International Journal of Instruction *January 2025 ● Vol.18, No.1*
e-ISSN: 1308-1470 ● www.e-iji.net *p-ISSN: 1694-609X*
pp. 549-568

Article submission code: 20240627190654
Received: 27/06/2024 Revision: 13/09/2024
Accepted: 20/09/2024 OnlineFirst: 05/10/2024

Enhancing Emotional and Social Engagement of Women with Disabilities in the Labor Market through Collaborative Learning in MOOCs

Aljawharah M. Aldosari
College of Education and Human Development, Bisha University, Saudi Arabia, *aljreyah@ub.edu.sa*

Refah Mobarak Ali Alshahrani
College of Education and Human Development, Bisha University, Saudi Arabia, *aljreyah@ub.edu.sa*

Hala F. Eid
Corresponding author, Department of Business Administration, Applied College, Bisha University, Saudi Arabia, *halh@ub.edu.sa*

In recent years, the rise of Massive Open Online Courses (MOOCs) has revolutionized the field of education, providing accessible and flexible learning opportunities to individuals worldwide. MOOCs have the potential to empower traditionally marginalized groups, including women with disabilities, by offering them a platform to enhance their skills and knowledge. However, the successful integration of women with disabilities into the labor market requires more than just technical expertise; it necessitates the development of emotional and social engagement skills. This study aims to investigate the implementation of collaborative learning projects in MOOCs, including the creation and allocation of group learning environments, the identification and provision of recommendations for successful group learning, the evaluation of learning outcomes, and the generation of adaptive feedback. Implementing learning groups in MOOCs necessitates comprehensive and integrated solutions. The study's key finding highlights that MOOCs can effectively cultivate collaborative learning by establishing clear learning objectives, forming diverse and inclusive groups, providing explicit guidelines, closely monitoring progress, delivering timely feedback, acknowledging, and rewarding individual contributions, and ensuring adequate technological support. By implementing these strategies, MOOCs have the potential to foster collaborative learning, enhance women with disabilities engagement, motivation, and learning outcomes, and ultimately empower them to thrive in the labor market.

Keywords: emotional engagement, social engagement, MOOCs, labor market, motivation, women with disabilities

Citation: Aldosari, A. M., Alshahrani, R. M. A., & Eid, H. F. (2025). Enhancing emotional and social engagement of women with disabilities in the labor market through collaborative learning in MOOCs. *International Journal of Instruction*, *18*(1), 549-568. https://doi.org/10.29333/iji.2025.18130a

INTRODUCTION

In recent years, the rise of Massive Open Online Courses (MOOCs) has revolutionized the field of education, providing accessible and flexible learning opportunities to individuals worldwide (Ebner et al., 2020). MOOCs have the potential to empower traditionally marginalized groups, including women with disabilities, by offering them a platform to enhance their skills and knowledge. However, the successful integration of women with disabilities into the labor market requires more than just technical expertise; it necessitates the development of emotional and social engagement skills (Lambert, 2020).

Collaborative learning has emerged as a promising approach to foster emotional and social engagement in online learning environments. By engaging in collaborative activities, learners can interact with their peers, share experiences, and develop crucial interpersonal skills. Therefore, enhancing emotional and social engagement in collaborative learning within MOOCs is essential for creating a fulfilling educational experience. By implementing structured collaborative activities, fostering a sense of community, utilizing technology, personalizing feedback, and promoting inclusivity, instructors can significantly improve learner engagement (Alamri et al., 2021). As MOOCs continue to evolve, prioritizing these elements will be crucial for ensuring that all learners could thrive in an increasingly digital educational landscape. Through thoughtful design and intentional practices, MOOCs can transform into vibrant learning communities that inspire and empower learners (Elizondo-Garcia et al., 2019). To enhance emotional and social engagement in MOOCs, several strategies can be implemented. Firstly, structured collaborative activities like group projects, peer reviews, and discussion forums can encourage interaction, with clear guidelines helping learners navigate these tasks effectively. Secondly, fostering a sense of community is crucial; instructors can create dedicated interaction spaces, conduct regular check-ins, and facilitate team-building exercises to help learners connect (Watted, 2023). Thirdly, leveraging technology such as video conferencing and collaborative platforms can promote real-time interaction and more dynamic learning experiences. Additionally, personalizing the learning experience through timely feedback and recognition of individual achievements can further engage learners (Shana & Alwaely, 2021). This article explores the significance of enhancing emotional and social engagement of women with disabilities in the labor market through collaborative learning in MOOCs (O'Brien et al., 2024).

The Need for Collaborative Learning in MOOCs

MOOCs offer free, online courses to anyone with an internet connection and have been adopted by a growing number of universities and institutions worldwide (Kennedy & Laurillard, 2019). Several studies have shown that MOOCs have the potential to provide access to education for learners who may not have access to traditional educational opportunities. A study by Liyanagunawardena et al. (2013) found that the majority of MOOC learners come from developing countries and have limited access to education. Additionally, MOOCs have been found to be effective in providing professional development opportunities for individuals who are already employed

(Radford et al., 2014). MOOCs have also been found to be effective in improving learning outcomes. A study by Yousef et al. (2015) found that MOOCs can improve student achievement and retention rates, especially when accompanied by active learning strategies such as peer feedback and collaborative learning.

MOOCs follow a more instruction-oriented didactic concept, according to which the learning material of a course is structured into smaller, thematic units. Each unit consists of a sequence of a collection of videos (e.g., short lecture, summary, reading materials, exercise, and collaborative discussion forums) followed by quizzes intended to give the course participant feedback on their level of achievement (Liu, 2021). Due to the necessary scalability to large numbers of participants, there is no personal support for the participants (e.g., direct communication, supervised forums, correction of exercises) instead, automatic correction procedures for the exercises must usually be sufficient. In this respect, MOOC is distance learning with a very large number of participants, without the usual forms of collaborative learning support (Zaremohzzabieh et al., 2022).

The COVID-19 paradox of online collaborative education

The COVID-19 pandemic has significantly impacted the growth rate of distance learning. As schools and universities around the world were forced to close their doors to prevent the spread of the virus, many turned to online and distance learning as a means of continuing education (Resnik et al., 2022). According to a report by UNESCO, the pandemic has resulted in the largest disruption of education in history, with more than 1.5 billion students affected by school and university closures. This has led to a surge in demand for online and distance learning options. The report states that as of September 2020, over 94% of the world's student population was affected by school closures, and more than 1.2 billion learners were using online and distance learning platforms, as shown by the statistical analysis in the Figure 1 (UNESCO, 2020). However, MOOCs face several challenges, including low completion rates, limited engagement, and lack of accreditation. A study by Ho et al. (2022) found that completion rates for MOOCs are typically low, with only a small percentage of learners completing the course. Additionally, MOOCs have been found to have limited engagement, with many learners dropping out after the first week of the course. The question therefore arises as to whether and how distributed collaborative learning can be used to support learners in MOOCs and what challenges arise.

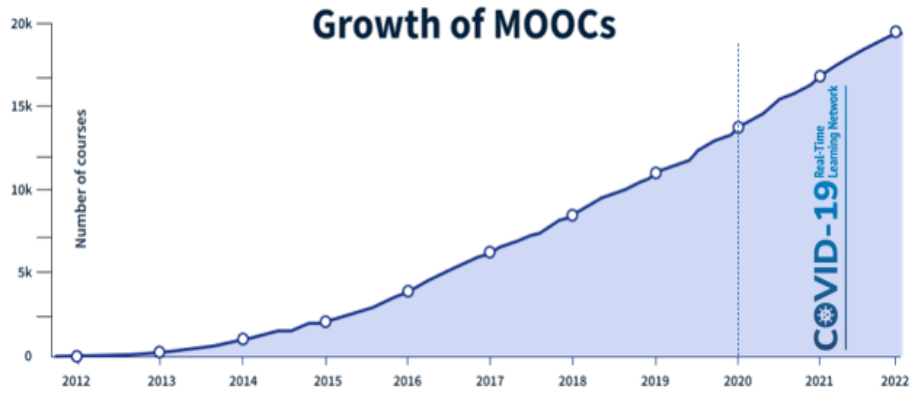

Figure 1
The growth in MOOCs courses available for a decade adaptive from (Shah, 2021)

Collaborative activities are one of the most important components of active learning strategies, which can be used and employed through MOOCs, as they greatly contribute to encouraging students to search and interact during the learning process, especially when applying collaborative learning strategies (Cohen, 2019). According to the connectivism learning theory, the learner's performance should be active within the online learning environment, where this is done by integrating a variety of learning activities in MOOCs. The success of collaborative learning depends largely on the ability of the group members to conduct as effectively a sequence of learning activities as possible (Downes, 2019). However, collaborative learning in MOOCs also faces several challenges that can hinder its effectiveness. One of the significant challenges of collaborative learning in MOOCs is the uneven participation of learners. A study by Hu et al. (2022) found that some learners tend to dominate the conversation, while others remain silent. This can lead to a lack of engagement and participation among some learners. Collaborative learning in MOOCs can also lack social presence, which can hinder the formation of meaningful connections between learners. A study by Zhu et al. (2018) found that collaborative learning activities in MOOCs often lack the sense of community and social interaction that is present in traditional classroom settings. Collaborative learning in MOOCs can also be hindered by limited feedback. A study by Wang et al. (2018) found that peer feedback in MOOCs can be limited and ineffective, leading to a lack of engagement and motivation among learners.

On the other hand, the development of new collaborative learning models and approaches is expected to drive the widespread adoption of collaborative learning in MOOCs. There is a large volume of published studies describing the role of collaborative learning in MOOCs that can enhance students' emotional and social engagement. A study by Hoppe et al. (2021) found that collaborative learning activities in MOOCs led to an increase in students' emotional engagement, including their interest and motivation to learn. Another study by Wang and Yang (2023) found that collaborative learning in MOOCs increased students' social engagement, including their

sense of belonging and social connectedness with other learners. This study aims to investigate the development of social and emotional skills among women with disabilities participating in MOOCs through collaborative learning, supported by learning analytics models.

Research Questions:

1. How can collaborative learning in MOOCs facilitate the development of social and emotional skills among women with disabilities?
2. What are the key factors that contribute to the success of collaborative learning in enhancing social and emotional engagement of women with disabilities in MOOCs?
3. How can learning analytics models be utilized to support and enhance collaborative learning experiences for women with disabilities in MOOCs?
4. What are the implications of developing social and emotional skills through collaborative learning in MOOCs for the labor market inclusion of women with disabilities?

Theoretical Foundation

The intersection of disability, education, and employment has garnered increasing attention in recent years, particularly as it pertains to women with disabilities. This literature review examines the role of collaborative learning in Massive Open Online Courses (MOOCs) as a means to enhance emotional and social engagement among this demographic, ultimately aiming to improve their labor market outcomes. More recent attention has focused on the provision of collaborative learning, connectivism, and learning analytics play significant roles in MOOCs, offering opportunities for enhanced engagement, knowledge creation, and data-driven decision-making. Collaborative learning activities in MOOCs promote effective communication and teamwork, while connectivism emphasizes networked learning and individualized experiences. The following section gives a brief overview of the theoretical foundation of this study.

Emotional Engagement

Emotional engagement in learning environments is crucial for motivation and retention. Research by Obiosa (2020) emphasizes that emotional engagement encompasses students' affective reactions to learning tasks, which can be particularly significant for women with disabilities. Studies, such as those by Amukune and Józsa (2023), have shown that positive emotional experiences can lead to increased persistence in educational pursuits. For women with disabilities, who often face societal stigma and barriers, fostering an emotionally supportive learning environment can enhance their confidence and commitment to learning.

The study in question builds on these findings by exploring how collaborative learning in MOOCs can enhance emotional engagement. The significant difference in emotional engagement scores between the two groups in the study highlights the potential of MOOCs to create a sense of belonging and motivation among participants. By

incorporating elements that resonate emotionally, such as relatable narratives and peer support, MOOCs can empower women with disabilities to pursue their education and career goals.

Social Engagement

Social engagement is equally important, as it relates to the interactions and relationships formed within educational contexts. Research indicates that social networks significantly influence career opportunities and professional growth (Murwaningsih, 2024). For women with disabilities, social engagement can mitigate feelings of isolation and provide essential support systems. A study by Breindl (2010) found that participation in online communities enhances social capital, which is vital for navigating the complexities of the labor market.

The current study demonstrates that collaborative learning environments in MOOCs can significantly improve social engagement. The findings suggest that women with disabilities who participate in collaborative activities are more likely to engage with peers, contribute to discussions, and share resources all of which can enhance their employability skills. This aligns with research by Toma and Berge (2024), who posits that community-building efforts within online courses lead to greater student satisfaction and engagement.

Learning theories for collaborative learning in MOOCs

Behavioral learning theory, which emphasized reinforcement as a mechanism for learning, has evolved with the advancement of digital communication technologies. Collaborative learning in Massive Open Online Courses (MOOCs) has emerged as a strategy to foster effective communication, sharing skills, and knowledge creation among students. This literature review aims to explore the relationship between collaborative learning, connectivism, and learning analytics in MOOCs, highlighting their potential benefits and challenges.

Collaborative learning in MOOCs encompasses various activities such as discussion forums, peer feedback, and group projects. Research by Joo et al. (2018) demonstrated that group projects in MOOCs enhance collaborative learning and increase student satisfaction with the course. It involves dividing students into groups to discuss specific topics, solve problems, and work together towards a common goal. This approach encourages students to listen to diverse perspectives, express and defend their ideas, and navigate challenges (Hernández-Sellés et al., 2019).

Connectivism, a learning theory that emphasizes networked learning, has gained attention in the context of MOOC activities. MOOCs, with their focus on social networks, self-directed learning, openness, and networked learning, offer learners a tailored and diverse learning experience. This approach facilitates engagement, motivation, and improved learning outcomes (Bakki et al., 2020; Downes, 2019). Networked learning in MOOCs fosters deeper learning, better knowledge retention, and increased motivation and engagement among learners (Kop et al., 2011).

Learning analytics dashboards are tools that provide educators with real-time data and visualizations of learner performance and engagement. These dashboards support data-driven decision-making to enhance the learning experience and support learners. For example, Yousef and Khatiry (2021) developed a learning analytics dashboard for a MOOC on educational research methods, which included features such as real-time performance data, visualizations of learner progress, and predictive analytics to identify at-risk learners.

Obstacles to Collaborative Learning in MOOCs:

In order to gain a deeper understanding of the obstacles encountered by students engaging in online participatory collaborative learning, a series of interviews were conducted with 23 women with disabilities across various disciplines at Charity Albir in Bisha (Itaa). The sample was carefully selected to ensure representation in terms of both gender and disciplines. Among the participants, 12% reported having vision impairment, 15% experienced hearing difficulties, and 73% faced physical disabilities. Additionally, to corroborate these challenges, we sought input from the faculty members at Bisha University, comprising 19 individuals. Approximately 47% of the faculty members specialized in teaching scientific subjects, while the remaining 53% focused on social subjects. The interviews revealed various obstacles, which are summarized in Table 1:

Table 1
The basic obstacles facing students during participatory in collaborative learning online

No	Item	Faculty members n=19		Women n=23	
		Repetition	**%**	Repetition	**%**
1	Women with disabilities lack social presence.	12	63%	15	65%
2	Women' lack of collaborative learning skills, especially in the early years.	13	68%	19	82%
3	Lack of sufficient support from the faculty members for collaborative learning strategies in MOOCs.	16	84%	21	91%
4	The lack of emotional engagement caused by the decreased women with disabilities ' positive attitude.	17	89%	18	78%

The table indicates that both faculty members and women with disabilities recognize similar obstacles in participatory collaborative learning online. These challenges include a lack of social presence, students' deficient collaborative learning skills, insufficient support from faculty members for collaborative learning strategies in MOOCs for women with disabilities and decreased positive attitude leading to reduced emotional engagement. Addressing these obstacles can help improve the effectiveness and outcomes of collaborative learning experiences in online environments. The existing literature on behavioral engagement in MOOCs has highlighted the importance of course social interactions in promoting engagement (Sun & Bin, 2018). Moreover, previous studies have explored the relationships between collaborative learning and

students' engagement especially in higher education (Brindley et al., 2020). These studies indicate the need for teaching strategies that not to depend on the teacher as a first and last source of information, and not to depend on a specific group of students without others. Thus, in the collaboration phase, the learners attach particular importance to taking their time restrictions into account, so that all group members are available for any synchronous collaboration (Capdeferro & Romero, 2020). Likewise, a local proximity of the group members is desirable, so that local meetings are possible if necessary. Finally, MOOCs should ensure that groups are formed in a way that encourages collaboration and diversity. Groups should be formed based on shared interests or learning goals, and students should be encouraged to work with peers who have different backgrounds and perspectives (Saqr et al., 2020).

METHOD

The current research relied on the semi-experimental approach to measure the effect of interaction within collaborative groups in MOOCs compared to those studied individually, that combine elements of both experimental and observational studies. Unlike fully randomized experiments, semi-experimental designs may not randomly assign participants to treatment and control groups. Instead, they often rely on pre-existing groups or conditions, allowing researchers to assess the impact of an intervention while considering real-world variables and contexts.

Tailoring the Semi-Experimental Approach in the Study

1. **Target Population**: The study focuses on women with disabilities, a specific demographic that may not be easily randomized due to logistical or ethical concerns. By using a semi-experimental design, the researchers can work within existing groups or communities. The study population will consisted of women with disabilities who have participated in training programs aimed at promoting their employment (O'Cathain, 2020). Participants were recruited through community-based organizations, disability advocacy groups, and job placement agencies. This study recruited a total of 90 participants with ages ranging from 27 to 45 years. These participants were randomly assigned to either an intervention group or a control group. The MOOC training program, which aimed to enhance metacognitive knowledge and promote the use of effective training strategies, consisted of three key components: awareness, reflection, and practice. Among the participants, 12% had vision impairment, 15% were hard of hearing, and 73% had a physical disability as depicted in Figure 2.
2. **Collaborative Learning Environment**: The use of MOOCs (Massive Open Online Courses) allows for a natural setting where participants engage collaboratively. This environment can be observed and analyzed without strict experimental controls, making it more reflective of real-world scenarios.
3. **Data Collection**: Researchers can employ both qualitative and quantitative methods to gather data on emotional and social engagement. Surveys, learning

analytics dashboard, and participation metrics can provide a comprehensive view of the impact of the intervention.

4. **Comparative Analysis**: The study can compare the outcomes of participants who engage in collaborative learning with those who do not, examining differences in engagement levels. This comparative aspect is key to assessing the effectiveness of the approach.
5. **Contextual Factors**: The semi-experimental design allows the researchers to take into account various contextual factors that may influence engagement, such as socio-economic status, prior education, and support systems, which are crucial for understanding the experiences of women with disabilities in the labor market.

Measurement tools

The experiment was applied in the "Teaching and Learning Methods" course, which is presented online via MOOCs, and the results of the research were measured through the following tools:

Learner engagement in MOOCs Scale (Deng et al., 2020): the MES provides a valuable tool for improving MOOCs by identifying areas of low engagement, personalizing learning experiences, providing feedback, promoting social interaction. The scale consists of 12 items that measure learner engagement across three dimensions: behavioral engagement, emotional engagement, and cognitive engagement. The behavioral engagement dimension measures the extent to which learners are actively participating in the course, such as by completing assignments, watching videos, and participating in discussion forums. The emotional engagement dimension measures the extent to which learners are emotionally invested in the course, such as by feeling motivated, interested, and satisfied with the learning experience. The cognitive engagement dimension measures the extent to which learners are intellectually engaged in the course, such as by reflecting on their learning, applying what they have learned, and generating new ideas.

Learning analytics dashboard (Yousef & Khatiry, 2021). The learning analytics dashboard is used to personalize learning experiences for individual learners based on their engagement levels. For example, learners who are highly engaged may benefit from more challenging assignments or opportunities to collaborate with peers, while learners who are less engaged may benefit from more support and scaffolding. For example, learners who are struggling with a particular concept may receive targeted resources and support.

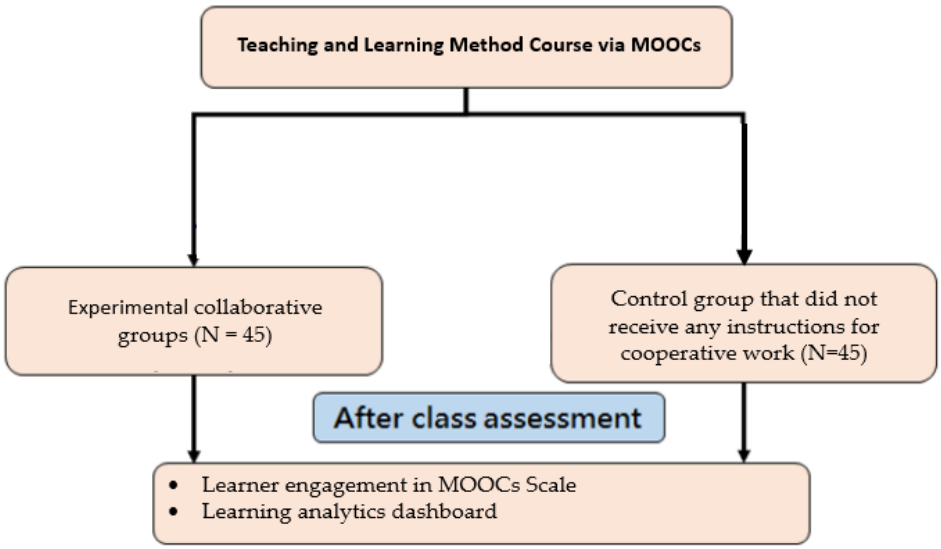

Figure 2
The distribution of groups according to the design of the research sample

The participants in the control group are expected to be independent learners, taking responsibility for their own learning, and managing their time and resources effectively. On the other hand, the experimental group participants are expected to be active learners, engaging in discussions, projects, and other activities that promote deeper learning and understanding. Both groups' women are often comfortable with using technology and may have grown up with digital tools and platforms.

The study encompassed a module on electronic accounting, which exemplifies the real-world utilization of computers and contemporary technology in the accounting realm, obviating the necessity for conventional manual accounting practices. Online accounting relies on tailor-made accounting software that facilitates the digital execution of accounting procedures. The course was delivered via a digital platform to both the control and experimental groups, wherein the experimental group received additional social assistance and support through cooperative learning techniques and discussions. The training course lasted for 8 weeks, from 1/7/2023 to 30/8/2023.

FINDINGS AND DISCUSSIONS

The specific objective of this study was to develop women's' social and emotional skills among MOOC participants by supporting collaborative learning using learning analytics models. The results from this study are divided into two major parts i.e., learner engagement in MOOCs and using learning analytics.

Learner Engagement in MOOCs

Deng et al. (2020) develops and validates a MOOC engagement scale (MES) to assess women's' engagement in online courses. The MES scale has four components: social engagement, emotional engagement, cognitive engagement, and behavioral engagement. Using 5-point Likert scale (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree. The results from MES are presented in Table1.

Table 1
Comparison of groups in the MOOC engagement scale (MES)

No	Item	G1 (Mean)	G1 (SD)	G2 (Mean)	G2 (SD)	T-Test	Sig.
Behavioral engagement							
1	I set aside a regular time each week to work on the MOOC.	3.1	1.1	4.2	0.9	0.7740	Not Sig.
2	I took notes while studying the MOOC.	3.5	0.78	4.2	0.88	0.5953	Not Sig.
3	I revisited my notes when preparing for MOOC assessment tasks.	4.2	0.75	4.6	0.81	0.3624	Not Sig.
Cognitive engagement							
4	I often searched for further information when I encountered something in the MOOC that puzzled me.	3.5	0.98	3.8	0.93	0.2221	Not Sig.
5	When I had trouble understanding a concept or an example, I went over it again until I understood it.	4.1	0.55	4.3	0.61	0.2435	Not Sig.
6	If I watched a video lecture that I did not understand at first, I would watch it again to make sure I understood the content.	2.3	3.9	2.6	4.2	0.3476	Not Sig.
Emotional engagement							
7	I was inspired to expand my knowledge in the MOOC.	2.3	0.63	4.6	0.93	2.0475	Significant
8	I found the MOOC interesting.	2.6	0.53	4.2	0.71	1.8059	Significant
9	I enjoyed watching video lectures in the MOOC	4.1	0.88	4.2	0.83	0.0827	Not Sig.
Social engagement							
10	I often responded to other learners' questions.	1.8	0.33	4.2	0.72	3.0302	Significant
11	I contributed regularly to course discussions.	1.9	0.36	3.9	0.62	2.7896	Significant
12	I shared learning materials (eg, notes, multimedia, links) with other classmates in the MOOC	2.1	0.46	4.3	0.52	3.1688	Significant

G1 = Control Group; G2 = Experimental Group; SD = Standard deviation; DF = 88
Sig. = Significant 95% confidence interval of the difference

The results indicate that there were significant differences in behavioral engagement across groups, with Group 1 (G1) reporting a mean of 3.1 (SD = 1.1) for setting aside regular time for the MOOC, compared to Group 2 (G2) at 4.2 (SD = 0.9; T-Test = 0.7740), and similar findings for note-taking (G1: 3.5, SD = 0.78; G2: 4.2, SD = 0.88; T-Test = 0.5953) and revisiting notes (G1: 4.2, SD = 0.75; G2: 4.6, SD = 0.81; T-Test =

0.3624). Cognitive engagement also showed significant differences, with G1 averaging 3.5 (SD = 0.98) for searching further information versus G2's 3.8 (SD = 0.93; T-Test = 0.2221), and similar results for revisiting difficult concepts and watching videos again. In contrast, emotional engagement revealed significant differences, as G2 felt more inspired to expand their knowledge (G1: 2.3, SD = 0.63; G2: 4.6, SD = 0.93; T-Test = 2.0475) and found the MOOC interesting (G1: 2.6, SD = 0.53; G2: 4.2, SD = 0.71; T-Test = 1.8059), while enjoyment of video lectures showed no significant difference (G1: 4.1, SD = 0.88; G2: 4.2, SD = 0.83; T-Test = 0.0827). Finally, social engagement was significantly higher in G2, with means of 4.2 (SD = 0.72) for responding to other learners (G1: 1.8, SD = 0.33; T-Test = 3.0302), contributing to discussions (G1: 1.9, SD = 0.36; G2: 3.9, SD = 0.62; T-Test = 2.7896), and sharing learning materials (G1: 2.1, SD = 0.46; G2: 4.3, SD = 0.52; T-Test = 3.1688).

It can be seen from the data in Table 1 that the results of behavioral engagement as well as cognitive engagement were insignificant between the two groups, and this is since the video-designed lectures within the learning environment were beneficial to the cognitive side. These results are consistent with the study of Wei et al. (2021), who indicated that the cognitive aspect is closely related to the women's' behavior, especially when it is in the study of the MOOCs that arises from their personal choice.

While social engagement as well as emotional engagement, there were statistically significant differences in favor of the G2 experimental group. By analyzing the results of the social skills of the second experimental group, we find that this group had a different privacy from the first control group, as the interaction within the groups helped the women's' of the group to establish social relationships by commenting on their colleagues and creating sub-groups for private discussion at a specific point, and this is what the t-test result indicated for social skills in the second experimental group, which is significant at the level of 0.05, and this explains the difference between it and the first group, as its results were not significant. The most obvious finding to emerge from the analysis is that interaction through MOOCS group discussions led to the strengthening of personal relationships between group members, in contrast to separate learning pathway. This goes in the same direction with the vision of George Siemens in connectivism learning theory, whereby social interaction on educational topics ultimately leads to the acquisition or development of a set of habits, ideas, and attitudes, such as the ability to manage dialogue and the courage to express opinions, as indicated by the results of the social engagement scale items from 10-12 which reflect the principles of connectivism (Downes, 2019).

Moreover, collaborative learning includes many patterns of communication that usually takes place through free discussions, which in turn includes many nodes and connections, which calls for contemplation and the discovery and assimilation of concepts and principles. This is achieved by using several operations such as: prediction, observation, research and investigation, comparison, logical reasoning, in addition to courage and the ability to make decisions (Kaliisa et al., 2022).

Several factors have been found to affect behavioral engagement in MOOCs, including course content, learner characteristics, and social interactions (Deng et al., 2020). Research has found that women's' with disabilities are more likely to be behaviorally

engaged when the course content is relevant and meaningful to their interests and goals, when they have a strong sense of self-efficacy, and when they have opportunities to interact with other learners and receive feedback (Sökmen, 2021). Several studies have examined the predictors of behavioral engagement in MOOCs. For example, a study by Zheng et al. (2023) found that prior knowledge, course design, and instructor feedback were significant predictors of behavioral engagement. Research has found that there are differences in behavioral engagement across different disciplines in MOOCs.

Learning Analytics Dashboard

Interactions between group members were analyzed in terms of sharing information, files, and comments. We find that there is an intensity of interaction in the second group, because the learning environment allowed them to create groups, unlike the control group, which relied mainly on individual learning, and the sharing of information and data came through personal initiatives only without guidance from the learning environment as depicted in Figure 3. The philosophy of building collaborative knowledge via the MOOCs discussion has played a major role in e-learning environments, not only in in-creasing communication, and interaction between students, but also extending to developing the independence of the learner and making his role pivotal in the education-al-learning process (Al-Omoush et al., 2021). This philosophy is reflected in several applications that meet the standards and characteristics of the second generation of the higher education, most notably MOOCs, sharing free content wikis, sharing encyclopedias, and social networks (Supena et al., 2021). The sustainable development strategy, " Kingdom of Saudi Arabia's Vision 2030", came at the forefront of the education goals, the need to harmonize the outputs of the educational system with the needs of the labor market, in addition to providing women's' with disabilities with the necessary knowledge and skills for their jobs.

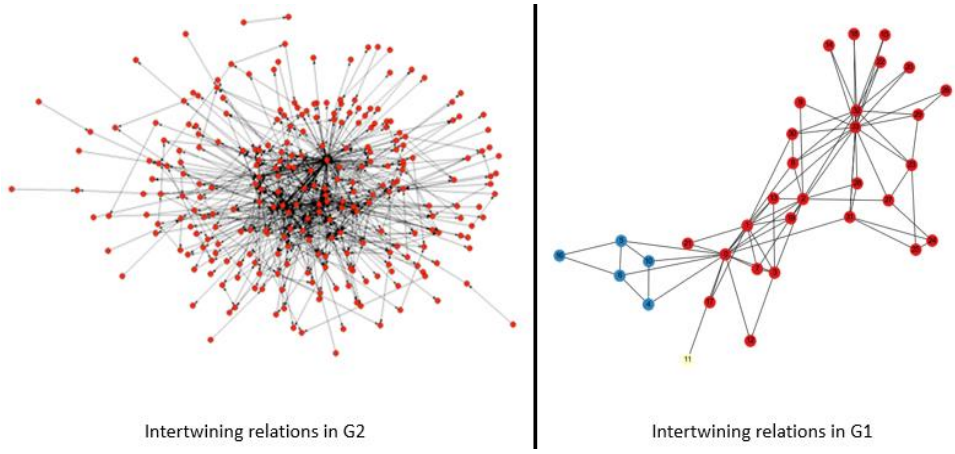

Figure 3
Interactions between groups members

From the graph above we can see that nodes represent information and data on the network, and therefore consider any element that can be selected to be a learning

material. Thus, nodes represent the focus of ideas, interactions, and feelings with peers, data, and build a new knowledge. The gathering of these nodes will lead to a large network of discussion linked by several topic connections. Networks can unite to form larger networks, and each node has the ability and efficiency to operate and perform its function according to its style. The network itself is composed of nodes and includes the communication network (Downes, 2022). These results are consistent with the fact that the reasons for the low rates of women's' with disabilities engagement in e-learning environments are due to women's' sense of social isolation, and the decline in direct communication between women's' with disabilities and faculty members (Maré & Mutezo, 2021). Therefore, the researchers found that collaborative discussions are one of the methods that lead to women's' with disabilities involvement in participatory activities, as the work environment based on discussions and working in groups requires building links between women's' with disabilities and each other, as well as the educational content they study, in the sense of establishing connections on the part of the learner and the content that helps him in making new decisions. It is based on scientific foundations, where the learner realizes when the previously acquired information is replaced by new information and knowledge, in the sense that it requires the learner to decide in forming new relationships in this educational network (Secules et al., 2021).

CONCLUSION

This study aimed to measure the impact of collaborative interactions in the MOOC environment on the development of women's' with disabilities social and emotional skills. The research sample consisted of 90 women's' with disabilities who were divided into two groups, the first is a control group, and the second is an experimental group. The results showed that tutors must encourage the creation of collaborations and the adoption of successful project-based learning in large-scale learning environments, such as MOOCs. Moreover, scalable learner support strategies are required at all stages of the learning project life cycle for the usage of collaborative learning in MOOCs. In contrast to the control group, which primarily relied on individual learning and the sharing of information and data only occurredv through personal initiative without guidance from the learning environment, we find that there is an intensity of interaction in the second group where collaborative discussions provide an appropriate environment for employing collaborative learning skills and building them effectively in order to increase women's' with disabilities social and emotional skills in learning activities and overcome social isolation.

IMPLICATION

The adoption of collaborative learning in MOOCs offers numerous benefits for women with disabilities in the labor market. By participating in collaborative activities, these learners can develop crucial communication, teamwork, and problem-solving skills that are highly sought after by employers. Collaborative learning also provides a supportive community where learners can share their experiences, exchange knowledge, and gain confidence in their abilities.

Furthermore, collaborative learning in MOOCs can help alleviate the isolation often experienced by women with disabilities. By connecting with peers, they can build social networks, receive emotional support, and develop a sense of belonging. This social engagement contributes to their overall well-being and can enhance their motivation to pursue employment opportunities. This will carry significant implications for the target participants, particularly in fostering an inclusive and empowering learning environment.

1. **Boosting Emotional Engagement**: The significant differences in emotional engagement highlight the potential for MOOCs to inspire and motivate women with disabilities. By designing courses that focus on emotional resonance such as incorporating stories of successful women with disabilities in various fields educators can enhance participants' motivation to pursue further education and career opportunities. This emotional connection is crucial for building self-efficacy and resilience (Eryilmaz, 2015).
2. **Enhancing Social Connections**: The marked improvement in social engagement among participants indicates that collaborative learning can serve as a powerful tool for establishing networks. For women with disabilities, who may face isolation or limited access to professional networks, MOOCs can facilitate connections with peers, mentors, and industry professionals. This social capital can lead to greater opportunities for collaboration, mentorship, and job placements (Tnay et al., 2020).
3. **Supporting Adaptive Learning Strategies**: The lack of significant differences in behavioral and cognitive engagement suggests that while participants are engaging with the content, they may need tailored support to enhance these aspects. Offering adaptive learning strategies, such as personalized feedback or peer support groups, can help participants set achievable goals and develop effective study habits, which are essential for academic and career success (Lestari et al., 2022).
4. **Fostering Inclusivity in Course Design**: The study underscores the importance of inclusivity in course design. By ensuring that MOOCs are accessible through features like captioning, flexible pacing, and varied content formats educators can better support women with disabilities. This inclusivity not only benefits the participants but also enriches the learning environment for all (Prasetyo et al., 2021).
5. **Career Readiness and Skill Development**: The emotional and social engagement fostered through collaborative learning can directly impact career readiness. By promoting skills such as teamwork, communication, and problem-solving within the MOOC framework, participants can gain competencies that are highly valued in the labor market. This preparation is particularly vital for women with disabilities, who may encounter additional barriers in employment (Shareefa et al., 2023).

FUNDINGS

This study was funded by the King Salman center For Disability Research Group Grant no KSRG-2023-052.

ACKNOWLEDGMENT

The authors extend their appreciation to the King Salman center For Disability. Research for funding this work through Research Group no KSRG-2023-052.

Author Contributions: The authors confirm their responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Almulla, M. A. (2020). The effectiveness of the project-based learning (PBL) approach as a way to engage students in learning. *Sage Open*, *10*(3), 2158244020938702. https://doi.org/10.1177/2158244020938702

Al-Omoush, K. S., Orero-Blat, M., & Ribeiro-Soriano, D. (2021). The role of sense of community in harnessing the wisdom of crowds and creating collaborative knowledge during the COVID-19 pandemic. *Journal of Business Research*, *132*, 765-774. https://doi.org/10.1016/j.jbusres.2020.10.056

Bakki, A., Oubahssi, L., George, S., & Cherkaoui, C. (2020). A model and tool to support pedagogical scenario building for connectivist MOOC. *Technology, Knowledge and Learning*, *25*, 899-927.

Brindley, J. E., Blaschke, L. M., & Walti, C. (2020). Creating effective collaborative learning groups in an online environment. *International Review of Research in Open and Distributed Learning*, *10*(3). https://doi.org/10.19173/irrodl.v10i3.675

Capdeferro, N., & Romero, M. (2020). Are online learners frustrated with collaborative learning experiences?. *International Review of Research in Open and Distributed Learning*, *13*(2), 26-44. https://doi.org/10.19173/irrodl.v13i2.1127

Cohen, A., Shimony, U., Nachmias, R., & Soffer, T. (2019). Active learners' characterization in MOOC forums and their generated knowledge. *British Journal of Educational Technology*, *50*(1), 177-198. https://doi.org/10.1111/bjet.12670

Deng, R., Benckendorff, P., & Gannaway, D. (2020). Learner engagement in MOOCs: Scale development and validation. *British Journal of Educational Technology*, *51*(1), 245-262. https://doi.org/10.1111/bjet.12810

Downes, S. (2019). Recent work in connectivism. *European Journal of Open, Distance and E-Learning (EURODL)*, *22*(2), 113-132.

Downes, S. (2019). Recent work in connectivism. *European Journal of Open, Distance and E-Learning (EURODL)*, *22*(2), 113-132.

Downes, S. (2022). Connectivism. *Asian Journal of Distance Education*, *17*(1).

Ebner, M., Schön, S., & Braun, C. (2020). More than a MOOC—seven learning and teaching scenarios to use MOOCs in Higher Education and Beyond. In *Emerging Technologies and Pedagogies in the Curriculum* (pp. 75-87). Springer, Singapore. https://doi.org/10.1007/978-981-15-0618-5_5

Galikyan, I., Admiraal, W., & Kester, L. (2021). MOOC discussion forums: The interplay of the cognitive and the social. *Computers & Education*, *165*, 104133. https://doi.org/10.1016/j.compedu.2021.104133

Hernández-Sellés, N., Muñoz-Carril, P. C., & González-Sanmamed, M. (2019). Computer-supported collaborative learning: An analysis of the relationship between interaction, emotional support and online collaborative tools. *Computers & Education*, *138*, 1-12. https://doi.org/10.1016/j.compedu.2019.04.012

Herodotou, C., Rienties, B., Boroowa, A., Zdrahal, Z., & Hlosta, M. (2019). A large-scale implementation of predictive learning analytics in higher education: The teachers' role and perspective. *Educational Technology Research and Development*, *67*, 1273-1306.

Ho, N. T. T., Pham, H. H., Sivapalan, S., & Dinh, V. H. (2022). The adoption of blended learning using Coursera MOOCs: A case study in a Vietnamese higher education institution. *Australasian Journal of Educational Technology*, *38*(6), 121-138.

Hoppe, H. U., Doberstein, D., & Hecking, T. (2021). Using sequence analysis to determine the well-functioning of small groups in large online courses. *International Journal of Artificial Intelligence in Education*, *31*, 680-699.

Hu, Y., Donald, C., & Giacaman, N. (2022). Cross validating a rubric for automatic classification of cognitive presence in MOOC discussions. *International Review of Research in Open and Distributed Learning*, *23*(2), 242-260.

Joo, Y. J., So, H. J., & Kim, N. H. (2018). Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs. *Computers & Education*, *122*, 260-272.

Kaliisa, R., Rienties, B., Mørch, A. I., & Kluge, A. (2022). Social learning analytics in computer-supported collaborative learning environments: A systematic review of empirical studies. *Computers and Education Open*, 100073.

Kennedy, E., & Laurillard, D. (2019). The potential of MOOCs for large-scale teacher professional development in contexts of mass displacement. *London Review of Education*, *17*(2), 141-158.

Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. *International Review of Research in Open and Distributed Learning*, *12*(3), 19-38.

Kwon, H. R., & Silva, E. A. (2020). Mapping the landscape of behavioral theories: Systematic literature review. Journal of Planning Literature, 35(2), 161-179. https://doi.org/10.1177/0885412219881

Liu, C. (2021), "The adoption of e-learning beyond MOOCs for higher education", *International Journal of Accounting & Information Management*, Vol. 29 No. 2, pp. 217-227. https://doi.org/10.1108/IJAIM-08-2020-0129

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs: A systematic study of the published literature 2008-2012. *International review of research in open and distributed learning*, *14*(3), 202-227.

Maré, S., & Mutezo, A. T. (2021). The effectiveness of e-tutoring in an open and distance e-learning environment: evidence from the university of south africa. *Open Learning: The Journal of Open, Distance and e-Learning*, *36*(2), 164-180. https://doi.org/10.1080/02680513.2020.1717941

Radford, A. W., Robles, J., Cataylo, S., Horn, L., Thornton, J., & Whitfield, K. (2014). The employer potential of MOOCs: A mixed-methods study of human resource professionals' thinking on MOOCs. *International Review of Research in Open and Distributed Learning*, *15*(5), 1-25.

Resnik, P., Dewaele, J. M., & Knechtelsdorfer, E. (2022). Differences in the Intensity and the Nature of Foreign Language Anxiety in In-person and Online EFL Classes during the Pandemic: A Mixed-Methods Study. *TESOL Quarterly*. https://doi.org/10.1002/tesq.3177

Saqr, M., Nouri, J., Vartiainen, H., & Malmberg, J. (2020). What makes an online problem-based group successful? A learning analytics study using social network analysis. *BMC medical education*, *20*, 1-11. https://doi.org/10.1186/s12909-020-01997-7

Secules, S., McCall, C., Mejia, J. A., Beebe, C., Masters, A. S., L. Sánchez-Peña, M., & Svyantek, M. (2021). Positionality practices and dimensions of impact on equity research: A collaborative inquiry and call to the community. *Journal of Engineering Education*, *110*(1), 19-43. https://doi.org/10.1002/jee.20377

Shah, D. (2021). A decade of MOOCs: a review of MOOC stats and trends in 2021. *Class Central*. Retrieved 10th Jan 2023, from https://www.classcentral.com/report/mooc-stats-2021/

Sökmen, Y. (2021). The role of self-efficacy in the relationship between the learning environment and student engagement. *Educational Studies*, *47*(1), 19-37.

Sun, G., & Bin, S. (2018). Construction of learning behavioral engagement model for MOOCs platform based on data analysis. *Educational Sciences: Theory & Practice*, *18*(5).

Supena, I., Darmuki, A., & Hariyadi, A. (2021). The Influence of 4C (Constructive, Critical, Creativity, Collaborative) Learning Model on Students' Learning Outcomes. *International Journal of Instruction*, *14*(3), 873-892.

UNESCO. (2020). Three ways to plan for equity during the school closures. Available from https://gemreportunesco.wordpress.com/2020/03/25/three-ways-to-plan-for-equity-during-the-coronavirus-school-closures

Wang, J., & Yang, H. (2023). Research on online evaluation method of MOOC teaching quality based on decision tree-based big data classification. *International Journal of Continuing Engineering Education and Life Long Learning*, *33*(1), 10-22.

Wang, Y., & Baker, R. (2018). Grit and intention: Why do learners complete MOOCs?. *The International Review of Research in Open and Distributed Learning*, *19*(3).

Wei, X., Saab, N., & Admiraal, W. (2021). Assessment of cognitive, behavioral, and affective learning outcomes in massive open online courses: A systematic literature review. *Computers & Education*, *163*, 104097. https://doi.org/10.1016/j.compedu.2020.104097

Yousef, A. M. F., & Khatiry, A. R. (2021). Cognitive versus behavioral learning analytics dashboards for supporting learner's awareness, reflection, and learning process. *Interactive Learning Environments*, 1-17. https://doi.org/10.1080/10494820.2021.2009881

Yousef, A. M. F., Wahid, U., Chatti, M. A., Schroeder, U., & Wosnitza, M. (2016). The impact of rubric-based peer assessment on feedback quality in blended MOOCs. In *Computer Supported Education: 7th International Conference, CSEDU 2015, Lisbon, Portugal, May 23-25, 2015, Revised Selected Papers 7* (pp. 462-485). Springer International Publishing.

Zaremohzzabieh, Z., Roslan, S., Mohamad, Z., Ismail, I. A., Ab Jalil, H., & Ahrari, S. (2022). Influencing factors in MOOCs adoption in higher education: a meta-analytic path analysis. *Sustainability*, *14*(14), 8268. https://doi.org/10.3390/su14148268

Zheng, L., Long, M., Niu, J., & Zhong, L. (2023). An automated group learning engagement analysis and feedback approach to promoting collaborative knowledge building, group performance, and socially shared regulation in CSCL. *International Journal of Computer-Supported Collaborative Learning*, 1-33.

Zhu, M., Sari, A., & Lee, M. M. (2018). A systematic review of research methods and topics of the empirical MOOC literature (2014–2016). *The Internet and Higher Education*, *37*, 31-39.

Lambert, S. R. (2020). Do MOOCs contribute to student equity and social inclusion? A systematic review 2014–18. Computers & Education, 145, 103693.

O'Brien, K. M., Nagro, S. A., Binkert, G. D., Szocik, K., & Gerry, M. (2024). Field experiences in special education teacher preparation: A review of the literature. Teacher Education and Special Education, 47(1), 5-25.

Alamri, H. A., Watson, S., & Watson, W. (2021). Learning technology models that support personalization within blended learning environments in higher education. *TechTrends*, *65*(1), 62-78.

Elizondo-Garcia, J., Schunn, C., & Gallardo, K. (2019). Quality of Peer Feedback in Relation to Instructional Design: A Comparative Study in Energy and Sustainability MOOCs. *International Journal of Instruction*, *12*(1), 1025-1040.

Watted, A. (2023). Examining motivation to learn and 21st century skills in a massive open online course. *International Journal of Instruction*, *16*(3), 797-822.

Shana, Z., & Alwaely, S. (2021). Does the Flipped Classroom Boost Student Science Learning and Satisfaction? A Pilot Study from the UAE. *International Journal of Instruction*, *14*(4), 607-626.

Eryilmaz, A. (2015). Positive psychology in the class: the effectiveness of a teaching method based on subjective well-being and engagement increasing activities. *International Journal of Instruction*, *8*(2), 17-32.

Tnay, J. K. S., Adruce, S. A. Z., Lau, E., Ting, H., Ting, C. Y., & Sandhu, M. K. (2020). Teacher's Engagement in the Social and Emotional Guidance of Elementary School Students. *International Journal of Instruction*, *13*(3), 827-844.

Lestari, K. E., Utami, M. R., & Yudhanegara, M. R. (2022). Exploratory Analysis on Adaptive Reasoning of Undergraduate Student in Statistical Inference. International Journal of Instruction, 15(4).

Prasetyo, T., Rachmadtullah, R., Samsudin, A., & Aliyyah, R. R. (2021). General Teachers' Experience of the Brain's Natural Learning Systems-Based Instructional Approach in Inclusive Classroom. International Journal of Instruction, 14(3), 95-116.

Shareefa, M. (2023). Demystifying the impact of teachers' qualification and experience on implementation of differentiated instruction. *International Journal of Instruction*, *16*(1), 393-416.

Obiosa, N. (2020). Effects of Students' Motivation and Engagement on Students' Satisfaction in a Lecture: Empirical Analysis. *International Journal of Instruction*, *13*(3), 861-876.

Amukune, S., & Józsa, K. (2023). Approaches to Learning in Elementary Classrooms: Contribution of Mastery Motivation and Executive Functions on Academic Achievement. *International Journal of Instruction*, *16*(2).

Murwaningsih, T. (2024). The Influence of Teacher Professional Attitude, Welfare, Continuous SelfDevelopment, and Job Satisfaction on High School Teachers Performance. *International Journal of Instruction*, *17*(1), 229-252.

Breindl, Y. (2010). Critique of the democratic potentials of the internet: A review of current theory and practice. *tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society*, *8*(1), 43-59.

Toma, R., & Berge, M. (2024). What Drives Student Engagement? A Community Engagement Framework for Online Education. *International Journal of Advanced Corporate Learning*, *17*(3).