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'Peer-Jamming': Promoting Collaborative Learning and Enhancing Students' Engagement using Jamboard

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Abstract

Online learning is broadly described as online-based learning which utilises information systems that consist of users, technology, processes and strategies. Educational activities are engaged with students and instructors located in different places and times. Online learning becomes highly valuable and instrumental during the pandemic of Covid-19 which forced higher education to be shut down and both students and instructors were to continue the process of teaching and learning remotely. Technological tools are perceived to be instrumental in migrating physical learning to a remote environment. The shift to online learning due to the pandemic was fraught with difficulties. Despite the many challenges, information and communication technologies are harnessed to alter the ways of teaching and learning and to innovate digital materials, courses and content effectively. Online learning brings rising challenge to ensure student engagement and academic excellence within remote setting. The social distance may impact students' academic success due to low digital engagement. To illustrate this concern, Technological Acceptance Model (TAM) is used to frame the study and to examine students' reactions to the technology used for language learning. This quantitative study gives focus on the use of Google Jamboard during online learning as a means to promote cooperative learning, to instil social presence within online community and to provide feedback at real-time. The findings indicated students' positive reaction and attitude towards the use of Jamboard. This pedagogical approach is an alternative strategy for any instructors to engage their students more actively and meaningfully, simultaneously improve rapport and interaction between an instructor, student, and their peers during online learning. Jamboard has proven to be an excellent interactive and value-added tool which helps to shape the instruction session, hence is fast becoming a necessity for both online and in-person instruction.

Keywords: Collaborative Learning, Google Jamboard, Interactive, Online Learning, Technological Acceptance Model (TAM)

Introduction

When the pandemic hits, the process of teaching and learning is shifted online which comes with its limitations and setbacks. Within an online setting, students are physically distant from

their peers and their instructors. Students would have the tendency to become disengaged if there is little interaction between students with their peers, instructors and learning content, thus creating "attainment gaps" (Protopsaltis and Baum, 2019; Greenhaw et al., 2021). This may affect the success rate in their academics as well as reducing the overall quality of their learning experience. Face-to-face interaction is needed to intensify students' learning experience when students are able to establish connection with their peers and instructors. However, within an online setting, the element of face-to-face interaction is missing, thus making students feeling isolated and the learning experience becomes impersonal (Sweeney et al., 2021). Learning environment is argued to have positive effect on learners' performance. Therefore, to ensure meaningful learning occurs, the environment of online learning needs to be stress-free while promoting active interaction between peers and instructors (Lavoué et al., 2018; Anak Yunus & Hua, 2021; Meepung et al., 2021).

Online learning is defined by a set of characteristics; (1) teacher-student separation, (2) students' accountability and independence, (3) teachers' creativity in managing instructional resources, and (4) using technological innovation as instructional media (Yaumi, 2007). Hattie (2008) also asserted that more emphasis and primacy should be given to pedagogy over technology to ensure effective teaching and learning strategies. For online learning to be purposeful, it is imperative for instructors to initiate pedagogical dialogue about online instruction, thus able to design new instruction which would provide learners with the opportunities "to clarify new concepts, challenge old assumptions, practice a skill, form original idea, discuss, debate among students and between instructors and achieve learning objectives" (Capra, 2011, p. 290). Despite the time of crisis, the process of education can still be sustained by leveraging online learning be it synchronous learning or asynchronous learning through adaptation of online learning tools and Internet websites that can be customized to suit the learning needs and learning outcomes (Tabata et al., 2008; Lazim et al., 2021; Hashemi, 2021). There is abundance of readily available online tools that can be adopted to enhance students' learning experience through the creation of a collaborative and interactive online setting while maintaining "a human touch", as students are given allowances to express their immediate feedback and ask queries (Blankley et al., 2019; Dhawan, 2020; Sia & Adamu, 2020; Castillo- Cuesta et al., 2022).

Technological innovation has been the key element to promote methodologies that facilitate the active involvements of students and collaborative learning (Piccardo et al., 2021; Wang, 2010). The pandemic has become the catalyst in the innovation of technology to ensure least disruption for teaching and learning. During the pandemic, the pedagogical landscape is being transformed by technology which promotes active collaborative learning (Castillo- Cuesta et al., 2022). Web 2.0 digital tools or social media tools have emerged to support students not only in their social lives but also in the shared process of learning and making them autonomous learners (Wang, 2010). Online learning platforms are created allowing teachers and students to conduct document collaboration, virtual meeting and online assessment. Research has shown that through the use of information and communication technologies as one of the strategies to promote student participation can help students to stay engage with online lessons and increase their "acquisition of competences" (Quality Indicators for Learning and Teaching (QILT)). During online learning, it is critical for instructors to engage students actively while simultaneously helping them to improve their understanding on the subject content. According to Brown et al (2009), student engagement is marked as a very important indicator at higher education institutions. To ensure higher success, satisfaction and retention rates, academicians are expected to support online learning and promote

active engagement using a range of strategies (Brown et al., 2009). Moore (2009), asserted that in order to develop active student engagement during online learning, three types of interactions have to be established; student-content interactions, student-teacher interactions and student-student interactions. Interactions among students and students with instructors can promote positive outcomes like minimising the sense of isolation among peers and instructors, thus lead to improved motivation and better learning performance (Ashan, 2021; Croxton, 2014; Nilson & Goodson, 2021).

During crises like the pandemic, technology is utilised to sustain the learning process and ease students' anxiety by replicating the actual scenario in a conventional classroom. Digital tools function as "mediators and cognitive tools" that can enhance the creation of ubiquitous and conducive learning spaces for learners (Marin et al., 2016; Castillo- Cuesta et al., 2022). Online workspace is one of the many innovative technological tools that promotes social collaborative learning by sharing of ideas and resources (Wang, 2010). It is established that social interaction is the key for improved academic performance, thus instructors are using various technological tools to carry out various projects and learning activities, which eliminates barriers like distance, time and resources (Castillo- Cuesta et al., 2022; Chu et al., 2021).

As a means to address the issue of student-teacher separation, online collaborative tool like Google Jamboard provides a meaningful collaborative learning experience and fairer space for students to express their thoughts freely during synchronous online lesson. Collaborative learning in a form of robust group discussion makes students feeling more connected within an online setting for it facilitates self-efficacy and increased engagement in learning tasks (Blaine, 2019). Jamboard is a free online tool which provides endless opportunity for students to collaborate on projects, brainstorm ideas, design concept maps in creative and innovative manner (Kanno, 2020; Dahal et al., 2020; Gulati et al., 2021; Castillo- Cuesta et al., 2022). Jamboard may facilitate creative thinking and encourage language use in an engaging manner by allowing its users to add frames, change the background, write with a digital pen in different colours, create a text-box, add a shape, insert an image or create a sticky note. All these features can be dragged into the digital whiteboard and activities pertaining to language learning like brainstorming sessions, preview activities, and exercises involving grammar and vocabulary building can be organised (Gulati et al., 2021).

In the digital whiteboard, students can be involved in problem-based learning while honing their collaboration skills as they get the opportunity to share ideas, opinions, make comments and receive input from their peers. This online collaboration process can be highly motivating for students as they are empowered to share their input in a non-intimidating environment and receive immediate feedback from their peers and instructors. Sustaining students' motivation especially during online learning is paramount to ensure energetic and directed learning behaviour (Sowton, 2021). Google has become one of the pioneers whom have immensely invested in designing various online learning platforms to ease the process of teaching and learning at various educational levels. Chinnery (2008) has coined the term GALL (Google-assisted language learning) to describe Google's pedagogical applications that are equipped with communicative, informative, productive and collaborative online tools. Google's unique collaborative feature not only allows easy feedback, but most importantly encourages social and interactive participation which support diverse learning styles, thus making it a practical pedagogical online tool to enhance learning in a language classroom (Gulati et al., 2021). The rapid rise of interactive multimedia and technological tools comes with the presumption that with active and interactive engagement with the technological

tools, hence the more beneficial it is for learning (Kennedy & Sundberg, 2020). However, the effectiveness of each technological tool should be assessed and its benefit should not be assumed to be fit for all. Further examination on the level of effectiveness and acceptance of technology to support learning should be carried out. In order to determine the level of students' acceptance in using the technological learning tool, a theoretical model of Technology Acceptance Model (TAM) which was developed by Davis (1989) can be utilised to assess and to examine the factors that cause users to accept, reject or willing to use the new technology. TAM is able to determine an individual's behavioural intention to use technology which can be predicted by two fundamental variables; Perceived Usefulness and Perceived Ease of Use. According to Davis (1989), Perceived Usefulness measures "the degree to which a person believes that using a particular system would enhance his or her job performance" and Perceived Ease of Use refers to "the degree to which a person believes that using a particular system would be free of effort" and (p. 320).

To address the issues above, this study investigates the level of students' acceptance of using technology in learning language and literature, with reference to the use of Google Jamboard (henceforth Jamboard) as well as exploring their perceptions toward their experience in using Jamboard during online learning.

Literature Review

Peer-jamming: A Communicative pedagogical approach using Jamboard

To jam or jamming is a colloquial term which is coined from a social gathering of musicians where musicians improvised their solos and musical arrangements. This informal event brings together a group of musicians that perhaps do not play regularly together to practice their music for the purpose of enjoyment and sharing of musical ideas (Cambridge Dictionary). Based on the concept of jamming, this term is re-fashioned to describe a socio-digital learning event and interaction which occurs in an online setting. Peer-Jamming is a teaching technique that is based on a conceptual framework as proposed by Brown et.al (2022) which prioritises expectation management and engagement principles for both students and academics. This framework is framed by two major theories namely Critical Discourse Theory and Communicative Theory that may improve the mode of interaction during online learning as members of an online classroom are actively engaged in a circular and recursive interaction between instructor, student, and peers (see Figure 1). Peer-Jamming promotes collaborative learning which supports a significant paradigm shift "from professor-centric to learner-centric andragogy" (Sutton & Jorge, 2020; p. 3] that may significantly improve the rapport between the students with their peers and students with their instructor.

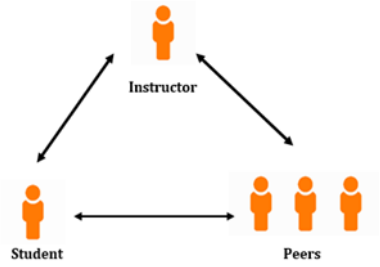

Figure 1. Interaction between instructor, student and peers

This pedagogical approach is applied by utilizing Google Jamboard. A Jamboard is a digital interactive whiteboard which allows both students to work with their peers and instructors to conduct their brainstorming session in a much meaningful and interactive manner (see Figure 2). Sweeney et. al (2021) in their reflection of using Jamboard asserted that the use of this interactive whiteboard not only has revolutinised online learning also it promotes communication skills, critical thinking, creativity and collaborative skills between students and also instructors. Based on the output from the digital whiteboard, instructors will be able to identify the gaps in students' learning, thus may able to modify his or her content delivery.

Moreover, Jamboard encourages active learning as students utilize the different built-in writing tools to jot down ideas during their brainstorming session. Links to the Jamboard can be shared which comes with editing privilege for the group members and the instructor. Discussion session can be done remotely or face-to-face as group members convene in real time to discuss the assigned task and organize their ideas via the Jamboard (Ching, 2021). This jamming process brings together students from various backgrounds and levels of proficiency during their online meeting in the Jamboard. Jamboard offers the functionality to create multiple white boards in a single session. Being digital natives, using Jamboard was very intuitive to the students. Each student in the class, regardless of their location, could join the shared Jamboard and claim a "whiteboard" slide to design a concept map and mark up each slide by adding highlighters, images and sticky notes. Jamboard allows for immediate feedback in real time from the instructor and their peers about the concept map that they have produced either through free writing or sticky notes. This helps students to improve their concept map until they arrive at the final outcome. Jamboard is an innovative pedagogical tool which provides seamless facilitation of all groups during online classes, and triggers discussion by encouraging students to justify their opinion and "develop reasoning" (Ching, 2021; p. 39) during the peer-jamming session.

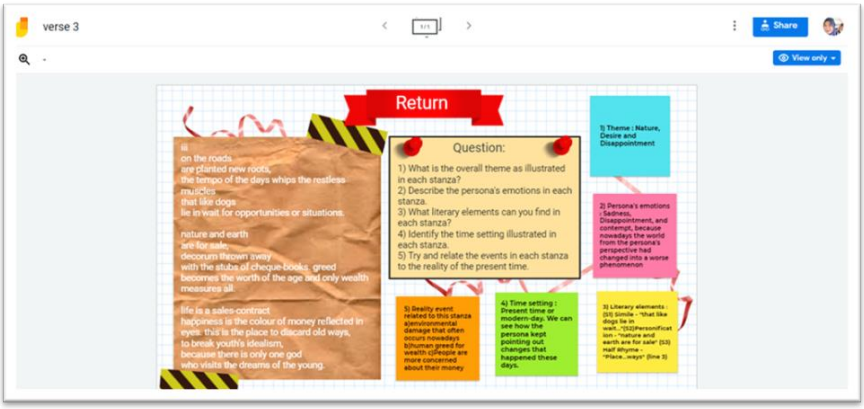

Figure 2. Sample of students' Jamboard

However, like any other technological innovation, Jamboard also comes with several limitations (see Table 1). These limitations although can cause slight disruption to the process of creating instructional designs suitable for language learning yet its strengths still manage to overcome its drawbacks.

Table 1
Advantages and limitations of Google Jamboard

Advantages	Limitations
Free to use.	A maximum of 20 slides per Jamboard
Many participants may edit the same slide or different slides at one time. Marks and text appear in almost real time.	A maximum of 50 collaborators can edit simultaneously. In practice, no more than 6–7 editing collaborators is recommended per slide at one time.
Can be accessed via a browser on a laptop, tablet or phone, or via the Jamboard phone/tablet application.	Relies on an active internet connection.
Editors may be anonymous which can encourage shy participants.	Anonymity may also be undesirable in some situations. If participants login with a Google account attribution is visible during live editing.
Jamboard saves all edits automatically to the cloud and these are accessible via Google Drive. It is also possible to export an entire Jamboard as a PDF file as a study aid or record of the session.	When using Jamboard there is no facility for audio communication so a simultaneous meeting software such as Microsoft Teams or Zoom is necessary for simultaneous verbal discussion
Ease of use.	The cognitive load on students due to familiarising themselves with another online platform.
Student autonomy: students have freedom to contribute using any tool and to move between slides.	Student autonomy: students may also change or delete parts of the Jamboard slides in an undesired way.

Source: (Sweeney et al., 2021)

Technology Acceptance Model

Technology Acceptance Model (TAM) is adopted as the theoretical perspective to frame this study by examining the overall level of acceptance on the use of Jamboard for language learning. Individual behavior in technology adoption can be predicted by perception and belief. TAM suggests that when students are exposed to a new technology, many factors can influence their acceptance decision (Utami, 2021). TAM is an extensively used model for technology acceptance that originated from Fishbein and Ajzen (1977) who used action theory to reason behaviour related to computer usage. TAM was later further developed by Davis (1989) (see Figure 1). The model predicted that an individual's behavioural intention to use technology is directly impacted by attitude which is then predicted by two crucial factors: Perceived Ease of Use and Perceived Usefulness. The Attitude variable in the model reflects an individual's favourable or unfavourable assessment towards making a behaviour. TAM as proposed by Davis (1989) suggested that behavioural intention to use technology is affected by perceived ease of use and perceived usefulness. Perceived ease of use defines the level of individual belief that technology is

easy to apply or effortless, thus driving individuals to adopt or use the technology. Meanwhile, perceived usefulness explains that technology can improve performance and support tasks and encourages individuals to use technology to assist him or her to complete a task (Davis, 1989; Utami, 2021).

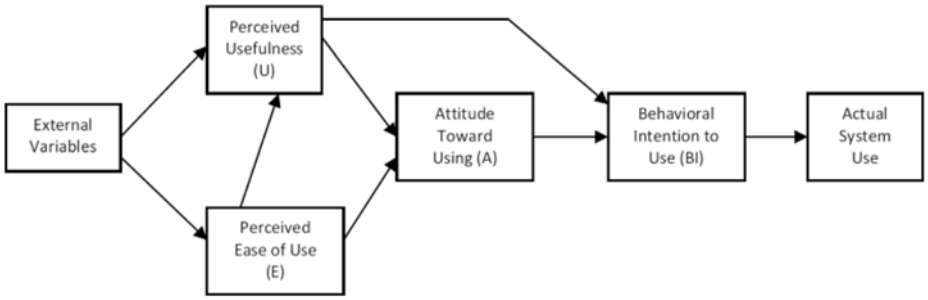

Figure 1: Technology Acceptance Model (Davis, 1989; p. 985)

Methods

Research design and Research Instrument

This study adopted a Quantitative approach in which a survey adapted from Alfadd & Mahdi (2021); Ching (2021); Yang and Wang (2019) was formulated through the online platform of Google Form. All the items in the survey were re-contextualised and validated according to the purpose of the study. By using purposive sampling, the survey forms were distributed to 34 students from the Languages and Cross-Cultural Communication programme. Questionnaires are a popular tool for collecting data, with electronic questionnaires affording a modern format that allows respondents equal access and anonymity (Jackson & Furnham, 2000). The survey which was formulated based on the TAM model consists of five main sections; Section A: Demographic profiles, Section B: Perceived usefulness, Section C: Perceived ease of use to use and intention to use and Section D: Students' attitude towards using the technology. The respondents were required to answer the items in the survey based on their experiences in using Google Jamboard for collaborative learning during their Language and Literature subject.

Table 2
Survey Items based on TAM

Criteria	Number of items
Perceived usefulness	12 items
Perceived ease of use and intention to use	3 items
Attitude toward using new technology	2 items

Using Peer-Jamming Approach: Teaching Procedures

In a Language and Literature subject, the students were divided into different groups. They were assigned with a task to critically analyse a poem by a Malaysian poet, Salleh Ben Joned entitles *Malchin Testament*. Each group is expected to identify the different literary elements featured in the poem and to analyse the poem through principles of literary criticism. Each group was assigned to one stanza of the poem. Based on the reading approach of SQ3R (survey, question, read, recite, and review), each group is required to critically analyse and decipher the meaning of each stanza by evaluating the

literary elements used in the stanza. Each group leader was required to set up a personalised Jamboard and all members are to convene and 'jamming' together at their digital board as they develop their concept map for each stanza. The process of jamming is done remotely and outside class hours and the time contributed for this task was considered as part of student learning time. The jamming process also promotes students to be autonomous and more independent in managing the group task. In the following class, each group was asked to share the link to their Jamboard through the chatbox in the Microsoft Teams and the instructor projected the content of the Jamboard to the class and the group presented their concept map. The whole class was expected to be part of the presentation. Their peers and the instructor can further add on to the Jamboards with any additional ideas or give them praises for any significant interpretation of the poems that they have highlighted in their Jamboards.

Data Analysis

The findings from the survey were analysed descriptively using Statistical Package for the Social Sciences (SPSS) version 27 as well as from the data tabulated by the Google Form.

Results and Discussion of Findings

Demographic Profiling

The demographic profiles of the respondents are illustrated in Table 1. A total of 34 respondents have answered the survey with 23 female (73.5%) and 8 male (26.5%) respondents. Their age range is between 18-22 years old. A majority of the respondents with 55.9% has scored Band 3 in their MUET exam while 23.5% of them has obtained Band 4.

Perceived Usefulness

The following depicts the responses of the students pertaining to items related to perceived usefulness. Item 'It enables everyone to participate' received the highest percentage with 85.3% and 70.6% of the respondents agreed that Jamboard is a good online tool. Item 'using Jamboard is easier than face-to-face groupwork' received the lowest percentage with only 14.7%. Table 3 illustrates the specific details of the findings.

Table 3
Perceived Usefulness

Aspect	Statement	Percentage
Perceived Usefulness	It enables everyone to participate	85.3%
	It helps to collaborate with friends in remote location	67.6%
	Jamboard is fun to use	67.6%
	It helps me to know the opinion of my classmates	61.8%
	It makes me feel the teacher values my opinion	47.1%
	It helps me to stay focus	26.5%
	It is a good online learning tool	70.6%
	Using Jamboard is useful for visualizing the task	29.4%
	I find it easy to use Jamboard to do the task in a group synchronously	20.6%
	Jamboard for collaborative learning in class is favourable.	23.5%
	Using Jamboard is easier to do than face-to-face groupwork	14.7%

Based on the survey results as depicted in Table 3, Jamboard's capacity to support explicit thinking and collaborative learning efficiently among students in sharing their ideas, utilising visual supports and creating space to express their creativity and innovative thinking is found to be highly beneficial for English language learners (Norton et al., 2013; Haythornthwaite & Kazmer, 2002). Moreover, in a study by Piccardo et. al., (2021), students at higher education perceive online collaborative tools to be cognitively useful and motivational. In addition, the positive reactions on the usefulness of Jamboard from the students supports findings from Kabir et. al., (2020) who maintained that technology is a useful tool to maintain students' engagement with their peers and the learning content. This also echoes [50] who affirmed that technology application in instructional design improves learning effectiveness as more creative and innovative pedagogical practices are created to engage students.

Perceived Ease of use

The survey listed three items to measure the respondents' perceived ease of use of the Jamboard. The details are illustrated in Table 4.

Table 4
Perceived ease of use

Aspect	Statement	Frequency	Percentage
Perceived Ease of Use	Does the use of Jamboard help to improve your confidence and motivation during online learning?	34	100%
	Do you think Google Jamboard is a useful tool to help you with your group discussion?	31	96.9%
	Do you think Google Jamboard has helped to improve your rapport (relationship) with your group members?	32	94.1%

The unanimous positive responses from the students on the use of Jamboard as an engagement and collaborative tool showed the importance for students to feel as part of the members of the community and not isolated (Shea et al., 2003; Wang, 2010). Apart from supporting learning and developing digital skills, Jamboard also helps students to become more autonomous during the collaborative work as they negotiate different perspectives and ideas when designing their concept maps.

Attitude toward using new technology

In general, the respondents have expressed their keenness and interest on using Jamboard for collaborative learning. They considered that Jamboard was a valuable tool to be used in their Language and Literature classes. The innovative features of Jamboard are user-friendly that allows concept maps to be designed easily. However, despite the benefits of Jamboard the respondents have stated several challenges while using it. The main challenge that they encountered is poor Internet connection which prevented them from accessing Jamboard. This challenge echoes a study by Kabir et. al (2020) who argued that students are motivated to attend online classes and express their positive intention to adopt technology for educational purposes, however drawbacks like unavailability of devises and low or no Internet connectivity create additional constraints. In addition, Jamboard is only accessible via PC and not available in application form that can be downloaded into smart phones. The respondents found this to be most inconvenient as some of them have only access to smart phones. Moreover, Jamboard comes with limited features like limited colour palettes and limited number of words that can be written on its sticky notes.

Despite these challenges, the respondents found Jamboard as a motivational learning tool to interact and collaborate with their peers. A respondent stated that

> "Jamboard can make the student more creative in designing their own presentation, chit chatting using sticky notes while in the process doing it, share the thoughts together so that student and the lecturer can get to know the knowledge from each other".

Nguyen et. al (2021) asserted that students at higher education prefer synchronous remote classes which reflects their desire to engage in active social interaction with their peers. This further concretised the importance of social presence for learning in online courses where connection of "human-human interaction" across learners and instructors during synchronous online learning can reduce "psychological distance", improve

"instructional satisfaction" and learning outcomes [Nguyen et al., 2021; p. 7; Erlam et al., 2021; Benito et al., 2021). Apart from that, the respondents found Jamboard to be a useful revision tool because they can refer to their discussion notes on a certain topic by revisiting the shared links. The boards can also be downloaded either in image or PDF format and be uploaded as part of class materials. The respondents also expressed that Jamboard is an effective online tool for Question-and-Answer sessions as well as a Reflection tool to evaluate the students' level of comprehension on each lesson.

Conclusion and The Way Forward

This study has shown students' positive experience in using Jamboard and their intention to continue using the digital tool. The result from the survey based on the TAM questionnaire indicated high level of acceptance among the students. The students at large agreed that Jamboard was not only motivating but also beneficial and easy to use. Despite its benefits, the students also have expressed the challenges in using Jamboard with poor Internet connection as the main factor which impeded their learning process. In regards to the level of attitude of students when using Jamboard, the students agreed that group discussions became more enjoyable and engaging as they explored the different features of Jamboard such as its colourful features and choosing a background for their maps. The findings also expressed students' willingness and intention to continue using Jamboard and acknowledge its suitability as a learning tool. Due to the limitation of this study like small sample size that affects the generalisation of the findings, it is recommended for future research to investigate on the application of other digital tools that support collaborative learning and students' engagement in multiple language learning contexts.

This research has implicated that in this post-pandemic era, digital tools such as Google Jamboard are useful in creating digital teaching and learning environments which is proven to increase learners' motivation and improve learning outcomes. Within the realm of online learning and digital pedagogy, it is imperative for students to interact actively and cognitively engaged in meaningful online interactions within a supportive learning community. Online learning spaces like Jamboard support pedagogical practices of digital pedagogy model in which it helps to nurture students' collaborative skills and self-efficacy, to improve the ability to construct knowledge and problem solving skills. The disruption caused by the pandemic has provided invaluable opportunity for instructors to embrace the disturbance and transform it into a learning opportunity Living in a post pandemic and VUCA era requires instructors to reflect on their pedagogical practices by upskilling themselves in using flexible pedagogical models for higher education as part of their preparedness effort for future crises.

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References

Al-Maroof, R. A. S., & Al-Emran, M. (2018). Students acceptance of google classroom: An exploratory study using PLS-SEM approach. *International Journal of Emerging Technologies in Learning (Online)*, *13*(6), 112.

Alfadda, H. A., & Mahdi, H. S. (2021). Measuring students' use of zoom application in language course based on the technology acceptance model (TAM). *Journal of Psycholinguistic Research*, *50*(4), 883-900.

Ahshan, R. (2021). A framework of implementing strategies for active student engagement in remote/online teaching and learning during the COVID-19 pandemic. *Education Sciences*, *11*(9), 483.

Yunus, A. C. C., & Hua, T. K. (2021). Exploring a gamified learning tool in the ESL classroom: The case of Quizizz. *Journal of Education and e-Learning Research*, *8*(1), 103-108.

Benito, A., Dogan Yenisey, K., Khanna, K., Masis, M. F., Monge, R. M., Tugtan, M. A., ... & Vig, R. (2021). Changes that should remain in higher education post COVID-19: A mixed-methods analysis of the experiences at three universities. *Higher Learning Research Communications*, 11 (4).

Blankley, A., Kerr, D., & Wiggins, C. (2018). An examination and analysis of technologies employed by accounting educators. *The Accounting Educators' Journal*. 28, 75-98.

Blaine, A. M. (2019). Interaction and presence in the virtual classroom: An analysis of the perceptions of students and teachers in online and blended Advanced Placement courses. *Computers & Education*, *132*, 31-43.

Brown, A., Lawrence, J., Basson, M., & Redmond, P. (2022). A conceptual framework to enhance student online learning and engagement in higher education. *Higher Education Research & Development*, *41*(2), 284-299.

Capra, T. (2011). Online education: Promise and problems. *Journal of Online Learning and Teaching*, *7*(2), 288-293.

Castillo-Cuesta, L., Ochoa-Cueva, C., & Cabrera-Solano, P. (2022). Virtual workspaces for enhancing collaborative work in EFL Learning: A case study in higher education. *International Journal of Emerging Technologies in Learning (iJET)*, *17*(2), 4-18.

Ching, M. C. H. (2021). Tahap penerimaan Google Jamboard sebagai alat digital dalam e-pembelajaran: Satu kajian. *JuKu: Jurnal Kurikulum & Pengajaran Asia Pasifik*, *9*(2), 34-45.

Chinnery, G. (2008). You've got some GALL: Google-assisted language learning. *Language Learning & Technology*. 12 (1)

Chu, A. M., Liu, C. K., So, M. K., & Lam, B. S. (2021). Factors for sustainable online learning in higher education during the COVID-19 pandemic. *Sustainability*, *13*(9), 5038.

Chu, S. K. W., Reynolds, R. B., Tavares, N. J., Notari, M., & Lee, C. W. Y. (2021). *21st century skills development through inquiry-based learning from theory to practice*. Springer International Publishing.

Croxton, R. A. (2014). The role of interactivity in student satisfaction and persistence in online learning. *Journal of online learning and teaching*, *10*(2), 314.

Dahal, N., Luitel, B. C., Pant, B. P., Shrestha, I. M., & Manandhar, N. K. (2020, December). Emerging ICT tools, techniques and methodologies for online collaborative teaching and learning mathematics. In *Mathematics Education Forum Chitwan* (Vol. 5, No. 5, pp. 17-21).

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of educational technology systems*, *49*(1), 5-22.

Erlam, G. D., Garrett, N., Gasteiger, N., Lau, K., Hoare, K., Agarwal, S., & Haxell, A. (2021, October). What really matters: Experiences of emergency remote teaching in university teaching and learning during the COVID-19 pandemic. In *Frontiers in Education* (Vol. 6, p. 639842). Frontiers Media SA.

Fishbein, M., & Ajzen, I. (1977). *Belief, attitude, intention, and behavior: An introduction to theory and research. Philosophy and Rhetoric.* 10 (2).

Goodyear, P. (2005). Educational design and networked learning: Patterns, pattern languages and design practice. *Australasian journal of educational technology*, *21*(1).

Greenhow, C., Lewin, C., & Willet, S. K. B. (2021). The educational response to Covid-19 across two countries: A critical examination of initial digital pedagogy adoption. *Technology, Pedagogy and Education*, *30*(1), 7-25.

Gulati, N., & Bhatt, P. (2021). Google Apps for English language teaching and learning: The classroom and beyond. *The Achievers Journal: Journal of English Language, Literature and Culture*, *6*(4), 29-44.

Hashemi, A. (2021). Online teaching experiences in higher education institutions of Afghanistan during the COVID-19 outbreak: Challenges and opportunities. *Cogent Arts & Humanities*, *8*(1), 1947008.

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.

Haythornthwaite, C., & Kazmer, M. M. (2002). Bringing the Internet home: Adult distance learners and their Internet, home, and work worlds. *The Internet in everyday life*, 429-463.

Jackson, C. J., & Furnham, A. (2000). *Designing and analysing questionnaires and surveys: A manual for health professionals and administrators*. Whurr Publishers.

Kabir, M. R., Islam, M. A., & Deena, S. A. (2020). Explaining the adoption of technology-based design of higher education during and after COVID 19 period from a developing country perspective. *IxD&A*, *46*, 88-119.

Khlaif, Z. N., Salha, S., & Kouraichi, B. (2021). Emergency remote learning during COVID-19 crisis: Students' engagement. *Education and information technologies*, *26*(6), 7033-7055.

Kanno, M. (2020). Maintaining and enhancing students' collaborative learning in a Japanese EFL higher education context. *Journal of Education, Innovation, and Communication*, 91-106.

Lavoue, E., Monterrat, B., Desmarais, M., & George, S. (2018). Adaptive gamification for learning environments. *IEEE Transactions on Learning Technologies*, *12*(1), 16-28.

Lazim, C. S. L. M., Ismail, N. D. B., & Tazilah, M. D. A. K. (2021). Application of technology acceptance model (TAM) towards online learning during covid-19 pandemic: Accounting students perspective. *International Journal of Business, Economics, Law*, *24*(1), 13-20.

Marcolini, J. P., Acosta, H. S., Walsh-Haney, H., Johnson, B., Cooper, S. J., & Frost, L. (2021). Pandemic PD: Sustaining Inquiry and Community Amid K-12 Uncertainty. *Journal of STEM Outreach*, *4*(3), 1-12.

Meepung, T., Pratsri, S., & Nilsook, P. (2021). Interactive Tool in Digital Learning Ecosystem for Adaptive Online Learning Performance. *Higher Education Studies*, *11*(3), 70-77.

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education*. 3 (2).

Nguyen, T., Netto, C. L., Wilkins, J. F., Bröker, P., Vargas, E. E., Sealfon, C. D., ... & Stein, G. M. (2021). Insights into students' experiences and perceptions of remote learning methods: From the COVID- 19 pandemic to best practice for the future. In *Frontiers in Education* (p. 91). Frontiers.

Nilson, L. B., & Goodson, L. A. (2021). *Online teaching at its best: Merging instructional design with teaching and learning research*. John Wiley & Sons.

Norton, A., Sonnemann, J., & McGannon, C. (2013). *The online evolution: When technology meets tradition in higher education*. Melbourne, Australia: Grattan Institute.

Sia, J. K. M., & Adamu, A. A. (2020). Facing the unknown: pandemic and higher education in Malaysia. *Asian Education and Development Studies*, *10*(2), 263-275.

Sweeney, E. M., Beger, A. W., & Reid, L. (2021). Google Jamboard for virtual anatomy education. *Clinical Teacher*, *18*(4), 341-347.

Yaumi, M. (2007). The implementation of distance learning in Indonesian higher education. *Lentera Pendidikan: Jurnal Ilmu Tarbiyah dan Keguruan*, *10*(2), 196-215.

Piccardo, E., Antony-Newman, M., Chen, L., & Karamifar, B. (2021). Innovative features of a plurilingual approach in language teaching: Implications from the LINCDIRE project. *Critical Multilingualism Studies*, *9*(1), 128-155.

Quality Indicators for Learning and Teaching (QILT), https://www.qilt.edu.au/

Silverman, R., & Hines, S. (2009). The effects of multimedia-enhanced instruction on the vocabulary of English-language learners and non-English-language learners in pre-kindergarten through second grade. *Journal of educational psychology*, *101*(2), 305.

Shea, P. J., Pickett, A. M., & Pelz, W. E. (2003). A follow-up investigation of "teaching presence" in the SUNY Learning Network. *Journal of asynchronous learning networks*, *7*(2), 61-80.

Sowton, C. (2021). *Teaching in challenging circumstances*. Cambridge University Press.

Sutton, M. J., & Jorge, C. F. B. (2020). Potential for radical change in Higher Education learning spaces after the pandemic. *Journal of Applied Learning and Teaching*, *3*(1), 124-128.

Sweeney, E. M., Beger, A. W., & Reid, L. (2021). Google Jamboard for virtual anatomy education. *Clinical Teacher*, *18*(4), 341-347.

Tabata, L. N., & Johnsrud, L. K. (2008). The impact of faculty attitudes toward technology, distance education, and innovation. *Research in higher education*, *49*, 625-646.

Utami, T. L. W. (2021). Technology adoption on online learning during Covid-19 pandemic: implementation of technology acceptance model (TAM). *Diponegoro International Journal of Business*, *4*(1), 8-19.

Wang, Q. (2010). Using online shared workspaces to support group collaborative learning. *Computers & Education*, *55*(3), 1270-1276.

Yang, Y., & Wang, X. (2019). Modeling the intention to use machine translation for student translators: An extension of Technology Acceptance Model. *Computers & Education*, *133*, 116-126.