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Is there Connectivism in Online Engagement?

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Abstract

In the context of the digital area, online engagement is essential to the connectivism framework. Connectivism, a term coined by George Siemens, offers a framework for comprehending how learning takes place in networked environments while also recognising the special opportunities and difficulties given by the digital age. Learners take an active part in online discussions, interact with multimedia contents, work together with peers, and produce and disseminate their own knowledge. This quantitative research study was conducted to explore perceptions of learners on online engagement which contains four elements: connectedness, diversity, openness and autonomy. This study was conducted on 129 students from Centre of Foundation Studies, UiTM Kampus Dengkil who undergo the process of online learning. A valid and reliable questionnaire was used to gather the data. It consists of four sections, demographic information and questions regarding learner-to-learner interaction, learner-to-instructor interaction and learner-to-content interaction. The findings indicated that most of the students gave positive perceptions on the engagement strategies with the learner-to-instructor being the most valued among the three. In addition, there is a strong positive correlation observed between the four elements that were documented. The results of the study have implications for students' online engagement, motivation, academic performance and adaptability to future learning environments.

Keywords: Connectivism, Online Engagement, Connectedness, Openness, Diversity, Autonomy

Introduction

Background of Study

In light of lifelong learning, it is now essential to have access to relevant information and be able to draw on the viewpoints of others. Learning theories may provide direction for educators who are adjusting to these changes. New theories might be required if present ones fall short of explaining learning in these situations (Goldie, 2016). A network learning

theory called 'connectivism' that was created for online learning has grown in popularity. It was first published online by Siemens (2005) "Connectivism: A learning theory for the digital age", ideas which have been developed by Downes (2005, 2006, 2012). Connectivism is being acknowledged by educators for its potential to improve comprehension and administration of teaching and learning with digital technologies. The learning theory of connectivism has attracted a lot of interest in the context of online engagement and digital learning environments.

The Massive Open Online Courses (MOOC) movement was started as a result of this learning theory being implemented by educational institutions today. As stated in Utecht & Keller (2019), many educational institutions have developed websites like Edx, available at https://www.edx.org/, where anybody can enroll in a course and/or participate in public discussion on a particular subject. These institutions recognise the changing nature of how, where, and what people choose to learn. The communities of learners created by these MOOCs advance the discussion.

According to Stephen Downes, the main elements of connectivism that are supportive of (or necessary for) learning in networks are autonomy, connectivity, diversity, and openness. These terms are meant to describe how a network works and are thought of as positive or desirable conditions. Despite the fact that words used in one discipline may have entirely different meanings and implications in another, the linguistic similarities between the idea of connectivist principles and two other ideas personality theory and self-determination theory seem to beg for further investigation, (Tschofen & Mackness, 2012).

Because of technology improvements, the necessity for lifelong learning, cultural diversity, and the promotion of open educational materials, connectivism and its guiding principles for learning are relevant in Malaysia. Understanding and applying the connectivist principles will help the nation's educational practices become more successful and inclusive. The primary focus of this research is to examine the four fundamental elements of connectivist ideology: connectedness and diversity, which is measured by learner-to-learner interactions, openness measured by learner-to-instructor interactions and autonomy which is measured by learner-to-content interactions.

Statement of Problem

As mentioned in the previous section, the four fundamental elements of connectivism are connectedness, diversity, openness and autonomy. The ideal situation is when the students are able to treasure each of these fundamental elements. In relation to the elements, the platform being used recently is also significant to contribute to the connectivism theory. In this digital era, online learning no longer stands as an option, instead it becomes an essential platform for the students. This is supported by a study that revealed the students preferred an online learning environment to face-to-face learning and perceived the former as being very useful (Jaradat & Ajlouni, 2021)**.** Connectedness and diversity from a learner-to-learner perspective is ideally implemented if increasing collaboration, expanding networks, improving social presence, obtaining peer feedback, taking advantage of multiple perspectives, cultural awareness, cognitive flexibility and enhancing problem-solving are achieved. In an ideal situation, a successful online student engagement is influenced by a number of psychosocial factors such as peer community, an engaging online teacher, and by structural factors such as life load and course design **(**Farrell & Brunton, 2020**).** However,

there are challenges in online learning which are communication barriers, differences in prior knowledge, conflicting perspectives and inequalities and bias.

Many studies reported that students from remote rural villages are unable to access online education due to the lack of the internet, smart devices and electricity. The online mode of learning, albeit it is reported a potential strategy to shift from the traditional education system to modern learning, cannot be sustainable in the context where there is limited or no infrastructure for the internet and electricity (Paudyal & Rana, 2021). Apart from lacking information and communication technology skills, the students also encountered non-physical challenges, such as mental health issues (anxiety and stress), poor time management skills, and distractions (Jaradat & Ajlouni, 2021).

Observing similar situations in Malaysia, there are many researches have been done to investigate the students' perception on online learning when they are forced to jump to the online platform when the pandemic abruptly changes the way they learn and communicate with their teachers, peers and content, such as (Ana et al., 2020; Nazilah, 2021; Thandevaraj et al., 2021). However, there is still not many available research findings which specifically focus on the pre-university students' perception towards the connectivism elements in online learning. Consequently, this study was conducted to obtain the first-hand information from the pre-university students on how they perceived learner-to-learner, learner-to-instructor and learner-to-content from their experiences in online learning. It is inevitable to fill the gap between the advantages of connectivism theory and the challenges in online learning, as well as the lack of findings on the pre-university students' perception towards connectivism elements in online engagement for Malaysia.

Objective of the Study and Research Questions

This study is done to explore perception of learners on online engagement. Specifically, this study is done to answer the following questions;

1. How do learners perceive connectedness & diversity in online engagement?
2. How do learners perceive openness in online engagement?
3. How do learners perceive autonomy in online engagement?
4. Is there a relationship between components in connectivism in online learning?

Literature Review

Online Learning: Drawbacks and Benefits

Online learning has revolutionised education and allowed learners from all backgrounds to engage in individualised, interactive learning experiences by utilising digital technologies to offer flexible access to a variety of courses and resources. Numerous advantages of online learning include its accessibility, flexibility, and variety of available courses. Furthermore, online education opens up opportunities for learners worldwide by giving them access to knowledge and resources from all around the world in the field of education. However, drawbacks of online learning include potential issues with motivation and self-discipline, as well as less social engagement and face-to-face connection than in traditional classes. Some students may additionally face challenges due to technical difficulties and the requirement for dependable internet access. Additionally, not all courses or learning styles may be suited to online learning because some practical or hands-on disciplines may call for physical presence and opportunities for experiential learning that are more readily available in traditional settings.

Past Studies on Benefits and Challenges of Online Learning

Many studies have been done to investigate the benefits of online learning. Among the benefits that the students experienced from online learning are becoming technology literate, the learning becoming accessible and flexible, increasing positive attitudes, and more efficient *(*Herwiana & Laili, 2022). However, another research also revealed that the most important factors behind the students' dissatisfaction during online learning are a distraction and reduced focus, psychological issues, and management issues (Maqableh & Alia, 2021).

There have been many past studies on online learning challenges. The study by Maqableh & Alia (2021) was done to investigate issues on students' dissatisfaction during online learning. To assess online learning, student satisfaction, and its positive and negative elements, two online questionnaires were undertaken. Following the emergency switch to online learning, data from 483 participants were gathered in the first survey. For the second survey, data from 853 students who had taken three semesters of online coursework were gathered. The analysis of the data from both questionnaires reveals that students struggled with a number of concerns when switching to online learning during the COVID-19 pandemic, including technological difficulties, mental health issues, time management, and finding a balance between life and school. The findings also revealed that over a third of the students polled expressed dissatisfaction with their online learning environment. Focus groups were used in a follow-up investigation to analyse and pinpoint the causes of the students' unhappiness with the online learning environment during the COVID-19 pandemic in January 2021. According to the findings, managerial problems, psychological problems, and distraction and loss of focus are the main causes of their unhappiness.

Another study by Barrot et al (2021) also looked at the challenges faced by the students during online learning. The study which involved 200 students (66 male and 134 female) from a private higher education school in the Philippines, found that the types and degrees of problems that college students face when learning online differed. Using a mixed-methods approach, the results showed that their least challenging skill was technical literacy and competency, whereas their biggest issue was related to their home learning environment. The studies also showed that the COVID-19 pandemic had the biggest effect on the standard of education and the mental health of students. The most common student techniques adapting to the issues were including resource management and utilisation, help-seeking, improving technical ability, time management, and learning environment control.

Conceptual Framework

Figure 1 shows the conceptual framework of the study. This study explores online engagement through connectivism (Downes, 2010). One worry for online classes is the issue of engagement (Rahmat, 2022). For learners to feel connected in online classes, they need to be engaged with their peers, the instructor and the content of the lesson. According to Downes (2010), connectivism involves connectedness & diversity, openness and also autonomy among the learners. In addition to Martin & Bolliger (2018), in order for online classes to be successful, they need to have the components of learner-to-learner engagement, learner-to-instructor engagement and also learner-to-content engagement. This study merges the theory of connectivism by Downes (2010) and types of engagement by Martin & Bolliger (2018) to reveal the framework in figure 1 below. In the context of this study, connectedness & diversity is measured through learner-to-learner engagement. Next,

openness is measured by learner-to-instructor engagement and autonomy is measured by learner-to-content engagement.

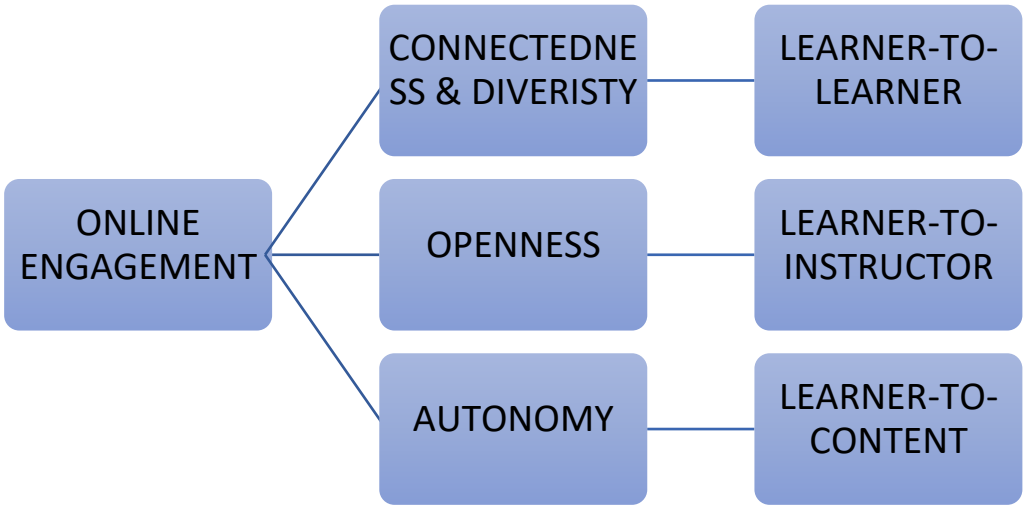

Figure 1: Conceptual Framework of the Study-Connectivism in Online Engagement

Methodology

This quantitative study is done to explore motivation factors for learning among undergraduates. A purposive sample of 129 participants responded to the survey. The instrument used is a 5 Likert-scale survey and is rooted from Downes 92010) and Martin & Bolliger (2018) to reveal the variables in table 1 below. The survey has 4 sections. Section A has items on demographic profile. Section B has 6 items on connectedness & diversity. Section C has 8 items on openness and section D has 8 items on autonomy as depicted in Table 1.

Table 1
Distribution of Items in the Survey

SECTION	**CONNECTIVISM (Downes, 2010)**	**TYPE OF INTERACTION (Martin & Bolliger, 2018)**	**No. of Items**
B	Connectedness & diversity	Learner-to-learner	6
C	openness	Learner-to-Instructor	7
D	autonomy	Learner-to-Content	8
		Tot no. of Item	21

Table 2
Reliability of Survey

Cronbach's Alpha	**No. of Items**
0.934	21

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .934, thus, revealing a good reliability of the instrument chosen/used. Further analysis using SPSS is done to present findings to answer the research questions for this study.

Findings

Findings for Demographic Profile

The first analysis made was to identify within the whole sample which is considered as demographic profile including the semester while the respondents having online distance learning (ODL), learning devices used, the quality of internet connectivity and preferred platforms for online meeting and sharing contents.

Q1. Semester while you are having ODL in Pusat Asasi UiTM.

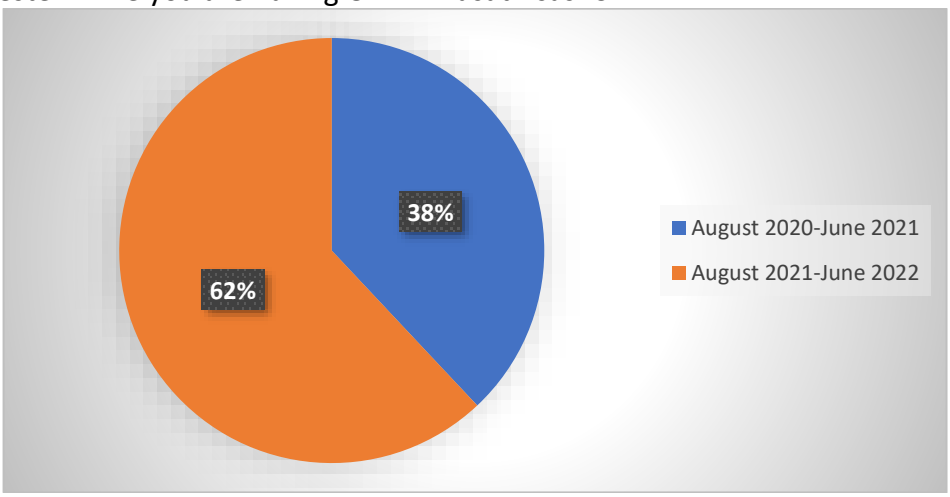

Figure 2: Percentage for Duration ODL

Figure 2 reports that 38% of the sample, which is 49 respondents, undergo online learning in semester August 2020 to June 2021 while 62% which is 80 respondents were in semester August 2021 to June 2022.

Q2. Learning Device.

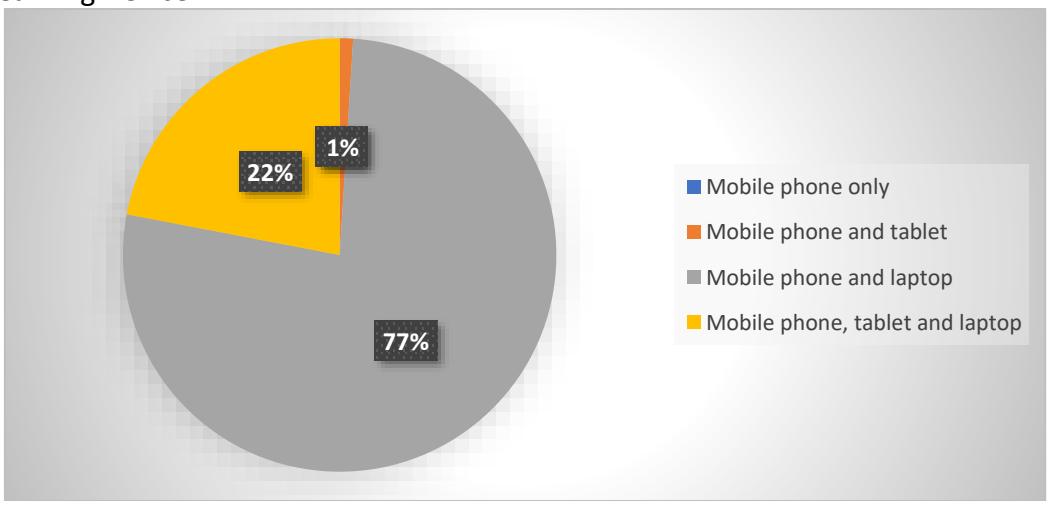

Figure 3: Percentage of Learning Device

As indicated in figure 3, the data collected provides the devices commonly used by the respondents. It is apparent that none of the respondents used mobile phones only while engaging in online learning and 1% of the respondents employed mobile phones and tablets. Most of the respondents, 77% in total, utilized mobile phones and laptops and approximately 22% made use of mobile phones, tablets and laptops.

Q3.Internet Access

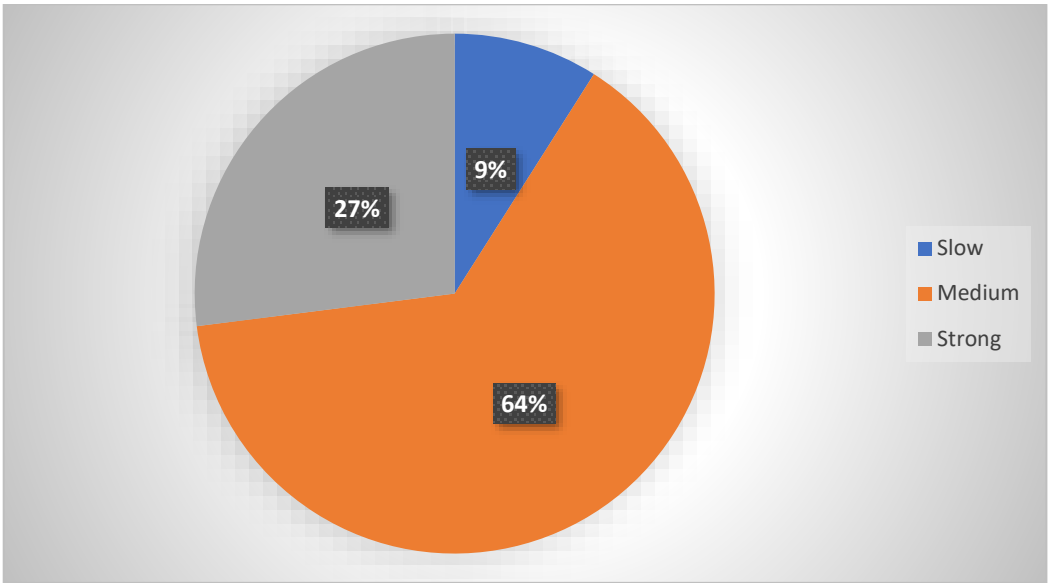

Figure 4: Percentage for Internet Access

Based on data tabulated in figure 4 above, data shows how easily individuals can connect to and utilise the internet, taking into account elements like speed, reliability, and service availability. Slow internet access indicates a weak, unreliable, or limited connection, which can hinder or restrict internet usage. In this research, 9% of the respondents have slow internet access. Additionally, 64% of the respondents have medium accessibility of the internet which indicates it may be sufficient for basic browsing, emails and certain streaming activities. A strong internet connection which indicated by 27% of the respondents implies a fast, dependable, and widespread connection that makes it possible to browse, stream, download, and engage in other online activities effectively.

Q4 Preferred Platform for Online Meeting.

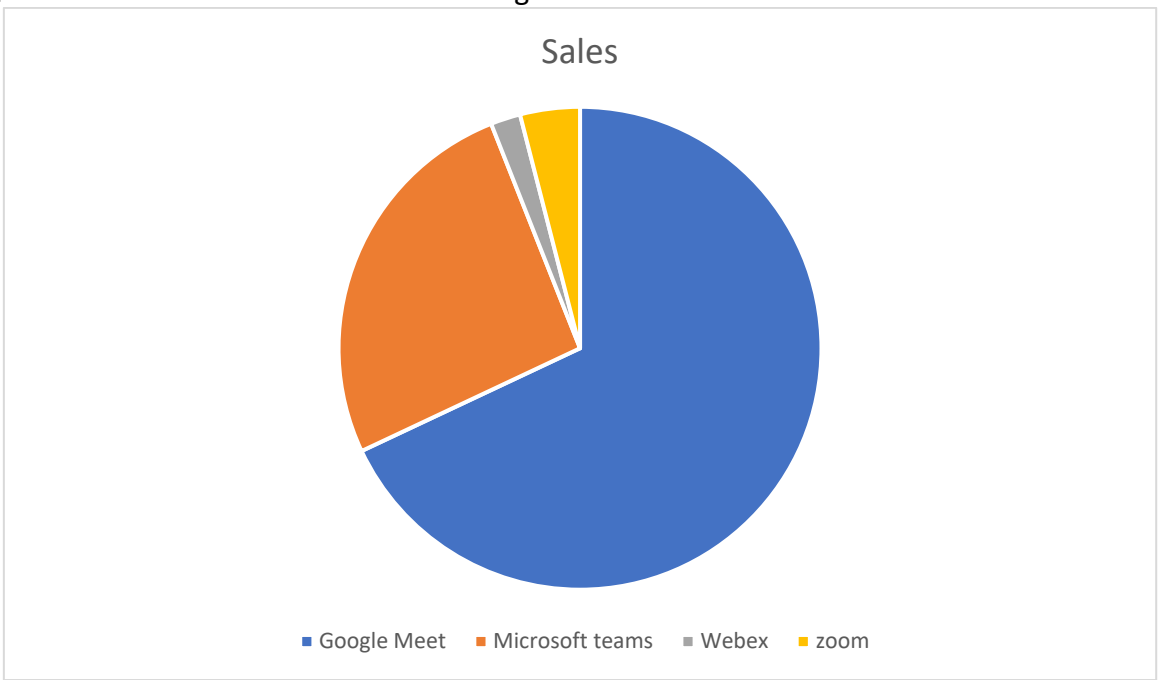

Figure 5: Percentage for Preferred Online meeting

Depending on the respondents' needs, preferences, and requirements, different platforms may be used for online meetings. Figure 5 shows several well-liked websites for online meetings which are google meet, microsoft teams, webex and zoom. Google meet is the most popular platform for meeting while the least preferred is webex.

Q5 Preferred Sharing Platform for Course Materials

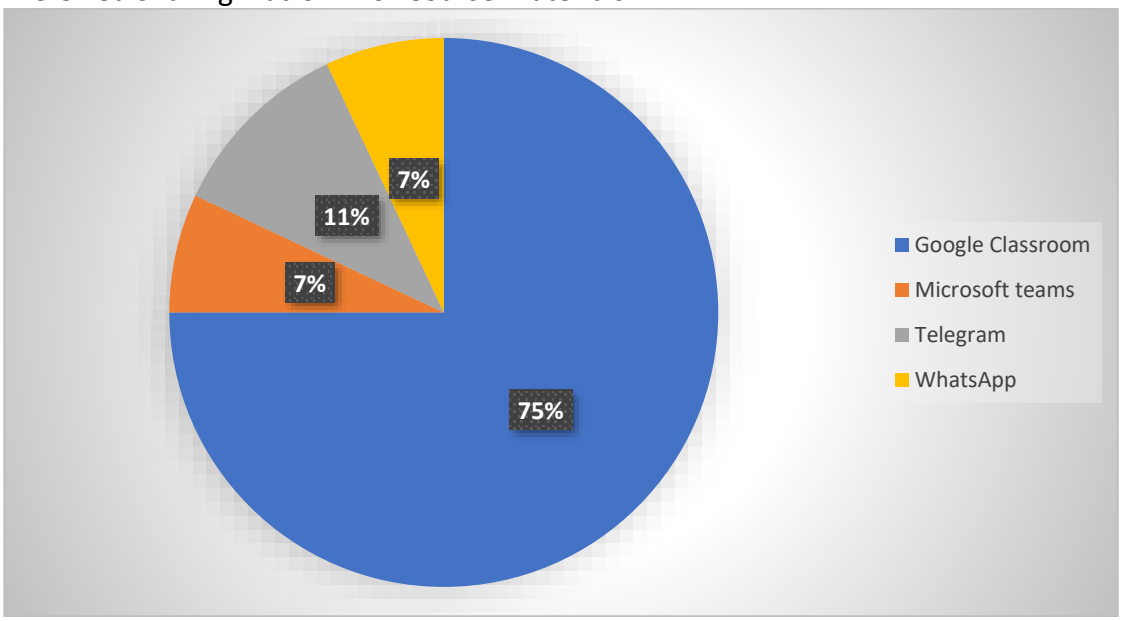

Figure 6: Percentage for Preferred online platform

When it comes to sharing course materials, depending on particular needs and preferences, several platforms can be useful and effective. Based on figure 6 above, the majority of the respondents, representing 75% of the respondents chose google classroom as

the preferred platform for distributing and sharing the course materials, followed by telegram which is 11%, and 7% chose microsoft teams and whatsapp.

Findings for Connectedness & Diversity

This section presents data to answer research question 1- How do learners perceive connectedness & diversity in online engagement? In the context of this study, this is measured by learner-to-learner interaction.

Learner-To-Learner Interaction

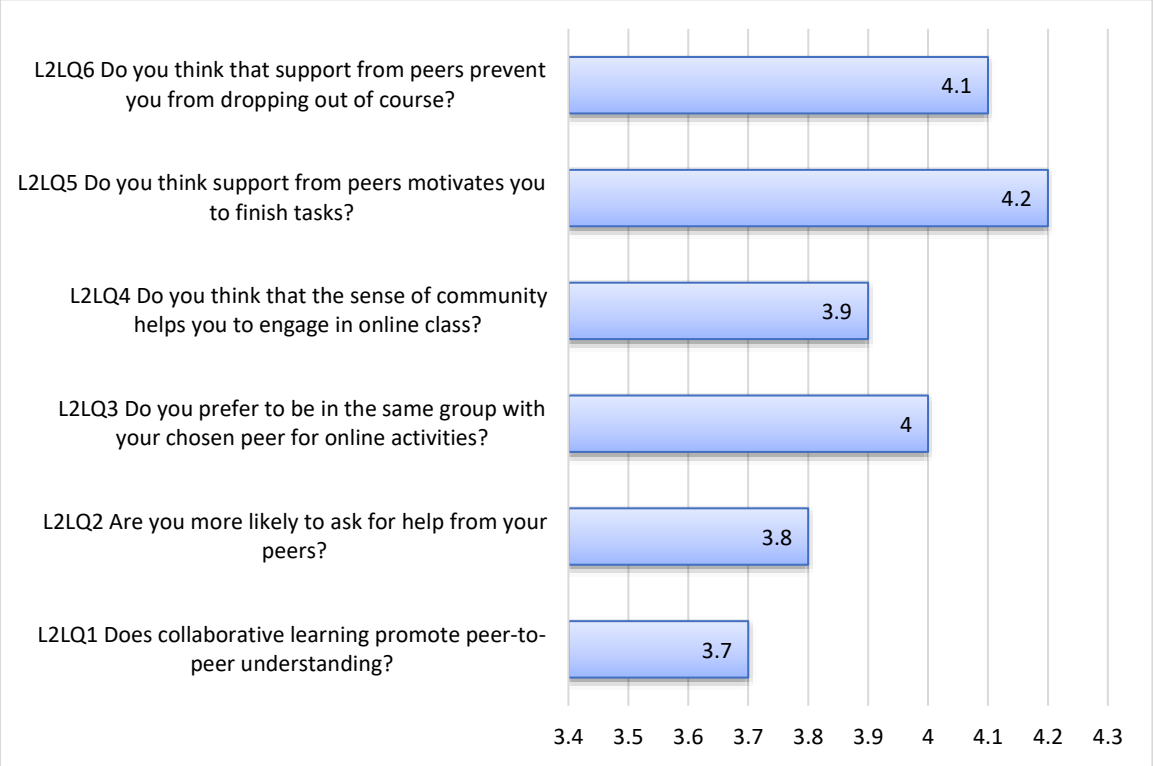

Figure 7: Mean for Learner-to-Learner Interaction

On the learner-to-learner interaction which is measuring the connectedness and diversity, over 80% of respondents agreed and totally agreed that item 5 (83.7%), 'Did you think support from peers motivates you to finish tasks', was highly significant. This item has the highest mean score on this subscale as shown in figure 7 with a mean score of 4.2. Other items that also have the mean score above 4.0 are item 3 item 6. With a mean of 4.0, item 3 was agreed by 73.6% of respondents who prefer to be in the same group with their chosen peers for online activities while for item 6, with a mean of 4.1, 79.8% of them agreed that the support from peers prevent them from dropping out of course. The least important item chosen by the respondents was item 1 which states that collaborative learning promotes peer-to-peer understanding with a mean score of 3.7, representing 62% of the respondents.

Findings for Openness

This section presents data to answer research question 2- How do learners perceive openness in online engagement? In the context of this study, this is measured by learner-to-instructor interaction.

Learner-To-Instructor Interaction

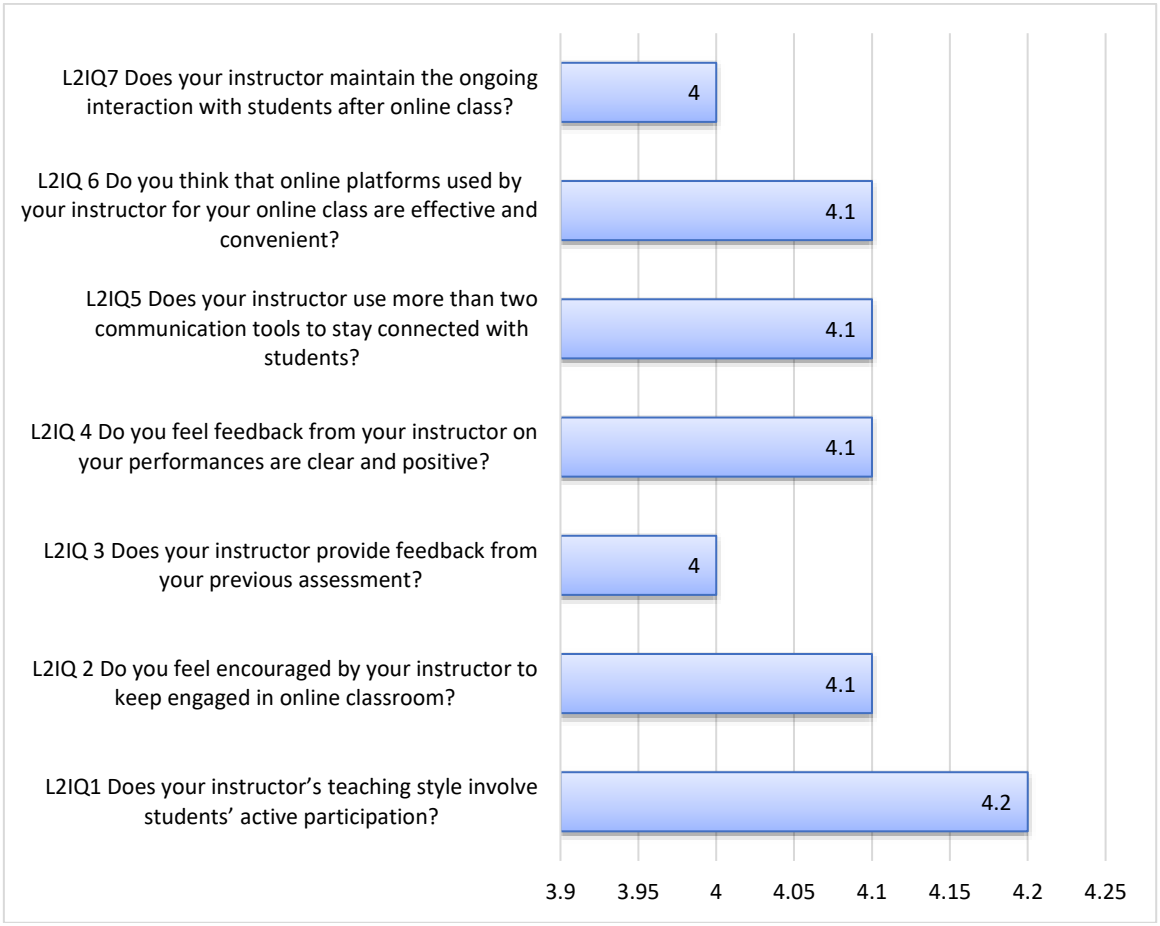

Figure 8: Mean for Learner-to-Instructor Interaction

On the learner-to-instructor interaction which is measuring openness, all of the items as shown in figure 8 have the mean score above 4.0. The highest mean score on this subscale, with a value of 4.2 representing 87.9% of the respondents agreed and totally agreed with item 1, 'Does your instructor's teaching style involve students' active participation?'. Item 3 and item 7 mean value 4. Item 2, 4, 5 and 6 mean value 4.1.

Findings for Autonomy

This section presents data to answer research question 3- How do learners perceive autonomy in online engagement? In the context of this study, this is measured by learner-to-content interaction.

LEARNER-TO-CONTENT INTERACTION

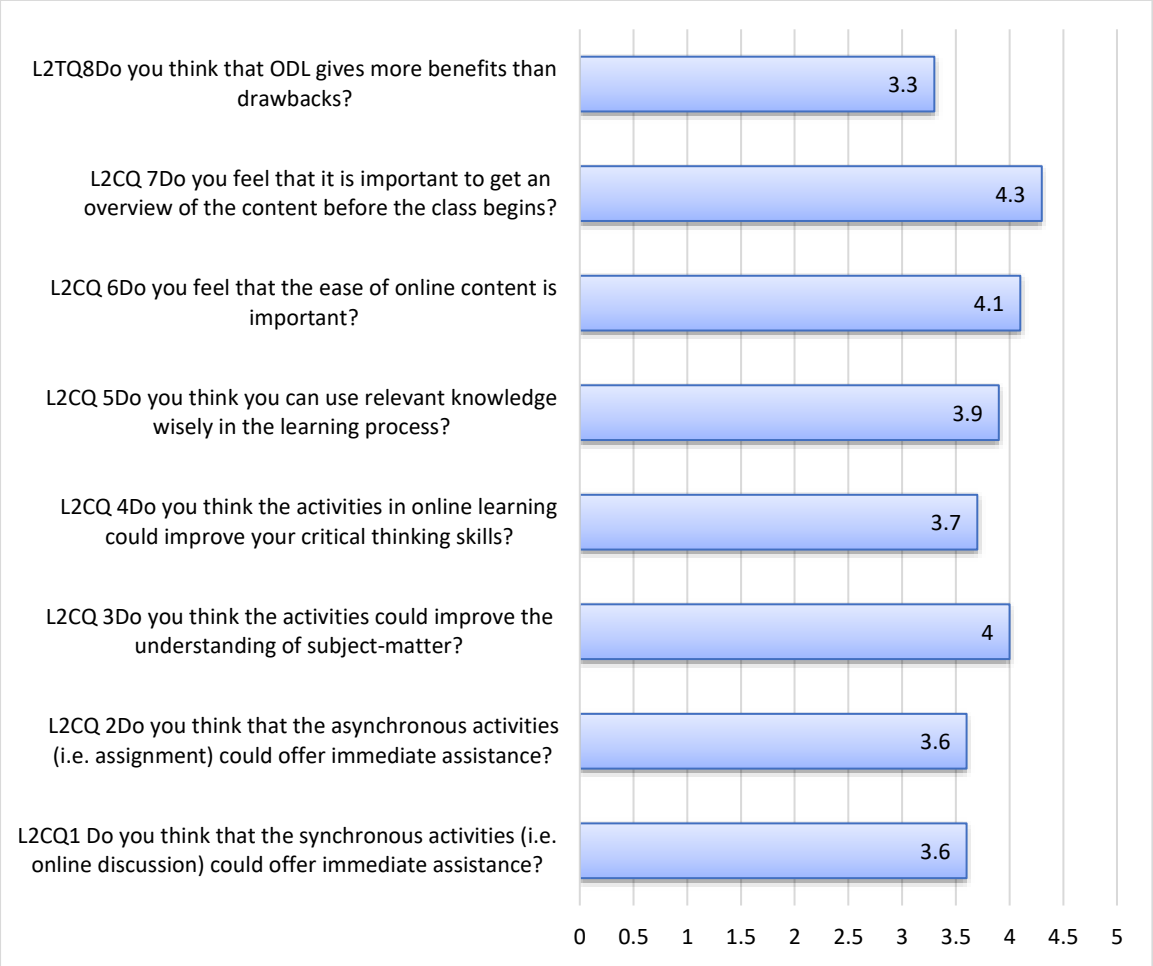

Figure 9: Mean for Learner-to-learner interaction

On the learner-to-content interaction, over 80% of respondents agreed and totally agreed that item 7 (86.9%), 'Do you feel that it is important to get an overview of the content before the class begins', was highly significant. This item has the highest mean score on this subscale as shown in figure 9 with mean score is 4.3. Other items that also have the mean score above 4.0 are item 3 (mean is 4.0) and item 6 (mean is 4.1). 79% of respondents agreed that activities could improve the understanding of subject-matter while 84.5% agreed the ease of online content is important. The least important item chosen by the respondents was ODL gives more benefits than drawbacks with mean score is 3.3, representing 45.8% of the respondents.

Findings for Relationship between components in connectivism in online engagement?

This section presents data to answer research question 4- Is there a relationship between components in connectivism in online learning? To determine if there is a significant association in the mean scores between components in connectivism, data is analysed using SPSS for correlations. Results are presented separately in table 3, 4 and 5 below.

Table 3: Correlation between Connectedness & Diversity and Openness

Correlations

		CONNECTEDNESSdiveristy	OPENESS
CONNECTEDNESSdiveristy	Pearson Correlation	1	.597**
	Sig. (2-tailed)		.000
	N	129	129
OPENESS	Pearson Correlation	.597**	1
	Sig. (2-tailed)	.000	
	N	129	129

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

Table 3 shows there is an association between connectedness & diversity and openness. Correlation analysis shows that there is a high significant association between connectedness & diversity and openness (r=.597**) 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 connectedness & diversity and openness.

Table 4
Correlation between Openness and Autonomy

Correlations

		OPENESS	AUTONOMY
OPENESS	Pearson Correlation	1	.749**
	Sig. (2-tailed)		.000
	N	129	129
AUTONOMY	Pearson Correlation	.749**	1
	Sig. (2-tailed)	.000	
	N	129	129

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

Table 4 shows there is an association between openness and autonomy. Correlation analysis shows that there is a high significant association between openness and autonomy (r=.749**) 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 openness and autonomy.

Table 5
Correlation between Autonomy and Connectedness & Diversity

Correlations

		AUTONOMY	CONNECTEDNESSdiveristy
AUTONOMY	Pearson Correlation	1	.680**
	Sig. (2-tailed)		.000
	N	129	129
CONNECTEDNESSdiveristy	Pearson Correlation	.680**	1
	Sig. (2-tailed)	.000	
	N	129	129

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

Table 5 shows there is an association between autonomy and connectedness & diversity. Correlation analysis shows that there is a high significant association between autonomy and connectedness & diversity (r=.680**) 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 autonomy and connectedness & diversity.

Conclusion

Summary of Findings and Discussions

This study confirms the importance of all four key principles (connectedness, diversity, openness and autonomy) of online engagement strategies that exist within the connectivism theory, especially on the openness component which is measured by learner-to-instructor interaction based on the learners' perceptions. According to Bolliger and Martindale (2004), although there are times when it is difficult to discern the role of the instructor from the course material and instructional technology, the instructor is the key component of highest significance in online learning. Recognising the significance of this aspect is essential for instructors looking to teach online or improve their effectiveness in doing so, instructional designers looking to create engaging online courses, and administrators looking to support staff and faculty involved in productive online programmes.

Pedagogical Implications and Suggestions for Future Research

In the digital age, connectivism theory promotes learners autonomy, networked interactions, critical thinking, and flexibility. It has numerous pedagogical implications that restructure traditional instructional approaches. It is important to emphasize that the openness engagement strategies which support the interaction with the instructor were valued more than the interaction with other learners and the contexts or the learning materials. Online learners place a high value on the presence of the instructor as they acknowledge regular updates from their instructors.

Future research on the connectivism theory may focus on various areas to advance the understanding of its applications, and its potential to improve teaching and learning in the

digital era by examining these research topics. The design and facilitation of instructional tactics that adhere to connectivist principles, as well as efficient assessment and evaluation methods customised to networked learning settings, can all be the subject of research. In order to help educators develop professionally and successfully apply connectivism in many educational contexts, more research is required.

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