



CONNECTING TO LEARN: A CONNECTIVIST ANALYSIS OF TRAINING AND SUPPORT FOR DISTANCE EDUCATION STUDENTS' ONLINE INTERACTION IN ESWATINI

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Abstract:

The study investigated how distance education students in the teaching stream at a selected university in Eswatini are being trained and supported to interact online. The study was underpinned by the post-positivist research paradigm and adopted a mixed-methods concurrent triangulation design, in which structured questionnaires yielded data from 338 students supplemented by qualitative data from four focus group discussions involving 40 students. The results showed that training and support were insufficient. Quantitatively most students reported receiving no training in the general use of the Moodle LMS (59.1%), and even higher proportions reported no training in interactive tools did so in interactive tools – (84%), plug-in tools – (84.9 %), social media for learning – (84%), and OERs (89.4%). Only 9.8% received support when facing technical challenges for online. Qualitatively, students reported limited training varied, different proficiency levels and weak support structures, which left them relying on on peer support and trial-and-error learning. However, students agreed they had support around clarifying course content (71%), assignment tasks (72.7%) and online group work (58.9%). The study concludes that the lack of training and support poses a challenge to the quality of online interaction and learning. Five recommendations are made: (1) comprehensive LMS orientation; (2) a 24/7 technical support helpline; (3) peer mentorship programmes; (4) digital literacy frameworks; and, OER and social media training embedded in curricula. These interventions are important to promote interaction and optimize outcomes for distance education in resource-poor settings.

Keywords: distance education, online learning, student training, technical support, Learning Management System, interaction, Eswatini

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1. Introduction

The growth of online learning in higher education has reshaped pedagogical landscapes worldwide, requiring rethink of how institutions prepare and support students to learn in digital environments (Ally, 2019). Within the context of distance education, interaction (student-content, student-instructor and student-student) serves as a crucial piece of a successful learning experience (Moore, 1989). Yet, to make meaning in online spaces, students need sufficient digital literacies (Martin *et al.*, 2020), as well as institutional support over time.

In Eswatini, distance education has become an important strategy used to increase higher education opportunities and to overcome geographic and socio-economic constraints (Maphosa, 2022). The Institute of Distance Education (IDE) is one such institute within the University of Eswatini, which serves 1,815 students across a variety of academic programmes and relies mainly on the Moodle Learning Management System (LMS) for teaching and learning. However, the shift towards online learning is bringing to light crucial deficiencies in how institutions prepare and support students for success in digital spaces (Czerniewicz *et al.*, 2020).

Literature suggests that effective online learning depends on intentional institutional commitment to prepare students for e-learning through training on LMS navigation and using interactive tools or integrating social media while facilitating access to open educational resources (Bradley, 2021; Mtshali *et al.*, 2020). Moreover, regular technical support and academic assistance are crucial to keeping students engaged and preventing dropout (Rotar, 2022; Su & Waugh, 2018). Despite this acknowledgement, however, there is limited empirical evidence, especially from African settings such as Eswatini, on how distance learning students are actually trained and supported.

The paper aims to contribute to filling this gap by investigating how distance students in a specific university in Eswatini are prepared and supported to interact in online learning.

1.1 Research Purpose

- The purpose of the study was to establish how distance education students were trained and supported for interaction in online learning at the selected university in Eswatini.

1.2 Research Objectives

The study pursued the following specific objectives:

- To ascertain the training provided to students for general use of the Learning Management System
- To determine the training provided for interactive features and plug-in tools of the LMS
- To establish the training provided for social media and open educational resources usage in learning

- To investigate the support available for technical challenges and academic clarification
- To assess student experiences of support in online group activities and accessing learning materials

2. Literature Review

Online students must be provided with adequate preparation and support to benefit most from online learning discourse. This section reviews literature on training and support for general LMS usage, interactive features, plug-in tools, social media usage, and open educational resources.

2.1 Training and support in the general use of the LMS

Learning online utilises an LMS, which provides course instructors and students with an online classroom where all teaching and learning processes occur (Bradley, 2021). Students must navigate the virtual learning environment to access course content in various multimedia formats (Jung & Huh, 2019). Maphosa and Bhebhe (2019) underscore the importance of enhancing students' digital literacy skills to benefit from e-learning.

Digital literacy refers to the ability of a student to use the digital learning environment to engage in learning processes (Brodie, 2018). Students need to master basics such as logging in and downloading and uploading content. A digital divide exists because students possess differing computer skills (Cloete, 2017). Through the LMS, course instructors and students communicate, share materials, submit assignments, and take tests (De Oliveira *et al.*, 2016). Deliberate training and support are needed for students to derive maximum benefits from online learning.

2.2 Training and support in the use of interactive features of the LMS

An LMS allows online students to be involved in the co-construction of knowledge (Chang & Kuo, 2021). Online discussion forums provide opportunities for social interaction and teamwork as students interact and exchange ideas asynchronously (Alzahrani, 2017; Mtshali *et al.*, 2020). Training and support enable students to participate meaningfully in discussions, contributing insightfully and responding to others beneficially.

In online discussion forums, students engage in deeper learning through deep thinking and interactive activities (Salter & Conneely, 2015). Students and lecturers interact and share knowledge through digital technologies, requiring adequate digital literacy (Salter & Conneely, 2015).

2.3 Training and support in interactive plug-in features

An LMS works with plug-in tools from external sources, such as virtual interactive whiteboards, Google Jamboard, or Miro board, which promote active and cooperative learning strategies (García-Almeida & Cabrera-Nuez, 2020; Montrezor, 2021). A

Jamboard is a web-based whiteboard system allowing real-time co-authoring using any laptop, tablet, or smartphone (Sweeney *et al.*, 2021). Up to fifty students may work collaboratively and simultaneously, creating different slides or working on a single slide (Sweeney *et al.*, 2021). Training and support enable students to make effective use of such tools for knowledge creation and sharing.

2.4 Training and support in the use of social media for learning

Social media platforms promote collaborative learning. Social media is defined as 'a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content' (Kaplan & Haenlein, 2010, p. 61). Popular platforms like Facebook and WhatsApp allow users to create and share content in different multimedia formats, supporting learning communities that alleviate students' loneliness and isolation (Van den Berg & Mudau, 2022).

Social media enhances interaction and communication in online learning environments (Wickramanayake & Muhammad, 2018). Students engage in active and self-directed learning through participation in social media activities. Wickramanayake and Muhammad (2018) found that students agreed that social media improved their critical thinking and problem-solving skills. However, deliberate training is needed on the responsible use of social media platforms for learning.

2.5 Training and support in the use of Open Educational Resources (OER)

Open educational resources (OER) are "*teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and repurposing by others*" (Hewlett Foundation, 2017, p. 1). OER have grown in popularity because they allow internet users to access learning material without hindrances or costs (Christoforidou & Georgiadou, 2022). OER includes lecture material, reference books, simulations, experiments, syllabi, and curricula (Hewlett Foundation, 2017).

Students should be taught information literacy skills to search for and select appropriate OER for educational purposes. OER-based courses ensure students, especially in developing countries, access relevant materials through the "*free and open*" concept (Sandanayake, 2019). Training should provide awareness of different online information databases and repositories containing OERs, how to identify them, and their proper use (Christoforidou & Georgiadou, 2022).

2.6 Support for online technical challenges

Distance education students may encounter technical challenges while working online. The nature of challenges faced by open and distance e-learning (ODEL) students relates to new communication tools and how to utilise technologies for learning (Rotar, 2022). Institutions should implement programmes to train and support students (Nawaz & Khan, 2012).

There are growing calls for ODeL institutions to operate with fully functional call centres offering students all forms of support on-demand, including technical support (Kondra *et al.*, 2011). Failing to get assistance when encountering technical challenges negatively impacts learning progress, resulting in feelings of isolation and neglect. Issues of isolation and lack of support have been identified as causes of student attrition in online courses (Su & Waugh, 2018).

2.7 Support for online learning community activities

Students working online require support in understanding online learning communities and how to participate in community activities for enhanced learning. Students who belong to an online learning community are engaged in learning and derive satisfaction from online learning experiences (Berry, 2019). Students with a sense of community derive academic benefits such as enhanced participation and deep learning (Garrison *et al.*, 2001).

Course instructors should support students to participate in online learning communities by providing opportunities to interact with peers with a deep sense of connection (Koslow & Pina, 2015). Students who participate in online learning community activities remain motivated to learn as they feel the support of others (Hilliard & Stewart, 2019). Clear tutorial guidelines on roles, responsibilities, and expected codes of behaviour make participation in online community activities easier for students (Fiock, 2020).

3. Theoretical framework

This study is underpinned by connectivism, a learning theory developed by Siemens (2005) and Downes (2007) specifically to address learning in the digital age. Connectivism posits that learning is a process of connecting specialised nodes or information sources, and the capacity to form connections between sources of information is more critical than the current state of knowing (Siemens, 2005).

3.1 Core principles of connectivism

Connectivism provides a foundational framework for understanding learning in digitally networked environments. Central principles include: learning and knowledge are rooted in the diversity of opinions; learning is a process of connecting specialised nodes or information sources; learning may reside in non-human appliances such as databases and devices; the capacity to know more is more critical than current knowledge possession; connections must be nurtured and maintained for sustained learning; the ability to perceive connections across fields, ideas, and concepts is a core skill; currency, or accurate and up-to-date knowledge, drives learning activities; and decision-making is integral to the learning process (Siemens, 2005).

3.2 Application to training and support in online learning

Connectivism provides a robust theoretical lens for examining how distance education students are trained and supported for interaction in online learning. The theory emphasises three critical types of connections. First, connection to technology: students must develop competence in using the LMS, interactive tools, and plug-in features. (Hoppe *et al.*, 2007). As Siemens (2005) contends, learning may reside in non-human appliances that are not human artefacts and students' proficiency with technology underpins all other learning tasks.

Second, connection to information: the theory's focus on connecting to specialised nodes of information is consistent with training students to access and use Open Educational Resources. Students require information literacy of information, such that they source, judge and gather varied resources (Downes, 2007).

Third, connection to people: the theory also suggests that learning is embedded in a supportive community of practice and knowledge networks. Training in, and support for the use of, social media platforms, discussion forums, and collaboration tools promote student-student and student-teacher communication. As Siemens (2005) observes, "*the pipe is more important than what is in the pipe*" (p. 6), referring to the importance of being and establishing learning connections.

3.3 Support structures in connectivist learning

Connectivism guides the development of support systems that are necessary to maintain meaningful online education. Networks of learning must be actively cultivated and cared for over time (Siemens, 2005). Technical support ensures that students have consistent access to, and interaction with, learning platforms. Academic support helps students understand course materials and assessment expectations. Peer and community support makes connections and learning between peers possible. The absence of these supports can undermine the learning network and leave students isolated or disengaged (Su & Waugh, 2018).

4. Methodology

4.1 Research paradigm

The research took place within the post-positivist paradigm, which accepts that no one philosophy will suffice to answer a research question and values the plurality of methodologies (Morris & Burkett, 2011). This paradigm was chosen to gain full insight into online interaction by combining objective reality (positivist) that considers data without interpretation, and subjective reality (interpretivist), which captures the meanings attach to their experiences (Dawadi *et al.*, 2021).

4.2 Research approach and design

The study used a mixed methods research design combining quantitative and qualitative methods to provide both depth and breadth (Creswell & Plano Clark, 2017). A concurrent

triangulation design was adopted in which quantitative and qualitative data were collected simultaneously (Castro *et al.*, 2010). This design allowed the researcher to conduct triangulation across both types of data, confirming, cross-validating and substantiating outcomes. Analysis and interpretation of these data were integrated by juxtaposing them (Bazeley, 2018).

4.3 Population and sampling

The population of the study consisted of 1,815 distance education students at the Institute of Distance Education, University of Eswatini. For the quantitative part, stratified random sampling (Babbie, 2012) was used to select 361 students (approximately 20% of the population). The sample was stratified by sex, faculty and level. The final sample included 338 students who answered the questionnaires.

In terms of the qualitative part, a purposeful sampling approach was employed to identify 40 distance education students (10 per focus group) who were information-rich and had personal experience of online learning (Creswell & Plano Clark, 2017). The criteria for inclusion were: students from levels two to four, who are enrolled in four specific academic programmes, registered in active Moodle LMS courses, and with at least two years of online learning experience.

4.4 Data collection tools

Quantitative data were collected using an electronic semi-structured questionnaire through Google Forms. The questionnaire included demographic information and six subsections corresponding to study objectives, with about ten items in each subsection. Responses were on a scale of 1 to 4 (Strongly Agree – Strongly Disagree). Four synchronous FGDs with 10 participants and lasting 1.5 hours, were conducted on Zoom. A semi-structured FGD guide was used, comprising demographics and 5 sub-sections determined by research objectives, made up of only open-ended questions.

4.5 Validity, reliability, and trustworthiness

Content validity and face validity were considered by subjecting instruments to an expert in online learning who scrutinized the appropriateness, clarity and readability (Oluwatayo, 2012; Whiston, 2012). Internal consistency reliability was measured by Cronbach's alpha coefficients, which were very good for section 1 ($\alpha = 0.90$) and section 3 ($\alpha = 0.91$), good for section 2 ($\alpha = 0.81$) and section 5 ($\alpha = 0.86$), but moderate for section 4 ($\alpha = 0.70$, Tavakol & Dennick, 2011).

The trustworthiness of the qualitative data was addressed using Lincoln and Guba's (1985) four criteria: credibility (pilot testing, member-checking, triangulation), transferability (thick descriptions, verbatim quotations), dependability (audit trails), and confirmability (reflexive journaling; triangulation).

4.6 Data analysis

The quantitative data on Google Forms were exported to Excel and analyzed with SPSS version 28. Means and standard deviations were computed, with a criterion mean of 2.50 (50%).

Thematic content analysis was conducted for the qualitative data according to systematic stages (Dube & Shawe, 2022): audio recordings were transcribed, initial codes were applied, themes were developed by sorting data into categories, themes were reviewed against the wider dataset; and themes were defined and named. The process was applied iteratively until the themes were finalised, and findings were supported with verbatim quotations.

4.7 Ethical issues

Ethical clearance was received from the University of South Africa (UNISA) College of Education Ethics Review Committee as well as the University of Eswatini (UNESWA). Respondents to the questionnaire signed their electronic informed consent forms by agreeing in Google Forms; FGD participants signed written informed consent. All participants were fully informed that participation was voluntary (Miller, 2016). The participants' identity and privacy were ensured through submitting anonymous questionnaires and the adoption of pseudonyms in FGDs (Coffelt, 2017; Wiles *et al.*, 2008). Participants were advised of their right to withdraw at any point without penalty (Melham *et al.*, 2014).

5. Results

The results of the training and support provided to students for online engagement are presented in this section, starting with the quantitative findings from the structured questionnaire and moving on to the qualitative findings from the focus group discussions.

5.1 Quantitative results on how students were trained and supported

Following the third research objective, the third component of the questionnaire aimed to elicit responses on how students were prepared and supported for involvement in online learning. Responses to questions on how students were trained and supported for interaction in online learning are shown in Table 1.

Table 1: Responses on how students are trained and supported for interaction in online learning

Statement	SA	A	D	SD	T	M	ST.D	Decision
I have been trained in the general use of the Moodle LMS	102 (30.2%)	36 (10.7%)	103 (30.5%)	97 (28.7%)	338	2.42	0.996	Disagreed
I have been trained in the use of interactive features of the LMS, such as the discussion forum	19 (5.6%)	35 (10.4%)	160 (47.3%)	124 (36.7%)	338	1.85	0.756	Disagreed
I have been trained in interactive plug-in features such as Jamboard	21 (6.2%)	30 (8.9%)	180 (53.2%)	107 (31.7%)	338	1.90	0.797	Disagreed
I have been trained in the use of social media for learning	32 (9.5%)	22 (6.5%)	151 (44.7%)	133 (39.3%)	338	1.81	0.894	Disagreed
I have been trained in the use of open educational resources (OERs)	15 (4.4%)	21 (6.2%)	167 (49.4%)	135 (40.0%)	338	1.75	0.891	Disagreed
I have received support when facing technical challenges online	12 (3.6%)	21 (6.2%)	253 (74.8%)	52 (15.4%)	338	1.98	0.819	Disagreed
I have been supported when seeking clarity on course content	73 (21.6%)	167 (49.4%)	73 (21.6%)	25 (7.4%)	338	2.85	0.841	Agreed
I have been supported when seeking clarity on assessment tasks	40 (11.8%)	206 (60.9%)	73 (21.6%)	19 (5.6%)	338	2.79	0.719	Agreed
I have been supported in working in an online group	47 (13.9%)	152 (45.0%)	114 (33.7%)	25(7.4%)	338	2.65	0.809	Agreed
I have been supported in accessing relevant learning material	34 (10.1%)	22 (6.5%)	88 (26.0%)	194(57.4%)	338	1.70	0.765	Disagreed
Average Mean						2.1		Disagreed

Only 40.9% (n=138) of respondents acknowledged receiving training in the general usage of the Moodle LMS, indicating that the majority had not. A minority of 16% (n=54) confirmed receiving training on interactive features such as the discussion forum. Only 15.1% (n=51) indicated receiving training on interactive plug-in features like Jamboard. Only 16% (n=54) said they had received training in using social media for learning. Only 10.6% (n=36) affirmed receiving training in the use of open educational resources (OER). On technical support, only 9.8% (n=33) confirmed receiving support when facing technical difficulties online. Only 16.6% (n=56) confirmed receiving assistance in accessing learning material on the online learning platform.

However, the majority of respondents, 71% (n=240), confirmed receiving assistance when requesting clarification on course content. Similarly, 72.7% (n=246)

indicated they were supported when seeking clarification on assessment tasks. Additionally, 58.9% (n=199) acknowledged receiving support when participating in an online group.

Overall, respondents disagreed that they were trained and supported for online interaction, with an average mean response of 2.1. Most item means fell below 2.50, indicating disagreement. Only three of the ten items had a computed mean higher than 2.5, showing agreement.

5.2 Qualitative results on how students were trained and supported

This section presents the qualitative results from FGDs on how students were trained and supported for interaction in online learning. The central theme generated sub-themes such as provision of computer literacy training, minimal training for Moodle LMS use, varied levels of proficiency, lack of support in Moodle LMS use, lack of technical troubleshooting support, and lack of training on social media and OER use.

Table 2: Main theme and sub-themes on how students are trained and supported

Theme	Sub-Themes	Related Issues
Training and support for students for interaction in online learning.	Computer literacy training provided	- General computer course offered in first-year - Computer literacy skills from high school - Varying levels of computer proficiency
	Lack or minimal training provided in Moodle LMS use	- No specific training on how to use Moodle - Availability of a video on Moodle usage
	Varied levels of proficiency in Moodle use	- Some students are good at using Moodle - Some students struggle with Moodle
	Lack of Support for Moodle Use	- No one is available to provide Moodle support - Frustration when one cannot access Moodle - Challenges experienced while using Moodle
	Lack of Support for technical troubleshooting	- No one is available to offer technical support - One may have problems with log-in credentials - No one to report technical problems to
	Lack of training for social media use	- No training for social media use for online learning - Learning through trial and error

Theme	Sub-Themes	Related Issues
	Lack of training for OER use	• No training for OER use • No knowledge about OER

Computer literacy training was offered mostly through computer courses in the first semester of the first year. FGD participants indicated: *"We take a computer course in the first year, and this assists us in using computers and the Internet to access the LMS"* (FGDA10).

Regarding Moodle training, participants revealed: *"I was not trained on how to use Moodle. I try things myself and also learn from my friends"* (FGDB1). *"No one was trained in Moodle use. We learn as we use it"* (FGDD6). While there was a pre-recorded video on Moodle usage, its accessibility was unclear.

Students exhibited varied levels of proficiency: *"Personally, I do not have any problem working on Moodle"* (FGDA9), while *"Some students struggle in uploading assignments on Moodle or in taking quiz exercises"* (FGDC1).

Lack of support was evident: *"The problem comes when one is working on Moodle and faces a slight problem; there is no one to assist"* (FGDC4). *"It would be helpful if there is a helpline where one can quickly call to get Moodle support at any time"* (FGDA1).

Technical support was inadequate: *"When one encounters technical problems, there is no one who can be contacted for support, especially after hours"* (FGDB9). *"One cannot phone the technician at night, so if there are technical challenges, one has to wait until the following day"* (FGDD7).

Social media training was absent: *"I have never received any form of training in the use of WhatsApp or Facebook for learning online"* (FGDC3). *"We use WhatsApp every day, so the same way we apply the skills when we use it for learning"* (FGDB4).

OER training was lacking: *"I am not aware of open educational resources and what they are. I have never been trained on them"* (FGDC9). *"I am not aware of the different licenses for open educational resources"* (FGDD8).

However, support for content clarification was confirmed: *"We often post questions on the 'Ask Me' forum on Moodle or a WhatsApp group, and the lecturers would respond"* (FGDD8). Similarly, support for assessment clarification and online group work was acknowledged by participants.

5.3 Triangulation of quantitative and qualitative findings

Table 3: Triangulation table of findings from quantitative and qualitative data

Findings (Quantitative data)	Findings (Qualitative data)	Areas of convergence/divergence
Students received limited training in the general use of the Moodle LMS	No adequate specific training for Moodle usage.	The finding that there was limited specific training for students to use an LMS is supported by both data sets.
There was a lack of training on using the LMS's interactive features, such as the discussion forum.	Students learn to use the features by using them, with no training	The finding that no training was provided to students on how to use the interactive aspects of LMS is supported by both data sets.
There was a lack of training on using interactive plug-in features like Jamboard.	There was no training; students simply learned how to use the features by practically using them.	Both data sets confirmed that no training was given to students on using LMS plug-in features.
There was a lack of training received in the use of social media for learning.	There was no training. Students utilised their experience in the social use of the platforms such as WhatsApp	The finding that students were not given any instruction on how to use social media for learning was supported by both data sets.
There was a lack of training received in the use of open educational resources (OER).	No training at all in OER usage	Both data sets confirmed the finding that no training was received by students in the use of open educational resources (OER).
Students were not generally supported when facing technical challenges.	Lack of Support for technical troubleshooting.	Both data sets corroborated the finding that students were not supported for technical troubleshooting.
Students were not generally supported when accessing learning material on the online learning platform.	No support was provided, and students had to learn on their own to navigate the LMS and access content.	Both sets of data supported the finding that students were not assisted in obtaining course materials on the online learning platform.
Assistance was received when students sought clarification on the course content.	Assistance was received, and there were various ways of seeking and receiving support.	Both data sets supported the finding that they received assistance when seeking clarification on the course content.
Assistance was received when students sought clarification on assessment tasks.	Various methods for requesting and getting support were available, and assistance was obtained.	Both data sets supported the finding that students received assistance when seeking clarification on assessment tasks.
Assistance was received when students participated in online groups.	Continuous guidance and support were reported.	Both data sets supported the finding that students received assistance when participating in online groups.

The quantitative and qualitative findings converged on several key issues. Both data sets confirmed that students received limited or no specialized training in Moodle LMS usage, interactive features, plug-in tools, social media platforms, and OERs. Both confirmed a lack of technical support and assistance in accessing learning materials. However, both data sets also confirmed that students received support when seeking clarification on course content, assessment tasks, and when participating in online group activities. Table 3 summarizes the triangulation of findings.

6. Discussion

The study found that distance education students had not been adequately trained in the general use of the Moodle LMS. This finding is inconsistent with views by Bradley (2021) that for effective online learning to occur, students should be trained on how to use the LMS effectively. Similarly, Al-Fraihat *et al.* (2020) note that an LMS performs different functions, including allowing opportunities for collaborative learning, and it is vital for students to be trained. From a connectivist viewpoint, poor LMS training disrupts the foundational connection to technology on which networked learning depends (Siemens, 2005).

The researchers also found that students had not been trained to use interactive tools such as discussion forums. This is a concern given Du *et al.*'s (2022) finding that meaningful participation in online discussion fosters student engagement. Kurnaz *et al.* (2018) state that online discussion encourages active participation, and students can participate only if they are able to compose, edit, post contributions and respond to others' posts. The connectivist principle that learning occurs through connects with others is undermined when students lack the competence to participate meaningfully (Siemens, 2005).

Students had not been trained to use interactive plug-in features like Google Jamboard. This is inconsistent with assertions by Kühl and Wohninsland (2022) that students who can use interactive whiteboards have enhanced online interaction and collaboration. Shi *et al.* (2018) note that students' achievement in online learning is enhanced by meaningful participation in collaborative work on interactive whiteboards.

Though students were not trained in using social media for learning, they could use it and actually used WhatsApp for learning. This finding is consistent with arguments by Ansari and Khan (2020) that students' ability to utilize social media enhances their chances for interaction and promotes active collaborative learning. Durgungoz and Durgungoz (2022) note that effective use of WhatsApp for educational purposes fosters teacher-student and student-student interaction. Students' self-directed learning of social media tools demonstrates connectivist learning in action (Downes, 2007), though this should be complemented by institutional training.

Students had not been trained in using open educational resources (OERs) and lacked awareness of OERs. This is against the claims by Christoforidou and Georgiadou (2022) that using OER increases learning experiences. According to Cummings-Clay

(2020), being able to use and access OERs enables students to cost-efficiently have access to learning materials. This can be seen as a major missed opportunity with respect to connectivism since no connection was established between students and rich information sources (Siemens, 2005).

When students encountered technical problems online, they did not have support. This runs counter to Pham *et al.*'s (2021,p9) contention that technical support should be a priority area of online learning support. Mayanja *et al.* (2019) argue that engagement with content, peers and instructors is central, and that students can engage in such interactions only if they have access to working technology, they can engage in such interactions. In connectivist language, unresolved technical problems cut students off from the learning network, disconnecting them from other learners and information sources (Siemens,2005).

Distance education students received help when they sought clarification on course content. This agrees with Richardson *et al.* (2016) in that they highlighted the need for instructors to be visible and interact with students by providing all types of academic support while teaching in virtual sessions. Zuhairi *et al.* (2020) highlight the significance of systematic and continuous online academic assistance. This shows that some elements of connectivist learning networks are working, namely the cross link between students and instructors as knowledge nodes (Downes, 2007).

Students were also supported when they sought clarification on online assessment tasks. This support is important given Domínguez-Figaredo *et al.*'s. (2022) observation that expectations for online assessment often lack specificity. Gil-Jaurena *et al.* (2017) likewise highlight several difficulties students with online examinations, calling for sufficient support.

Learners were supported in digital groups and learning communities. This supports Fiock's (2020) assertion that students will participate in online learning communities when course instructors outline roles and responsibilities. Encouragement from instructors and other students helps keep students motivated and on track (Hilliard & Stewart, 2019). This illustrates the value of connectivism's focus on cultivating learning networks and preserving social ties (Siemens, 2005).

Learners were not supported in accessing appropriate learning resources. This is contrary to connectivist fundamentals of linking students with learning materials (Siemens, 2005). The connectivist notion that learning involves connecting specialized nodes or information sources (Siemens, 2005) underscores the need for online students to be connected to such sources. This result undermines the quality of online teaching and learning experiences, and is contrary to basic connectivist principles.

7. Conclusions

This article examined the training and support that distance education students at one university in Eswatini received for online learning interaction. Based on connectivist

theory, findings indicate that there are apparent gaps in the institutional supports available to prepare students for successful participation within digital learning spaces.

First, distance education students lack basic technology. Most received no training, or only minimal training, in overall LMS use (59.1% untrained), interactive features (84% untrained), plug-in tools (84.9% untrained), social media for learning (84% untrained), and open educational resources (89.4% untrained). This widespread lack of training goes against the connectivist tenet that learners have to first make connections with technology before engaging in meaningful networked learning (Siemens, 2005).

Second of all, the lack of technical support is so poor. Since only 9.8% of students have access to online technical support, the university also does not have the support structures in place to help maintain students' ties to their learning networks. This lack goes against best practices in distance learning, which call for 24/7 helpdesk support (Kondra *et al.*, 2011; Rotar, 2022). If the tech connections are lost and you have no support, then the whole learning network topples (Siemens, 2005).

Third, educational scaffolding is inconsistently implemented. Student perceptions also indicated that they received support in the areas of clarifying course content (71%), composing assessment task questions (72.7%) and participating in an online group (58.9%), though there was a clearly demonstrated lack of support for accessing learning material (84% unsupported). This discrepancy implies that the academic support is often crisis-driven. Connectivism highlights that students need to be able both to access and assess sources of information as much as they need to have mastery over content (Siemens, 2005).

Fourth, students exhibit incredible resilience and self-learning in the face of institutional inadequacies. Qualitative Comments Student learned how to use LMS features, social media tools and collaborative tools through peer support, experimentation and trying things. Students really liked how they could rely on peer-based collaborative technology usage without expert intervention. This naturally occurring creation of peer-supported networks is consistent with connectivist theory (Downes, 2007). But it is not fair, and it is not sustainable to depend on student-led action.

A fifth argument is that a lack of preparation and support has an impact on the quality of interaction. All three forms of interaction fundamental to online learning-learner-content, learner-instructor, and learner-learner (Moore, 1989), are disrupted when students are not technologically proficient and don't have institutional backup.

Sixth argument: contextual factors in Eswatini's higher education setting need specific attention. As a developing country with varying degrees of technological infrastructure and readiness, Eswatini cannot preferentially adopt training and support approaches from more well-resourced environments. The university needs culturally responsive resource appropriate approaches (Czerniewicz *et al.*, 2019; Maphosa, 2022).

Seventh argument: an all-encompassing training system has become essential. The point is not a few separate projects; instead, what the college needs is to approach this systematically and scaffold an approach starting with basic digital literacy, working its

way through more advanced competence with collaborative tools, use of social media, and usage of OER.

Lastly, there must be an institutional culture and policy that student support is a linchpin of online learning quality. The present situation is the result of a systemic failure to prepare students for digital learning. *"When quality distance education can be achieved, it is only possible through the lenses of viewing training and support as not value-added, but inextricable elements of program design"* (Richardson *et al.*, 2016).

8. Recommendations

Given the findings and conclusions of this study, practical suggestions are recommended to improve training and support for interaction in online learning in distance education institutions in Eswatini, as well as potentially other contexts:

8.1 Develop and implement a comprehensive digital literacy framework

The institution should develop a required digital literacy curriculum that covers basic technology skills, learning management system skills, use of interactive tools and advanced collaboration features. This scaffolding of digital literacies must start from basic computer literacy in the freshman year, and develop with progressively higher levels of digital literacies. It does need to be contextualised to suit the Moodle LMS and digital tools at this institution in particular. For robustness, the framework should feature tests of competence that certify students' minimum attainment. In addition, it ought to be credit-granting and officially integrated in the curricula. This is particularly sympathetic to the alarming finding that 59.1% of students were without basic LMS training and also reflects Brodie (2018), who believes that digital literacy acts as a groundwork for making informed use of online learning.

8.2 Establish a 24/7 technical support helpline and online support portal

The institution must develop strong technical support systems to ensure that students have ready and reliable access to support. This infrastructure should have a toll-free Helpline that operates 24/7 with trained staff to solve such issues as login, platform navigation, loading and unloading of files, and minor troubleshooting. In addition to this, an Internet-based ticketing system should permit students to submit the repairs in electronic form and enable them to track the progress of such repairs. A good FAQ and knowledge base should include written step-by-step guides and video modules on common technical problems. And not just that, live chats to be directly built into the LMS, so you can hand-hold them through real-time support during high-stakes times – assignment deadlines and exam windows. This subtheme accounts for the disappointing statistic that only 9.8% of students received technical support and supports Kondra *et al.*'s proposal of a fully operational call centre in distance learning institutions (Debattista-Costa *et al.*, 2011).

8.3 Implement a structured LMS orientation programme

Now that you have enrolled in your first online class, all distance education students are expected to complete a detailed LMS orientation that will provide them with the necessary skills to be successful navigating and participating within the university's digital classroom. It applies to the program but should also explain some basics of navigation, e.g. how to log in, where and how to find courses, a general anatomy of what students might see on the LMS, and introduce common language they will encounter. It shall provide means of communication such as announcements, messaging functions, forums and chats. *"Students really need to know how to engage with tech and course content – download materials, watch things, go through external links – as well as the mechanics for submitting assessment tasks such as uploading assignments online and taking quizzes/tests/exams and reading your marks/feedback."* Orientation should also highlight the interactive aspects, e.g. how to get involved in forums, utilise collaborative tools and access group work spaces. Offered as a structured course in the LMS, students are able to orient themselves by doing, and through their explorations they become comfortable using the system. This mitigates the troubling number of 84% of students who were not trained in interactive LMS functionality and meets Bradley's (2021) plea for intentional training on LMS to be at the bedrock of online learning.

8.4 Develop an Open Educational Resources (OER) literacy programme

To bridge the divide in student familiarity with Open Educational Resources (with 89.4% of students indicating no prior experience), the university should need to adopt a more formal strategy for promoting OER literacy across curricula. It starts with incorporating OER instruction in research methods and academic writing courses, such as teaching students how to identify, critically evaluate, and ethically utilize openly licensed educational resources. The university should create a sourcebook of OERs specific to its program offerings: cataloged by discipline/course with clear instructions for use and citation. The workshops on Creative Commons licensing could be expanded to allow a better understanding of the different types and what the implications are around use of the resource. Additionally, faculty could include OER treasure hunts as homework assignments in the classes that would have students searching for and using OER for completed course projects. This realises Christoforidou and Georgiadou's (2022) emphasis to build awareness of databases and repositories of online information, as well as Siemens' (2005) connectivist principle that learning is connecting across many different nodes in the network.

8.5 Systematise academic support through multiple channels

Based on the positive report that 71% of students received support regarding course content, the university could increase and standardize academic support by instituting channels for multi-line communication—discussion forums on LMSes, scheduled virtual office hours, email assistance with response time guarantees, and WhatsApp consulting hours. The roles of teachers and what is expected regarding response time also need to

be made concrete. Content-specific orientation videos should be designed to answer questions that have arisen more than once about content, expectations, and assessment. Peer tutoring with the students helping each other through the LMS should be established. These initiatives are a continuation of existing best practices with an effort to close gaps in support availability.

8.6 Train lecturers and instructional staff in online pedagogy

Understanding that successful student support relies on front-line facilitators, the university needs to offer comprehensive training for online teaching and learning to all faculty members, including understanding facilitating skills; strategies for engagement; how to design and develop assessments; and offering students long-distance support. There needs to be a community of practice and solution bank for online educators where they collaborate, troubleshoot issues and co-create support materials. High-quality online pedagogy should be rewarded through rewards programs, teaching awards and promotion guidelines that prioritize digital instruction innovation. Online teaching certification should be required for all who teach in an online or distance education course. This acknowledges insufficiencies of support as being systemic and confirms that preparation for success needs to start with the preparation of the teacher (Nawaz & Khan, 2012).

8.7 Develop a comprehensive student support policy for distance education

The university should develop and implement a transparent policy document that provides clear accountability for student support entitlements (such as access to specific training programs, support services, and standardised response times) as a mechanism to address systemic support failure. The policy should specify institutional roles by indicating which units are responsible for different aspects of support. It ought to establish quality guidelines for online course development that require the incorporation of necessary support components and define funding decisions so that there is money to hire technical support personnel, develop training regimes, and maintain support facilities. This systematic model guarantees uniformity, transparency, and institutional dedication in promoting student achievement.

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Conflict of Interest Statement

The authors declare that they have no financial or personal relationships with other people or organisations that could inappropriately influence their work.

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