Exploring Online Learning from Connectivism View

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Abstract
Online learning has become an inevitable mode during Covid-19 that propels education in many countries including Malaysia ahead of time. An approach that is claimed to be time and space effective is a solitary journey to many learners. Connectivism theory, however, proposes four main principles that should exist in any learning experience. Thus, this paper investigates online learning through connectivism theory to determine whether diversity and openness, connectedness and autonomy have any influence on online learning. This quantitative study used a survey questionnaire that is divided into three main sections with 21 items to elicit the answers for the research questions. The results from 116 respondents among undergraduates determine that diversity and openness, connectedness, and autonomy have positive influence on online learning experiences. The study also determines that there is a positive significant association across variables in connectivism. This implicates the need to include these principles in the design of online learning.
Keywords: Online Learning, Connectivism, Online Interaction, Openness, Connectedness

Introduction
Background of Study
The definition of online learning across literature involves few elements; technology, time, interactivity, physical distance, educational context, other synonymous terms, and challenges (Singh, & Thurman, 2019). Thus, online learning, also known as e-learning, refers to the use of interactive technology that can be accessed from anywhere either synchronously or asynchronously for educational purposes.

The Malaysian Higher Learning Institution began to implement online learning in the late 1990's nonetheless, a true embrace of this alternative learning method only happened in March 2020 when the traditional formal in-class learning method was disrupted due to Covid-

19 and the movement restriction order took place for almost two years. Majority of the stakeholders raised concerns over the effectiveness of online learning methods. This includes issues with technology and accessibility to the instructors and understanding of learning materials (Chung et al., 2020; Selvanathan et al., 2023). Nevertheless, Nasir (2020) and Sufian et al (2020) found that learner-teacher interaction is at benefit with online learning.

According to Omar et al (2021), online learning experiences can be categorized into five emerging themes namely institutional support, emotional engagement, cognitive engagement, behavioural engagement, and students' satisfaction. This echoes the connectivism theory that proposes learning is a result of engagement to interrelated knowledge coming from social interaction, experience, observations, and institutions (Siemens, 2005). In 2018, Martin and Bolliger proposed that a positive online learning environment can be created if the social interactions; learner-to-learner, learner-to-instructor, and learner-to-materials, are understood.

Statement of Problem
Effective social interactions during the online learning process is an important factor in achieving desired outcomes. Abou-Khalil et al (2021); Aydin (2021); Sidik et al (2021) confirmed that effective engagement among students, with instructors, and with course content, as well as the suitability of the platform used, have significant and impressive effects on the success of teaching and learning. However, Agormedah, et al (2020); Noori (2021) stated in their research that the COVID-19 pandemic had a negative impact on students' experiences in higher education, particularly in terms of engagement and learning experience.
While there are many known factors for the success of online learning, failures are still reported thus, this study intends to look into one important determinant: the learners and their learning strategies. Do the learners engage in online learning and how do they practice these engagements that can have impacts on their online learning? These will be analysed through the connectivism theory.

Objective of the Study and Research Questions
This study is done to explore perception of learners on the impact of diversity and openness, connectedness, and autonomy on the effectiveness of online English language learning within a connectivism view. Specifically, this study is done to answer the following questions:
● Do diversity & openness influence online learning?
● Does connectedness influence online learning?
● Does autonomy influence online learning?
● Is there a relationship across variables in connectivism?

Literature Review
Disadvantages of Online Learning
One of the most glaring drawbacks of online learning is the lack of interactions that take place (Rawashdeh et al., 2021). This absence of essential personal interactions is the most noticeable drawback of e-learning, not only among colleague learners, but also between instructors and learners (Islam et al., 2015). Another significant downside of online learning identified is it triggers overreliance on technology. This technological dependence exists in which the entire learning session could be put to a halt in the event of any device or software

problem and ultimately can impede the learning process (Zaki, 2022). Simultaneously, the use of this technology also draws a line separating the computer and tech-savvy students and those who are not. This has a direct impact on the learners' motivation to learn. Those who are well versed with the complicated technology employed will be motivated and those who are not will feel left out and side-lined and this may negatively impact the outcome of their study. Internet connectivity issues such as limited access to the Internet is also another concern raised pertaining to online learning (Mandvikar, 2022). Having limited access to the Internet where the learning materials and resources are made available by instructors will dampen learners' motivation and interest to learn. This is further worsened by the absence of classmates and instructors physically who at times can be the reference point whenever there is any misunderstanding or confusion on the subjects learnt. Sadeghi (2019) puts forth that although learners can interact through chat rooms, discussion boards, emails and video conferencing software, the experience is in no comparison to the traditional learning methods. Given that online learning allows flexibility in terms of learners' learning pace, the likelihood of being distracted and forgetting deadlines are also high. Zaki (2022) postulates that since e-learning necessitates the use of a computer and other similar equipment, the learner may experience eye strain, poor posture, and other physical issues.

Advantages of Online Learning
Despite the challenges that online learning has, it also offers many benefits to learners as well as instructors. Mohd et al (2020) outlined four advantages of online learning: flexibility of time, flexibility of environment, effectiveness of cost and self-discipline and responsibility. Puwanto (2020) was in line with the first two advantages stating that the most prevalent advantages of online learning are time and space; that learners are not confined to attend classes at specific time and venue thus, resulting in a comfortable education environment. These flexibilities are sought by learners who have time constraint or distance issues. Hussein et al (2020) similarly agrees that online learning has advantages such as cost-effectiveness, time-effectiveness, safety, convenience, and improved participation. Apart from the flexibility of time and space, Yuhanna et al (2020) also found that online learning allows learners to achieve their goals and instructors too as they can keep track of the learners' progress thus, reporting them. Most learning platforms nowadays such as Google Classroom and Microsoft Teams are equipped with the tools necessary for those purposes.

Past Studies on Disadvantages of Online Learning
Over the years, online learning has become increasingly popular as a convenient and flexible alternative to traditional classroom-based education. However, while online learning offers many benefits such as increased accessibility and flexibility, there are also disadvantages that come with this mode of education. Numerous studies have been conducted on online learning, and their findings suggest that online learning has its own set of unique challenges that can lead to disadvantages in online learning.
According to Hermanto & Srimulyani (2021), there are certain weaknesses in online learning that must be addressed for it to be successful. The study, which sampled 108 teachers and 386 students, has shown that the respondents experienced a lack of motivation, and this lack of motivation is increasingly significant when it comes to student assignments. Another most significant challenge with online learning is the integration of various components such as students, teachers, learning resources, and technology. The success of online learning heavily

depends on the seamless integration of these components. If any of these elements are not appropriately integrated, it may result in drawbacks in the process of online learning.

Mahyoob (2020) conducted a study involving 184 students who were taking English courses at Science and Arts College, Alula, Taibah University, Saudi Arabia. The study focused on assessing the new experiences of students who were involved in online learning, as well as examining its effectiveness. The study found that the disadvantages of online learning often involved technical issues such as audio, video, online class access, and online platforms, as well as academic and communication issues. In conclusion, while online learning provides convenience and flexibility, its limitations in terms of technical issues, academic challenges, and communication barriers may hinder the learning experience for some students.

Past Studies on the advantages of Online Learning
There would always be two spectrums when a phenomenon is studied thus, some literature also suggests that there are advantages of online learning. Thus, it sheds light and throws hopes to its advocates or functions as an assurance to those still in doubt. A past study done by Don et al (2022) investigated the social presence in the online classroom. For this study, 38 students responded to a given questionnaire which revealed that there was effective interaction between the instructor and the learners by which the former managed to give clear instructions while the latter were able to explain the solutions required in the instructions. This shows that online learning does promote effective social presence.

Another study that also reported the advantages of online learning was done by Almahasees et al (2021) with participation of 280 students and 50 faculty members in a university in Jordan who responded to two different online surveys. The study intended to determine the faculty's and the students' perceptions towards their experience with online learning. The students cited that they have access to learning materials as well as recorded lectures that allow self-paced learning, learn new skills, and save cost of travelling. The faculty members agreed that online learning promoted flexibility, self-learning, good time management and self-discipline as well as cost effectiveness for both faculty members and students. Due to the flexibility, the researchers concluded that online learning is convenient to be adopted especially during times of crisis, like Covid-19.

Conceptual Framework
Figure 1 shows the conceptual framework of the study. The concept of this study is rooted from connectivism by (Siemens, 2005). There are four main principles in connectivism and they are diversity, openness, connectedness, and autonomy. Online learning serves different learners in different ways. The success (or failure) of the online class depends on how learners feel about the learning experience (Rahmat, 2021). The four principles from Siemens (2005) are then scaffolded with types of interaction by Martin & Bollinger (2018) to reveal the breakdown in Figure 1. In the context of this study, diversity & openness is measured through learner-to-learner interaction. Next, connectedness is measured by items in learner-to-instructor interaction. Finally, autonomy is measured by learner-to-content interaction.
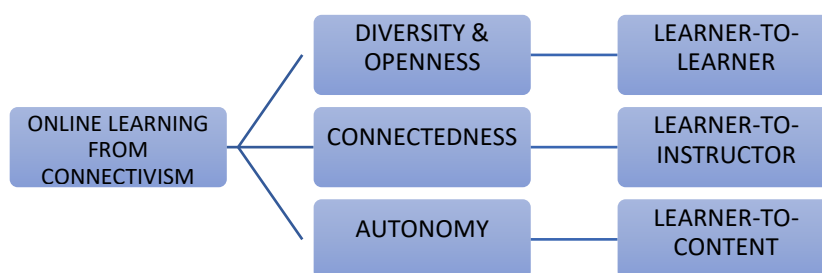
Figure 1- Conceptual Framework of the Study- Online Learning from Connectivism View.

Methodology

This quantitative study is done to explore motivation factors for learning among undergraduates. A purposive sample of 116 participants responded to the survey. The instrument used is a 5 Likert-scale survey and is rooted from Martin & Bollinger (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 diversity & openness. Section C has 8 items on connectedness and section D has 8 items on autonomy.

Table 1
Distribution of Items in the Survey

SECTION	CONNECTIVISM (Siemens,2005)	TYPE OF INTERACTION Martin & Bollinger (2018)	No of Items
B	DIVERSITY & OPENNESS	Learner-to-learner	6
C	CONNECTEDNESS	Learner-to-Instructor	7
D	AUTONOMY	Learner-to-Content	8
		Tot no. of Item	21

Table 2
Reliability of Survey

Reliability Statistics

Cronbach's Alpha	N of Items
.947	21

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .947, 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
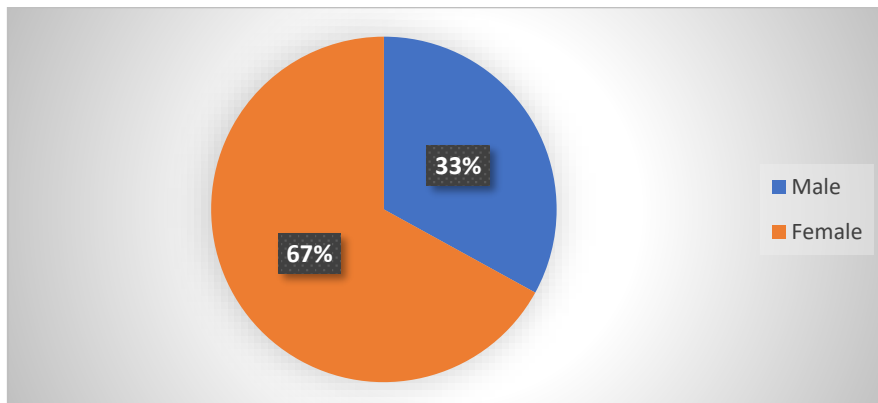Findings for Demographic Profile
Q1.Gender

Figure 2- Percentage for Gender

Figure 2 indicates the percentage of respondents involved in the research in which 33% were male and 67% were female.

Q2.Internet Access

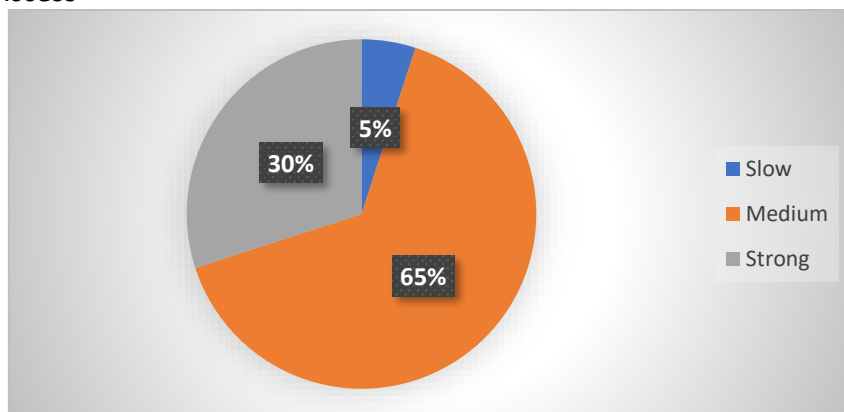Figure 3- Percentage for Internet Access

Figure 3 demonstrates the strength of the Internet connection owned by the respondents during their virtual learning . 65% of the respondents reported that they had medium Internet connectivity while 5% indicated they had poor Internet access. The remaining 30% stated that they had a strong and good connection to the Internet.
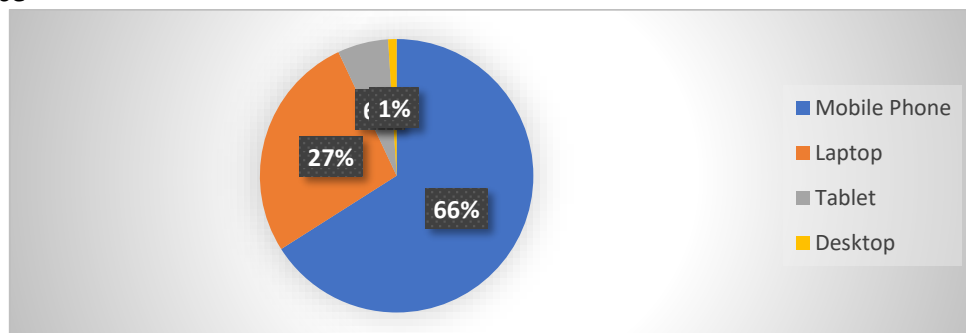
Q3 Device

Figure 4- Percentage for Device

Figure 4 displays the types of devices used by the respondents while undergoing their online learning. The highest percentage recorded at 66 was mobile phone, followed by 27% (laptop), tablet (6%) and the least number of respondents used desktop which only recorded 1%.

Findings for Diversity & Openness
LEARNER-TO-LEARNER INTERACTION

Figure 5 : Mean for Learner-to-learner interaction

The research findings firstly demonstrate that openness and diversity have an impact on online learning. The findings for learner-to-learner interaction in online learning are displayed in Figure 5 to illustrate this. When respondents felt that peer support motivated them to complete their assignment, they were more likely to believe that diversity and openness had an impact on their online learning (mean 3.8). Next, for online activities, respondents likewise preferred to be in the same group as their chosen peers (mean 3.7). The final question in the questionnaire had the lowest mean (3.4). Results show that peer encouragement prevented students from failing the course.

Findings for Connectedness
This section presents data to answer research question 2- Does connectedness influence online learning? In this context of study, it shows that the connection between students and instructor has an impact on online learning.
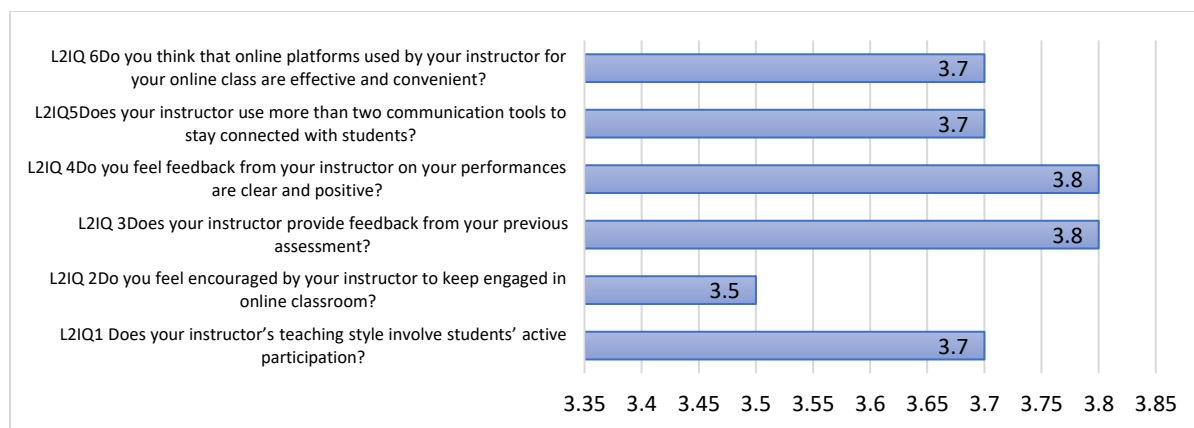
Learner-To-Instructor Interaction

Figure 6: Mean for Learner-to-instructor interaction.

Figure 6 shows the mean for learner-to-instructor interaction. The respondents perceived that their instructor provided feedback for their previous assessments and the feedback received were clear and positive (mean 3.8). They also perceived that their instructor's teaching style involved their active participation and the instructor used more than two communication tools to stay connected with them and the choice of online platforms used by their instructor for the online class is effective and convenient. The lowest mean (3.5) was noted by the statement by which the respondents perceived that they felt encouraged by their instructor to keep engaged in online classrooms. This learner-to-instructor interaction shows a positive trend.

Findings for Autonomy
This section presents data to answer research question 3- Does autonomy influence online learning?
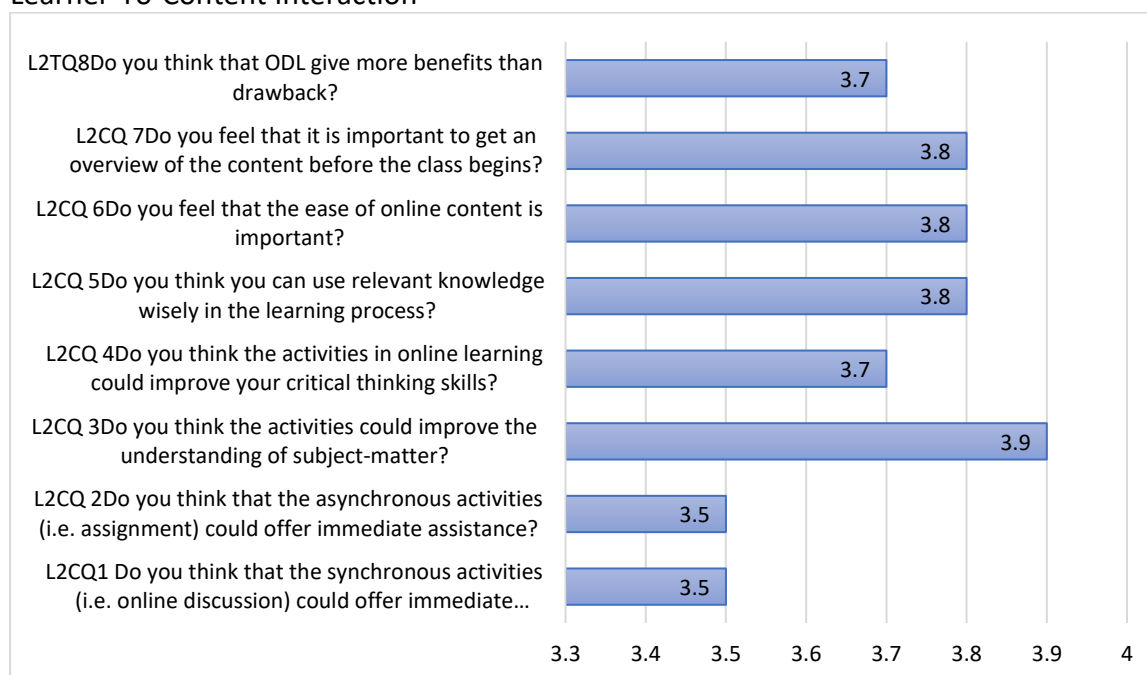
Learner-To-Content Interaction

Figure 7 : Mean for Learner-to-content interaction

Figure 7 shows the mean for learner-to-content. The respondent perceived that the online activities could improve the understanding of the subject matter (mean 3.9). Next, the respondents also perceived that they could use relevant knowledge from online wisely in their learning process and that they also felt that the ease of online contents and getting an overview of the contents prior to class are important for effective learning (all with mean 3.8). The lowest mean (3.5) states that both synchronous and asynchronous online activities do provide immediate assistance for their learning.

Findings for Relationship across Variables in connectivism
This section presents data to answer research question 4- Is there a relationship across variables in connectivism?

To determine if there is a significant association in the mean scores between metacognitive, effort regulation, cognitive, social, and affective strategies data is analysed using SPSS for correlations. Results are presented separately in Tables 3, 4, 5 and 6 below.

Table 3
Correlation between Diversity & Openness and Connectedness

Correlations

		TotalmeanDIVERSITYOpeness	TOTALMEANCONNECTDNESS
TotalmeanDIVERSITYOpeness	Pearson Correlation	1	.582**
	Sig. (2–tailed)		.000
	N	116	116
TOTALMEANCONNECTDNESS	Pearson Correlation	.582**	1
	Sig. (2–tailed)	.000	
	N	116	116

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

Table 3 shows there is an association between diversity & openness and connectedness. Correlation analysis shows that there is a high significant association between diversity & openness and connectedness (r=.582**) 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 diversity & openness and connectedness.

Table 4
Correlation between Diversity & Openness and Autonomy

Correlations

		TotalmeanDIVERSITYOpeness	TOTALMEAN autonomy
TotalmeanDIVERSITYOpeness	Pearson Correlation	1	.630**
	Sig. (2-tailed)		.000
	N	116	116
TOTALMEANautonomy	Pearson Correlation	.630**	1
	Sig. (2-tailed)	.000	
	N	116	116

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

Table 4 shows there is an association between diversity & openness and autonomy. Correlation analysis shows that there is a high significant association between diversity & openness and autonomy (r=.630**) 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 diversity & openness and autonomy.

Table 5
Correlation between Connectedness and Openness

Correlations

		TOTALMEAN CONNECTDNESS	TOTALMEAN autonomy
TOTALMEANCONNECTDNESS	Pearson Correlation	1	.739**
	Sig. (2-tailed)		.000
	N	116	116
TOTALMEANautonomy	Pearson Correlation	.739**	1
	Sig. (2-tailed)	.000	
	N	116	116

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

Table 5 shows there is an association between connectedness and openness. Correlation analysis shows that there is a high significant association between connectedness and openness (r=.739**) 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 and openness.

Conclusion

Summary of Findings and Discussions

The findings show positive directions towards online learning. Diversity and openness in learner-to-learner interaction do have a positive impact on online learning. The students agree that they are motivated to finish their task, engaged in the online activities, promoted to better understanding, willing to ask for help and prevented from dropping out when their interactions with peers are diverse and open. These findings are inconsistent with the results found by Rawashdeh et al (2021); Islam et al (2015) that there was absence of personal interactions among colleague learners that leads to other challenges in online learning.

Next, when connectedness is present in learner-to-instructor interactions, online learning experience among the students is also positive. The students perceive this connectedness through teaching style, engagement from the instructor, feedback given, and use of various effective and convenient communication tools by the instructor. Don et al (2022) also found that when the instructor gives clear instructions the students can perform better.

In addition, the autonomy provided through learner-to-content interactions also has a positive impact on online learning. The autonomy given assists them to have better understanding, use knowledge gained wisely in the learning process, and improve critical thinking skills. The students also perceive that ease of online contents and overview of contents before class improve the positive online learning experience and synchronous and asynchronous online learning offer immediate assistance. In essence, they perceive that autonomy over the contents has more benefits than drawbacks in online learning. These findings reflect the results of the study by Almahasees, et al (2021) that when learners have access to learning materials, they are able to self-pace their own learning and learn new skills. Finally, there are significant positive associations across the variable in connectivism: diversity and openness and connectedness; diversity and openness and autonomy; and connectedness and openness. In relation to connectivism, these findings support the findings of study by Omar et al (2021), who determined that online learning experiences revolve around institutional support, emotional engagement, cognitive engagement, behavioural engagement, and students' satisfaction; interconnectedness among all these elements make online learning successful.

(Pedagogical) Implications and Suggestions for Future Research

As we go into the post-pandemic future, hybrid teaching will likely become more widespread in educational settings, with some students interacting remotely, some interacting in person, and still others shifting between the two. These will give students diverse learning experiences therefore, the findings of this study implicate that regardless of the choice made online learning should target at providing the most positive impactful experience among learners by considering diversity, openness, connectedness and autonomy in its design.

Covid-19 marked a significant change in the history of education world-wide. The challenges of online learning have now shifted from the issue of internet connection to social interactions; from determining the most suitable device to offering autonomy in the choice of learning platforms; from worries over unsuitable learning materials to diverse and open Internet contents that could promote responsibility and self-control; and from rigid course contents to contents that promote the use of current technology (Pokhrel, 2021; Coman et.al., 2020; Rogerson-Revell, 2015). Perhaps, these are the directions for future research.

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