

The Effect of Performance Anticipation on Students' Recognition in Online Learning

Katherine Ronauly Maharani Silaban¹, Wilis Srisayekti¹, Windy Nathasya Saputra¹, Gabriella Samantha Carmella¹, Alifatunnisa Hafidza¹, Rausyan Fikri Muhammad Ilham¹, Fanny Rizkiyani^{1,2}, Nurul Izzah Binti Shari³

¹Fakultas Psikologi, Universitas Padjadjaran, Sumedang, Indonesia

²Fakultas Keguruan dan Ilmu Pendidikan, Universitas Islam Nusantara, Bandung, Indonesia

³Faculty of Social Sciences and Humanities, University Technology Malaysia, Johor, Malaysia

Abstract. This experimental research investigated the effect of performance anticipation on students recognition in the context of online learning. Data were collected through online presentation via Zoom and analyzed with between-participants posttest-only control group design. The data collected comprised 69 students aged 17 to 20 years with mean and SD of 18.09 years and 0.59, respectively. The confederate, experimental, and control groups conducted the presentation in the first, second, and zero order. The results showed a significant difference between the control and experimental groups in recognition scores ($p = .011$), which decreased performance anticipation of student's recognition ability in online learning contexts. The findings can be utilized by educators to design learning scenarios needed to optimize students understanding of presentation materials and lectures. Furthermore, presentations should be scheduled at the beginning of the class and limited to one per session.

Keywords: Performance anticipation, memory, recognition, online presentation

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*Corresponding author: Fakultas Psikologi, Universitas Padjadjaran, Hegarmanah, Kec. Jatinangor, Kabupaten Sumedang, Jawa Barat 45363, Indonesia
E-mail: wilis@unpad.ac.id

Introduction

Presentations are activities frequently encountered by students during the teaching and learning process. These are commonly used as a form of assessment, for students to display respective communication skills (Grieve et al., 2021; Živković, 2014). Moreover, possessing good presentation skills also prepared students for the workforce. Several studies stated that good presentation and communication skills were considered essential for job seekers (Algouzi et al., 2023; Clokie & Fourie, 2016).

The implementation of presentation methods during the teaching and learning process has numerous challenges. Instructing students to present in front of an audience often caused anxiety (Amini et al., 2019; Grieve et al., 2021; Nash et al., 2015). Simply imagining oneself speaking in front of many individual can make a person feel uncomfortable. This discomfort often manifested in certain physical reactions such as sweating, stuttering, blushing, and dizziness (Lall et al., 2020). A common issue faced by students was difficulty in remembering the material provided before

the presentation. This phenomenon known as performance anticipation had been investigated by several preliminary studies (e.g., Caron et al., 2021; Forrin et al., 2019). Previous studies identified the term as the next-in-line effect, where people struggled to remember certain information when approaching the turn of the person to deliver the presentation (Brenner, 1973). This finding was in line with the experiment conducted by Bond and Kirkpatrick (1982), stating that participants did not show a loss in memory recall, except when anticipating respective turn to present. Therefore, performance anticipation is experienced by people before performing, typically marked by feelings of anxiety or frequent thoughts about the upcoming performance.

Caron et al. (2021), stated that performance anticipation comprised two main components, namely thoughts about an upcoming performance and performance anxiety. When waiting for one's turn to perform, attention is focused on the preparation process by thinking about the upcoming presentation (Bond & Kirkpatrick, 1982; Brenner, 1973; Caron et al., 2021;

Forrin et al., 2019). Additionally, anxiety also played a significant role, by disrupting the functioning of working memory (Cocks et al., 2015; Vater et al., 2016). In this context, the material studied before the delivery of the presentation must pass through working memory and be properly encoded in order to be transferred to long-term memory, which can be either recalled or recognized later (Myers & Dewall, 2015). The disruption of working memory by anxiety due to an impending performance, impacts the ability to recognize information. The term commonly used to discuss anxiety related to presentation is performance anxiety, defined as the fear of performing in front of an audience. This usually occurs when there is an evaluative component and increased exposure to the public (Caron et al., 2021; Wilson & Roland, 2002).

Performance anticipation has several negative impacts on academic performance, especially in terms of memory loss. First, it affects the ability to recall previously learned materials. Second, preliminary studies had reported that the presence of an audience during a performance test reduced memory recall before an individual delivered a presentation (Forrin et al., 2019). A critical method of measuring memory is by assessing recognition ability, the capacity to remember previously known stimuli when comparing new ones with those already stored in memory (Jahromi, 2021). Meanwhile, a memory recognition test was used to measure this variable, by presenting previously studied material, alongside the new ones (Rich, 2017). Furthermore, understanding and managing performance anticipation is crucial for optimizing the academic performance of students.

Previous studies (Bond & Kirkpatrick, 1982; Brenner, 1973; Caron et al., 2021; Forrin et al., 2019) had examined performance anticipation in the context of face-to-face college courses. In the experimental investigation conducted on students, Caron et al. (2021) stated that performance anticipation hindered the ability to comprehend information preceding the presentation. However, the variable had not been studied as an online college course.

The context of online college courses, differed from face-to-face courses in terms of social presence. Furthermore, social presence, defined as the extent a person is perceived as real in mediated communication (Bali & Liu, 2018), enabled the individual to convey emotions, and attitudes, as well as relating interpersonally with others (Richardson et al., 2017). It is considered high when individuals engaged in an interaction genuinely feel the presence of one another.

Online courses were considered less interactive than face-to-face courses, based on a traditional perspective. It was criticized for being less social engaging, due to the presence of fewer nonverbal gestures (Rovai, 2001). Zhan and Mei (2013), studied

the effect of academic self-concept and social presence on student achievement and satisfaction, and reported that those taking online courses experienced lower social presence compared to face-to-face courses, despite having similar levels of academic self-concept (Soper, 2016). Furthermore, a survey of 107 students from the Open University of Indonesia, Taiwan branch found that these students generally perceived face-to-face courses as being better than online courses in terms of social presence, interaction, and satisfaction (Bali & Liu, 2018).

In face-to-face communication situations, high levels of social presence does not always have a positive impact. Individuals with high social anxiety or communication barriers often feel uncomfortable in the presence of others (Oh et al., 2018). The individuals tend to feel more comfortable when perceiving lower levels of social presence. This is consistent with the study by Poeschl (2017) on public speaking, which stated social presence affected the performance of speakers. The perceived social presence of speakers can affect respective mood and presentation styles, including distracting the delivery process (Poeschl & Doering, 2015). These reactions hindered the cognitive resources allocated to the presentation, resulting in better performance (Poeschl, 2017).

Based on this, differences in the level of social presence potentially impacted performance anticipation and recognition abilities of students, which is in line with previous studies. Sunardi (2022) stated that students felt more anxious when presenting face-to-face compared to online presentations. In addition, the presence of live audiences contributed to this, as participants were that visibly anxious, showing certain signs, such as trembling, blushing, etc. Some felt intimidated by the gaze of the audience, increasing anxiety. Other previous studies stated that the fear of negative evaluation was the most dominant cause of anxiety in online presentations (Andesta & Nurcholis, 2022). The results were also consistent with the study by Rahmi and Murtafi'ah (2022) on speaking anxiety, which stated participants felt less anxious when speaking online because there was no need to face the audience. Therefore, this study aimed to further investigate the effect of performance anticipation on students recognition ability in the context of online lectures.

The effect of performance anticipation on student memory was empirically displayed in the context of face-to-face classes and had not been studied in respect to online classes (Caron et al., 2021; Forrin et al., 2019). The implementation of online classes had started to decrease with the waning of the pandemic, although there is still a possibility for it to be conducted occasionally. An article reviewing more than 60 studies stated that blended teaching which combined the

benefits of online and face-to-face learning, was a promising method for the education system (Imran et al., 2023). However, assuming performance anticipation affected student memory, it could lead to a reduction in the effectiveness of online learning.

This caused previous studies to replicate the procedure adopted by Caron (2021), leading to the development of an online lecture simulation presented to participants. The results would benefit educators, particularly lecturers, in designing learning scenarios, especially when the courses entailed the delivery of presentations.

The present study examined whether the context of online lectures induced anticipation in students, even when the audience were not physically present. This anticipation led to anxiety, which affected working memory. Based on the explanation, the study aimed to determine whether performance anticipation affected recognition ability in the context of online lectures.

Methods

Research Design

An experimental method with a between-participants posttest-only control group design was adopted (Christensen et al., 2015). The experimental analyses focusing only on two groups, namely the experimental and control. The design method was considered appropriate, incorporating two features that eliminated threats to internal validity. This included the inclusion of a control group and the randomization of participants into the experimental groups (Christensen et al., 2015). The participants were randomly assigned to the experimental and control groups, while a posttest was administered after the treatment.

Participants

The study selected 69 students from the Faculty of X at University Z, class of 2023, using convenience

sampling. This number met the minimum requirement stated by Borg and Gall (Cohen et al., 2007), which specified the sample size for causal-comparative and experimental research methods should not be less than 15. The participants consisted of five males (7.2%) and 64 females (82.8%), with ages between the range of 17 to 20 years (Mage = 18.09 years, SD = .59).

Potential participants were contacted through WhatsApp, in order to provide an overview of the investigation. Meanwhile, those who agreed to participate were asked to provide online informed consent by clicking on the Agree option. The participants were then asked to select a study schedule from several options provided. As an incentive for participation, these participants received LINE stickers worth 10 coins.

Research procedure

The study randomly assigned participants to either the experimental, or control group. Randomization, defined as a crucial control technique in experimental studies, ensured the equalization of both known and unknown extraneous variables (Christensen et al., 2015). In the experimental group, participants were instructed to present in the second order, while the control were not asked to deliver a presentation. However, of the 69 participants, 35 were placed in the experimental group, and 34 in the control. The study conducted 21 sessions for data collection, with a maximum of four participants in each session. These individuals were invited to the experimental sessions according to the preferred schedule.

The experimental sessions were conducted in an individual observation room on the 3rd floor of Building 2, Faculty of X, University Z. These were held in a laboratory setting to control the extraneous variables that could affect student performance in online classes, such as home environment factors

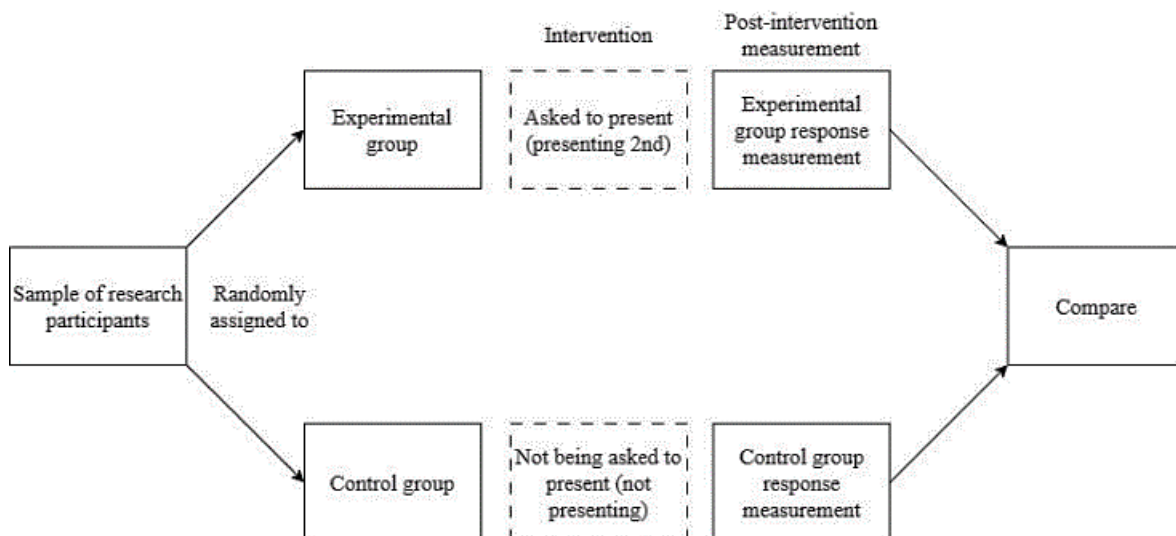


Figure 1. Research design between-participants posttest only design

(Aschenberger et al., 2023), the use of smartphones (Dontre, 2021) and social media (Dontre, 2021; Hollis & Was, 2016) during classes.

Each participant was escorted to an individual observation room equipped with a laptop. On arrival, the participants were taught how to minimize and maximize the Zoom Meeting tab. Afterwards, the participants were left alone in the room, similar to attending an online class from respective homes. An instructor then gave instructions through Zoom, ensuring that both the instructor and other participants were not met physically.

The instructor read the instructions for delivering the presentation according to the provided material when all participants were ready for the experimental session. Participants were given 15 minutes to prepare for a three-minute oral presentation, and were informed that recognition abilities would be tested individually with multiple-choice questions about the presentation. In order to ensure equal preparatory time, the material file on each laptop in the observation room was locked. When the 15 minutes was about to start, the password to unlock the file was provided and all participants were instructed to open it simultaneously. In addition, each laptop screen had a blank Google Docs file to be used while preparing for presentations

After the 15 minutes had elapsed, each participant was informed of the respective presentation order through the private chat feature on Zoom. For those in the experimental group, the study showed that these individuals would present second, following a confederate acting as the first presenter. Meanwhile, the participants in the control group were not assigned a presentation slot due to time constraints.

Once presentation orders had been assigned, the confederate acting as the first presenter, delivered the initial presentation. Following this, a Google Form link containing multiple-choice questions about the first presentation material was shared through Zoom chat to measure recognition ability. After all participants had completed the quiz, another Google Form link containing a questionnaire to measure the performance anticipation of each participant was also shared through Zoom chat.

Immediately after the completion of the instruments on both Google Forms provided, a debriefing session was held. During this session, it was explained that the participants did not need to deliver presentations. The main purpose of the study, which aimed to investigate whether performance anticipation affected recognition ability in the context of online learning was revealed. The participants were asked to keep the entire process confidential. Additionally, a second informed consent form designed to suit the actual purpose of the investigation was provided. At the

end, all participants were appreciated and permitted to leave the observation room.

Experimental Materials

Prior to starting the experimental session, all the necessary applications were opened on the laptop for each participant. Initially, the same Zoom meeting room was opened, and the name changed to match the participant who would be using that laptop.

Participant Presentation Materials

Participants were given the material titled Relaxation and Meditation extracted from pages 509 to 510 of the book titled Psychology in Modules 11th Edition by Myers (2015). This book served as the main reference text for the Y course. The presentation material contained 1118 words, including several illustrations and graphics.

The selection of presentation material was based on the following considerations and information. First, the participants, mainly students of the Faculty of X, class of 2023, had not yet received presentation material. According to the current curriculum, presentation material was not included in the courses at this level. In order to confirm this, one of the lecturers teaching Course Y in Faculty X at University Z, was consulted. The lecturer confirmed that the presentation material used in this study had not yet been covered in the courses offered. Second, the material used was written in English to coincide with the methods of delivery commonly applied by instructors. The presentation material was excerpted from an English text and written in the original language.

Confederate material

In each session, the confederate was given the first turn for the presentation. The confederate read the presentation script prepared in advance, which was based on stress. The material extracted from pages 488 to 495 of the book titled Psychology in Modules 11th Edition by Myers (2015). The presentation in each session lasted for approximately three minutes with the material selection for the confederate based on the same considerations and information as the participants.

Recognition Ability

Recognition ability referred to the capability of an individual to identify previously learned information. The participants were presented with several items on a list and asked to identify initially presented (Matlin & Farmer, 2019). This study measured recognition ability using a multiple-choice quiz consisting of 10 questions with four answer choices for each item based on the material presented by the confederate.

The content validity evidence of the items in the recognition ability instrument was obtained through expert judgment. A lecturer teaching Course Y

reviewed the appropriateness of the items for measuring students recognition ability regarding the material of the confederate. The results of the qualitative analysis showed that all items were valid. Furthermore, four students with characteristics similar to the participants reviewed the writing aspects, readability, and clarity of the questions in the recognition ability instrument. The qualitative analysis showed that the questions were properly understood.

An example in the item from this instrument was experts defined stress as a process in which individuals perceived and responded to certain events “as... or...”. The answer choices included Threat or challenge, Danger or obstacle, Obstacle or danger, and Threat or obstacle. The coefficient alpha (α) value for the question items is .741, representing an acceptable level of reliability (Shrestha, 2021).

Manipulation Check

The study measured two components of performance anticipation namely thoughts about upcoming performance and performance anxiety, as a manipulation check. Each component was measured using a single item on an 11-point Likert scale ranging from zero to 10. The item measuring thoughts about upcoming performance was during the first presentation, how often did the individual think about the presentation? For performance anxiety during the first presentation, how anxious was the individual about the next presentation? The manipulation was considered successful when the scores of both components of performance anticipation in the experimental group significantly differed from the control.

Data analysis

Normality and homogeneity tests were conducted on the data for thoughts about upcoming performance, performance anxiety, and recognition ability. The following results were obtained for thoughts about upcoming performance, the normality tests for the control and experimental groups were ($P = .018$), and ($P = .00$), respectively, and ($P = .00$) for the homogeneity. Concerning the performance anxiety, the normality tests for the control and experimental groups were ($P = .002$), and ($P = .001$), with a homogeneity value of ($P = .00$). In terms of recognition ability, the normality test for the control and experimental groups were ($P = .043$), and ($P = .047$), and ($P = .583$) for homogeneity. Despite the homogeneity of the data, it was not normally distributed. The Mann-Whitney U test was used to perform inferential statistical analysis.

Ethical Considerations

The present study was reviewed by the members of Faculty X, University Z, following the applicable regulations. The process was conducted based on the principles stated in the Declaration of Helsinki. The

participation process in the principle for persons was voluntary and lacked coercion because participants were allowed to withdraw at any time without any consequences. The confidentiality of the data was maintained and used only for scientific purposes. In addition, the consent for publication had been obtained.

Regarding the principle of beneficence-nonmaleficence, the participants gained experience by engaging in psychological experiments, thereby contributing to the advancement of knowledge concerning the impact of performance anticipation on student memory. This study may potentially cause discomfort to participants. Therefore, to minimize this risk, the students were allowed to withdraw whenever necessary. At the end of the entire process, the participants were debriefed about the purpose of the study and were provided with contact information, in case any risks associated with the process was experienced.

In respect to the principle of justice, every participant was treated equally. The assigning of these individuals to the experimental and control groups was performed randomly, ensuring that each participant had an equal chance of being in either group. Participants had equal rights to withdraw and received the same incentive for participating.

Results and Discussion

Demographic Data

Table 1 shows the demographic data of the participants, including gender and age. Based on gender, the participants consisted of 64 females and five males with majority 18 years old.

Recognition Ability Posttest

Inferential statistical calculations were conducted using the Mann-Whitney U test because the data failed to meet the assumptions. The normality test for the control and experimental groups were (.043), and .047, with a homogeneity test of .583. The results in table 2 showed that the average recognition ability score of the control group was greater than the experimental group ($M= 4.32$ vs. $M= 3.23$). The results of the Mann-Whitney U test for the posttest recognition ability yielded a p-value of .011, indicating a significant difference in quiz scores between the experimental and control groups.

Table 1
Demographic data of research participants

Category	Frequency	Percentage (%)
Gender		
Male	5	7.2
Female	64	82.8
Age		
17 years	8	11.6
18 years	48	69.6
19 years	12	17.4
20 years	1	1.4

Table 2

Descriptive statistics of recognition ability, performance anxiety, and thoughts about upcoming performance

Variable	Control Group		Experiment Group	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Recognition	4.32	1.63	3.23	1.61
Performance anxiety	5.50	3.29	8.31	1.45
Thoughts about one's upcoming performance	5.38	3.16	8.71	1.56

Notes: *M*, mean; *SD*, standard deviation

Performance Anxiety

Inferential statistical calculations were conducted using the Mann-Whitney U test because the data obtained did not meet the assumptions [Normality tests for the control group was .002), while the experimental group obtained .001, and .00 for homogeneity]. The results in table 2 showed that the experimental group had a higher average score of 8.31, while the control was 5.50. The results of the Mann-Whitney U test for the performance anxiety questionnaire yielded a p-value of .00, indicating a significant difference in the level of performance anxiety between the experimental and control groups.

Thoughts About Upcoming Performance

Inferential statistical calculations were conducted using the Mann-Whitney U test because the data failed to meet the assumptions [Normality tests for the control and experimental groups were ($P = .018$), were ($P = .00$), and ($P = .00$) for homogeneity]. The results in Table 2 showed that the average scores of the experimental and control groups were 8.71 and 5.38, respectively. This indicated that the experimental group had a higher average. The results of the Mann-Whitney U test for the thoughts about upcoming performance questionnaire yielded a p-value of .00, depicting a significant difference in the frequency of thoughts about upcoming performance between the experimental and control groups.

Discussion

The study aimed to examine the effect of performance anticipation on student recognition in the context of online learning. Based on the results of the data analysis, it was found that information about being the second presenter increased the anxiety of individuals, even though the presentations were conducted online. This was proven by the higher average score of the performance anxiety questionnaire in the experimental group, which was 2.81. The finding is consistent with the study by Caron (2021) on performance anticipation, stating that the anticipation of a presentation led to higher levels of anxiety during the first presentation.

Differences between the experimental and control groups was also observed in the frequency of thoughts

about upcoming performance. Calculations proved that even though the presentations were conducted online, informing the experimental group about being the second presenter resulted in higher frequency of thoughts about performance compared to the control group who were not scheduled to present. This finding is consistent with theories stating that individuals pay more attention on preparing themselves when the presentation is anticipated to be soon (Bond & Kirkpatrick, 1982; Brenner, 1973; Caron et al., 2021; Forrin et al., 2019).

The intensity and frequency of both components of performance anticipation resulted in a significant difference in recognition ability tested through the posttest. The findings showed that performance anticipation affected recognition ability even when presentations were conducted online. This is consistent with the findings of Caron (2021), stating that students given the second and fifth presentation orders had lower quiz scores compared to those who were not instructed.

Based on the anxiety processing efficiency theory, the decline in recognition ability was caused by feelings of worry, which is characterized by concerns about evaluation, failure and anticipating unpleasant consequences (Calvo & Eysenck, 1992). It tends to disrupt processing and reduces the temporary storage capacity of working memory. Individuals allocate attentional resources, such as evaluation, failure, and unpleasant consequences to worries. This causes the attentional resources in working memory that should be available for ongoing tasks to become less obtainable (Calvo & Eysenck, 1992).

Online and offline classroom contexts, possess differing characteristics including the absence of instructors and peers physically present before the participants. In face-to-face classroom contexts, the physical presence of peers can lead to a perception of high social presence, thereby increasing anxiety (Oh et al., 2018), and affecting the performance of speakers (Poeschl, 2017).

In accordance with the results of this study, the phenomenon of performance anticipation also occurred in online learning contexts. This was based on various reasons, such as fear of negative evaluation from others (Angelidis et al., 2019), excessive anxiety (Amini et al., 2019), lack of vocabulary and difficulty in understanding the material (Sunardi, 2022). The low score of a participant who used Google Translate showed that lack of vocabulary and difficulty in understanding the material led to the phenomenon of performance anticipation, which impacted recognition ability.

When associated with the processing efficiency theory (Calvo & Eysenck, 1992) and the two components of performance anticipation (Caron et al.,

2021), it was found that the task of giving presentations in an online learning context induced worry or anxiety in individuals. This was proven by the higher scores of performance anxiety in the experimental group. The finding is consistent with previous studies on the face-to-face contexts, stating that performance anxiety is a component of performance anticipation (Caron et al., 2021; Wilson & Roland, 2002). Furthermore, when individuals feel anxious about upcoming presentations, attentional resources are allocated to worrying about the presentations, rather than focusing on the task (Calvo & Eysenck, 1992), which is listening to the presentation of peers. This was indicated by the higher and lower scores of thoughts about upcoming performance and recognition ability in the experimental group compared to the control.

These findings are beneficial for educators, especially lecturers, in planning online learning scenarios. In addition, student presentations should be scheduled at the beginning of the session or class. Instructors were recommended to schedule only one student presentation per session. The measures were adopted to avoid the impact of performance anticipation, enabling students to have a better understanding of both the presentation and the course materials.

The current study was conducted in an online learning context within a laboratory setting. Therefore, it is absolutely possible that other variables could affect students performance and recognition abilities when listening to such presentations in a natural setting.

This study has several limitations such as the measurement tool used was a posttest designed during the investigation. The validity evidence was limited to content validity evidence and did not cover other types, such as internal structure and convergent validity. The material used was written in English text. Although it was used in daily academic practices, extraneous variables caused by language differences cannot be fully controlled. The laptops used for data collection had similar screen widths but differed in other aspects such as keyboard type, and color. Potential extraneous variables arising from these differences in devices could not be prevented.

Active participation in the experiment may introduce bias. This was addressed by ensuring the participation of only two researchers alternately for all sessions. Furthermore, similar instructions and scenarios were used for each study session to minimize bias related to experiment time. It was not conducted simultaneously for all participants due to different schedules. Pre-testing was also not conducted in this study. The anxiety variables in participants that could potentially affect the results of the experiment were not controlled, therefore, future studies are needed. The study failed to explain the extent of the effect of each

component, namely performance anticipation and thoughts about upcoming performance on recognition ability, hence the need for further investigation.

Conclusion

In conclusion, this study aimed to investigate whether performance anticipation affected students recognition ability in online learning contexts. The results showed that performance anticipation significantly reduced recognition ability in online learning contexts. These findings were consistent with previous similar studies in traditional face-to-face learning contexts. The novelty of this study focused on the empirical evidence that performance anticipation, especially performance anxiety, was experienced by students during online learning. Performance anxiety reduced recognition ability, which subsequently impacted academic performance.

These findings helped educators in planning learning scenarios. By understanding and considering the impact of performance anticipation, especially performance anxiety, in learning, educators were able to develop effective strategies to support student success in online learning contexts. Further studies were aimed at thoroughly exploring performance anxiety, specifically in the context of higher education were needed to address these limitations.

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