Perception of readiness for online learning: Voice from Mathematics Learners

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Abstract. This research explores learners' mathematics readiness for online learning in Universitas Muhammadiyah Gresik. A total number of 125 learners participated in an online questionnaire in June 2020. The instrument used is student readiness for online Learning (SROL) instrument consisting of four dimensions, online student attributes, time management, communication, and technical. Validity and reliability of SROL instrument were examined. Statistic descriptive students' perception of data on readiness in online learning was presented, while to look at differences in perceptions of male students and female students used the Anova test. The results showed the technical and communication competencies components were rated high for importance compared to online student attributes and time management. Other results also show that gender has significantly different perceptions of online learning readiness.

1. Introduction

Online learning has improved in college since the 1990s [1,2]. To facilitate this online learning, the college developed a learning management system (LMS). This LMS as a medium to facilitate online courses, as well as facilitate student learning activities [3]. Data obtained from universities in Indonesia today, almost 100% of students are enrolled in courses held online. Increasing data on courses held online in this college, further analysis is needed regarding the level of readiness of students in preparing for online learning. Online learning requires readiness from students in terms of how they prepare for learning, organizing, engaging and completing all the necessary needs, in order for them to graduate in the course.

The concept of student readiness in online learning was first introduced in 1998 [4]. In their research, student readiness in online learning was divided into three phases: students' preference in course modality, student competence and confidence in utilizing computer-mediated communication, and students' ability to participate in self-directed learning. Then many other researchers then continued further research into student readiness in online learning through the development of a number of instrument student readiness on online learning [5-11].

The survey was conducted in 18 US colleges and found many universities developed their own assessment instruments for their student readiness and these instruments were not validated and
published [12]. Based on the review of the instrument, produced four main components of student readiness, namely student attributes, time management, technical, and communication competencies [5,6,7,8,10,11]. The success of online learners lacks a high discipline of learning [13]. The instrument was developed and revised in 2004 [9], emphasizes self-direction such as leveraging resources for learning and learning, initiative, and desire for interaction such as using resources to communicate with institutions as well as with friends as a driving factor in students' success for online learning.

Furthermore, researchers have noted that time management is a very important second element for online learning. Time management challenges such as being able to take coursework [14], completing assigned work on time [15], as well as actively participating in online instruction classes [16] have been noted in literature. Unlike face-to-face lectures where there is a set meeting time, students participate in online lectures in asynchronous activities at their own time and this can be a challenge if they do not have self-discipline.

Another dimension has been identified as an important element for online learning is technical competencies in online learning. Technical skills such as sending and receiving emails, researching and downloading information online, and installing software are indicators associated with success in online learning [17]. Tsai and Tsai [18] found that students with high internet competencies showed higher levels of learning in web-based assignments than students with low internet competencies. In addition, the quality of online learning systems, such as ease of use and quality of resources, is considered an important factor in successful online learning [19,20].

Furthermore, the last dimension considered important in online learning readiness is course communication. Many researchers have identified convenience with online learning as a component of student readiness for online learning [9,21,22]. Convenience in online learning is defined as students' willingness to connect and communicate with others through computer-mediated communications such as email, discussion forums, and chats and confidence in accessing these resources [9,22]. Students' willingness to participate in online discussion forums is critical to the effectiveness of online learning [23]. Online classrooms provide many asynchronous and synchronous communication tools used to facilitate communication between teachers and students.

A lack of consistency among existing student readiness for online learning and surveys from both published and unpublished sources. Online learning is no longer an innovation but has become a must in universities in Indonesia today. In addition, although some studies on student readiness in online learning have been conducted, it remains important for researchers to examine this over time as technology has changed the way online lectures are offered to students with various LMS today. The purpose of this study is to examine students' readiness for online learning in this year, especially mathematics students in parts of East Java, Indonesia. This Research Question are: 1) What competencies do math students consider essential to their readiness to online learning? 2) How do math students perceive their confidence in their readiness for online learning? 3) Is there a difference between male math students and female math students to online learning readiness?

2. Methods
The study was a survey, distributed through the student whatsapp group of Mathematics Education study program in Universitas Muhammadiyah Gresik, as many as 125 students with details of 77 women, and 48 men. The instrument used is the Student Readiness instrument for Online Learning (SROL), adopting the instrument that has been developed by Martin [24]. This instrument consists of 20 statement items. The 20 items are organized into four subscales: (a) online student attributes (5 items), (b) time management (5 items), (c) communication (5 items), and (d) technical (5 items). Participants rated each item twice, once for the importance of online readiness competencies and once for confidence in their readiness for online learning, which resulted in 40 responses and eight subscale. For important rankings, students were asked, "Assess how important this competency is to you in your online learning" on a Likert scale of 5 points from 1 (not important at all), 2 (not important), 3 (not important or not important), 4 (somewhat important), up to 5 (very important). In the section for confidence, respondents were asked to "Assess your confidence in your ability to
achieve the following competencies in online learning" on a Likert scale of 5 points out of 1 (very unconfident), 2 (somewhat unconfident), 3 (not confident or unconfident), 4 (somewhat confident), up to 5 (very confident).

Furthermore, data analysis procedures use descriptive statistics to present average perception on each dimension. Then, Anova test to find out the differences of each dimension.

3. Results

3.1. Student Perception on the Importance and Confidence of Online Learning Competencies

To answer questions number 1 and 2, the average of each sub indicator of online course attributes, time management, communication, and technical competence is presented in table 1. Of each component, it has an average value above 4.00. This shows that according to students all items in the four components are rather important until it is very important, as well as in terms of confidence, students express rather confident to be very confident, in terms of their ability to achieve learning achievement through online learning.

| Table 1. Learners' Mathematics Readiness in Online Learning Descriptive Statistics |
|-------------------------------------------------|---------------------------------|------------------|
| Student Readiness Online Learning Competencies | Importance | Confidence |
| **Online Student Attributes**                   |            |              |
| 1. Set goals with deadlines                      | 4.77       | 4.68         |
| 2. Be self-disciplined with studies              | 4.64       | 4.62         |
| 3. Learn from a variety of formats               | 4.58       | 4.62         |
| 4. Be capable of following instructions in various formats | 4.69 | 4.68 |
| 5. Utilize additional resources to answer course-related questions | 4.57 | 4.65 |
| **Mean**                                         | **4.65**   | **4.65**     |
| **Time Management**                              |            |              |
| 1. Devote hours per week regularly for the online class | 4.57 | 4.73 |
| 2. Stay on task and avoid distractions while studying | 4.05 | 4.25 |
| 3. Utilize course schedule for due dates         | 4.58       | 4.49         |
| 4. Complete course activities/assignments on time | 4.12 | 4.17 |
| 5. Meeting multiple deadlines for course activities | 4.31 | 4.45 |
| **Mean**                                         | **4.32**   | **4.42**     |
| **Communication**                                |            |              |
| 1. Use asynchronous technologies                  | 4.61       | 4.33         |
| 2. Use synchronous technologies                  | 4.52       | 4.12         |
| 3. Ask the instructor for help via email, discussion board, or chat | 4.81 | 4.82 |
| 4. Ask classmates for support (accessing the course, clarification on a topic) | 4.90 | 5.68 |
| 5. Discuss feedback received                     | 4.86       | 4.61         |
| **Mean**                                         | **4.74**   | **4.71**     |
| **Technical Competence**                         |            |              |
| 1. Complete basic computer operations             | 4.80       | 4.75         |
| 2. Navigate through the course in the Learning Management System | 4.82 | 4.75 |
| 3. Participate in course activities               | 4.82       | 4.81         |
| 4. Access the online grade book for feedback on performance | 4.66 | 4.85 |
| 5. Access online help desk/tech support for assistance | 4.37 | 4.60 |
| **Mean**                                         | **4.69**   | **4.75**     |

Based on table 1, of the four components of online course attributes, time management, communication, and technical competence, for the interest category, each has an average value above 4.00. In a row their average score is 4.65 for online course attributes; 4.32 for Time Management; 4.74 for Communication components; and 4.69 for Technical Competence components.

Then, in terms of students' confidence in their competencies to be able to complete online learning, of the four components of online course attributes, time management, communication, and technical competence, each has an average score above 4.00. In a row their average score is 4.65 for online
course attributes; 4.42 for Time Management; 4.71 for Communication components; and 4.75 for Technical Competence components.

Furthermore, the analysis of differences in perceptions of male and female students, the first analysis was conducted from the average perception in terms of interests and the confidence side of students towards their competencies, which was presented at table 2. Of the four components of online course attributes, time management, communication, and technical competence, each had an average score above 4.00 except the time management component, which earned an average of 3.71 in female students. Female students of each component obtained an average score of 4.76 for the Online Student Attributes component; 3.71 for Time management components; 4.31 for Communication; 4.65 for Technical Competence components. Male students for each component scored 4.67 for Online Student Attributes; 4.87 for Time management components; 4.31 for Communication; 4.68 for Technical Competence components.

| Gender | Online Student Attributes | Time Management | Communication | Technical Competence | Online Student Attributes | Time Management | Communication | Technical Competence |
|--------|---------------------------|-----------------|--------------|---------------------|---------------------------|-----------------|--------------|---------------------|
| Female | 4.76                      | 3.71            | 4.31         | 4.65                | 4.57                      | 4.45            | 4.38         | 4.68                |
| Male   | 4.67                      | 4.87            | 4.31         | 4.68                | 4.85                      | 4.69            | 4.59         | 4.91                |

The second analysis to look at the difference in perception between male and female students, was to test one way anova using SPSS, whose results were presented at table 3, assuming normal and homogeneous distributed data had been met. Based on Anova's test results, it showed that there was a significant difference between the perception of male and female students, which was shown with a significant score of less than 0.05.

| Gender       | Sum of Squares | df | Mean Square | F     | Sig. |
|--------------|----------------|----|-------------|-------|------|
| Between Groups | 1.996          | 3  | .665        | 2.920 | .037 |
| Within Groups | 27.572         | 121| .228        |       |      |
| Total        | 29.568         | 124|             |       |      |

4. Discussion
The findings of this study, the four components of online learning readiness will be discussed based on three criteria namely respondents, interests, student confidence. Surveys specifically to math students, how they readiness to online learning, still not much done. Mathematics learning has different characteristics when compared to learning in other fields, so the readiness required is also different. Of the four readiness components for online learning, communication, and technical competence obtained a higher average compared to the other two components: online course attributes and time management. In contrast to the research already conducted which surveyed 177 students from various fields of science who studied online learning [24]. In his research, online student attributes and technical competencies had a higher average compared to the other two components, both in terms of interests and from student confidence. We can observe that, in terms of technical competencies, mathematics students and students in general in other fields have the same response, the components are considered important in online learning readiness.

The second finding related significant differences between male math students and female students to their readiness in online learning. In general, of the four components male students had higher confidence compared to female students. This is in line with research that conducted a survey of 85 mathematics students in Brunei Darussalam, about the readiness of mobile learning [3]. In his research
found that male students were more interested in using an M-learning system more than female students. In line with research which conducted that female more dominant than male\cite{25}; \cite{26}; \cite{21}; \cite{27}; \cite{28}. But these findings differ from research already conducted \cite{29}; \cite{30} which found that there was no significant difference between male students and female students in their readiness for online learning.

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