the level of student readiness can reach to continue working together in a teaching and learning system between teacher and student.

Fourth Stage: Identifying Student Endurance

This stage identifies the students' endurance to solve learning problems within themselves.

Fifth Stage: Student Will Write a Reflection

This reflection will be made into a material that is used by the researcher to identify elements of resilience within the students. Some of the elements of resilience are: students begin to show characteristics of their consistency in performing learning activities, students stay happy although they face problems in learning, students feel determined to continue trying again and again until they succeed, the students' effort maintains in which they will try to answer questions and solve problems effectively, students will become optimistic, they do not experience any emotional disturbance when performing online learning activities, students manage to show positive behaviour from the beginning, during, and until the end of the learning process.

Based on the explanations given above, shows that scenario and concept of learning development using the Edmodo software in learning consist of fives phases. In which the software really facilitate the learning process by providing easy access to information and free flow of discussion platform for students as stated by Marimuthu *et al*. (2017). The software proven to be helpful tools for teacher and student since learning using Edmodo facilitates and increase effectiveness in communication, learning and users also appreciate Edmodo because it save time (Al-said, 2015). Other study also shows positive outcome using Edmodo as tools for writing lesson, stating that the software enable online learning to be easily managed and organized properly (Jones & Rice, 2017).

Second Objective

Exploring the development of resilience in the internal and external contexts via online learning using the Edmodo software

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In this research, the researcher has found that the development of resilience happens in two different dimensions, but they support one another. This can be seen through the excitement of the students to participate in the learning process at the first stage, which can be seen from the students' facial expression which signifies their interest to continue with the online learning system.

The students also successfully display their confidence within themselves by enthusiastically answering the questions given by the teacher. This can be shown through their behaviour where they actively answer the questions that was given by the teacher. Although online learning is a new experience that they are going through, they still managed to perform the learning activities successfully.

Other than that, the students are also able to display their interest to continue learning. Although essentially, mathematics is a hard subject, the learning session conducted via the Edmodo software indicate that the students tried their best and use this opportunity to increase their knowledge in learning mathematics.

Overall, the development of resilience in this research, seen through the students' willingness and flexibility to adapt in an online learning system, is high. From the researcher's observations, the students are constantly open and calm receiving teaching inputs and still continue with the online learning activities. At the end of the learning session, the students also display their interest in continuing with the implementation of the online learning system.

According to the discussion above we can concludes that Edmodo provides the best environment of learning and teaching whether in online or offline classes. This software are fully equipped with tools that can create positive impact on academic achievement by maintaining good learning and teaching process (Balasubramanian *et al*. 2014; Demir & Akpinar, 2018). This shows that this software can increase and built resilience in student by giving them motivation, interest and enjoyable learning experience.

Conclusion

Overall, the usage of the Edmodo software in learning mathematics affects student resilience. Undeniably, in the learning system of a subject, it is not easy for students to stick with the learning process continuously and able to maintain their momentum of acceptance on the learning input and the teaching situation via online. However, the researcher has found that in this research, the students are able to stick with the learning system well; in fact, the students indicate that they are interested to continue learning using the Edmodo software in learning mathematics.

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