

University Students' Perception on Online Engagement in Learning

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ABSTRACT

Online learning has emerged as an advanced mode of learning and shaped learning developments in recent years. Online learning allows learning to take place remotely when needed and ensures the process of learning is able to take place. Nonetheless, issues emerge when some students could engage and immerse in online lessons well, while some others may be facing challenges and struggling in engaging in online learning. Interactions are needed to support engagement in digital learning, calling for the need of this study to examine learners' perceptions towards online learning in the context of engagements among learners, between learners and instructors and learners and content engagement. Such examinations could assist in determining pedagogical improvements that could better enhance online learning experience. This study employed a survey-based approach using a questionnaire to pool target students' perceptions in the form of means on matters pertaining to online learning engagement, in the aspects of engagement among learners themselves, instructors and learning content. Overall data revealed the highest mean supporting how much they preferred and needed online learning support from peers the most, yet also revealed a strong need for interactions with learning content, followed by valuing their teachers for positive online engagement. These findings suggest that positive engagements via these interactions matter to them. These results could impact the need for a standard and strong learning support system and more advanced pedagogical shift to support students in navigating online learning to create better online learning engagement in the modern landscape of the ever-growing digital world.

Keywords: online learning, students' perception, interaction, online engagement

INTRODUCTION

Against the backdrop of traditional learning environment that is still taking hold, online learning emerges as a promising new and innovative learning ecosystem in today's borderless and growing digital world. Digital learning mode has been in demand and has become part of a standard learning mode in moulding and preparing the current generations for an ever-growing digital world. In higher education, online learning has indefinitely been absorbed into academic operations. Bergdahl (2022) emphasised that current research input indicated growth in conceptual grasp of engagement which encompasses the immersion of online learning. The growth of "interactive media" in the late 20th century has led to interest in digital student engagement and environments (Kennedy, 2020). Arifudin (2025) described digital learning as "a central component of the future of education" against the evolution of technology where the traditional learning model is "being challenged".

Studying student engagement aids in understanding learners' acceptance and readiness in navigating new learning experiences online. Hu and Xiao (2025) highlighted the importance of learning engagement based on the asynchronous and independent nature of online learning. Such engagement is critical for learning and is also reflected in several reviews conducted during recent decades (e.g., Alrashidi et al., 2016; Bond, 2020; Henrie et al., 2015; Martin et al., 2020), in Bergdahl (2022). Ringer and Kreitz-Sandberg (2022) perceived that while there is sufficient evidence of expansion in the development of online learning, grasping student perception on online learning is progressively crucial. Online learning engagement is essential as there is a lack of chances for online learners to engage with the learning institution (Martin & Bolliger, 2018).

In particular, online learning engagement involves the importance of interacting with the other learners, teachers and learning content remotely. Xiao et. al, (2025) was particularly focusing on the vitality of teacher-student interaction, where positive interaction between instructors and students is encouraged between the two parties. Furthermore, collaboration and interaction within social contexts is emphasised where social constructivism stressed its necessity of teacher-student engagement in digital learning. As put by Kennedy (2020), high student engagement levels rely on interaction. Humber (2020) captured the importance of considering students' real experiences.

Thus, this study significantly serves as a continuous discovery of investigating students' online learning engagement in a form of perception on online learning experiences. Their perception will mirror which interaction is more highly regarded for them than the other in supporting their online learning experiences. Their level of perception will then reflect which interaction would help them engage in online learning the most. To sum, investigating how they perceive online learning interaction in measuring their perception on engagement in online learning paves the way as an ongoing effort in comprehending student online learning engagement against the prevailing traditional world of learning.

Statement of the problem

Interaction matters in influencing student engagement. This even matters today when online learning mode is starting to take hold in education. Online platforms have helped almost everyone globally and of course for education, online learning benefits those involved in the teaching and learning activities with no doubts (Stecula & Wolniak, 2022; Rawashdeh, Mohammed, Arab, Alara & Al-Rawashdeh, 2021). The learning institutions, educationists, learners are all amongst those who benefitted from online learning. Stecula and Wolniak (2022) also mentioned that the learning instructions via online are made possible through the days when physical interaction is not permitted. It has become a necessity nowadays as online learning has become very much convenient to the teachers and the learners due to its advantages and values such as learning flexibility (learning time and space), accessibility (geographical barriers), and cost-effectiveness (Rawashdeh et al., 2021). The online platforms have made the teaching and learning, including assessment, achievable and successful.

Learners are able to continue their schools and colleges at their convenience. In addition, online learning also provides opportunities for students to be independent learners, to be able collaborate with peers, instructors and also learners from elsewhere, to become active learners when they get to respond and to give feedbacks during class; and, at the same time to those who are introvert, according to Masalimova, Zheltukhina, Sergeeva, Sizova, Novikov and Sadykova (2024) learners are able to voice out ideas and opinion when they do not have to face the instructors and peers physically.

Additionally, online engagement helps in improving learners cognitively (Al-Obaydi et al., 2023). Al-Obaydi et al., (2023) also highlighted that learners will develop their understanding through thinking critically and independently when the materials are provided online. Then, when the learning is conducted creatively, filled with fun and joy, the learning can affect learners emotionally (Tu et al., 2025). They will feel motivated to engage in the forum and also participate in other online activities with enthusiasm. With the joy of learning, Tu et al., (2025) mentioned that learners will develop a positive attitude during the learning process; they view the learning as manageable and rewarding. Completing and submitting work should also be efficient, as learners have the online platforms that make the process hassle-free (Wang et al., 2022).

Furthermore, online learning supports peer-to-peer interaction (Loh et al., 2024). Building on this interaction, Loh et al., (2024) emphasised that learners can support each other through discussion in groups on any online platform. Not only can learners exchange their understanding, but they also can improve their interaction socially (Weng et al., 2024). This situation can boost their learning motivation when they view learning as stress-free and comfortable (Jiang et al., 2022). Online learning too helps learners to engage with their instructors confidently. It benefits those who are introverted (Almusharraf & Almusharraf, 2021). With online learning, Jiang et al., (2022) also observed that they are able to ask questions and share ideas during the online class without fear or nervousness. This is because online learning allows real-time video conference calls, collaborative learning that is group chats and discussion, asynchronous online learning that is pre-recorded lectures, and so forth. Learners, hence, can interact or participate without facing their instructors face-to-face (Almusharraf & Almusharraf,

2021). Finally, with online instruction, learners are able to engage with learning materials more efficiently when they can be exposed to the online interactive materials (Weng et al., 2024). For instance, the instructors will expose interactive multimedia content for further reading, personalised quizzes, gamified learning tasks, and so forth (Weng et al., 2024). With such convenience, learners are able to learn at their own pace, in their own time, and within their own space (Hongsuchon, et al., 2022; Shahabani, 2023).

However, there have been issues in learning online such as limited engagement and focus amongst certain learners (Wang, 2022). Some learners may not be able to stay long when there is no physical contact (Akpen, Asaolu, Atobatele, Okagbue & Sampson, 2024). Akpen et al., (2024) also mentioned that learners hardly stay focused during the instructions as they can get carried away with their surroundings. Learners are easily distracted when no one is observing them which results in less participation during class and lessens the quality of learning (Wang, 2022). With such learning experience, teachers or the instructors too may face challenges in terms of managing and controlling their learners. In addition, online learning, at the same time, is seen to limit teacher-learner interaction (Ong & Quek, 2023). This is inconsistent from the traditional approach where face to face interaction provides a close relationship and empathy between teachers and their learners. Ong and Quek (2023) added that some learners may feel ignored when they are no longer having close contact with the teachers. This can be frustrating to some learners which can develop emotional strain and discouragement. Finally, online learning is observed to steal the natural skill and talent of the learners when the process involves more technological instruments and gadgets (Akpen et al., 2024). Moreover, with the existence of artificial intelligence (Ai) that has become the important tools in most learning activities, it becomes a serious concern that learners may rely heavily on these applications and features (Abalkheel, 2022). Other than that, the involvement of technology and the use of digital platforms can also bring some hiccups as they depend so much on the internet connection. Poor internet connection can disrupt this online instruction (Abalkheel, 2022) which results in ineffective learning. Hence, though most beneficial aspects with the use of technology and the practice of online instructions are witnessed and mentioned by many, there are also some drawbacks that we need to observe seriously and take action. This effort can help monitor learners' learning engagement, motivation, anxiety and perhaps those struggling with lessons.

Though many studies have been conducted to investigate factors that contribute to the success or failure of online learning and digital platforms, there is still room for an ongoing exploration of learner's engagement in online learning. Against the backdrop of the traditional learning system that still persists, online learning engagement remains a new domain that should be constantly discovered. Learners' engagement during online learning can be observed in terms of learner-to-learner, learner-to-instructor and learner-to-content engagement so that the learning activities remain successful and relevant.

Objectives of the Study and Research Questions

Thus, this study is conducted to explore perception of learners on online learning engagement based on these objectives;

- To investigate how learners perceive learner-to-learner engagement during online classes
- To investigate how learners perceive learner-to-instructor engagement during online classes
- To find out how do learners perceive learner-to-learner content engagement during online classes
- To discover the differences in the total mean scores of students' perceptions across the three interactions in online engagement

Specifically, this study is conducted to answer the following questions;

- How do learners perceive learner-to-learner engagement during online classes?
- How do learners perceive learner-to-instructor engagement during online classes?

- How do learners perceive learner-to-learner content engagement during online classes?
- What are the differences in the total mean scores of the students' perceptions across the three interactions in online engagement?

LITERATURE REVIEW

Student engagement is a fundamental part of the learning process. Student engagement is defined as “energy in action” (Appleton, Christenson, Kim, & Reschly, 2006, p. 428). Several subtypes of student engagement (SE) exist, such as academic, cognitive, intellectual, institutional, emotional, behavioural, social and psychological” (Taylor & Parsons, 2011). On the other hand, Suejam and Rodway (2025) mentioned student engagement, in a writing sense, as the way learners engage with given feedback instead of acting as the sole reason in improving in writing, according to Ellis, 2010; Zhang et al., 2021; Yu et al., 2021.

Online Engagement

Online engagement is a concept that demonstrates how learners interact with their learning (Muzammil, Sutawijaya & Harsasi, 2020; Richards & Thompson, 2023). The online learning engagement can refer to how learners pay attention to the content delivered by the instructors, how learners interact with their peers for assistance and support, and how learners connect to the materials for further understanding (Muzammil et al., 2020); Turk, Turk, Muftuoglu, Karakaya & Karakaya, 2024). The engagement is also closely related to learners' attendance, grades, and school success hence, making it a crucial factor for online learning environments (Alrashidi et al., 2016). Since online learning has its challenges, such as poor internet connection, lack of human touch, difficulty in understanding the learning content, and so forth, learners must have concern over their learning (Abou-Khalil et al., 2021). Abou-Khalil et al. (2021) also mentioned that learners will seek alternative strategies to ensure that they will not disengage from the learning process. Hence, the contacts with peers and the instructors are essential (Wang et al., 2022). During or after the learning, they will ask questions amongst themselves for understanding, and they will be curious to know more about the content learnt (Wang et al., 2022). In this case, learners will seek further explanation from their instructors. This active interaction, in fact, promotes learning interest and thus allows learners to engage in the learning more meaningfully and effectively (Muzammil et al., 2020).

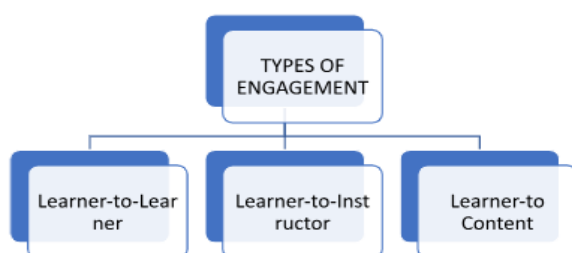
Theoretical Framework

Online learning engagement can be gauged in a form of three types of interaction, namely learner-learner, learner-content and learner-instructor interaction. Moore's 1989 theory of interaction matches the structure that frames this study in investigating students' perception on online learning engagement involving these three elements, as well as the theory's focus in distant learning.

Moore's Theory of Interaction (1989)

Three Types of Interactions

The framework outlines the importance of responding to the needs of these three interactions in distant education.



Moore's theory of interaction (1989)

These interactions are developed to clearly describe the workings of interactions in distance education. According to Moore (1989), distant educators need to be mutual on the variation between three classifications of interaction; learner-content interaction, learner-instructor interaction and learner-learner interaction.

Learner-to-Learner Interaction

This interaction describes a learning situation when there is no “real-time presence of an instructor”. Learner-to-learner interaction among students of a class is at times an exceptionally invaluable learning resource. Moore (1989) added that Phillips, Santoro and Kuehn's (1988) illustrated the importance of learner-to-learner interaction among undergraduates, by which the skills of group work and skilled committees are prudent to function in society, particularly for business purposes. The students were then offered the benefit of interacting individually with the instructor via online communication and peer group communication via asynchronous e-mail and synchronous ‘chatting’ on the computer.

Learner-to-Instructor Interaction

Learner to instructor interaction is hailed as pertinent by most educators, as well as highly desired by the majority of learners. This is an interaction involving the learner and subject matter expert. Instructors teaching remotely make the effort as any other educators in achieving similar aims. With prescribed curriculum and programme content, the instructors strive to maintain and stimulate students' interest in what is being delivered, to drive students' learning, to elevate interest, which includes autonomy and intrinsic motivation. Simply, the instructors are described to teach, get students to practise and evaluate. A professional instructor is able to influence learners by teaching effectively through interaction via distant communication systems.

Learner-to-content Interaction

This is the first form of interaction involving the learner and subject matter at hand. Moore (1989) referred to this interaction as “defining characteristic of education”. Education cannot take place without an interaction between the learner and content. This interaction leads to transformation in the learner's understanding, cognitive framework and viewpoint.

In distant learning, a characteristic of courses is content-interactive. It works in a one-way form of interaction with content specialists to assist distant learners in learning the content matter. Learners become self-directed.

Past Studies on Students' Perceptions on Interactions in Online Learning

Studies on students' perception on digital learning suggest how well students perceive their interactions in engaging with their peers, instructors and learning content. A study by Miao et al., (2022) delved into student perceptions of rapport, climate and loneliness in exploring connections in the online learning environment using full time undergraduates in a massive public Chinese university. They discovered that there was the immediate influence of teacher-student engagement and student-student engagement on social existence and online learning engagement. The study also reported that teacher-student engagement and learning engagement and student-student engagement and learning engagement were resolved by social presence. Similarly, Kaufmann and Vallade (2020) discovered the significance of the teacher's role in creating and sustaining rapport and climate in online learning (as it can be a “lonely experience”). The same result was found in a study that utilised a questionnaire survey in investigating teacher-student influence; students' learning effects were positively influenced by teacher-student interaction, also referred to psychological atmosphere, level in online education (Sun et al., 2022). Conversely, a study on student perception on online engagement by Redmond et. al., (2023) using a mixed method approach indicated the students perceived student-course interaction as the most important by majority of the students that could influence their success in engaging in an online course. Buelow et al., (2018) discovered the same result through their online survey, and revealed that the students felt interactive tasks were engaging, particularly the thought-provoking stimuli that were connected to practical scenarios and students were invited to express different opinions and individual views. On the other hand, Humber's (2021) findings, in a qualitative case study on undergraduates' perception on online learning reported the students as perceiving value in primarily communicating with their instructor, engaging with the coursework, and communicating with peers.

METHODOLOGY

This quantitative study is conducted to explore motivation factors for learning among undergraduates. A purposive sample of 73 participants responded to the survey. The instrument used was a 5 Likert-scale survey as shown below (table 1). The scale is an indicator of the respondents' perception towards learning experiences in the three types of interactions reflecting engagement in online learning. Scale 1 indicates a strong indicator of the respondents' disagreement, Scale 2 indicates a disagreement, Scale 3 is to indicate that the respondents do not have any opinion on a statement, Scale 4 to indicate agreement, and Scale 5 to show a strong level of agreement.

Table 1 Indicator of the respondents' perception towards online learning

1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

The questionnaire is rooted from Martin & Bolliger (2018) on learners' online engagement to reveal the variables in table 2 below. The survey has 4 sections: Section A on the respondents' demographic profile, Section B on statements in which they would reflect their perception on engagements in learner-to-learner interactions in online learning, Section C investigates online learning engagement in terms of learner-to-instructor experiences, and Section D took a look at online learners' perception in engagements to do with learner-to-content interaction.

Table 2 Distribution of items in the survey

SECTION	TYPE OF INTERACTION	No of Items	Cronbach Alpha
B	Learner-to-learner	6	.806
C	Learner-to-Instructor	8	.834
D	Learner-to-Content	8	.834
Total no. of Item		22	.913

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .913 thus, revealing a strong reliability of the instrument employed for this study. Further analysis using SPSS was applied to present findings to answer the research questions on perception on the three interactions and range of difference in the means of the interactions.

Data obtained from the questionnaire were keyed in and analysed using the Statistical Package of Social Sciences (SPSS Version 30). This software was utilised to obtain the descriptive statistics to determine the mean, standard deviation, frequency and percentage in indicating the respondents' form of perception towards online learning. Reliability and validity of the survey questionnaire were also obtained to determine the consistency and accuracy to investigate the respondents' perception.

FINDINGS

Findings for Demographic Profile

Table 3 Findings for demographic profiles

Question	Demographic Profile	Categories	Percentage (%)
1	Gender	Male	31.5%
		Female	68.5%
2	Semester	Part 1-4	94.5%
		Part 5 and above	5.5%
3	Cluster	Science & Technology	49.3%
		Social Sciences & Humanities	50.7%

Table 3 indicates percentage of data on the demographic profiles of the respondents. For gender, the highest percentage went to female respondents with 68.5 per cent, followed by males (31.5%). Majority of the respondents were in semesters 1 to 4, with 94.5%, compared to only 5.5% of semester 5 and above. Social sciences cluster comprised the largest portion of respondents with 50.7%, while 49.3% were of Science and Technology cluster.

Descriptive Statistics

Findings for Learner-to-Learner Engagement

Table 4 Mean for learner-to-learner interaction

Statement	Mean	SD
L2LQ1 Does collaborative learning promote peer-to-peer understanding?	3.5	.81720
L2LQ 2 Are you more likely to ask for help from your peers?	3.9	.94119
L2LQ 3 Do you prefer to be in the same group with your chosen peer for online activities?	4.3	.71699
L2LQ 4 Do you think that the sense of community helps you to engage in online class?	4.2	.69681
L2LQ 5 Do you think support from peers motivates you to finish tasks?	4.2	.83766
L2LQ 6 Do you think that support from peers prevents you from dropping out of course?	4.3	.83128

Table 4 indicates mean for learner-to-learner interaction online. This finding intends to answer the research question: How do learners perceive learner-to-learner engagement during online classes? The highest mean ($M=4.3$) went to the respondents' highest perception on being in the same group with their chosen peer for online activities. A similar high perception based on mean of 4.3 went to obtaining support from peers that prevents them from dropping out of course. Mean of 4.2 revealed a fairly positive perception on online engagement to do with a sense of community to help them engage in online classes. A similar high mean of 4.2 involved the respondents' strong perception on obtaining support from peers to finish tasks. Mean of 3.9 showed a lower regard for asking for help from their peers. The lowest mean ($M=3.5$) revealed their least likeness towards collaborative learning for peer-to-peer understanding.

Findings for Learner-to-Instructor Interaction

Table 5 Mean for learner-to-instructor interaction

Statement	Mean	SD
L2IQ1 Does your instructor's teaching style involve students' active participation?	4.1	.76401
L2IQ 2 Do you feel encouraged by your instructor to keep engaged in the online classroom?	4.0	.80783
L2IQ 3 Does your instructor provide feedback from your previous assessment?	3.8	.87499
L2IQ 4 Do you feel feedback from your instructor on your performances are clear and positive?	4.0	.88149
L2IQ5 Does your instructor use more than two communication tools to stay connected with students?	3.9	.87128
L2IQ 6 Do you think that online platforms used by your instructor for your online class are effective and convenient?	4.1	.80476
L2IQ7 Does your instructor maintain the ongoing interaction with students after online class?	4.0	.70495

Table 5 illustrates perception on learner to instructor online learning engagement. This finding strives to answer the research question: How do learners perceive learner-to-instructor engagement during online classes? The highest mean ($M=4.1$) was the respondents' highest level of perception on instructor's teaching style involving students' active participation, and platforms used by their instructor for an effective and convenient online class respectively. This was followed by $M=4.0$, an also high perception on given encouragement by their instructor to keep them engaged in the online classroom, and feeling clear and on positive feedback from their instructor on their performance respectively. A similar high perception based on a mean ($M=4.0$) was on instructors maintaining ongoing interaction with students after online class. The next mean of $M=3.9$ was the students'

lower perception on instructors using more than one communication tool to stay connected with students. The lowest mean was $M=3.8$ on their least acceptance on instructors providing feedback on students' previous assessment.

Findings for Learner-to-Content Engagement

Table 6 Mean for learner-to-content interaction

Statement	Mean	SD
L2CQ 1 Do you think that the synchronous activities (i.e. online discussion) could offer immediate assistance?	3.8	.71805
L2CQ 2 Do you think that the asynchronous activities (i.e. assignment) could offer immediate assistance?	3.6	.79069
L2CQ 3 Do you think the activities could improve the understanding of subject-matter?	3.5	.94261
L2CQ 4 Do you think the activities in online learning could improve your critical thinking skills?	3.6	.88986
L2CQ 5 Do you think you can use relevant knowledge wisely in the learning process?	3.8	.73920
L2CQ 6 Do you feel that the ease of online content is important?	3.9	.73585
L2CQ 7 Do you feel that it is important to get an overview of the content before the class begins?	4.3	.73611
L2TQ 8 Do you think that ODL gives more benefits than drawbacks?	3.5	.97065

Table 6 indicates learner-to-content online engagement. This data aims at answering the research question: How do learners perceive learner-to-learner engagement during online classes? The highest mean of $M=4.3$ revealed the respondents' highest preference over getting an overview of the content before the class begins. This is followed by $M=3.9$ on their lower preference over the importance of ease of online content. The following mean of $M=3.8$ displays the students' slightly lower perception on how synchronous activities (i.e. online discussion) could offer immediate assistance, and use of relevant knowledge wisely in the learning process respectively. An even lower mean was $M=3.6$ on the respondents' opinion on asynchronous activities (i.e. assignment) offering them immediate assistance, and that activities in online learning could improve their critical thinking skills. The lowest mean ($M=3.5$) went to the respondents' least regard for online activities that could improve the understanding of subject-matter, and that ODL gives more benefits than drawbacks.

Comparison of Mean

Table 7 Comparison of mean

Type of Engagement	Total Mean	SD
Learner-to-learner	4.1	.57804
Learner-to-instructor	3.8	.55829
Learner-to-content	4.0	.57894

Table 7 illustrates comparison of total mean on the three types of interactions. This is to answer research question 4: What are the differences in the total mean scores of the students' perceptions across the three interactions in online engagement? The three total means reflect the students' overall value of perception across the three interactions. This is to indicate different degrees of the students' perceptions about the three types of interactions in online learning.

Learner to learner interaction has an overall highest mean ($M=4.1$) indicating the students' highest level of perception on creating online engagement through peer-to-peer interactions. Subsequently, overall learner to content interaction analysis ($M=4.0$) revealed the students' next highest level of perception was on their interaction with the learning content. This is followed by the students' slightly overall lower perception level ($M=3.8$) when interacting online with their instructor. These overall means for the three interactions also portray a very slight difference of means between learner to learner and learner to content interaction, while a minor difference between the aforementioned means and learner to instructor interaction.

DISCUSSION

Sequentially, findings concerning the highest overall mean of the students' overall perception on interaction between peers revealed that the students' responses displayed their highest impression on their interaction with their contemporaries in motivating, driving and supporting their online engagement. This finding reflected that working and collaborating with people of the same age could drive them to create a positive online learning engagement for a successful online learning experience. This is followed by their next highest high regard for their interaction with the learning content in guiding them in engaging in an online learning environment. This could reflect that the students felt the online content of subject matters greatly in guiding and supporting them remotely for a positive online learning engagement. Following close is the students' slightly lower perception in interaction with their instructor in supporting their online learning engagement. This could mean that they students may feel that their connection with knowledgeable and more experienced figures was not needed compared with how strongly they feel when connecting with their friends and content of online lessons. Their strong feeling over interacting with learning content may also indicate that they could direct their own learning online.

Nevertheless, the close gap also points to the students' collective need for engagement across all three types of online learning engagement in order to support their online learning. This hints that effective online learning may still require a simultaneous presence of their peers, instructors and learning content in striving for success in online learning.

Furthermore, the result of this study illustrates the students valued learner-learner interaction the highest seems to strengthen the study by Miao et al., (2022) who discovered that there was the immediate influence of teacher-student engagement and student-student engagement on social existence and online learning engagement. Contrarily, this study's finding on the students' highest perception on learner-learner interaction does not resonate with a study that discovered students' learning effects were positively influenced by teacher-student interaction (Sun et al., 2022). A similar contrast is also seen between the result of this study and the one by Kaufmann and Vallade (2020), who discovered the importance of the teacher's part in creating connection and online learning environment. On the other hand, this study's result on the highest value on working with peers did not echo findings by Buelow et al., (2018) who found that the students felt interactive tasks were engaging, suggesting their students' strong perception on learning content. This study's finding contrasts with a finding by Redmond et al., (2023) study who revealed that student-course interaction was valued the most by majority of the students in determining engagement success. Additionally, the students' lowest value on learner-teacher interaction does not go parallel with findings by Humber (2021), who reported the students as perceiving value in primarily communicating with their instructor, engaging with the coursework, and communicating with peers. Overall, the finding of this study that the students' view on student-student interaction in online learning taking precedence suggests an overall distinct view on the importance of peer-to-peer interaction when compared with the previous investigations.

CONCLUSIONS AND RECOMMENDATIONS

In essence, the findings answered all this study's research questions. The answers rest in how highly the students perceived their interaction with their peers in engaging in online learning, reflecting how important the students felt about how well they could be involved and motivated to learn online, and remotely. This implies their strong belief in how important human or social support is in their involvement in online learning, especially people of the same age who are experiencing the same situation (learning online and remotely) as they are. The answer to the third research question on perception on learner-instructor interaction in online learning engagement can be seen in how the students valued their instructors the least. Nevertheless, the minor gap in the different degrees does not discredit their view on the importance of connecting with knowledgeable figures as they are perceived as providing valid and reliable knowledge and skills. The third research question is answered in how high the students viewed interaction with their learning content, perceiving the ability to engage with online course content and how they are designed to support distant online learning to navigate their online learning experience. These three elements of interactions are needed, though in different degrees. All three act as lifelines in driving, supporting, enriching and completing their whole digital learning experiences. This findings of this study also

demonstrate how pertinent effective distant engagement is in the form of people who are in the same circumstances (their peers), the need for reliable skills and knowledge (learning content), and their strong belief in the guidance of knowledgeable figures (instructors).

Given these outlooks on how important and different the students view these interactions in reflecting how engaged they could be in online learning, it is imperative to consider these: Future research needs to continuously tap into the perception of students as digital learning is the future of learning. Delving into how they perceive online learning experiences is prudent, especially in the pursue of understanding what the students are experiencing and feeling towards digital learning. How students feel about this new mode of learning further paves ways to strengthen and enhance their learning experiences, particularly when they are accustomed to traditional approaches of teaching and learning. Given the students' highest level of perception on interacting with their contemporaries, consider the need to create peer mentoring programs or framework to assist in designing comprehensive and robust peer support system. Their high regard for online learning content calls for online content and self-directed strategy training. Consequently, continuous teacher training on digital teaching and learning is desired to better prepare instructors for effective online communication practices with students to further improve students' online learning experiences.

The limitation of this study may appear in a form of a small sample participants due to time constraint, yet the findings of this investigation define this study as a prelude for future similar studies. Larger samples may allow for more insights into many other student perceptions on this matter, which may include a larger multidisciplinary scale.

Overall, the findings of this study set a preliminary and continuous insight into how they felt about interacting with the three aspects of online learning for successful online learning experience. In the light of the emerging world of digital and remote learning, studying the students' views on matters of online learning experience is pertinent, coming from the realisation that the current generations of students are the internal stakeholders who need support and assistance the most in this new world of digital learning.

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