Do MOOCS need a special instructional design model?

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Abstract

This paper reports instructional designers' perceptions of their present approaches to designing MOOCs. In addition to their acceptance of using a new ID model to design MOOCs based on Connectivism as a learning theory. The research revealed that IDs are interested in using a new model that is based on Connectivism to build MOOCs. Instructional designers' opinion was measured using a survey questionnaire that was created by the researcher. This study presents an evaluation of the instructional design quality in a randomly selected sample of 30 Massive Open Online Courses (MOOCs). The quality was assessed using a researcher-developed Content Analysis Checklist (CAC), which was reviewed and validated by a panel of five instructional design experts. Findings indicate that the majority of the courses demonstrated weak alignment with key principles of Connectivism, reflecting generally low instructional design quality from this theoretical perspective. These findings supported the need to develop a new ID model to ensure that connectivism learning theory is actively implemented in MOOCs. The novelty of the study contributes to the ID field by providing initial justification for the development of an ID model that is more appropriate for the Connectivism-based MOOC environment as well as looking into refining the pedagogical design in MOOCs. Further research can be suggested to conduct a comparison of the effectiveness of MOOCs using the existing ID model with MOOCs using the Connectivism model in terms of learning outcomes, motivation and student satisfaction.

Keywords:MOOC, instructional design, connectivsm learning theory, need analysis.

Introduction

MOOCs are web-based learning spaces that enable students to take courses from prestigious institutions without any need for institutional degrees, credentials, or certification requirements and solely aim at self-development. MOOCs provide distance learners with access to knowledge in an open environment. In this environment, the learners can access content using reusable and interactive resources in a sometimes-non-structured way. Where learners rely less on the instructor and more on the content and fellow learners. The rise of the MOOC concept is likely attributable to the inadequacies of traditional teaching and learning designs. In addition, technology offers the potential to provide informal chances for people to have an adequate learning experience beyond the conventional classroom constraints aside from a desire for open and flexible educational contexts (Saadatmand & Kumpulainen 2014). While MOOCs are offered online, design and development in a MOOC environment differ from conventional online courses. Besides enrollment requirements, the number of learners, interaction within the course, and receipt of credit for completion, the significant difference is that MOOCs have a different theoretical foundation.

MOOCs were originally conceptualised based on the learning theory of Connectivism, which gained widespread adoption as prestigious institutions in the United States began offering their course content online. Connectivism addresses how learning occurs in a digitally connected and networked world made possible by rapid advances in information and communication technologies (ICT). The innovations and developments that helped to transform the learners from passive engaging participants, establishing and generating a stance with the upsurge of Web 2.0, have impacted not only the education sector but also the transforming of societal structure (Rafiza et.al., 2016).

However, traditional pedagogical frameworks and instructional planning tools, although well-established, often fall short in meeting the evolving needs of contemporary learners. As academic environments shift, these conventional approaches may no longer offer sufficient flexibility or relevance (Peng et.al,

2023; Nasreen et.al, 2022; Halili et.al., 2019). Educational leaders and developers must deviate significantly from behaviourism strategies toward a more genuine and multidimensional approach to educational models. It has become a fact that we need to develop our educational tools to coincide with the development of technology. Daniel (2012) also argues that limited information is available concerning the teaching and learning process or the modelling techniques employed by instructional design specialists when developing and implementing MOOCs. Since the teaching model is extremely vital for every kind of content and material planning, designing a MOOC poses a significant issue. For instance, learning design is difficult to lay down when addressing the massive groups of students who will be engaged in learning (Adair, et.al., 2014). Hence, from the point of view of this research, there is a need to investigate this matter to see if there is a need to develop a new ID model to design MOOCs that is based on the adequate learning theory that was originally used to develop MOOCs.

Instructıonal desıgn model for MOOC

Despite the diversity of instructional models available to course developers, MOOCs demand a bespoke design framework. As noted by Julia et al. (2021), while conventional instructional models are structured around fixed educator-learner ratios and predefined learning outcomes, MOOCs require more adaptive strategies due to their open nature and large, diverse learner populations. Kasch et al. (2017) also highlighted ongoing challenges in MOOC pedagogy, noting the absence of consolidated best practices or design standards. The foundational theory of MOOCs—Connectivism—differs significantly from those underpinning traditional design models (i.e., Behaviourism, Cognitivism, and Constructivism), and thus, applying traditional approaches often results in design flaws. Siemens and Downs (2005) argue that this mismatch between theory and design tools has led to pedagogical inconsistencies.

Supporting this notion, Billy (2016) observed that many instructional models used in MOOC development were not created with MOOCs in mind, thereby limiting their effectiveness. Richter and Krishnamurthi (2014) called for deeper exploration into new learning theories that align better with MOOC-specific requirements. Similarly, Sonwalkar (2013) emphasized the urgent need to improve the pedagogical efficacy of these courses. Sergis et al. (2017) further argued that the distinct nature of MOOCs requires innovative design strategies. Their shortcomings, they contended, are often the result of poor instructional design foundations.

A consistent theme across studies is the lack of tailored instructional tools to address the complexities inherent to MOOCs (Rafiza et al., 2015). Early investigations into MOOC design highlighted the need for instructional models that originate from Connectivism, ensuring conceptual consistency and relevance. Yet, contemporary literature continues to show a scarcity of studies that effectively implement or propose such models that investigate this matter specifically rather than just conclusions. Therefore, the current research intends to further investigate this problem by finding out whether or not MOOCs need a connectivism-based Instructional Design Model to design MOOCs. The findings from this research can help in creating a new instructional design model for MOOCs.

Research objectıves

The prime objective of the current research is to find out whether or not MOOCs need a special instructional design model that is based on connectivism as a learning theory for instructional designers and course creators to design MOOCs. This research is organized into 2 sections, with the following objectives:

1. Determine instructional designers' perceptions of the current traditional models they use in designing MOOCs.
2. Determine the level of acceptance and intention of instructional developers to use a connectivism-based Instructional Design Model (CBIDM) to design MOOC modules.
3. Identify the extent to which connectivism principles are deployed by instructional designers in the design of current MOOCs.
4. Identify the extent to which networked learning principles are deployed by instructional designers in the design of present-day MOOCs.
5. Identify the degree to which instructional designers implement digital learning environment precepts in the design of present-day MOOCs.

Methods

The quantitative method was used to collect information for the needs analysis phase. The analysis for the first three objectives of Phase 1 will be conducted to determine to what extent current MOOCs reflect connectivism principles and to what extent current MOOCs support the connectivism learning environment, as well as to what extent current MOOCs enable networked learning principles. The requirements analysis analyzes the viewpoints of instructional designers through a survey on their impressions of traditional instructional design models they use in building MOOCs, as well as their acceptance of utilizing a connectivism-based instructional design model to design MOOCs. The goal of the research was explained to the participants before they responded to the questionnaire.

Population and sampling

There are two groups of samples employed in this study Sample 1 was a sample of MOOCs and sample 2 was a sample of instructional designers and MOOC experts. Sample 1 will be chosen randomly with a certain criterion. While in sample 2 purposive sampling method will be used. Purposive sampling was chosen to match the research requirements as well as to obtain valuable information from the context of this research. The initial stage of this research involved identifying and selecting existing MOOCs through a combination of search engine queries and recommendations from education-focused blogs and expert sources for sample MOOCs included in the research based on two important criteria. First and foremost, classes had to be conducted in English. Second, the course websites had to be open to the public between June and December 2020, which was this research timeframe. After looking for three major platforms (Coursera, edX, and FutureLearn) were selected for inclusion in the study, given their substantial global enrolment rates and diverse course offerings For sample 2, 59 participants answered the survey questionnaire. The characteristics of the target population include those individuals who are responsible for the design and development of MOOCs and who have formal training in instructional design. The sample also will include those who have at least a PhD degree in related disciplines such as (Instructional design, Online learning, etc. with teaching experience in the same field.

The methods of purposeful and snowball sampling were used. Purposive sampling, according to Merriam (2009), is a method for selecting a sample from which the most can be learned. In this case, the research required a specific set of characteristics for its participants to acquire a thick, rich overview of the design process models used by instructional designers of MOOCs (Lodico et al., 2010). Therefore, the sample will be limited to those who could provide insight into instructional design models theories and strategies that they have used or adapted to the MOOCs environment. In addition to the purposive sampling strategy, to find initial participants, snowball sampling will be employed by asking those who had already been identified as meeting the criteria to suggest additional participants who will be then included in the research if they met inclusion criteria (Lodico et al., 2010; Merriam, 2009).

Instruments

In this research, two instruments were constructed: the ID questionnaire and a comprehensive course scan questionnaire developed to facilitate data collection from the selected MOOCs.

The ID questionnaire

To investigate the instructional designers' perception of the existing ID models in designing MOOCs and their acceptance of a new model that is based on connectivism as a learning theory, the researcher had to create the ID questionnaire. Following an extensive literature review, a preliminary list of 20 items was formulated for the questionnaire. The instrument was then validated through Content Validity Index (CVI) analysis to ensure its reliability. In designing the questionnaire, the priority was clarity—ensuring that expert reviewers would interpret the task accurately. The expert panel was selected based on specific criteria: each member had a minimum of five years of experience in instructional design and held at least a postgraduate degree in a relevant field.

The experts received the validation instrument alongside detailed instructions. They were asked to evaluate each item's relevance and clarity and provide feedback for improvement.

Table 1
The panel of experts

#	Degree	Department	Years of Experience	Institution
Exp 1	PHD	Educational Technology	20	Cairo University
Exp 2	PHD	Educational Technology	20	Cairo University
Exp 3	PHD	Educational Technology	15	Cairo University
Exp 4	PHD	E-Learning	15	Institute of Public Administration
Exp 5	Masters	E-Learning	10	Institute of Public Administration

Table 2
The measures that the experts used to review the instrument items

Are the items relevant to the concept/construct being measured?	Is the wording of the item clear? (i.e., easy to understand?)
1- Not relevant	1- Unclear / Not easy to understand
2- Somewhat relevant	2- Somewhat clear / Somewhat easy to understand
3- Quite relevant	3- Quite clear / Quite easy to understand
4- Highly relevant	4- Highly clear / Very easy to understand

CVI calculations were then conducted, including I-CVI, S-CVI/AVE, and S-CVI/UA metrics. Results demonstrated strong content validity: both the relevance and clarity of the instrument received S-CVI/AVE scores of 0.965, while S-CVI/UA scores reached 0.850, affirming the instrument's suitability for assessing Connectivism in MOOCs.

Creating the Course Scan Questionnaire

To evaluate the instructional design of selected MOOCs, a Content Analysis Checklist (CAC) was constructed, reflecting Connectivist principles and features identified in the literature. The checklist included 46 items and underwent the same validation process as the questionnaire. The expert panel confirmed the instrument's validity, with S-CVI/AVE scores of 0.970 for relevance and 0.974 for clarity. The S-CVI/UA scores were 0.852 and 0.870, respectively, confirming its robustness for evaluating instructional design in MOOCs.

Results

Instructional designers' background

A needs analysis survey questionnaire was delivered to a group of instructional designers as part of the research. The survey was completed by 59 persons in total. The findings of the respondents' backgrounds are reported in Table 3.

The demographics of the survey participants, a total of 59 instructional designers, are shown in Table 3. Table 3 shows that the overall number of female respondents outnumbers the total number of male respondents. Female respondents accounted for 36 (59%) of the total instructional designers in the survey, while male respondents accounted for just 24 (40%). When it comes to job experience, most respondents have experience with instructional design for 6 to 10 years, accounting for 47% of all instructional designers. Only 7 of the total respondents have 1 to 5 years of job experience, accounting for 12% of the total. While 23 respondents (40%) have worked for more than ten years. In terms of the number of MOOCs designed by respondents, the findings revealed that most of the IDs have designed more than 5 MOOCs 36 (62%). Only 22 (37%) respondents have less than 5 MOOCs designed.

Table 3
Participants' Demography

Item		Frequency	Percentage
Gender	Male	24	40
	Female	35	59
Working Experience	1-5	8	13
	6-10	27	46
	More than 10	23	39
Education Degree	Diploma	6	10
	Bachelor	4	6
	Masters	29	49
	PHD	20	33
	None	0	0
Number of MOOCs designed	None	0	0
	1-5	23	38
	More than 5	36	61

Perceptions and intention to use a Connectivsm-Based Instructional design model (CBIDM)

The IDs' perceptions of using traditional ID models to design MOOCs, as well as their level of acceptability and intention to utilize the Connectivism-based instructional design model to develop MOOCs, were reported in the following findings. These findings supported the necessity for a new instructional design model based on connectivism to ensure that connectivism theory is actively implemented in MOOC designs. As a result, the following findings are addressed in light of the research objectives:

ID perception on the current traditional models used to design MOOCs

This section is designed to elicit the IDs' opinions on their existing MOOC design strategies. The IDs' perceptions of existing MOOC design methodologies are discussed in Table 4. The findings suggest that IDs believe that using an ID model is critical while creating MOOCs. A mean value of 4.06 (SD =.96) demonstrates this. The majority of the designers are also open to modifying the traditional models they employ to create MOOCs. Furthermore, the majority believe that a Connectivism-Based methodology will improve the MOOC instructional design quality. A mean value of 3.79 (SD =.80) demonstrates this.

Implementing a connectivism-based model in MOOC design, according to IDs, will improve MOOC instructional design quality. The mean value of 3.79 (SD =.804) demonstrates this. When it comes to MOOC design, the majority of instructional designers likewise expressed dissatisfaction with present models. This was demonstrated in item 9 with a mean value of 3.1 (SD =.973) believed that utilizing CBIDM in MOOC design would be beneficial to their MOOC design process, as evidenced by item 14 with a mean value of 3.96 (SD =.764). As a result, the instructional designers believe that applying and implementing a connectivism-based model in MOOC design provides numerous benefits, as evidenced by most of the mean value for each item is high. Key findings from the content analysis are presented in Table 4.

Table 4
Instructional designers' perceptions of their current ways of designing MOOCS

Item	Description	Mean	SD	Interpretation
1	Instructional designers need to learn how to use ID models to design MOOC courses.	4.06	0.96	High

2	I do not intend to change the current traditional instructional design models I use to design MOOCs.	2.32	0.79	Moderate
3	Instructional designers need to have basic knowledge of the different types of instructional design models.	4.18	1.07	High
4	I will be a better instructional designer if I know how to use different types of instructional design models.	3.86	1.18	High
5	I am comfortable with my current way of designing MOOCs with the traditional instructional design models.	2.86	0.97	Moderate
6	I always use instructional design models when designing a MOOC.	3.67	0.80	High
7	Using a connectivism-based instructional design model will increase the quality of MOOCs' instructional design.	3.84	0.69	High
8	Using the Connectivism-based instructional design Model will enable connectivist learning.	3.72	0.73	High

ID acceptance and intentions on using CBIDM in designing MOOCs

This part is to investigate the IDs' acceptance and intention of using a connectivism-based model in designing MOOCs. The analysis of the data for instructional designers' perceptions of using a connectivism-based model in MOOC design is shown in Table 5. The MOOC design process would benefit from the Connectivism-Based ID Model. The mean value of 3.96 (SD =.76) demonstrates this. The majority of instructional designers also expressed an interest in seeing MOOCs designed using the Connectivism-Based instructional design paradigm. With a mean value of 4.01 (SD =.81), this was demonstrated in item 9. As demonstrated by the mean score of 4.06 (SD =.82), the majority of IDs agree that utilizing a connectivism-based model would be a very good idea. As a result of the majority of the mean value for each item being high, the IDs believe that applying and implementing a connectivism-based model in MOOC design creates several benefits in terms of learning quality. The findings are shown in Table 5.

Table 5
Instructional designers' IDs acceptance and intentions on using CBIDM in designing MOOC

Item	Description	Mean	SD	Interpretation
1	I would find the Connectivism-Based ID Model useful for my MOOC's design process.	3.96	0.76	High
2	I am interested in using the Connectivism-Based instructional design model in my MOOC design.	4.01	0.81	High
3	Using a Connectivism-Based ID Model would help me to accomplish my tasks more quickly.	3.40	0.87	High
4	Using the Connectivism-Based ID Model would increase my productivity.	3.45	0.77	Moderate

5	I prefer other traditional ID models to a Connectivism-Based ID Model to design MOOCs.	2.54	1.07	Moderate
6	The connectivism-based ID Model would make MOOCs' design more effective.	3.69	0.70	High
7	Using a Connectivism-Based ID Model would be a very good idea.	4.06	0.82	High

The content analysis checklist

This CAC aimed to answer the question "To what extent are the Connectivism principles implemented in the current MOOCs' instructional design?" 30 courses were evaluated using the CAC on 3 different platforms, Coursera, EDX and Futurlearn. The researcher examined 8 courses in Futurelearn and 11 courses for both EDX and Coursera. The first part of the Questionnaire is the course demographics. The second part addressed the connectivism pedagogy. The third part addressed the MOOC network and the Fourth part addressed the MOOC learning environment principles. On the majority of connectivism principles, the majority of MOOCs received a low score. Each course received a score ranging from 0 to 144, if the MOOC scored 0, that would indicate that the MOOC didn't reflect any of the Connectivism principles or criteria and if it scored 144 that means that the MOOC does reflect all principles and criteria to an extremely high degree. The range of scores for the whole sample of 30 MOOCs was 0-100 points, with a mean value of 84.36, according to the research (STD 6.50). The findings are summarized and discussed further.

Course demographics

Table 6 below shows that the majority of the courses' duration was 3 weeks which was by scoring 7 courses 23%. Whereas 6 courses were four weeks 20%. While one course only was examined for the duration of 2, 8, 9, 11 and 13 weeks.

Table 6
MOOCs demographics

	Course Duration	**Number of Courses**	**Percentage**
1	2 weeks	1	3%
2	3 weeks	7	23%
3	4 Weeks	6	20%
4	5 Weeks	3	10%
5	6 Weeks	4	13%
6	7 Weeks	3	10%
7	8 Weeks	1	3%
8	9 Weeks	1	3%
9	10 Weeks	2	6%
10	11 Weeks	1	3%

11	13 Weeks	1	3%

Connectivism pedagogy

Items 7 through 19 in the instrument focused on evaluating the alignment between MOOC instructional design and Connectivist pedagogy. Most MOOCs received low scores in this domain, with an average of 20.76 out of a possible 36 points. Although many courses permitted open enrollment, only half offered learning activities beyond the platform itself. Additionally, 93.33% failed to allow learners to define their objectives, limiting autonomy. Most courses (76.67%) lacked peer-to-peer assessments or mechanisms for learner contributions to influence course content, suggesting a limited recognition of diversity. These findings are detailed in Table 7.

Table 7
MOOCs demographics

Item No	Questions	Yes	No	None	To some extent	To large extent	To a very large extent	N/I
1	Does the MOOC allow learners to key in their objectives?	2 6%	28 93%					0 0%
2	Is the MOOC open for enrolment?	30 100%	0 0%					0 0%
3	Does the MOOC promote learners' contribution?	0 0%	30 100%					0 0%
4	The MOOC activities require participants to learn from each other.			6 20%	15 50%	7 23%	2 6.%	0 0%
5	The MOOC activities require participants to contribute to the collective knowledge.			9 30%	17 56%	4 13%	0 0.00%	0 0%
6	The MOOC activities require participants to collaborate with other course participants.			23 76%	3 10%	2 6%	2 6%	0 0%
7	The MOOC activities require participants to collaborate with others outside the MOOC.			28 93%	1 3%	0 0.00%	1 3%	0 0%
8	Is there any feedback on the MOOCs' activities by the instructor(s) in this course?	24 80%	6 20%					0 0%
9	Is the feedback provided clearly explained to the participants?	24 80%	6 20%					0 0%
10	To what extent does the MOOC give learners opportunities to use/explore new technologies?			18 60%	7 23%	3 10%	2 6%	0 0%

11	Does the MOOC propose activities outside the MOOC platform?	15 50%	15 50%	0 0%
12	Does the MOOC allow learners to suggest new questions?	1 3%	29 96%	0 0%
13	Does the MOOC propose peer-to-peer assessment activities?	7 23%	23 76%	0 0%

MOOCs network

The second construct that another component assessed was the extent to which MOOCs enabled learner connections with resources and instructors. Most MOOCs again scored poorly, averaging 17 out of 42 points. In 90% of the courses, the structure of connections and information flow failed to reflect a decentralised, networked learning model. Furthermore, 83% featured "single points of failure," contradicting the Connectivist goal of establishing resilient, distributed knowledge networks. As a result, most MOOCs necessitated substantial infrastructure, including powerful servers, high bandwidth, and massive storage. Furthermore, most MOOCs did not take advantage of the learner's digital footprint to provide ongoing feedback to assist them in improving their knowledge or activities. The complete and detailed results can be found in Table 8.

Table 8
MOOCs network

Item No	**Questions**	**Yes**	**No**	**None**	**To some extent**	**To large extent**	**To a very large extent**	**N/I**
1	The weight of connections and the flow of information are distributed. (There is no one particular connection magnet for all the connections).			27 90%	3 10%	0 0%	0 0%	0 0%
2	There is no single point of failure of the MOOC. (The MOOC entities reside in different physical locations).			25 83%	3 10%	2 6.67%	0 0%	0 0%
3	There is no need for major infrastructures, such as powerful servers, large bandwidth, and massive storage to run the MOOC.			25 83%	3 10%	2 6.67%	0 0%	0 0%
4	The MOOC content is constantly changing with learners' contributions.			27 90%	3 10%	0 0.00%	0 0%	0 0%

5	There are no plug-ins required to run the MOOC.	30 100%	0 0%					0 0%
6	The MOOC can be accessed by the same tools we use to perform day-to-day activities. No need for special software (Android, Windows, Mac, OSX).	30 100%	0 0%					0 0%
7	No particular device is needed to run the MOOC.	30 100%	0 0.%					0 0%
8	Learners can create artefacts.	11 36%	19 63%					0 0%
9	Learners can share the artefacts they created.	10 33%	20 66%					0 0%
10	The MOOC keeps track of every user activity.			13 43%	17 56%	0 0%	0 0%	0 0%
11	Does the MOOC use an activity track to calculate learners' progress?			14 46%	16 53%	0 0%	0 0%	0 0%
12	Does the MOOC use activity tracking to give learners automated and informed feedback?			16 53%	14 46%	0 0%	0 0%	0 0%
13	Learners' network activities considered in learners' evaluation			19 63%	11 36%	0 0%	0 0%	0 0%

MOOCs learning environment

The third construct sought to determine how often the principles of the learning environment are used in MOOC instructional design. The final construct evaluated was learner interaction and engagement. Scores were again low, with an average of 46.6% and a standard deviation of 3.69. A large majority (86%) did not include live sessions, while 90% lacked instructor-led video updates. Synchronous communication tools were absent in 93.33% of the courses, and none included mechanisms for recognising or promoting experienced learners. Full results are illustrated in Table 9.

Table 9
MOOCs learning environment

Item No	Questions	Yes	No	None	To some extent	To large extent	To a very large extent	N/I
1	To what extent does the MOOC involve the creation of knowledge and			9 30%	18 60%	3 10%	0 0%	0 0%

	practices by its community?															
2	Does the MOOC contain different levels of difficulty, with different learning pathways?					3	10 %	11	36%	6	20%	10	33%	0	0%	
3	Are participants assisted by a technical guide for good navigation?					3	10%	7	23%	9	30%	11	36%	0	0%	
4	Does the instructor propose live events (Hangout, Tweetchat)?					26	86%	0	0%	1	3%	3	10%	0	0%	
5	Can resources be downloaded, stored and used without an internet connection?					6	20%	3	10%	4	13%	17	56%	0	0%	
6	As the course progresses, does the instructor provide video updates to summarize comments, synthesise discussions, provide critical perspectives, and direct learners to resources they may not have encountered before?					27	90%	2	6%	1	3%	0	0%	0	0%	
7	Learning activities can be completed (either indicated by the learner as completed or ticked as completed by the system or by the teacher)	30	100%	0	0%									0	0%	
8	Does the learning environment allow learners to communicate at least once face-to-face with the instructor?	2	6%	28	93%									0	0%	
9	Does the learning environment allow learners to	4	13%	26	86%									0	%	

	communicate face-to-face with other learners?														
10	Are the expected knowledge/Skills stated clearly?					0	0%	1	3%	3	10%	26	86%	0	0%
11	Does the MOOC state the expected activities?					15	50%	9	30%	3	10%	3	10%	0	0%
12	Does the MOOC give proper feedback to improve knowledge/Skills acquisition?					18	60%	4	13%	5	16%	3	10%	0	0%
13	Does the MOOC give proper feedback to improve activities' performance?	2	6%	28	93%									0	0.00%
14	Does the MOOC allow learners to mark the course as complete to calculate progress?	0	0%	30	100%									0	0%
15	Does the MOOC provide a clear and detailed video guide to all new learners?	2	6%	28	93%									0	0%
16	Do the MOOC activities presented through the course gradually from easier to more complicated (awareness to praxis)?					7	23%	7	23%	8	26%	8	26%	0	0%
17	Does the MOOC allow learners to choose skills/knowledge to learn from the beginning of the course?					4	13%	1	3%	10	33%	15	50%	0	0%
18	Does the MOOC have an automated promotion mechanism to promote learners from novice learners to competent learners?	0	0%	30	100%									0	0%

19	Is there a list of expected activities that need to be performed to complete the MOOC?	4	13%	26	86%	0	0%
20	Is the Online participant list available to help learners to do synchronous discussions?	2	6%	28	93%	0	0%
21	Does the MOOC have a learning environment map?	0	0%	30	100%	0	0%

Discussions and conclusion

This needs analysis research is composed of two stages. Stage one was executed via a survey comprising 20 items covering these three aspects such as demographic information of the instructional designers, the instructional designers' opinions of the use of traditional instructional design models to design MOOCs and the instructional designers' degree of inclination towards using a connectivism-based instructional design model in designing MOOCs. The survey questionnaire items were constructed and validated using the CVI analysis. The questionnaires were administered to 59 instructional designers. Microsoft Excel was used to analyze the data gained from this first phase. The need for a connectivism-based model to design the MOOCs was established by an analysis of frequency, percentage, standard deviation and mean score. In identifying these needs, the needs analysis stage took into account the opinions of the instructional designers. The findings regarding the perception of instructional designers on the use of the current traditional models in designing MOOCs found that the majority of them consider it vital for instructional designers to learn the application of ID models in designing online courses. In addition, some of them will continue to use the traditional models as and when relevant or appropriate. However, the majority of them don't mind changing the traditional models they use to design MOOCs to a connectivism-based model.

The findings investigated the acceptance and the intention of the instructional designers to use a connectivism-based model in the MOOC's design development. In other words, the purpose of this research was to gather instructional designers' views on their intentions to apply it in their design process. Based on the findings, the instructional designers are very receptive to the use of a connectivism-based model in the MOOC design process. These significant findings are in alignment with the view of Stanley (2015) and Alqahtani et.al., (2023) when they reported in their study that MOOC designers still use the already existing ID models to design MOOC without making any adaptations to suit the MOOC environment, and she has recommended having a new ID model for MOOCs. Lackner (2014) also believed that a special instructional design was imperative for MOOCs to become indispensable to students and instructors. Lastly, (Saadatmand, 2017) also sees that traditional ID models that were used in the creation and execution of MOOCs are being contested and may no longer be deemed relevant to MOOCs' educational contexts.

A Content Analysis Checklist was developed and validated using the CVI method. The CSQ had 47 items aimed to examine 3 main constructs that are seen to be essential in connectivism theory, connectivism principles, the network learning principles and the digital learning environment principles. A sample of 30 courses was examined using the CSQ on 3 different platforms, Coursera, EDX and Futurelearn. The researcher examined 8 courses in Futurelearn and 11 courses for both EDX and Coursera. The first part of the Questionnaire is the course demographics. The second part addressed the connectivism pedagogy. The third part addressed the MOOC network and the Fourth part addressed the MOOC learning environment principles.

On the majority of connectivism principles, the majority of MOOCs received a bad score. The available scores for each course ranged from 0 to 144, with 0 indicating that the course did not mirror any Connectivism principles or measures, and 144 being indicative of all principles and measures being mirrored to an exceedingly high degree. The range of

scores for the whole sample of 30 MOOCs was 0-100 points, with a mean value of 84.36, according to the research (SD 6.50). These findings supported the study of Margaryan et.al.,)2015) when a random sampling of 76 MOOCs reported a low-quality of instructional design. More reports of low-quality MOOC instructional design in other studies indicate that consideration of a new instructional design for MOOCs is long due (Sergis et.al., 2017). The conclusions drawn from part 2 of the needs analysis research support the findings in part 1 of a need to build a connectivism-based model to guide instructional designers to apply connectivism principles in their MOOCs design process. Overall, the evaluation reveals that most MOOCs fail to effectively incorporate Connectivism principles. Consequently, the instructional design quality of current MOOCs remains suboptimal when analysed through a Connectivist lens. These findings supported that further research should focus on the need to develop another new ID model to ensure that connectivism learning theory is actively implemented in MOOCs.

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