Online Modules Discussion Forums: A Pedagogical Platform Facilitating Learning in DE Environments

Dumisani Godfrey Mabasa
University of South Africa, Tshwane, South Africa

mabasdg@unisa.ac.za

Abstract: Student support in an open distance e-learning (ODeL) institution takes different forms and shapes. These forms and shapes are used in defining the nature of ODeL institutions. Bridging the distance gap between students in ODeL institutions, different platforms to facilitate interaction among students, students and their instructors are developed and made available. These interactions assist students by reducing the feeling of loneliness in the learning process. Loneliness is one of the experiences associated with dropout rates that negatively impact students' success rate. The question is, are students making use of these platforms as they were designed for, which is to facilitate the process of learning by interacting with other stakeholders such as with fellow students, students and instructors, students and content? The other question, given that students are from diverse backgrounds, is whether the platform is equally usable and accessible to all students. Are the other social challenges, such as poverty, low technological skills, inequality, network coverage, and loadshedding among factors, considered when introducing and rolling out these platforms to students? Leading the pack in these platforms is the online discussion forum, which is embedded in learning management systems (LMS), available on each online or blended or hybrid module registered for. For example, if a student has registered for two modules, each module has its own discussion forum. There is a concern whether participation in online discussion forums is related to students' success. The study determines whether participation in online discussion forums is related to a student's success in the module. Two modules were conveniently selected and used for meeting the purpose of study. The modules were offered using the blended or online pedagogy. The students' posting on the discussion forum was extracted and statistically analysed to determine whether it relates to success or performance in the modules. The study reported mixed results, where either participation or non-participation is related to student success. Student success comprises a variety of activities, for which participation by posting in online discussion forums forms part, however, it is not the only solution.

Keywords: Distance education, online discussion forum, pedagogical tools, student support, student success

1. Introduction and Background

Distance education (DE) is increasing exponentially, and it is common in many universities worldwide. There are generally two main types of education offering, namely the presence, also known as the conventional call, and DE (de Oliveira, Penedo & Pereira, 2018). DE's increased acceptance is established using technologies that allow interaction among students, students and instructors, students and content, being in different physical environments on virtual platforms and timelines (de Oliveira et al, 2018; Parker, 2020). Historically, in 1879, DE was delivered through the postal services, in the 1960s, radio and television were used, moving away from the postal services to electronic media as the purveyors of instruction. Various online learning platforms are identified, namely synchronous, asynchronous, blended or hybrid, massive online open courses (MOOCs), and open schedule online modules (Bergdahl & Nouri, 2021; Bozkurt, 2019; Dostál et al, 2018; Fidalgo et al, 2020; Hebebci, Bertiz & Alan, 2020; Kara et al, 2019; Shearer et al, 2020; Williamson, Eynon & Potter, 2020; Xu & Xu, 2019). DE has several implications for stakeholders, such as administrators, instructors, instructional designers, and policy makers, requiring a huge investment (Kara et al, 2019). Important issues such as academic structures; curriculum and learning materials; delivery; assessment; staff roles, reward and structure; intellectual property rights; student roles; infrastructure; budget/resources reallocation; and administration, among other things, must be considered for DE (Xiao, 2018). Some studies report that DE is characterised by high rates of attrition or dropout from online modules compared to similar face-to-face modules due to factors such as student unpreparedness, where those who remain, stand to benefit more than those who opt to take face-to-face modules (Xu & Xu, 2019). The first question to ask, is whether these stakeholders realise a return on investment from DE through students' performance. The study focused on interactions by posting in online discussion forums by students among each other, students and instructors, students and content, if such was related to performance in a module. There is a geographical digital and resources divide between individuals living in developed and developing countries, urban and rural areas, that is critical for possessing and effective use of information communication technologies (ICTs) (Lembani et al, 2019). There is evidence in literature that some students benefit from institutional resources and services tailored for online learning. However, the provision of additional learning facilities alone cannot improve module performance if students do not make use of such facilities. It is recommended that institutions should provide services that are clear, easy to use and accessible

to all students for their most effective use (Xu & Xu, 2019). The modules' discussion forums were accessible and easy to use by all registered students.

2. Background of the Study

Various online learning platforms are identified, namely synchronous, asynchronous, blended, massive online open courses (MOOCs), and open schedule online courses in DE (Bergdahl & Nouri, 2021; Bozkurt, 2019; Dostál et al, 2018; Fidalgo et al, 2020; Hebebci et al, 2020; Kara et al, 2019; Shearer et al, 2020; Williamson et al, 2020; Xu & Xu, 2019). The study focused on the asynchronous platform, determining whether participation by posting on the modules' online discussion forums relates to students' performance.

2.1 Synchronous and asynchronous distance education

DE institutions consider technology for their educational purposes, analysing the strength and limitations of each. It is imperative to determine the capability of interactive exchange, deciding whether asynchronous or synchronous media best fits the needs of the DE students (Parker, 2020). In terms of higher-quality computer-based technology, synchronous and asynchronous instructions have grown to be as efficient as face-to-face instructions (Bozkurt, 2019). In both synchronous and asynchronous communication in the DE environment, there are possibilities of face-to-face meetings for tutorials, student-student interactions, library study, laboratory or practice sessions, and use of industrialised processes where labour is divided, and tasks are assigned to various staff who work together in module development teams (Bozkurt, 2019). In synchronous environments, the instruction is delivered through two-way video conferences or internet chats (Xu & Xu, 2019). The instructors and students meet online for the session at a predetermined platform and time (Fidalgo et al, 2020). In synchronous DE, live and simultaneous interactions amongst students and instructors are allowed, where video or web conferencing, online or virtual lectures are conducted (He et al, 2021). However, in the asynchronous instruction environment, the instructors and students do not have synchronous sessions and students have access to module content through the internet at any time they want or need (Fidalgo et al, 2020). The recorded learning videos comprise the most common formats of the electronic instruments, with teaching being provided through recorded educational tools for students without live interactions and communication among students and teachers (He et al, 2021). The University of South Africa, where this study was conducted, progressed through the path of technological development through blended learning using asynchronous learning on learning management system (LMS) of the time.

Both synchronous and asynchronous pedagogies in DE environments have some advantages and disadvantages. In synchronous DE, students interact with fellow students, instructor or content, and students are present at an agreed platform. In asynchronous education, students do not have the opportunity to interact with anyone and can access the learning material at any time and place convenient to them. Students take ownership of the learning process in the asynchronous DE environment, where personal and family commitments are somehow accommodated. Students do not have to travel to the learning centre to access learning materials and may access such online. The study focused on the online discussion forum, an asynchronous platform for two blended online modules in an open distance e-learning (ODeL). The modules were offered through myUnisa, the university LMS portal, with the discussion forum being an asynchronous platform where students could interact with fellow students, tutors, and with module content by posting back or initiating an online conversation (Aloni & Harrington, 2018). The learning activities in asynchronous learning are not instant, but spread over time, allowing students sufficient time to achieve module tasks, and discuss complex topics or subjects (Göksu et al, 2021).

2.2 Online discussion forum

For years, asynchronous DE has been provided mostly on the LMS, which allows for the sharing of the module content, giving assignments and quizzes, and serves as open discussion forums (Göksu et al, 2021), producing high levels of interaction between teaching and learning processes (Tirado, Hernando & Aguaded, 2015). Asynchronous computer-mediated communication (CMC) technologies have advanced, sparking and facilitating a proliferation of online modules and qualification programmes within institutions of higher learning, with the use of the online discussion forum pedagogies leading the way (Lewinson, 2005; Tirado et al, 2015). On the discussion forums, students ask questions and get or provide answers, discuss the module materials, learn from one another, or construct new knowledge. It acts as the virtual classroom for online modules. Students are able to respond to or ask questions, at their own pace, time and place, outside the constraints of time and place

(Aloni & Harrington, 2018; Jelodar et al, 2020). Students and instructors may express either positive or negative comments, or share questions, frustrations, problems, and good experiences (Jelodar et al, 2020). During times of pandemic crisis, reports showed that an increased use of networks produced connection failures in several modules in other countries, due to system overload (Ferri, Grifoni & Guzzo, 2020). The more participation on the online discussion forum is an indication of students' motivation and engagement in the learning process. However, such enthusiasm is welcome, the higher participation creates challenges for instructors in providing timely, individualised, and high-quality feedback (Aloni & Harrington, 2018; Goel & Polepeddi, 2018), which could be difficult to execute. Constructive and timely feedback encourages students' participation on the discussion forum (Chiu & Hew, 2018).

In contrast, poor student participation on the forum shows less motivation or engagement with learning, resulting in teaching staff having fewer challenges. Students unlikely participate on the discussion forum when there is less involvement from instructors (Chiu & Hew, 2018). Available evidence shows that asynchronous discussion forums were conducted in close environments, with few studies on the impact of the activities on the forum in open environments. Few studies have examined how forum activities with different cognitive processing, particularly commenting, impact on student performance and participation in open learning environments. The investigation of asynchronous discussion activities in online modules can facilitate understanding of whether student participation relates to module performance (Chiu & Hew, 2018). Students may substantially benefit from a well-managed online module with a high level of peer and instructor interaction. Maintaining high-level interaction requires instructors to devote a substantial amount of time throughout the module. In such instances, instructors post messages on a regular basis, reminding students about requirements and deadlines, responding to questions in a timely manner, providing multiple ways for students to communicate with one another and instructors, offering personal feedback on assignments, responding to each student postings, asking for student feedback and being responsive to the input on the highly interactive module (Xu & Xu, 2019).

Some studies on whether active users of online modules' discussion forums contribute either positively or negatively, only concluded that active users make positive contributions (Wong et al, 2015). An online discussion forum is the most effective way of engaging with students in a multi-user virtual classroom environment (Balaji & Chakrabarti, 2010; Wong et al, 2015). The three main components of an effective learning environment are interaction modalities among students, between students and instructors, and their module content (Balaji & Chakrabarti, 2010; Shearer et al, 2020). Interactions are essential for knowledge construction, student motivation, and establishment of a social relationship amongst stakeholders (Aloni & Harrington, 2018; Goel & Polepeddi, 2018; Paechter et al, 2010). The study analysed whether posting on the discussion forum relates to students' performance. Participation takes various forms, such as reading textual materials, listening to audio materials, or viewing visuals or video materials (Anderson, 2008; Chiu & Hew, 2018). It is coupled with the assumption that communication efficiency is improved by matching media to the students' task information needs, making a positive learning contribution by providing immediate feedback, message personalisation, available language variety, and communication and social cues (Balaji & Chakrabarti, 2010). The online learning interaction theory is shaped around the most elementary constructs of the field, namely, the structure of instructional programmes; interaction between students and instructor; and the nature and degree of self-directedness of students (Moore, 2013). The online discussion forum is aimed at ensuring that student support is provided in a DE environment. The interaction happening in the online discussion forum mitigates the most common challenges associated with distance learning, such as a feeling of loneliness, resulting in a high rate of attrition, dropout, or high failure rate. The discussion forum was introduced to bridge the distance and social divides among students, students and instructors, and students and content. The purpose of the study was to investigate whether participation by posting messages on the online discussion forum relates to student performance.

2.3 Problem Statement

The introduction of online modules or MOOCs has a huge investment implication. Online instructors must be employed, and other resources deployed to facilitate learning and realise the online leaning objectives. Leading the way in the communication process is the discussion forum embedded on the modules. Given the high level of inequality and geographical social divides in distribution of resources in South Africa, many people in rural areas have less or poor access to facilities compared to those in urban areas (Lembani et al, 2019). South Africa is characterised by high inequality regarding the provision of education, showing large inequalities in educational inputs and outcomes (Spaull, 2015). For example, it is reported that there are large racial inequalities in matric

(Grade 12) attainment, with only 44 percent of black and coloured youth aged between 23 and 24 having attained matric compared to 83 percent of Indian youth and 88 percent of white youth. Despite some improvements, these inequalities in educational outcomes between students from wealthy and poor backgrounds are large and firmly entrenched (Spaull, 2015). There was only 40 per cent of the South African population with access to internet as reported in 2016, which improved to 63 per cent in 2020, with a lack of connectivity in many places being reported (StatsSA, 2022; UNDP/South Africa, 2020). The geographical divides on connectivity depend on the network service provider and other factors such as loadshedding in different areas. However, the system is within reach of every registered student, where those who could not access it due to connectivity in their areas, could go to the nearest centre where such services are provided at no added cost. The university where this study is conducted, applies a one-size-fits-all approach to education and does not treat students according to their demographic profiles, such as from poor or rich, rural, or urban background. Few studies examined how participation on online discussion forum, particularly commenting, impacts on student performance in online modules, which if investigated, could assist in understanding how participation relates to performance (Chiu & Hew, 2018). There are mixed feelings towards the offering of online education, with some supporting the initiative, while others do not, indicating that it is a waste of resources since there is no evidence supporting that student participation in the online discussion forums leads to better academic performance. For any investment made in education, a good return is expected, including on resources invested in online pedagogies (Xiao, 2018). It was in the interest of the study to determine whether student participation in online discussion forums by posting relates to their performance.

2.4 Hypotheses

The hypotheses of the study were formulated as follows:

H_1 = Participation frequencies by posting on the discussion forums are related to students' final mark performance

H_0 = Participation frequencies by posting on the discussion forums are not related to students' final mark performance

3. Research Design

The two online modules were conveniently selected for the study. The posting data frequencies were extracted from the online discussion forums of the two modules on myUnisa, the university LMS portal. Their final mark data for two semesters was extracted and analysed through Social Package for the Social Sciences (SPSS).

3.1 Descriptive Data Analysis

There were 2 789 records of students registered for the two semesters for the two modules. The students enrolled for different qualifications, namely Diploma in Tourism Management (15), National Diploma in Commercial Practice (50), National Diploma in Policing (57), National Diploma in Management Services (70), Diploma in Accounting Sciences (86), National Diploma in Logistics (119), Diploma in Administration Management (220), Diploma in Office Management and Technology (289), National Diploma in Administration Management (427), and National Diploma in Human Resources Management (1 455). All registered students were provided with access to the online discussion forums in their respective registered modules. Some students could repeat the modules either once or twice in the two semesters under study due to failure or dropout.

3.2 Gender Distribution

The gender distribution of the participants is presented in table 1 below.

Table 1: Gender profile of registered students

Modules	Male	%	Female	%	Total number of students	Total percentages
Module 1	298	24	949	76	1247	100
Module 2	337	22	1205	78	1542	100
	635		2154		2789	

Table 1 above shows the two modules that were registered for the two semesters under study, namely semester 1 (starting in January to June) and semester 2 (starting in July to December). There were 2 789 registered students for the modules. More students were registered for module 2 than module 1.

3.3 Descriptive Analysis (Participants in all Modules in all Semesters)

The mean and median values were the same, namely 51, the median being the value that cuts the distribution of scores in half, or fifty percent above or below as shown on Table 2 and Figure 1 below.

Table 2: distribution of scores

	FINAL_MARK	Frequencies
Mean	51.108	2.188
N	223	223
Std. Deviation	11.5932	2.6492
Median	51.000	1.000
Kurtosis	-.381	30.108
Skewness	-.111	4.601
Minimum	23.0	1.0
Maximum	81.0	25.0

The final mark has negative skewness and kurtosis, suggesting that more students obtained marks above 51, as indicated by the median on Table 2 and Figure 1.

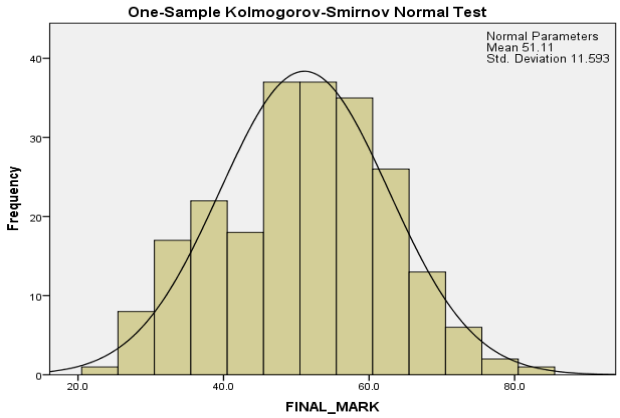

Figure 1: distribution of scores

The participation frequencies have positive skewness, suggesting lower participation.

3.4 Hypotheses Testing

In Table 3, the results of the Kolmogorov-Smirnov statistic were presented. A non-significant result (Sig. value of more than .05) indicates normality. In this case, the Sig. value is .000, suggesting violation of the assumption of normality.

Table 3: Hypothesis Test Summary

	Null hypothesis	Test	Sig.	Decision
1	The distribution of final mark is normal, with mean 51.1 and standard deviation 11.5932.	One-sample Kolmogorov-Smirnov Test	.000[a]	Reject the null hypothesis.
2	The distribution of frequencies is normal, with mean 2.2 and standard deviation 2.6492.	One-sample Kolmogorov-Smirnov Test	.000[a]	Reject the null hypothesis
The significance level is .050.				

The results show that the final mark and frequencies scores are not normally distributed, implying a need for non-parametric tests as presented below.

3.5 Non-Parametric Test (Kruskal-Wallis Test)

The Kruskal-Wallis test was used to test whether the distribution of scores for semesters and study units differs. Given that the significance level is more than 0.05 (e.g., .04, .01, .001), the study can conclude that there is no statistically significant difference in the continuous variable across the three groups as shown in table 4.

Table 4: Hypothesis test summary

	Null hypothesis	Test	Sig.	Decision
1	The distribution of final mark is the same across categories of semester.	Independent-Samples Mann-Whitney U Test	.296	Retain the null hypothesis.
2	The distribution of frequencies is the same across categories of semester.	Independent-Samples Mann-Whitney U Test	.239	Retain the null hypothesis.
The significance level is .050				

The distribution of the final mark and frequencies is not the same across categories of the semesters. These null hypotheses are retained.

3.6 Correlations Analysis

In table 5, the overall correlations between participation frequencies and final mark are presented. The results show that there are general correlations between participation frequencies and final mark.

Table 5: The overall correlations

			Final mark	Frequencies
Spearman's rho	Final mark	Correlation coefficient	1.000	.189
		Sig. (2-tailed)	.	.005
		N	223	223
	Frequencies	Correlation coefficient	.189**	1.000
		Sig. (2-tailed)	.005	.
		N	223	223
**. Correlation is significant at the 0.01 level (2-tailed).				

The Sig value of .005 was supported by the data and the correlation is significant at the 0.01 level (2-tailed) as shown in table 5.

Table 6: Correlations per semester

	Semester			Final mark	Frequencies
Spearman's rho	1.0	Final mark	Correlation coefficient	1.000	.173
			Sig. (2-tailed)	.	.069
			N	111	111
		Frequencies	Correlation coefficient	.173	1.000
			Sig. (2-tailed)	.069	.
			N	111	111
	2.0	Final mark	Correlation coefficient	1.000	.218*
			Sig. (2-tailed)	.	.021
			N	112	112
		Frequencies	Correlation coefficient	.218*	1.000

	Semester			Final mark	Frequencies
			Sig. (2-tailed)	.021	.
			N	112	112
*. Correlation is significant at the 0.05 level (2-tailed).					

Regarding the results of the modules per semester, data did not support any positive contribution on final marks, as shown in table 6.

Mixed results were reported when looking at different modules per different semesters, as shown in table 7 below.

Table 7: The correlations per module across the semesters

	1			Final mark	Frequencies
Spearman's rho	1	Final mark	Correlation coefficient	1.000	.153
			Sig. (2-tailed)		.108
			N	112	112
		Frequencies	Correlation coefficient	.153	1.000
			Sig. (2-tailed)	.108	
			N	112	112
	2	Final mark	Correlation coefficient	1.000	.268**
			Sig. (2-tailed)		.004
			N	111	111
		Frequencies	Correlation coefficient	.268**	1.000
			Sig. (2-tailed)	.004	
			N	111	111
**. Correlation is significant at the 0.01 level (2-tailed).					

In one semester, the same module achieved some correlations between participation frequencies and final marks, which was not the case in the other semester.

Table 8: Correlation across the semesters

MODULE	Semester				Final mark	Frequencies
1	1.0	Spearman's rho	Final mark	Correlation coefficient	1.000	.224
				Sig. (2-tailed)		.077
				N	63	63
			Frequencies	Correlation coefficient	.224	1.000
				Sig. (2-tailed)	.077	
				N	63	63
	2.0	Spearman's rho	Final mark	Correlation coefficient	1.000	.117
				Sig. (2-tailed)		.423
				N	49	49
			Frequencies	Correlation coefficient	.117	1.000
				Sig. (2-tailed)	.423	
				N	49	49

MODULE	Semester				Final mark	Frequencies
2	1.0	Spearman's rho	Final mark	Correlation coefficient	1.000	.186
				Sig. (2-tailed)		.206
				N	48	48
			Frequencies	Correlation coefficient	.186	1.000
				Sig. (2-tailed)	.206	
				N	48	48
	2.0	Spearman's rho	Final mark	Correlation coefficient	1.000	.344**
				Sig. (2-tailed)		.006
				N	63	63
			Frequencies	Correlation coefficient	.344**	1.000
				Sig. (2-tailed)	.006	
				N	63	63
**. Correlation is significant at the 0.01 level (2-tailed).						

When looking at all the modules per semesters, mixed results were reported, with one module not achieving any acceptable correlations in both semesters, whereas the other module achieved one acceptable correlation in one semester and none in the other semester, as shown in table 8.

4. Discussion of Findings (Results)

More participation on online discussion forum was an indication of students' motivation and engagement in the learning process. The higher participation is welcome, however can create challenges for instructors in providing timely, individualised, and high-quality feedback (Aloni & Harrington, 2018; Goel & Polepeddi, 2018). In contrast, poor participation on the forum shows less motivation or engagement with learning, resulting in teaching staff having fewer challenges. Students are unlikely to participate on the discussion forum when there is poor sense less involvement from instructors (Chiu & Hew, 2018). There were mixed results on whether participation in online discussion forum contributes towards student performance or not. The results of the current study were in line with evidence available in literature, stating that introducing online discussion forums does not make any difference if students do not use it.

5. Conclusion and Recommendations

The study concludes that, unless students use facilities such as online discussion forums, no positive contribution is made. Ways must be found to encouraged students to participate or use the pedagogical facilities made available to them. Despite a positive contribution from participation in online discussion forums, posting was a concern. There are mixed results supported by data, where some students who participated could not achieve a promotion marks, with some who did not post anything, achieving promotion marks. A comprehensive study is recommended, which study can look at all forms of participation in online discussion forum pedagogies, such as viewing, reading, or downloading, if such are related to performance. Online students support offers various advantages, however, must be used as part of the other learning support activities and not used in isolation.

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