

An Investigation of Students' Perception on Online Engagement

¹Noor Shahariah Saleh, ²Norhisyam Jenal, ³Siti Aishah Taib,
⁴Siti Mariam Mohammad Iliyas, ⁵Aini Ahmad, ⁶Maisarah
Noorezam

¹Akademi Pengajian Bahasa, Universiti Teknologi MARA Cawangan Negeri Sembilan, Kampus Seremban, ²Pengajian Kejuruteraan Mekanikal, Kolej Pengajian Kejuruteraan, Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang, ^{3,4,6}Akademi Pengajian Bahasa, Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang, ⁵Pusat Pengajian Bahasa, Tamadun dan Falsafah, Universiti Utara Malaysia
Email: noorshahariah@uitm.edu.my, aishah711@uitm.edu.my, sitim364@uitm.edu.my, a.aini@uum.edu.my, maisa691@uitm.edu.my
Corresponding Author Email: hisyam0324@uitm.edu.my

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Abstract

This study investigates university students' perceptions of online engagement, particularly focusing on interactions between learners, instructors, and course content. With the shift to online learning driven by the COVID-19 pandemic, understanding these perceptions is critical for optimizing digital learning environments. The research employed a quantitative approach, utilizing a structured survey distributed to 171 students from various faculties. The survey instrument, based on Martin & Bolliger's (2018) framework, assessed three types of engagement: learner-to-learner, learner-to-instructor, and learner-to-content. Findings indicate that peer support significantly enhances students' motivation and reduces dropout rates. Moreover, effective instructor communication, active participation, and meaningful feedback are highly valued by students. Content-wise, students appreciate activities that promote critical thinking and provide immediate assistance. Strong positive correlations were observed among all types of engagement, highlighting their significant relationships. These insights are crucial for educators and institutions aiming to develop strategies that foster a supportive and engaging online learning environment. Pedagogical implications and suggestions for future research are also highlighted in this paper.

Keywords: Online Engagement, Learner-To-Learner Interaction, Learner-To-Instructor Interaction, Learner-To-Content Interaction, Digital Learning Environments

Introduction*Background of Study*

Understanding university students' perceptions of online engagement is essential for improving digital learning environments, especially after the shift to online education due to the COVID-19 pandemic. Various studies have explored how students feel about their engagement in online courses. For example, Redmond et al (2023), and Blakey and Major (2019) found that students are more engaged when they participate in practical activities and real-life applications. These elements help keep students interested and motivated. Interaction with instructors and peers also plays a crucial role in making students feel connected and invested in their learning as highlighted in (Iliyas et al., 2023).

Quality of instruction is another important factor. Tan et al (2021), showed that students feel more motivated and satisfied when there is good interaction and constructive feedback in online classes. However, issues like social isolation, technical problems, and lack of support can negatively impact engagement. This is supported by Al Rawashdeh et al. (2021), who identified similar challenges faced by students. Meanwhile, Iliyas et al (2023), found that instructor online support, especially in guidance and material presentation, affected changes in students' behaviour positively.

In the context of Malaysian higher education, Wahid et al (2020), examined the engagement strategies used in online classrooms and found that learner-to-instructor interaction was the most significant factor in maintaining student engagement. This is consistent with the findings of Al Okla et al (2023), who emphasized the importance of collaboration and the use of educational technology in enhancing engagement levels. Meanwhile, Haris et al (2023), explored students' perceptions of online engagement through the lens of connectivism, highlighting the significance of connectedness, diversity, openness, and autonomy in fostering engagement.

Statement of Problem

Education in Malaysia has experienced a major shift to online learning recently. The full or hybrid implementation of virtual classrooms has necessitated a thorough understanding of how students engage in this new learning environment. Even though online courses are becoming more popular among learners, there is still a significant knowledge gap in students' perceptions of their participation in virtual environments. The perception of students' interactions with peers, instructors, and content remains unclear, despite these elements potentially influencing their online lessons (Hollister, 2022). Still, whether any correlation exists between these elements and the learners' experience in online classes remains unclear.

The lack of a thorough understanding of students' perspectives on their virtual learning experience hinders educators and learning institutions in enhancing the quality of students' online learning experiences. The lack of knowledge about students' perceptions of engagement in the virtual learning process presents challenges in developing effective strategies that foster a stimulating and dynamic environment, enabling students to access sufficient online teaching and learning resources (Werang & Radja Leba, 2022). Furthermore, enhancing the effectiveness of online learning requires understanding the perspectives of users (Muthuprasad et al., 2021). Neglecting to address learners' perceptions of online

education can result in stagnant syllabus, materials, and system development. As a result, students experience burnout and feel demotivated to learn via online platforms.

The previous studies have delved into students' perspectives on the practice of online learning and learner participation, with less emphasis on the interactions with peers, instructors, and content after the pandemic era. A study was conducted by Kadir (2023), on the engagement that students had in online language learning at Universiti Tun Hussein Onn Malaysia. The findings revealed that students adapted well to the online learning process. Based on the students' happiness responses to in-class participation, the findings also indicated that they experienced positive learning. Kadir (2023), emphasised the importance of highlighting engagement in learning among students during virtual lessons. This study agreed that the difficulties for academia and research related to the students' perceptions of online language learning, especially the influencing factors, will be a foundation for further studies in the future.

Additionally, research by Tan et al (2021), also looked at the students' perceptions of the virtual learning environment. Generally, the study unravelled the positive views of the students on motivation and satisfaction. However, the students' negative perception was linked to their lack of intention during virtual lessons. Researchers viewed three main contributors to online learning: quality instruction, virtual engagement, and instructional and technical support. Researchers also discovered a gap in understanding the role of educators in addressing the learning obstacles in online instruction. Moreover, drawing from students' perspectives on online engagement, Farah and Al-Hattami (2023) discovered that students projected different understandings of what engagement is. The learners strongly preferred hands-on activities, and they regarded peer interactions as crucial because this was where they felt the strongest connection. However, the study focused solely on the first digitally experienced students. To understand the current online learning situation, a study that revisits students' perceptions of blended or fully online experiences is required. Thus, the findings are useful for making the difficulties visible and enabling educators and educational institutions to revise their methods and environments.

Objective of the Study and Research Questions

This study investigates learners' perceptions of using learning strategies via online classrooms. More precisely, this study answers the following questions:

- How do learners perceive learner-to-learner engagement in online classes?
- How do learners perceive learner-to-instructor engagement in online classes?
- How do learners perceive learner-to-content engagement in online classes?
- Is there a significant relationship between all categories of engagement in online learning?

Literature Review

Drawbacks and Advantages of Online Class

Online learning provides several significant advantages, especially in terms of accessibility and flexibility, which are crucial for accommodating a diverse student population. According to Al Rawashdeh et al (2021), e-learning offers equal access to educational resources regardless of location, ethnicity, or age, thus making education more inclusive. Tan

et al (2021), emphasize that online instruction allows students to learn at their own pace, fitting their studies around other commitments. This flexibility is particularly beneficial for non-traditional students, such as working professionals or those with family responsibilities, as noted by (Blakey and Major, 2019). Furthermore, enhanced communication through e-learning platforms promotes increased interaction between students and instructors, creating a more engaging and supportive learning environment (Al Rawashdeh et al., 2021). Redmond et al (2023), support this by noting that interactive online environments can lead to high levels of engagement through practical, hands-on activities and real-life applications, which motivate students and make learning more relevant. Additionally, the cost-effectiveness of online education is a significant advantage, as it reduces expenses related to physical infrastructure and commuting (Al Rawashdeh et al., 2021). Finally, the ability to support different learning styles through multimedia and interactive content is a notable benefit of online classes, providing personalized learning experiences that cater to individual needs (Tan et al., 2021; Blakey & Major, 2019).

Despite the many advantages, online learning also presents several significant drawbacks that can impact its effectiveness. One of the primary concerns is social isolation, as the lack of face-to-face interaction can lead to feelings of disconnection and loneliness among students (Al Rawashdeh et al., 2021; Blakey & Major, 2019). This social isolation can negatively affect student engagement and overall satisfaction with the learning experience. Technical issues are another critical challenge, as technical difficulties, such as poor internet connectivity and inadequate technological skills, can disrupt the learning process and create barriers to accessing educational content (Al Rawashdeh et al., 2021; Tan et al., 2021). Furthermore, maintaining motivation and self-regulation in an online environment can be challenging for students, given the less structured nature of online courses (Al Rawashdeh et al., 2021). Tan et al (2021), note that a lack of direct supervision and clear instructions can lead to decreased engagement and academic performance. The quality of instruction is also a concern, as not all instructors are adequately trained for online teaching, resulting in varying levels of course quality (Redmond et al., 2023; Blakey & Major, 2019). Finally, ensuring academic integrity in online assessments poses a significant challenge, with concerns about cheating and dishonesty being more prevalent in virtual learning environments (Al Rawashdeh et al., 2021; Tan et al., 2021).

Past Studies on Online Class in Universities

The advancement of technology has significantly transformed the higher education field, particularly with the increasing number of online classes. As universities worldwide adapt to these changes, it is essential to understand the various aspects of online learning and its impact on students. Previous studies have explored diverse outlook of online education, including its advantages, drawbacks, and the factors that influence student engagement and satisfaction.

Al Rawashdeh et al (2021), investigated the advantages and disadvantages of e-learning in university education in the United Arab Emirates, focusing on students' perspectives. The respondents were university students in the UAE, and data were collected using a structured questionnaire validated by experts. The findings revealed that e-learning provides several advantages, such as accessibility, flexibility, enhanced communication, cost-effectiveness, and support for different learning styles. However, the study also identified significant

disadvantages, including social isolation, technical issues, reduced motivation and self-regulation, varying quality of instruction, and concerns about academic dishonesty. Consequently, the implications of this study suggest that understanding both the strengths and weaknesses of e-learning can help educators and institutions improve online learning environments, making them more engaging, effective, and supportive of students' needs.

Similarly, Redmond et al (2023), conducted a study to understand higher education students' perceptions of online engagement and what engagement means to them. The study involved 611 students from five disciplines at a regional Australian university known for distance education. Using a mixed-methods approach, data were collected through online surveys and semi-structured interviews. The findings indicated that students had positive perceptions of online engagement when they participated in practical, hands-on activities, real-life learning, and peer interactions. On the other hand, negative perceptions were associated with pre-recorded lectures, fully online courses, technological problems, and a lack of communication by lecturers. Therefore, the study's implications emphasize the need for practical activities and real-life applications to engage students. Additionally, continuous improvement in course design and instructional methods is necessary to enhance student engagement.

In addition, Tan et al (2021), explored higher education students' perceptions of the quality of online instruction and its impact on student satisfaction and motivation. The study utilized a scoping review of data from Google Scholar, ERIC, and ResearchGate, focusing on university students. The findings showed that students generally had positive perceptions of online instruction, noting high levels of motivation and satisfaction due to good online interaction and feedback. However, the study also highlighted several negative perceptions, including a lack of interaction, ambiguous instructions, deficits in technological skills, insufficient support, and concerns about academic dishonesty. Thus, the implications of this study highlight the importance of quality online instruction in maintaining student satisfaction and motivation. Addressing technological and instructional challenges is crucial for improving the effectiveness of online learning.

Moreover, Blakey and Major (2019), conducted a descriptive qualitative study to understand how students conceptualize engagement in online courses and to identify the elements they find engaging. The respondents were 40 students from the University of Alabama, and data were collected using an open-ended online survey. The study found that students identified several types of engagement: behavioural, cognitive, emotional, and agentic. Engaging elements included active learning strategies, interactive assignments, meaningful participation, and strong interactions between students and instructors. As a result, the implications of this study suggest that to foster engagement, online courses should incorporate interactive and active learning strategies. Furthermore, faculty training and course design should focus on creating engaging and supportive online learning environments.

Conceptual Framework

Figure 1 shows the conceptual framework of the study. This study explores three types of engagement in online learning. The conditions for successful online learning do not differ much from the needs in a face-to-face class. According to Rahmat et al (2021), in online

learning, learners need attention, satisfaction, relevance and confidence. Hence, this study investigates learners' perception on online engagement using Martin & Bolliger's (2018) categories such as learner-to-learner engagement, learner-to-instructor engagement and learner-to-content engagement.

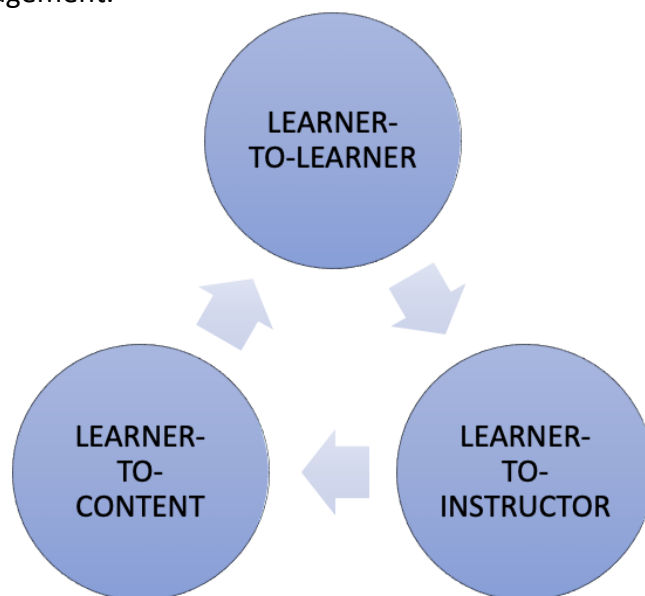


Figure 1- Conceptual Framework of the Study
Online Engagement Categories in Online Class

Methodology

This quantitative study is done to explore factors that influence online learning. A purposive sample of 171 participants responded to the survey. The instrument used is a 5 Likert-scale survey and rooted from Martin & Bolliger (2018) to reveal the variables in table 1 below. The survey has 4 sections. Section A has 7 items on demographic profile. Section B has 6 items on Learner-to-Learner interaction, Section C has 7 items on Learner-to-Instructor interaction, and Section D has 8 items on Learner-to-Content interaction.

Table 1

Distribution of Items in the Survey

| SECTION | TYPE OF INTERACTION | No of Items | |
|---------|-----------------------|-------------|------|
| B | Learner-to-Learner | 6 | .779 |
| C | Learner-to-Instructor | 7 | .873 |
| D | Learner-to-Content | 8 | .895 |
| | Total No. of Item | 21 | .927 |

The analysis shows a Cronbach alpha value of .779 for learner-to-learner interaction, .873 for learner-to-instructor interaction, and .895 learner-to-content interaction; thus, revealing a good reliability of the instrument used. Further analysis using SPSS is done to present findings to answer the research questions for this study.

Findings*Findings for Demographic Profile*

Table 2

Percentage for Gender

| | | |
|---|--------|-----|
| 1 | Male | 42% |
| 2 | Female | 58% |

Table 2 shows the percentage of the respondents' gender. Out of 171 participants, 58% of the respondents are females while the other 42% of the respondents are males.

Table 3

Percentage for Semester

| | | |
|---|----------|-----|
| 1 | Part 1-2 | 12% |
| 2 | Part 3-4 | 67% |
| 3 | Part 5-6 | 18% |
| 4 | Part 7-8 | 3% |

Table 3 tabulates the percentage of the respondents according to their semesters. Overall, semester three and four students recorded the highest percentage of respondents at 67%. This follows by semester five and semester six students at 18% and, semester one and two students at 12%. Semester seven and eight students marked the lowest percentage at only 3%.

Table 4

Percentage for Level

| | | |
|---|---------|-----|
| 1 | Diploma | 84% |
| 2 | Degree | 16% |

Table 4 presents the percentage of respondents according to their level. In total, 84% of the respondents are completing their diploma while only 16% of them are in the degree level.

Table 5

Percentage for Faculty

| | | |
|---|----------------------|-----|
| 1 | Science & technology | 30% |
| 2 | Social Sciences | 63% |
| 3 | Business Studies | 7% |

Table 5 shows the percentage of the respondents according to their faculty. In general, respondents from the Faculty of Social Sciences recorded the highest percentage at 63%. This follows by respondents from the Faculty of Science and Technology at 30%. Respondents from the Faculty of Business Studies however presented the lowest percentage at only 7%.

Table 6

Percentage for Learning Location

| | | |
|---|---------|-----|
| 1 | Home | 90% |
| 2 | College | 10% |

Table 6 shows the respondents percentage according to their learning location. With the percentage of 90%, most respondents happened to study at home. In contrast, only 10% of the respondents study in college.

Table 7

Percentage for Internet Access

| | | |
|---|--------|-----|
| 1 | Slow | 4% |
| 2 | Medium | 64% |
| 3 | Strong | 32% |

Table 7 presents the respondents percentage according to their internet access. In general, the majority of the respondents (64%) has medium internet access. This follows 32% of them having strong internet access. Only 4% of the respondents have slow internet access.

Table 8

Percentage for Institution

| | | |
|---|---------|-----|
| 1 | Public | 96% |
| 2 | Private | 4% |

Table 8 shows the percentage of the respondents according to institutions. With the percentage of 96%, the majority of the respondents are in public institutions, while only 4% are in private institutions.

Findings for Learner-to-Learner

This part contains the results of research question 1- How do learners perceive learner-to-learner engagement in online classes? Based on the respondents' perceptions, it offers insights into the learners' learning engagement in the virtual classroom.

Table 9

Mean for learner-to-learner interaction

| Statement | Mean |
|--|------|
| L2LQ1 Does collaborative learning promote peer-to-peer understanding? | 3.7 |
| L2LQ2 Are you more likely to ask for help from your peers? | 3.8 |
| L2LQ3 Do you prefer to be in the same group with your chosen peer for online activities? | 4.0 |
| L2LQ4 Do you think that the sense of community helps you to engage in online classes? | 3.9 |
| L2LQ5 Do you think support from peers motivates you to finish tasks? | 4.1 |
| L2LQ6 Do you think that support from peers prevents you from dropping out of the course? | 3.8 |

Table 9 presents an evaluation of the perceptions of learners regarding peer interactions within online learning environments. The findings show that collaborative learning is considered effective in promoting peer-to-peer understanding, receiving a mean score of 3.7. Learners also feel somewhat inclined to seek help from their peers, as indicated by a mean score of 3.8. A strong preference is evident for working in groups with chosen peers, which is highly valued with a mean score of 4.0, suggesting that students feel more comfortable and potentially more productive in familiar group settings. The sense of community within these online classes also appears to significantly enhance student engagement, scoring 3.9. Notably, peer support is viewed as a key motivator for completing tasks, with the highest mean score of 4.1, highlighting the critical role of social support in academic perseverance. Additionally, the support from peers is believed to play a substantial role in preventing dropout from online courses, with a mean score of 3.8.

Findings for Learner-to-Instructor

This section presents data to answer research question 2- How do learners perceive learner-to-instructor engagement in online classes?

Table 10

Mean for learner-to-instructor interaction

| Statement | Mean |
|---|------|
| L2IQ1 Does your instructor's teaching style involve students' active participation? | 4.0 |
| L2IQ 2 Do you feel encouraged by your instructor to keep engaged in online classroom? | 3.9 |
| L2IQ 3 Does your instructor provide feedback from your previous assessment? | 3.9 |
| L2IQ 4 Do you feel feedback from your instructor on your performances are clear and positive? | 3.9 |
| L2IQ5 Does your instructor use more than two communication tools to stay connected with students? | 3.9 |
| L2IQ 6 Do you think that online platforms used by your instructor for your online class are effective and convenient? | 3.9 |
| L2IQ7 Does your instructor maintain the ongoing interaction with students after online class? | 3.9 |

Table 10 provides insights into students' perceptions of their interactions with instructors in an online learning context, focusing on the effectiveness of the instructional strategies and communication methods used. The highest mean score, 4.0, indicates that students highly value instructors' ability to involve them in active participation. Scores of 3.9 across several other key aspects suggest a consistent positive perception among students regarding the supportive nature of the online learning environment. These aspects include the encouragement from instructors to stay engaged in the classroom, the clarity and positivity of feedback on students' performances, the use of multiple communication tools to maintain connectivity with students, the effectiveness and convenience of online platforms, and the ongoing interaction after class. These uniformly high scores reflect a strong student appreciation for the comprehensive and engaging approaches employed by instructors, which are crucial for maintaining student interest and promoting effective learning in online settings.

Findings for Learner-to-Content

This section presents the data to answer research question 3 - How do learners perceive learner-to-content engagement in online classes?

Table 11
Mean for Learner-to-Content Interaction

| Statement | Mean |
|---|------|
| L2CQ1 Do you think that the synchronous activities (i.e. online discussion) could offer immediate assistance? | 3.7 |
| L2CQ2 Do you think that the asynchronous activities (i.e. assignment) could offer immediate assistance? | 3.7 |
| L2CQ3 Do you think the activities could improve the understanding of subject-matter? | 4.0 |
| L2CQ4 Do you think the activities in online learning could improve your critical thinking skills? | 3.8 |
| L2CQ5 Do you think you can use relevant knowledge wisely in the learning process? | 4.0 |
| L2CQ6 Do you feel that the ease of online content is important? | 4.0 |
| L2CQ7 Do you feel that it is important to get an overview of the content before the class begins? | 4.1 |
| L2TQ8 Do you think that ODL give more benefits than drawback? | 3.4 |

Table 11 presents the mean scores for learner-to-content interaction. The highest mean value of 4.1 is recorded for item L2CQ7 which highlights the importance of getting the overview of the content before the class begins. Meanwhile, the lowest mean value (3.4) is recorded for item L2TQ8 which is on respondents' view of whether ODL gives more benefits than drawbacks, and three items (L2CQ3,5,6) shared the same mean value (4).

Findings for Relationship between all Types of Engagement

This section presents data to answer research question 4- Is there a relationship between all categories of engagement in online learning? To determine if there is a significant association in the mean scores between all categories of engagement, data is analysed using SPSS for correlations. Results are presented separately in table 12, 13, and 14 below.

Table 12

*Correlation between Learner-to-Learner (L2L) and Learner-to-Instructor (L2I) Engagement***Correlations**

| | | L2L | L2I |
|-----|---------------------|--------|--------|
| L2L | Pearson Correlation | 1 | .578** |
| | Sig. (2-tailed) | | .000 |
| | N | 171 | 171 |
| L2I | Pearson Correlation | .578** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 171 | 171 |

** . Correlation is significant at the 0.01 level (2-tailed).

Table 12 shows there is an association between learner-to-learner (L2L) and learner-to-instructor (L2I) engagement. Correlation analysis shows that there is a high significant association between learner-to-learner (L2L) and learner-to-instructor (L2I) engagement ($r=.578^{**}$) and ($p=.000$). According to Jackson (2015), coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between learner-to-learner (L2L) and learner-to-instructor (L2I) engagement.

Table 13

*Correlation between Learner-to-Instructor (L2I) and Learner-to-Content (L2C) Engagement***Correlations**

| | | L2I | L2C |
|-----|---------------------|--------|--------|
| L2I | Pearson Correlation | 1 | .651** |
| | Sig. (2-tailed) | | .000 |
| | N | 171 | 171 |
| L2C | Pearson Correlation | .651** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 171 | 171 |

** . Correlation is significant at the 0.01 level (2-tailed).

Table 13 shows there is an association between learner-to-instructor (L2I) and learner-to-content (L2C) engagement. Correlation analysis shows that there is a high significant association between learner-to-instructor (L2I) and learner-to-content (L2C) engagement ($r=.651^{**}$) and ($p=.000$). According to Jackson (2015), coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between learner-to-instructor (L2I) and learner-to-content (L2C) engagement.

Table 14

*Correlation between Learner-to-Content (L2C) and Learner-to-Learner (L2L) Engagement***Correlations**

| | | L2C | L2L |
|-----|---------------------|--------|--------|
| L2C | Pearson Correlation | 1 | .634** |
| | Sig. (2-tailed) | | .000 |
| | N | 171 | 171 |
| L2L | Pearson Correlation | .634** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 171 | 171 |

** . Correlation is significant at the 0.01 level (2-tailed).

Table 14 shows there is an association between learner-to-content (L2C) and learner-to-learner (L2L) engagement. Correlation analysis shows that there is a high significant association between learner-to-content (L2C) and learner-to-learner (L2L) engagement ($r=.634^{**}$) and ($p=.000$). According to Jackson (2015), coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between learner-to-content (L2C) and learner-to-learner (L2L) engagement.

Conclusion*Summary of Findings and Discussions*

The findings have revealed a comprehensive evaluation of students' perceptions of online engagement, particularly their interactions with peers, instructors, and content. Addressing the first research question, the study highlights learners' perceptions of learner-to-learner engagement in online classes. Collaborative learning is highly regarded by students, as it promotes peer-to-peer understanding and a sense of community. Students appreciate working in groups with peers they are familiar with, as this setup enhances their comfort and productivity. Peer support is viewed as a crucial motivator for completing tasks and preventing dropout, indicating the significant role of social support in online learning environments. This aligns with Wahid et al (2020), who also found that effective peer interactions were crucial in maintaining student engagement and preventing dropout. Similarly, Haris et al (2023), emphasized the importance of connectedness and peer support in fostering a positive learning environment.

The second research question focuses on learners' perceptions of learner-to-instructor engagement in online classes. Students value instructors who involve them in active participation, encourage engagement, provide clear and positive feedback, and use multiple communication tools to maintain connectivity. These strategies create a supportive online learning environment that keeps students interested and promotes effective learning. The

continuous interaction between students and instructors after class further enhances this engagement, as highlighted by Redmond et al (2023), who found that active instructor involvement and feedback were key to maintaining student interest. Similarly, Tan et al (2021) reported that students appreciated the clarity and positivity of feedback from instructors, which helped sustain their motivation and engagement.

Addressing the third research question, the study explores learners' perceptions of learner-to-content engagement in online classes. Students find both synchronous activities, like online discussions, and asynchronous activities, such as assignments, helpful for immediate assistance and improving their understanding of the subject matter. These activities also enhance critical thinking skills and provide a structured and accessible learning experience. However, students have a more measured perception of the overall benefits of online distance learning compared to its drawbacks, highlighting the need for well-designed activities and content delivery to foster effective learning and student satisfaction. This finding is consistent with Al Rawashdeh et al (2021), who noted that while online learning offers flexibility and accessibility, the lack of interaction and structured content can be challenging.

Finally, the fourth research question examines the significant relationships between all categories of engagement in online learning. Correlation analyses reveal strong positive relationships between different types of engagements. There is a significant association between learner-to-learner and learner-to-instructor engagement, indicating that positive peer interactions often coincide with positive instructor interactions. Similarly, learner-to-instructor engagement strongly correlates with learner-to-content engagement, suggesting that effective instructor communication enhances students' interaction with course content. Lastly, learner-to-content engagement also shows a strong positive relationship with learner-to-learner engagement, emphasizing that engaging content can foster better peer interactions. These findings are corroborated by Al Okla et al (2023), who also identified strong interconnections between different types of engagement.

Pedagogical Implications and Suggestions for Future Research

The findings from this study suggest several key pedagogical implications for improving online engagement in university settings. Firstly, fostering effective peer-to-peer interactions is essential. Educators should create opportunities for collaborative learning, as it promotes a sense of community and helps students feel more comfortable and productive. This can be achieved through group projects, peer review activities, and discussion forums that encourage students to work with peers they are familiar with (Wahid et al., 2020; Haris et al., 2023).

Secondly, the role of the instructor is critical in maintaining student engagement. Instructors should be trained to involve students actively in the learning process, provide clear and positive feedback, and use a variety of communication tools to stay connected with students. Continuous interaction beyond scheduled class times can further enhance engagement and motivation (Redmond et al., 2023; Tan et al., 2021). Incorporating these strategies can help create a supportive online learning environment that keeps students interested and promotes effective learning.

Thirdly, well-designed learner-to-content engagement is crucial for student success. Educators should ensure that online courses include both synchronous and asynchronous activities that are well-structured and accessible. These activities should aim to improve students' understanding of the subject matter and enhance their critical thinking skills. Providing an overview of the content before classes and designing assignments that are both challenging and supportive can help address the drawbacks associated with online learning (Al Rawashdeh et al., 2021).

This study contributes to the existing literature on online learning and student engagement by providing empirical insights into the factors that influence learner-to-learner, learner-to-instructor, and learner-to-content interactions. The theoretical contribution lies in the validation of Martin & Bolliger's (2018), engagement framework in a Malaysian context, showing its applicability across diverse educational settings. By correlating these interactions, the study affirms the interconnectedness of various engagement types and highlights the need for holistic strategies to enhance online learning environments.

Furthermore, the contextual contribution is evident in the exploration of Malaysian students' perspectives, particularly in post-pandemic educational settings. The findings not only provide a deeper understanding of the challenges faced in online learning environments but also suggest practical implications for improving student engagement through peer support, instructor communication, and content accessibility. These contributions are crucial for developing targeted interventions that cater to the specific needs of learners in Malaysia and other similar contexts.

Future research could focus on the long-term effects of peer support on student retention and academic performance in online settings. Studies could investigate how different types of collaborative activities impact learning outcomes and identify best practices for fostering peer-to-peer interactions (Wahid et al., 2020; Haris et al., 2023). Additionally, research could focus on the development and implementation of instructor training programs that emphasize active learning, effective communication, and feedback strategies. Evaluating the impact of such programs on student engagement and satisfaction could provide valuable insights into improving online instruction (Redmond et al., 2023; Tan et al., 2021).

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