STUDENTS' MATHEMATICS SELF-CONCEPT: THE CASE OF KOLEJ KOMUNITI BAGAN DATUK

Noor Farazila Radzi[1], Hashamuddin Ya'akob[2] and Md. Fauzi Ismail[3]

[1,2,3]Politeknik Ungku Omar, Malaysia
[1]farazilanoor@gmail.com
[2]hashamudin@puo.edu.my
[3]fauzimail@puo.edu.my

Abstract: The COVID-19 pandemic has causes changes in various sector including education. Teaching and learning were shifted to online mode. Previous study stated that students prefer face to face class (Shauqi et al., 2020; Rini, 2022). Therefore, the objective of this is to determine students' Mathematics self-concept during online learning. In addition, it is perceived as one of the most difficult subjects. Online questionnaire was distributed to students that have taken SSM1022 Mathematics course for Session 1 2021/2022 at Kolej Komuniti Bagan Datuk. The data processed using the Statistical Package for the Social Sciences (SPSS). Descriptive analysis was employed. The findings of this study stated that the students have positive self-concept in terms of ability. The respondents have moderate or unsure outlook in terms interest. Overall, the students have positive mathematics self-concept during online learning. The findings of this study can be used to improved teaching and learning strategy.

***Keywords**: self-concept, mathematics, online learning*

1. Introduction

The Coronavirus disease (COVID-19) caused a serious threat to the education sector. Students are not allowed to physically enter their learning institution. It has changed the way education is conducted. It led the education systems to shift to full online learning method. It is either conducted using synchronous or asynchronous methods (Selvanathan et al., 2020). Online learning become compulsory teaching method during the outbreak of the pandemic COVID-19 (Selvanathan et al., 2020).

In general, the changes from physical classroom environment to online learning environment raises challenges for students. It could be distraction such as noise during the online learning (Baticulon et al., 2021; Bringula et al., 2021). In addition, students have to learn on their own during asynchronous session. This is applied for some parts of the syllabus. These could lead to ineffective online learning.

One of the subjects offered by education sector is Mathematics. Mathematics plays an important role in every aspect of life. Through the perspective of education globally, mathematics is perceived as one of the most difficult subjects to learn due to its complexity and abstract nature (Azizah & Suhendra, 2020; Haase et al., 2019). Furthermore, the learning process that is interconnected and requires mastery comprehension from the previous topics

causes students to struggle throughout mathematics lessons. Students tend to be scared, worried and feel less interested to learn mathematics in depth (Nachiappan et al., 2016; Yahya & Amir, 2018).

In online mathematics learning, the display of the mathematical concepts, problems and process steps of the solutions and effective realization of the student-teacher interaction are two factors that affect learning outcomes (Karal et al., 2013). Karal et al. (2013) stated that prior research found that it is difficult for mathematics instructors to explain the concept in blended and online learning.

Online learning is different from face-to-face learning. Moreover, mathematics learning requires teacher feedback after working on practice questions but there is limited time for reflection (Petty & Farinde, 2013). Even worse, if the teacher only gives assignments and materials without any explanation. Based on the previous study, it is a challenge for both lecturers and students to apply e-learning especially in mathematics learning which contains a lot of abstract computational material (Ramadhani et al., 2021).

Most of the subjects need to be assessed by doing activities such as discussions, presentation and elaboration. In mathematics the teacher needs to communicate with students by writing words and symbolic language on the blackboard in addition to the discussion. This is not easy in online learning (Cassibba et al., 2020).

According to Shauqi et al. (2020), students stated that online learning has not provided better experience and productivity in mastering competencies. Students also hesitant to use it in the future. Majority of students prefer offline learning in face-to-face classes compared to online learning (Rini, 2022). In addition, the mathematics self-concept in the context of online learning is not yet investigated (Bringula, et al. 2021).

Mathematics self-concept is defined as a student's self-ranking of their skills, ability, enjoyment, and interest in mathematics (Erdogan & Sengul, 2014). Delima & Cahyawati (2021) stated that mathematics self-concept is students' perceptions of themselves regarding their mathematical abilities and skills, pleasure, and interest in carrying out mathematical activities. Self-concept is important in education since it is related to academic achievement (Ayodele, 2011; Lee & Kung, 2018).

The self-concept is needed to foster the students' views, self-confidence and positive attitudes when solving mathematics problems. Self-concept of students in learning consists of positive and negative self-concept (Sultra et al., 2018).

Therefore, this study aimed to determine students' perceptions towards mathematics learning. Students' perceptions are described through the self-concept of mathematics learning in Kolej Komuniti Bagan Datuk.

2. Materials and Methods

The purpose of this study was to determine the students' mathematics self-concept on online learning. This study was conducted at Kolej Komuniti Bagan Datuk. The population of this study consists of 14 students that have taken SSM1022 Matematik for Session 1 2021/2022 through online learning. The sample size was determined using Krejcie & Morgan (1970) table. The response rate was 100%.

The data was collected using questionnaires that were distributed using google form. The questionnaire items were adapted and modified from Bringula et al. (2021). The questionnaire consisted of two parts. The first part is about the students' profile. The second part is about students' mathematics self-concept.

Descriptive statistical analysis of frequency, percentage and mean scores were employed. The mean scores were categorized as follows: a mean score of 4.21–5 points were classified as very positive (VP), between 3.41–4.20 as positive (P), 2.61–3.40 as moderate (M), 1.81–2.60 as negative (N) and 1.00-1.80 as very negative. Scores under 2 were considered high negative (HN) (Jenkins, 2007; Suwannasri, 2016). Based on these researchers, the categorizes were adopted.

3. Results

Table 1 shows demographic profile of participants. The respondents of this study are male. 93% (13) respondent are 18-21 years old and 7% (1) only above 22 years old. It is found that 50% (7) of the online learners have their own personal space and 50% (7) of them do not have personal space during online mathematics class.

Table 1: Demographic profile of participants

Item	Frequency	Percentage
Gender		
Male	14	100
Female	-	-
Age		
18-21	13	93
22 and above	1	7
Personal space for online learning:		
Yes	7	50
No	7	50

Table 2 shows learners related factor. 7% (1) respondent reported that the internet connection is slow, 79% (11) stated that the internet connection is sometimes fast, sometimes slow, and only 14% (2) stated that their internet connection is fast. Most of the respondents, 43% (6) of them stated that mathematics online learning is harder than face-to-face. The rest of the respondent which is 29% (4) stated that it is easier than face-to-face and another 21% (3) of them stated that it is about the same level of difficulty with face-to-face. Only 7% (1) respondent stated that online learning is about the same level of ease with face to face. 64% (9) of the respondents rely on teachers or friends for further explanations. 14% (2) of them can understand the lesson by themselves. 21% (3) of them rely entirely on lecturer and classmate to understand the topics.

Table 2: Learners related factor

Item	Frequency	Percentage
Internet connection:		
Slow	1	7
Sometimes fast, sometimes slow	11	79
Fast	2	14
Perceptions of mathematics online learning:		
Harder than face-to-face	6	43
Easier than face-to-face	4	29
About the same level of difficulty with face-to-face	3	21
About the same level of ease with face to face	1	7
Mathematics learning autonomy:		
Most of the time, I can understand the lesson by myself. I seldom consult my teachers or my classmates	2	14
Sometimes I understand the lesson; sometimes I do not understand it. I consult my teachers or my friends for further explanations	9	64
I entirely rely on my teachers' lectures or from the help of my classmates and friends	3	21

Table 3 shows the result of Mathematics self-concepts in online learning environment. Generally, the students have positive perceptions on mathematics distance learning as indicated by the overall mean score (M= 3.51). Respondents have positive self-concept regarding obtaining good grades, lesson understanding, problem solving, doing well, attending the online class, doing the assignment in online mode, ability to finish the course, passing the course and more interest in learning.

The respondents have moderate or unsure outlook in terms of helping their classmate in completing the assignments, easily recall the lessons, better performance than classmates and enjoy the online class more than face to face.

Table 3: Mathematics self-concepts

Item	Mean
I can get good grades in the course	3.50
I can understand the lessons easily	3.57
I can solve problems easily	3.50
I can do well overall in the course	3.64
I can attend the class easily.	4.00
I can do the assignments easily	3.86
I can help my classmates with our assignments.	3.29
I can easily recall what I have learned	3.29
I can finish the course online rather than face-to-face.	3.57
I can perform better than my classmates.	3.21
I can pass the course	3.50
I will be more interested to learn.	3.50
I will enjoy the lecture more online than face-to-face.	3.21
Average scale	3.51

4. Discussion

The objective of this study have been achieved; to determine students' perceptions towards mathematics learning. The finding of this study stated that half of the respondent do not have personal learning space for online learning. According to Ismail et al., (2020), non-conducive environment is one of the challenges in online learning. Students with low-income group family background usually live in low-cost housing areas with small rooms that they share with other siblings. Therefore, they are not comfortable for online learning.

Poor internet access or lack of devices in a household is a major challenge for online learning in Malaysia (Zainol et al., 2021). This is in accordance with the finding of this study where most of the respondent stated that their internet connection is sometimes fast, sometimes slow.

For mathematics learning autonomy, the findings of this study stated that most of the students sometimes understand and sometimes do not understand the lesson and consult their lecturer or friends for further explanations. According to Kumi-Yeboah et al. (2017), the lack of social presence is one of the constrain in online learning experiences and academic self-concept of the students. Therefore, the lack of social presence may affect student understanding in online learning environment.

Based on the indicated findings, generally, students have positive self-concept. These findings suggest that students' have a positive self-ranking of their skills, ability, and interest in mathematics. It affects many critical behaviours of the students such as effort to learn, determination when confronted by a problem and participation in the lectures (Erdogan & Sengul, 2014). They believe that their abilities can still meet the demands of the course (Bringula et al., 2021). They are confident that they can still perform well despite the challenges and uncertainties they are facing. This also could be due to the current generation being close to technology, so it is easier to adapt to online learning (Hastini et al., 2020). Besides that, e-learning has the ability to enhance student understanding and positive impact on motivation, autonomy, participation, mathematical concepts, results and grades as stated by Freiman et al., (2017) and Moreno-Guerrero et al. (2020).

The finding of this study also stated that students have unsure outlook in terms of helping their classmate in completing the assignments, easily recall the lessons, better performance than classmates, enjoy the online class more than face to face and student perceived mathematics online learning is harder than face-to-face. These are undesirable effects of mathematics self-concept during online learning.

This might due to limited ICT usage in developing countries. Therefore, the investments in technology such as obtaining hardware and software for online learning become one of the constraints (Bhuasiri et al., 2012, Ismail et al., 2020). In addition, students' commitment and discipline also another issue in successful online learning.

The finding s of this study can be used by the management and instructor of the institution to take necessary measures to avoid left out students. At the same time, course learning outcome can be achieved. Future research is highly needed with larger sample size from another institution.

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