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A Mixed Methods Study of Graduate Students' Achievement Motivation and Perceptions of Implementing Asynchronous Online Discussions

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ABSTRACT

This study aims to examine the effect of asynchronous online discussions on female graduate students' achievement motivation and to explore their perceptions toward it at a university in Saudi Arabia. A sequential explanatory mixed methods design was employed. Quantitative data were collected using a one-group pretest-posttest design, with an achievement motivation scale. The sample consisted of 10 purposefully selected students. Qualitative data were obtained through a focus group discussion with 8 students who completed the first phase and volunteered to participate in this phase. This study lasted for one semester and was grounded in Social Cognitive Theory. The results showed a positive effect of asynchronous discussions on achievement motivation, with a large effect size in perseverance, ambition, and perceived efficiency, but not in goal setting. Qualitative results revealed positive perceptions toward its usage. Benefits and strategies that instructors could implement to enhance the implementation of online discussions are discussed. Finally, implications and recommendations for future studies regarding the use of asynchronous online discussions are discussed.

Keywords: Mixed-Methods, Asynchronous Online Discussions, Perceptions, Achievement Motivation, Higher Education.

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Introduction

Millennials are characterized as a tech-savvy generation who have diverse needs, learning preferences, and backgrounds from the older generations. They have grown up surrounded by digital tools that require educational environments to adapt accordingly. In response to this, educational institutions have tried to implement blended and online learning instruction and encourage educators to move toward web-based instruction that may meet students' needs and independent learning (Alfares, 2021).

Over the past decade, web-based instruction has grown rapidly in the educational fields. Woolf (2009) defined web-based instruction as an instruction that depends on using the Internet and helps in delivering educational materials and activities to enable the learners to access content, communicate and participate online with instructors and peers. This mode of learning puts more responsibility on students, requiring them to engage and take responsibility of their learning (Al-Hawamleh et al., 2022).

One of the platforms that is widely used in higher education that supports online learning is Blackboard. Blackboard is a learning management system (LMS) that allows instructors to create and manage online content and materials, tasks, grades and create virtual discussions (Subramanian et al., 2014). This platform also enables interactions between instructors and students (Blackboard, 2021).

Among Blackboard's various features, the discussion board stands out as a tool that might promote student engagement and interaction. According to Revere and Kovach (2011), discussion boards provide "a mechanism for students to increase their knowledge through student-driven content, peer review and exchange" (p. 115), which might foster students' motivation within online classes. There are two types of online discussions: synchronous and asynchronous (Xie et al., 2018). Asynchronous online discussions (AOD) have become one of the main elements that are used in higher education because they offer flexibility as students can study and review the material at their own pace. This may enable students to participate with thoughtful responses and may encourage critical thinking, increase students' ability for self and independent learning, contribute to a better understanding of the materials provided (Bokase, 2022), and enhance students' motivation (Pittman, 2013). However, the instructor's presence as a guide who provides questions and timely feedback plays an important role in the online learning environment (Cho & Tobias, 2016).

Today, the adoption of online learning has increased the accessibility to education (Meskhi et al., 2019). Thus, researchers have begun to question whether the same learning objectives of increasing students' interaction, motivation and achievement in face-to-face learning can also be met in web-based instruction (Roby et al., 2013). Motivation is an important component of effective learning that is often

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used in literature in correlation to achievement and engagement (Rafiola et al., 2020; Fitriwati, 2018). In online learning, motivation is essential for maintaining attention and effort in the absence of instructors (Bokase, 2022). Schunk et al. (2008) defined motivation as "the process whereby goal-directed activity is instigated and sustained" (p. 4), and it can affect what, when, and how we learn. Motivated students can engage with peers, instructors, and learning content, which can lead to better academic outcomes (Vezne et al., 2022). Furthermore, they are more likely to be self-regulated and have a deeper interest in learning (Bokase, 2022). Teodorescu et al. (2021) found that the learning environment, students' confidence, and interaction with instructors all encourage motivation during online learning. Additionally, Aldhafeeri and Alotaibi (2022) showed that digital education models and AOD can improve high school students' engagement and motivation. In agreement with the previous studies, Noor et al. (2022) discovered that tools like educational apps, virtual classrooms and online discussions can increase motivation, learning behavior, and students' knowledge growth. Therefore, exploring how AOD influences student achievement motivation is crucial for graduate students (Kryshko et al., 2020), which is still not fully explored.

In addition to motivation, perception is another main component of the learning process that also relates to students' achievement. Saltürk (2021) emphasized a strong correlation between students' perceptions and academic success. Similarly, Cinkara and Bagceci (2013) found that students with more positive learning attitudes tended to get higher grades. Popovici and Mironov (2015) explained that the main factor that affects students' learning and acceptance of new instructional models is needs and demands. They also mentioned that when students have positive perceptions toward a learning platform, they are more likely to engage with it and enhance their learning success.

In AODs, perceptions are also important. As Alzahrani (2019) found students' satisfaction with asynchronous e-learning contributed to positive outcomes in learning English, Karakış (2022) found that students' personal goals and perceptions toward online learning really affect how engaged they are. Additionally, Yilmaz and Yurdugul (2016) stated that learners' different learning styles and perceptions affect how they are engaged in online discussions. However, Gunes (2019) found that students in a distance learning program expressed dissatisfaction with being taught at a distance.

Achievement motivation and perceptions are key constructs of Social Cognitive Theory (SCT). This theory offers a framework for investigating how learners gain knowledge and develop motivation in online instruction (Ghazali et al., 2021). According to Bandura (1986) "human functioning is explained in terms of a model of triadic reciprocality in which behavior, cognitive and other personal factors, and environmental events all operate as interesting determinants of each other" (p. 18). This theory highlights that motivation and learning are correlated constructs that

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can be influenced by individual beliefs, environmental factors, and social interactions (Zimmerman & Schunk, 2003).

In AOD, these constructs become more relevant. This type of discussion offers opportunities for learners to interact, collaborate, and think thoughtfully. Moreover, Gaul and Kim (2020) emphasized that such discussions can encourage motivation and enhance two-way communication between students and instructors. Moreover, when these discussions are effectively designed, they can promote competence, self-regulation, and deeper engagement when students learn from peers' comments on their own ideas (Gaul & Kim, 2020), which raises an important question about how instructors can design such a discussion learning environment (Alzahrani, 2019).

However, despite the promising benefits of AOD in improving learning outcomes, most of the previous studies have examined using online discussions as a supplementary tool to the traditional classroom, rather than as a primary tool for instruction. Also, most of the studies utilized qualitative or anecdotal methods, not mixed methods. Additionally, even though AOD aligns closely with the principles of SCT, there is little research that applies this theory in such studies.

Regarding the Saudi Arabian context, due to Vision 2030, instructional institutions are encouraged to adopt new instructional methods (Ministry of Education, Saudi Arabia, 2021). Ghazali et al. (2021) stated that AOD is considered as one of these methods that might be used to enrich the online learning experience. Moreover, the sudden shift to fully online education due to COVID-19 has negatively affected students' motivation and perceptions toward learning (Alotaibi, 2021). Alotaibi (2021) found that female students in fully online English as a Foreign Language learners preferred traditional learning more than online learning because of the lack of engagement. While Al-Anezi (2021) found that students and faculty have positive perceptions toward e-learning, they have differences in digital competence when it comes to age and gender. However, based on a systematic review of the literature, there have been international studies and practices to use AOD to improve students' achievement motivation and perceptions to learn (Kent et al., 2016; Yong & Thi, 2022), but not in the Saudi context. Alzahrani (2019) recommended examining the effect of using different online tools for distance education in Saudi Arabia. Additionally, Alharbi (2022) reported a lack of Saudi research on how these tools can impact students' achievement motivation.

All of the above-mentioned gaps highlight the need to examine how AOD affect students’ perceptions and academic motivation within the Saudi learning context. Thus, the intent of this study is to examine the effect of using AOD as a primary instructional tool on the graduate female students’ achievement motivation and to explore their perceptions toward its usage in their learning at a university in Saudi Arabia. This study is guided by SCT. Moreover, while few studies have combined qualitative and quantitative research methods, this study employs a mixed

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methods design to provide a deeper understanding of the results. Additionally, this study is one of the few that have used AOD as a primary tool not as a supplementary one in online learning.

Research Questions

1. What is the effect of using AOD as an instructional tool on graduate female students' achievement motivation in the LMS course?
2. What are graduate female students' perceptions toward using AOD as an instructional tool in the LMS course?
3. How does the qualitative data help explain the quantitative results?

Methodology

Population and Sample

The study population consisted of female graduate students enrolled in the Educational Technology Department during the second semester of the 2022–2023 academic year at a university in Saudi Arabia. For the quantitative phase, the sample was purposefully selected and consisted of (n=10) students pursuing a Master's degree in Educational Technology. They are enrolled in the course named "Learning Management Systems". They were chosen purposefully because of their specialization and the potential of using the same instructional approach in their future, which makes their participation valuable to this study. For the qualitative phase, the sample consisted of (n=8) participants who completed the quantitative phase and volunteered to participate in a focus group discussion.

Instrument

For the quantitative phase, this study administered an achievement motivation scale to examine the effect of using AOD on students' motivation. This scale was constructed by AL-Sehaem (2022). It was chosen because it had been validated with a similar population in Saudi Arabia. Permission to use the scale was obtained from the author. The author assessed its content validity and internal consistency. Moreover, she measured its reliability, which indicated an acceptable value of $\alpha = 0.74$. The scale consists of 24 items and takes approximately 10 minutes to complete. It uses a five-point Likert scale, where students select one response indicating their level of agreement. Responses included "strongly agree," "agree," "neutral," "disagree," or "strongly disagree" choices. They are scored from 5 for "strongly agree" to 1 for "strongly disagree". The items are divided into four dimensions as stated by Al-Sehaem (2022), which are "perseverance, goal-setting, level of ambition, and perceived efficiency" (p. 10).

For the qualitative phase, a focus group discussion was used to explore students' perceptions toward the use of AOD. This method is commonly used in qualitative studies to collect data from multiple participants at the same time. It is also used to hear their voices and different opinions to gain a deeper understanding of the

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Volume (88) February 2023
العدد (88) فبراير 2023

quantitative results. The researcher developed the questions (n=15), which were reviewed by three qualitative research experts.

Design

This study employed a sequential explanatory mixed methods design. It consisted of two phases: quantitative followed by qualitative. In the quantitative phase, data were collected using a one-group pretest-posttest design (n= 10) with an achievement motivation scale. In the qualitative phase, data were collected via a focus group discussion (n= 8).

Data Collection

Before beginning the two phases, the researcher obtained all necessary permissions. Moreover, consent forms were provided to and signed by the participants for their voluntary participation. They were informed of their right to withdraw at any time , and the researcher would serve as the instructor. As confidentiality was a priority in this study, the researcher assigned pseudonyms to the participants instead of using their real names. Students were also assured that all data would be stored securely. Additionally, participants consented to audio recordings, which would be used for research purposes only.

To collect the quantitative data, a pre-achievement motivation scale was distributed in person. The instructor explained the intervention and how this study will be conducted. She posted discussion topics related to the LMS course content in Blackboard. Then, she explained how the discussion board in Blackboard will be the only and the primary tool for instruction and learning.

The content of the LMS course used in this study included topics focused on definitions, types, advantages, disadvantages, applications, tools, and research related to learning management systems. The instructor divided the students into four groups. Each group was responsible for finding 3-5 articles that covered all the learning objectives for a specific topic, which were posted on Blackboard.

After that, the instructor revised the articles to ensure their relevance, suitability, and use of trusted sources. After approval, students were asked to post them as new threads on the discussion board with some discussion prompts. The instructor provided instructions and guidance on how to use the discussion board and the expectations for students' responses.

The remaining students were required to answer those questions after reading the attached articles. Then, they started to respond constructively to their peers. They were asked to post opinions, comments, previous experiences, or recommendations. All groups participated respectively, in the same way throughout the semester in four

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AOD activities. Grades were given according to a rubric. A calendar was used to remind students to participate in the discussions. At the end of the semester, the post-achievement motivation scale was administered.

To collect the qualitative data, the researcher invited eight students who had completed the previously mentioned phase and had agreed to participate voluntarily in a focus group discussion. This session took place at the university and lasted about one hour. Students had 15 questions to discuss, which included questions about their perceptions toward the use of AOD as the primary tool for learning, not as a supplement to traditional instruction, its advantages, challenges, and suggestions for improving the implementation of this model in learning environments.

Results

Quantitative Results

To answer the quantitative research question, the researcher tested the following hypothesis: there are no statistically significant differences at the level $\alpha \leq 0.05$ between the mean scores of the experimental group in the pre and post applications of the achievement motivation scale, across all dimensions (perseverance, goal-setting, level of ambition, and perceived efficiency) and the overall total score. To verify this hypothesis, the following procedures were used:

The ***Wilcoxon Signed Ranks Test*** was used because of the small sample size (n= 10), to measure differences between the scores before and after the intervention. As shown in Table 1, the results revealed statistically significant differences in the three dimensions: perseverance with (Z= 2.41, p= .016), level of ambition with (Z= 2.66, p= .008), and perceived efficiency with (Z= 2.67, p= .008), as well as in the overall scale score with (Z= 2.81, p= .005), as the significance level is less than 0.05. All differences favor the post-measurement period, where positive ranks exceed negative ranks. However, there were no differences between the response scores in the pre- and post-administration of the scale regarding the goal-setting dimension with (Z= 1.53, p= .126), as the significance level is greater than 0.05.

Table 1
Wilcoxon Signed-Rank Test Results for Pretest and Posttest Scores on the Achievement Motivation Scale

Dimension	Ranks	N	Mean Rank	Sum of Ranks	Z	Sig
Perseverance	Negative Ranks	0	.00	.00	2.410	.016
	Positive Ranks	7	4.00	28.00		
	Ties	3				
	Total	10				
Goal Setting	Negative Ranks	2	2.50	5.00	1.529	.126
	Positive Ranks	5	4.60	23.00		

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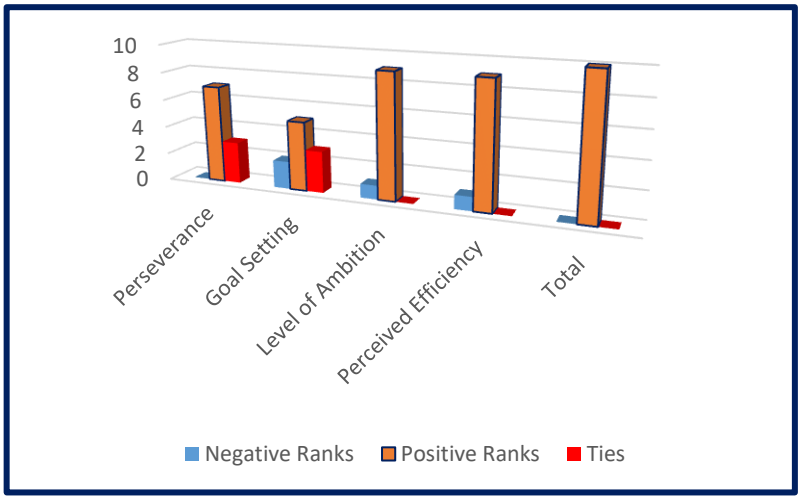
www.jalhss.com
Volume (88) February 2023
العدد (88) فبراير 2023

Dimension	Ranks	N	Mean Rank	Sum of Ranks	Z	Sig
	Ties	3				
	Total	10				
Level of Ambition	Negative Ranks	1	1.50	1.50	2.662	.008
	Positive Ranks	9	5.94	53.50		
	Ties	0				
	Total	10				
Perceived Efficiency	Negative Ranks	1	1.50	1.50	2.666	.008
	Positive Ranks	9	5.94	53.50		
	Ties	0				
	Total	10				
Total	Negative Ranks	0	.00	.00	2.807	.005
	Positive Ranks	10	5.50	55.00		
	Ties	0				
	Total	10				

Note. p values less than .05 indicate statistical significance.

These results suggest that AOD positively affected the achievement motivation in perseverance, ambition, and perceived efficiency dimensions but not in the goal-setting dimension. The distribution of positive ranks exceeding negative ranks is illustrated in Figure 1.

Figure 1
Rank Distributions for Pre and Post-Achievement Motivation Scale Scores



Additionally, to measure the effect size, ***Cohen's r*** was calculated. As shown in Table 2, the *r* values for the perseverance is (0.76), the level of ambition is (0.84), the perceived efficiency is (0.84), and the total score is (0.89), which all exceed 0.50. According to Cohen (1988), *r* values are interpreted as follows: 0.10–0.29 = small,

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Volume (88) February 2023
العدد (88) فبراير 2023

0.30–0.49 = medium, and ≥ 0.50 = large. Therefore, these results indicate that the intervention had a large and positive effect on most dimensions of students' achievement motivation.

Table 2

Effect Size of AOD on Student' Achievement Motivation (Cohen's r)

No	Dimension	Z	N	SQRT for Sample	r	Effect Size
1	Perseverance	2.41	10	3.16	0.76	Large
2	Level of Ambition	2.66	10	3.16	0.84	Large
3	Perceived Efficiency	2.67	10	3.16	0.84	Large
4	Total	2.81	10	3.16	0.89	Large

In summary, the results demonstrated the effectiveness of AOD as an instructional tool for enhancing graduate students' achievement motivation, specifically in perseverance, ambition level, and perceived efficiency, with large effect sizes across all dimensions. However, it indicated that further strategies may be necessary to enhance the dimension of goal-setting.

Qualitative Results

To answer the qualitative research question, data resulting from the focus group discussions were analyzed by transcribing the discussions, coding the data, grouping the codes, dividing them into categories that conveyed the same meaning, extracting the most influential themes, and then constructing narratives (Creswell, 2014). Additionally, to strengthen the credibility and accuracy of the collected data, the researcher employed member checking by reviewing the final report with the participants and included an external reviewer to provide feedback (Creswell, 2014). The results are presented in three themes as follows:

Benefits of Using AOD as a Primary Instructional Tool

Although students reported that it was their first time studying an entire course through AOD, they highlighted various benefits of this tool and how it encouraged their learning. They stated that it changed their role from passive to active learners and increased their excitement, enthusiasm, and activity. Faitmah reported that, "This model encouraged me to be eager to know each student's point of view. Since I did not earn a Bachelor's degree in Educational Technology, I found their constructive responses and information valuable." Sumiah agreed with her and added, "I often feel bored from reading presentations by instructors and being passive in classes. I don't want this kind of experience. I attend my regular classes just out of obligation. However, the situation here is different. I am active and enthusiastic to find information myself from different resources." Reem said that, "I studied about

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Volume (88) February 2023
العدد (88) فبراير 2023

student-centered learning, but I haven't experienced it. With this course, I am really active. I learned the actual meaning of student-centered learning."

Students also agreed that this model increased their motivation and responsibility for their own learning. Anwar said, "I feel motivated, and you can say I am responsible for reading the required materials to be able to answer and to contribute effectively. I also try to find additional resources for the discussion to convince my friends of my perspective during the discussions." Moreover, they believed this model has improved various learning skills, including critical thinking, academic writing, reading, and summarizing. Sherin noted, "I felt participation in AOD helped enhance our skills in research, critical thinking, summarizing, and writing." Fatimah added, "At the beginning, it was challenging for me to read the discussion threads and respond to my friends. My initial replies were short. Now, if you look at my progress, you will see that I can provide more detailed responses. I have learned from reading my classmates' answers."

Moreover, discussions enhanced retention, decreased the effort needed for learning, and saved time. Fatimah expressed, "I can discuss different ideas with my friends, and they correct me when I'm wrong. That way, the idea would, hmm, stick in my mind". Huda agreed with her and said, "I like reading different responses to the same question, so I read the answers from different perspectives. As a result, when I started studying for my exam, I found myself already familiar with most of the topics. Thus, I didn't need to put in as much effort as I usually do in traditional classes to understand and memorize the content, which saved me a lot of time."

Students also appreciate how they can focus on the materials and discussion posts, and can reread them multiple times at their own pace and preferred time. Mariam said, "I trained myself to read and write more quickly, which has always been a personal challenge. I've been a slow reader, and I used to feel embarrassed and frustrated in class. Now, I have started learning how to skim and answer faster. I believe if this model continues for, let's say, more than a year, I will be able to overcome this weakness." They appreciated how they enhanced their discussion skills in discussions. Reem noted, "At the beginning of the discussion, I was worried about writing a comment that might make my friends upset with me. Then, I discovered that it's okay, and I can express my opinion freely. I could say we activated the proverb, a difference in opinion doesn't invalidate mutual respect."

However, a student mentioned a challenge she faced during her learning. When she started her discussion late, she felt isolated and no one replied to her. Anwar said, "When I had a health issue and I was late for the discussion, I felt my posts didn't matter. I feel lonely and disengaged."

Strategies for Instructors to Enhance the Implementation of AOD in the Learning Environment

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Volume (88) February 2023
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Furthermore, the qualitative results offered various strategies that instructors might utilize to enhance the implementation and learning outcomes of AOD. Students appreciate when instructors provide feedback to each individual, as it motivates them to put in more effort. They like it to be positive and encouraging. Asma said, "Instructor's feedback makes a difference. As we need more encouragement." Aisha agreed and stated, "I like receiving positive feedback from my teacher, whether in traditional classes or online. This makes me feel appreciated, and I will work harder to show what a good student I am." Adding more, they suggested enrolling students in courses focused on developing discussion and persuasion skills. In addition, they recommended a third strategy. They suggested dividing the discussion activity into two stages, with sufficient time allocated for each: first, answering the discussion questions, and second, engaging in discussions with their peers. Sherin said, "If I were the instructor, I would specify some days for answering the discussion prompts, and others for responses and comments. This will help us stay active the whole week."

Students' Perceptions toward AOD's Implementation in Their Learning

The data also illustrated that most students had positive perceptions toward the implementation of AOD. According to Fatimah, it is a new instructional tool that she would like other students to try and enjoy. She said, "I would recommend my friends to enroll in a course that utilizes AOD as a primary tool for learning. I would tell them, you will enjoy it, just try to live the experience. It is something out of the ordinary." Anwar said, "I really enjoyed this journey of learning". Moreover, they agreed that they felt more confident. Huda said, "I like researching the same idea from different resources, not only the posted ones. It made me feel confident and knowledgeable during discussions." They also highlighted how they enjoyed the sense of belonging and felt part of the learning community. They felt their voices mattered. Reem noted, "It was amazing how we worked as one group, collaboratively discussing and replying to each other. I was waiting for anyone to reply to me, which made me feel my contribution was constructive."

Mixed Methods Results

To answer the mixed methods question, the quantitative and qualitative data were combined. The qualitative data revealed that students had a positive perception of using AOD as a primary instructional tool. This appears clearly from the perceived benefits they have reported of using this type of instruction, their enthusiasm and suggestions for increasing and enhancing the implementation of it in more courses, and how they would like other students to try and enjoy it. These results helped explain the quantitative data results, which revealed the positive effect of AOD in enhancing graduate students' achievement motivation. This aligns with what students have mentioned about the perceived learning and personality benefits.

Discussion

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This mixed methods study examined female graduate students' achievement motivation and explored their perceptions toward the use of AOD. A one-group research design with a pre-post achievement motivation scale and a focus group discussion was used to collect data. The results offered an affirmative response to the research's questions.

Regarding the first research question on students' achievement motivation, the results revealed that students' achievement motivation positively improved in three dimensions of the scale: perseverance, level of ambition, and perceived efficiency. However, there was no effect on the goal-setting dimension. These results are in agreement with previous studies in the literature, which show that students had better achievement motivation when using online discussions such as those by Pittman (2013), Aldhafeeri and Alotaibi (2022), Noor et al. (2022), and Yong and Thi (2022).

Regarding the second research question about students' perceptions, the analysis revealed that students held positive views toward the use of AOD. This becomes evident when students reported how this method of instruction has changed their roles from passive to active and confident learners, and increased their excitement, enthusiasm, and engagement. It is also clear from their observations that they have improved various learning skills, such as critical thinking, academic writing, reading, and summarizing. Additionally, they reported that this method helped them save time and learn faster, and they would recommend its implementation in different courses. These results support the previous studies' findings in the field regarding the positive perception, such as those by Yilmaz and Yurdugul (2016), Kent et al. (2016), Alzahrani (2019), and Al-Anezi (2021). They are also in line with the results of previous studies on the improvement of learning and personality skills, like those by Gaul and Kim (2020) and Bokase (2022). However, these results are in disagreement with the results of other studies, such as those by Gunes (2019) and Alotaibi (2021), which found that students in a distance learning program expressed dissatisfaction with being taught at a distance.

Regarding the third research question, the qualitative results provided additional explanations for the quantitative data. As discussed in the mixed methods analysis section, the perceived benefits of AOD, and how students would like others to try and enjoy it, support the positive achievement motivation in terms of perseverance, ambition level, and perceived efficiency. Moreover, these results help to understand why AOD does not affect the goal-setting dimension of students' academic motivation. Although this result was predictable since this dimension relates to students' habits and personalities, which require prolonged time and effort to be influenced, students confirmed it. They expressed a desire to study using this method for a longer period to improve other skills that take more time. This becomes clear when a student discussed her weakness of slow reading and writing and said, " I believe if this model continues for, let's say, more than a year, I will be able to overcome this weakness." Furthermore, this can be related to the recommended

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www.jalhss.com
Volume (88) February 2023
العدد (88) فبراير 2023

strategies that students have suggested to instructors for enhancing the implementation of AOD for better learning outcomes.

The above-mentioned results are related to the principles of SCT, which highlight the correlation between personal, cognitive, behavioral, and environmental factors in the learning process (Bandura, 1986). Via AOD, students become more active and confident, freely express their opinions, and engage with others in the learning environment, which reinforces their self-efficacy in learning, which is directly related to perseverance. Moreover, AOD helped increasing their enthusiasm and engagement. It also contributed to enhancing different learning skills like critical thinking, reading, and summarization. Students improve these skills by reading posts, discussing, and observing others (modeling), which raises their level of ambition. Additionally, the AOD learning environment influenced and changed how students think, feel, and behave, which explains the improvement in perceived efficiency, the core aspect of SCT. This is evident when a student was hesitant to share her thoughts at the beginning of the discussion phase, but then she changed her perspective after reading others' contributions and interacting with them. She said, "At the beginning of the discussion, I was worried about writing a comment that might make my friends upset with me. Then, I discovered that it’s okay, and I can express my opinion freely. I could say we activated the proverb, a difference in opinion doesn't invalidate mutual respect." These results highlight the importance of designing interactive environments to promote self-efficacy, motivation, and perception through social interaction. All of which align with the SCT framework. These theory-related results agree with the results of some previous studies that examined motivation in relation to the SCT like those by Zimmerman and Schunk (2003) and Ghazali et al. (2021).

Implications

The results of this study offer valuable insights for instructional designers, faculty members, and educational administrators in Saudi Arabia. Since Saudi administrators focus on improving learning as a part of Vision 2030, this study supports the adoption of new instructional tools. Additionally, a major contribution of this study is its existence because there have been few studies published in Saudi Arabia at different academic levels for female students that examine the use of AOD in the learning environments, particularly regarding students' achievement motivation and perceptions. Furthermore, this study utilized the SCT as a theoretical foundation, which could work as a basis for further studies on the adoption of AOD. All of this could inform more effective course design and teaching strategies that meet the needs of this generation. These results may also encourage educators to implement AOD as a supportive or primary tool in the learning process for different academic levels to prepare students to take responsibility for their learning as they reach a higher educational level.

Limitations

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www.jalhss.com
Volume (88) February 2023
العدد (88) فبراير 2023

There are some limitations for this study that might affect the generalizability of its results, such as: 1) the small sample size of this study. Thus, including a larger sample size might lead to different academic motivational levels and different views; 2) the SCT was the only theory used in this study to help in designing and interpreting the results. Therefore, using multiple theories might provide additional insights; and 3) this study lasted for only one semester, and increasing the time would help in getting more accurate results and a better understanding of the reasons behind them.

Recommendations

Since the results showed that students' achievement motivation positively improved in three dimensions of the scale: perseverance, level of ambition, and perceived efficiency, but not in the goal-setting dimension, it is recommended to conduct further research to explore the reasons behind this negative effect and to enhance students' achievement motivation in this dimension. Additionally, researchers are encouraged to conduct more studies to offer further instructional designs regarding the usage of this instructional tool. Finally, conducting future research to address the above-mentioned limitations is recommended to provide more accurate results and contribute to the literature on the use of AOD, particularly in the Saudi context.

Conclusion

Over the past decade, Saudi educational institutions have started to encourage instructors to implement web-based tools in their instruction as an attempt to support digital transformation across all sectors and to meet students' needs. A systematic review of the literature indicates a significant need for studies examining the implementation of these tools in Saudi Arabia, especially after students experienced low motivation and a negative perception toward their learning during the sudden shift of the instructional model caused by the COVID-19 pandemic. Nonetheless, using AOD as a primary instructional tool, rather than a supplement to traditional teaching, is one of the fields that needs more studies to be conducted. Since motivation and perceptions are major factors influencing students' academic success, this mixed methods study examined the achievement motivation of graduate female students and explored their perceptions toward the usage of AOD in relation to the SCT. The results indicate that graduate students’ achievement motivation has positively increased, and they hold positive perceptions of its usage in their learning. The results also discussed the benefits of AOD and strategies that instructors might consider to improve the implementation of online learning. However, more studies are recommended to examine the effects, benefits, and challenges of web-based tools for enhancing learning outcomes, satisfaction, motivation, and self-esteem in Saudi Arabia.

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مجلة الفنون والأدب وعلوم الإنسانيات والاجتماع
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Volume (88) February 2023
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مجلة الفنون والأدب وعلوم الإنسانيات والاجتماع
Journal of Arts, Literature, Humanities and Social Sciences
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