ATLANTIS PRESS
Advances in Social Science, Education and Humanities Research, volume 440
International Conference on Online and Blended Learning 2019 (ICOBL 2019)

Gender Factor in Designing Features of a Learning Management System in Higher Education

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***Abstract*— This study aims to analyze how gender differs in designing features of the Learning Management System (LMS) in higher education. The method in this study was quantitative research with the type of comparative research. Participants in this study were 223 students (111 male students and 112 female students) from different higher education institutions in Indonesia. The data were collected using questionnaire and analyzed using z-test with α = 0,05. The results showed that the assessment of male and female students did not differ significantly in relation to the design features of the LMS. These results can provide more understanding of the perceptions of male and female students on the design features of the LMS which are also an important part in achieving the effectiveness of blended learning.**

Keywords: gender, Learning Management System (LMS), higher education, blended learning

I. INTRODUCTION

Blended learning is a learning approach that is widely used in various higher education nowadays [1]. However, the lack of availability of technical guidance in designing LMS platforms has made the blended learning design process is carried out spontaneously so that it becomes unclear. This can cause the failure of the blended learning implementation [2]. Therefore, determining the factors that influence the acceleration of the development of the blended learning platform becomes necessary to achieve the objectives of blended learning [3].

The successful implementation of blended learning is not only limited to the use of technology but also in the process of creating a student learning environment [4][5]. In the context of blended learning, social and demographic characteristics are factors that can influence the adoption of learning processes that are supported by technology individually, one of which is gender [6]. Thus, for educators, gender is an important factor to note in designing LMS on blended learning activities to create effectiveness [3][7].

Gender differences in using technology have been analyzed and examined by many previous studies. Some researchers found that generally male students have more confidence than female students in using technology [8][9]. On the other hand, several other studies found that female students have more interest in using technology for learning process than male students. This also consists of the results study by [10][11] which confirms that although female students have less confidence in using technology, female students have more strong belief to learn to use technology. Thus, there is a gender gap in using technology for learning.

Several studies have tried to discuss technology-supported learning based on gender perspectives [12][13][14]. However, the existing studies still focused on assessing the level of technology acceptance based on gender. In other words, the availability of research that focuses on gender in the design of technological components is still limited in number, and this is the focus of this research. Therefore, the purpose of this study is to analyze how gender differences are related to the design of learning features supported by technology, in this case, the design features of LMS. Designing an efficient LMS feature in a virtual learning environment can increase the effectiveness of blended learning, in this case improving students' learning outcomes [3][15].

II. METHODOLOGY

This study adopted a quantitative descriptive approach. The data collection technique in this study was the survey method with an online questionnaire. All students used the same learning Management system (Moodle) as a blended learning platform. The type of blended learning was flipped classroom learning activities where teachers explained teaching material online but the results of homework were discussed in the classroom. The survey was conducted on Indonesian students from different campuses (public and private institution). The measurement variables used in this study can be seen in Table 1.

TABLE I. THE VARIABLE OF DESIGN FEATURES.

Questions	Variables	Items
1	Navigation	LMS navigation key
2	Response time	LMS system response time
3	Login	LMS login process
4	Display Design	LMS layout design
5	Download	Process to download a learning material content on LMS
6	Upload	Process to upload a task on LMS
7	Forum	Forum feature in LMS
8	Chat	Chat feature in LMS

In this study, the questionnaire design used a Likert scale (1-5) that had been tested for validity and reliability. The number of samples in this study were 223 students who were randomly selected to assess students' perceptions of the design features of the LMS that had been applied in their teaching and learning process (see Table II and Table III).

TABLE II. PERCENTAGE OF PARTICIPANTS BY THE INSTITUTION

The Institution	N	%
Public	145	65.02%
Private	78	34.92%

TABLE III. PERCENTAGE OF PARTICIPANTS BY GENDER

Gender	N	%
Male	111	49.78%
Female	112	50.22%

For statistical analysis, this study used two samples for means z-test with $\alpha = 0.05$ to find out whether there are differences between male students and female students concerning the design features of the LMS [16].

III. RESULTS AND DISCUSSION

After participating in the blended learning process, the students were given a survey to measure the students' perceptions. The summary of the results of the data processing can be seen as follows

TABLE IV. FEATURES RANKING BASED ON MEAN SCORES OF MALE STUDENTS

No	Features	Mean	Ranking
1	Navigation	3.4324	5
2	Response time	3.8378	1
3	Login	3.6577	2
4	Display Design	3.4054	6
5	Download	3.5405	4
6	Upload	3.3063	7
7	Forum	3.6486	3
8	Chat	2.9459	8

As can be seen in Table IV, the highest mean score for male students falls in feature 2 (response time, M = 3.8378), followed by item 3 (login, M = 3.6577) and number 7 (forum, M = 3.6486). It is followed by item 5 (download, M = 3.5405), item no. 1 (navigation, M = 3.4324), item no. 4 (display design, M = 3.4054), item no. 6 (upload, M = 3.3063), and the lowest mean score is item no. 8 (chat, M = 2.9459).

TABLE V. FEATURES RANKING BASED ON MEAN SCORES OF FEMALE STUDENTS

No	Features	Mean	Ranking
1	Navigation	3.5357	5
2	Response time	3.8750	1
3	Login	3.7143	2
4	Display Design	3.5268	6
5	Download	3.6696	3
6	Upload	3.5179	7
7	Forum	3.5625	4
8	Chat	3.1071	8

For female students, based on Table V, the mean score of the first highest falls in feature 2 (response time, M = 3.8750), followed by item 3 (login, M = 3.7143), item 5 (download, M = 3.6696), item 7 (forum, M = 3.5625), item 1 (navigation, M = 3.5357), item 4 (display design, M = 3.5268), item 6 (upload, M = 3.5179), and the lowest mean score is item 8 (chat, M = 3.1071).

Based on the mean score and item ranking, there seems to be a lot of similarities between male and female students. In other words, it appears that there is no difference between male and female students in terms of their assessment of the LMS feature. However, further verification is needed.

As for answering the research question about the comparison of perceptions between male and female students of features, a statistical test was conducted, in this case, the z test of two samples with a significance level of 0.05.

TABLE VI. SUMMARY OF GENDER STATISTICS IN NAVIGATION VARIABLE.

z-value	p-value
-0.8662	0.3864

`As can be seen in Table VI, the z test results show that there is no significant difference between male and female students in terms of navigation (z-value < 1.96 (z table two-tailed) or p-value > 0.05). In other words, male and female students are not significantly different in their assessment of the navigation variable.

TABLE VII. SUMMARY OF GENDER STATISTICS IN RESPONSE TIME VARIABLE

z-value	p-value
-0.3097	0.7568

`Table VII shows that there is no significant difference between male and female students in terms of system response time (z-value < 1.96 (z table two-tailed) or p-value > 0.05). In other words, male and female students are not significantly different in their assessment of system response time variable.

TABLE VIII. SUMMARY OF GENDER STATISTICS IN THE LOGIN VARIABLE.

z-value	p-value
-0.4952	0.6205

`Table VIII shows that there is no significant difference between male and female students in terms of login (z-value < 1.96 (z table two-tailed) or p-value > 0.05). In other words, male and female students are not significantly different in their assessment of the login variable.

TABLE IX. SUMMARY OF GENDER STATISTICS IN DISPLAY DESIGN VARIABLE

z-value	p-value
-1.0836	0.2786

Table IX shows that there is no significant difference between male and female students in terms of display design (z-value < 1.96 (z table two-tailed) or p-value > 0.05). In other words, male and female students are not significantly different in their assessment of display design variable.

TABLE X. SUMMARY OF GENDER STATISTICS IN DOWNLOAD VARIABLE

z-value	p-value
-1.0983	0.2721

Table X shows that there is no significant difference between male and female students in terms of the download process (z-value < 1.96 (z table two-tailed) or p-value > 0.05). In other words, male and female students are not significantly different in their assessment of the download variable.

TABLE XI. SUMMARY OF GENDER STATISTICS IN THE UPLOAD VARIABLE

z-value	p-value
-1.8468	0.0648

Table XI shows that there is no significant difference between male and female students in the upload process (z-value < 1.96 (z table two-tailed) or p-value > 0.05).

In other words, male and female students are not significantly different in their assessment of the upload variable.

TABLE XII. SUMMARY OF GENDER STATISTICS IN FORUM VARIABLE

z-value	p-value
0.6847	0.4935

As can be seen in table XII, the z test results show that there is no significant difference between male and female students in terms of the forum feature (z-value < 1.96 (z table two-tailed) or p-value > 0.05). In other words, male and female students are not significantly different in their assessment of forum variable.

TABLE XIII. SUMMARY OF GENDER STATISTICS IN CHAT VARIABLE

z-value	p-value
-1.4588	0.1446

Table XIII shows that there is no significant difference between male and female students in terms of chat feature (z-value < 1.96 (z table two-tailed) or p-value > 0.05). In other words, male and female students are not significantly different in their assessment of the chat variable.

IV. CONCLUSION

This paper analyzes gender differences in terms of assessing the design features of LMS. The motivation of this study lies in any features in LMS that can be improved to increase the learning outcomes of male and female students to establish the effectiveness of blended learning implementation.

Based on the results and discussion, it can be concluded that there is no significant difference between the assessment of male and female students towards the design features of the LMS, in this case for the navigation; system response time; login; display design; download process; upload process, forum feature, and chat feature. This means that the level of student assessment of the LMS features is not different. In other words, the results of this study illustrate that there is no gap between male and female students in their assessment of the design features of the LMS.

The results of this study can provide more understanding of the perceptions of male and female students on the design features of the LMS which are also an important part in achieving the effectiveness of blended learning implementation. Besides, the results of this study can also be used as references by instructors in designing learning instructions based on blended learning, particularly in the design features of the LMS which will then be submitted to learning technology developer.

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