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Student Adaptation to Digital Assessment in Online Learning

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Abstract:

This study analyzes how students' perceptions of online examinations changed during the transition from face-to-face to fully online examinations. We surveyed students at a distance learning university at the end of two academic years during which a new online exam system was implemented. The survey asked about students' experiences and opinions about online exams and their requirements. By comparing data from the two groups of students, we found significant changes in perceptions as students gained more experience with online exams. Our results suggest that familiarity leads to a preference for online over face-to-face exams and a more positive view of online exam procedures, especially webcam proctoring and the use of a digital interface for answering questions.

Keywords: online exams; digital assessment; student perceptions; familiarity; self-efficacy; higher education

Introduction

The field of student perceptions of digital assessment in online education has been extensively analyzed from a variety of perspectives, particularly with the growth of distance higher education. Recent research has highlighted student perspectives on topics such as online vs. paper exams, completion time, concerns about cheating, and technological barriers (Butler-Henderson & Crawford, 2020; Conrad & Witthaus, 2021; Muzaffar et al., 2021). This study seeks to delve deeper into student perceptions, specifically how this dimension changes as students become more familiar with online assessment procedures and tools.

Familiarity, coupled with experience, plays a critical role in technology usability and can shape user perceptions (Casaló et al., 2008). Research has examined the influence of familiarity and self-efficacy on students' perceptions and use of digital tools in different contexts. Studies like Shin & Kang (2015) and Lazar et al. (2020) used the Technology Acceptance Model (TAM) to analyze the influence of familiarity on student acceptance and performance with mobile learning systems. Others, such as Han & Yi (2018) and Lee et al. (2019), examined the relationship between familiarity, self-efficacy, and technology use for academic purposes.

While the literature suggests a positive relationship between familiarity and students' intentions/use of digital tools, few studies focus specifically on online exams (Kitmitto et al., 2018). Earlier research highlighted unfamiliarity as a threat to the validity of online assessments, while more recent work found no direct relationship between technology familiarity and online exam performance (Kitmitto et al., 2018; Soto Rodriguez et al., 2021; Zhang et al., 2016).

Students' perceptions of online exams have gained attention as digital assessment grows (Afacan Adanır et al., 2020; Böhmer et al., 2018; Domínguez et al., 2022; Ilgaz & Adanır, 2020; Matthíasdóttir & Arnalds, 2016; Pagram et al., 2018; Rios & Liu, 2017). In general, students express positive views, but concerns remain about cheating, technical issues, time constraints, and entering mathematical calculations. Most challenges have been addressed through technological advancements, and the case of cheating prevention now includes software, monitoring, time limits, and different exam versions (Backman, 2019).

Methodologically, studies on student perceptions use surveys, interviews, and focus groups (Van der Kleij & Lipnevich, 2021), often focusing on direct and indirect factors. In the context of online exams, indirect factors include interfaces and non-academic variables such as time or context (Butler-Henderson & Crawford, 2020), while direct factors are analyzed through behavior, performance comparisons, and questionnaires (Greiff et al., 2016; Rienties & Toetenel, 2016; Cakiroglu et al., 2017; Cukusic et al., 2014; Domínguez et al., 2022; Budge, 2011; Kitmitto et al., 2018; Muzaffar et al., 2021).

In summary, despite existing research, there is a gap in understanding how students' perceptions of online exams evolve over time, particularly during the transition from paper-based to online assessment. This study aims to address this gap by analyzing student perceptions during a rapid transition to online exams at a distance learning university during the COVID-19 pandemic. We examined familiarity and perception from both direct and indirect perspectives, considering students' opinions alongside their actual experiences with online and paper-based exams.

Method

The aim of this study is to understand how familiarity and self-efficacy with digital assessment systems influence students' perceptions of online exams. The research design examines how increased familiarity with online exams affects students' perceptions and preferences for this method of assessment. Two research questions guided the study:

- RQ1: Does familiarity with digital assessment influence student preference for online exams?
- RQ2: Does familiarity with digital assessment influence student perceptions of online exam requirements?

To investigate these questions, changes in preferences and perceptions between two groups of undergraduate students (GA, GB) at a distance learning university were analyzed. Both groups of students completed an online survey to provide contextual data and insights into their perceptions of online examinations at two points in time: the first year of implementation of a new proctored online examination platform used by the university, and the second year of this fully online examination format. The survey was voluntary, anonymous, and approved by the university's research ethics committee. It included closed, Likert-type, and open-ended questions, with content validated by subject matter experts.

The first group (GA, $n=714$, average age 37.2) responded to the survey in July 2020, after their first experience with the new online exam system. The second group (GB, $n=6,660$, average age 37.3) was surveyed one year later, in July 2021, after having had multiple opportunities to use the system. While both groups were enrolled in the same undergraduate courses, they represent slightly different student populations due to an increase in enrollment in 2021. This increase was likely influenced by economic factors and the pandemic, resulting in a greater proportion of younger students with less experience in distance learning environments in the GB group. This difference is reflected in the stronger correlation between younger age and fewer years at university observed in GB compared to GA.

According to the design research, the items of the survey were grouped into the variables that addressed the research questions. A description of these variables is provided below, and the corresponding questionnaire items can be found in TABLE 1.

- VD1: 'Familiarity', which measures years enrolled at the university and previous experience with online exams.
- VD2: 'Indirect perception', capturing students' views on the difficulty of online vs. face-to-face exams, proctoring, and interface usability.
- VD3: 'Direct perception', assessing student preference for online vs. in-person exams.

Table 1: Grouping of survey items and research dependent variables.

Research variables	Correspondent items
<i>Variable related to familiarity with online exams (VD1):</i>	
1. Experience with online exams.	(4) Number of years at university. (5) Experience with online exams.
<i>Variables related to indirect perceptions about online exams (VD2):</i>	
2. Perception of difficulty in online exams.	(9) Difficulty of online exams compared to face-to-face exams. (10) Difficulty in cheating on online exams compared to face-to-face exams. (11) Time required to take online exams compared to face-to-face exams.
3. Perception of proctoring systems in online exams.	(13) Contrast of exam proctoring systems: online vs. face-to-face. (14) Acceptance of the webcam as a surveillance system.
4. Perception of digital interfaces in online exams.	(15) Contrasting ways of writing in exams: by hand vs. keyboard. (16) Contrasting ways of ticking MCQ in online exams: by hand vs. keyboard. (17) Contrasting ways of answering questions in online exams: keyboard vs. submit handwritten answers. (18) Contrasting ways of answering questions in online exams: keyboard vs. submit voice recording.
<i>Variable related to direct perception about online exams (VD3):</i>	
5. Preferred exam type.	(19) Preference for online or face-to-face exams.

Analysis and results

To examine whether familiarity with digital assessment influences students' preference for online exams (RQ1), the relationship between years at university (VD1), previous experience with online exams (VD1) - these two together being related to familiarity - and preferred exam method (VD3) was analyzed.

- Years at university & exam preference: A Kruskal-Wallis test revealed significant differences in preferred exam method based on years enrolled at the university, but only in the second group (GB) who had more experience with the online system (the two groups of students were tested and only in GB were there significant differences, $p < 0.000$; $\alpha = 0.05$). Pairwise comparisons showed that students who preferred face-to-face or "other" types of exams had been at the university significantly longer than those who preferred online exams.
- Prior online exam experience & exam preference: A chi-squared test showed a significant relationship between prior online exam experience and preferred exam method, again only in the GB. With the target level of statistical significance set at less than 5% ($p < 0.05$), the test was performed on the two groups, resulting in a favorable level of significance only in GB ($p < 0.001$). Further analysis revealed that students with prior online exam experience were more likely to prefer online exams, and this trend was stronger in GB, where students had more practice with the system (see Figure 3).

The results of the analysis to answer RQ1 suggest that increased familiarity with online exams, whether through years at university or direct experience with online assessments, is positively correlated with a preference for online exams. This finding supports the notion that familiarity plays a role in shaping student preferences for assessment methods.

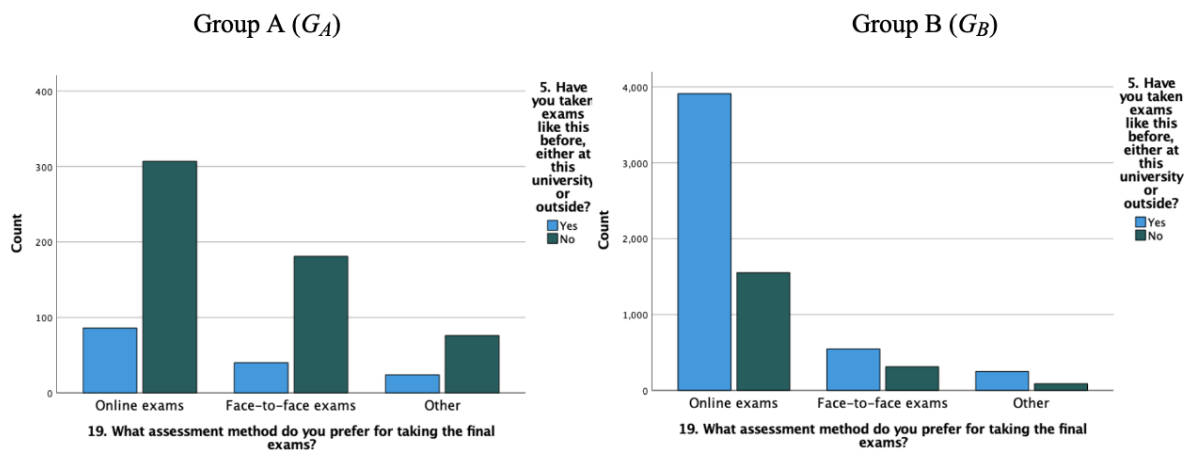


Figure 1: Relationship between previous online exam experience and preferred exam type.

Finally, to answer RQ2, descriptive statistics were used to compare the indirect perception of online exams (VD2) between the two groups of students (G_A with less experience with online exams, G_B with more experience). The main results of the analysis are presented below:

- Overall improvement in perception: Mean scores for most items decreased or remained the same in G_B , indicating a generally improved perception of online exams with increased familiarity. The only exception was the perceived time required for online exams, which was less critical for G_B students than for G_A students (see Figure 2).
- Three items showed a significant shift from negative perceptions in G_A to positive perceptions in G_B :
 - Digital proctoring was viewed more favorably than in-person proctoring.
 - Typing was preferred to handwriting for open-ended questions.
 - The ability to submit handwritten answers was considered less important.
- Several aspects maintained positive perceptions in both groups, regardless of experience:
 - Convenience of clicking vs. handwriting answers for multiple choice questions.
 - Perceived difficulty of online vs. in-person exams.
 - Ease of cheating on online exams.
 - Appropriateness of webcam proctoring.
 - Preference for keyboard input over voice recording.

Increased familiarity with digital assessment leads to more positive perceptions of specific online testing requirements, particularly those related to proctoring and digital interfaces. However, certain aspects, such as perceived difficulty of online exams and concerns about cheating, remain consistent regardless of experience.

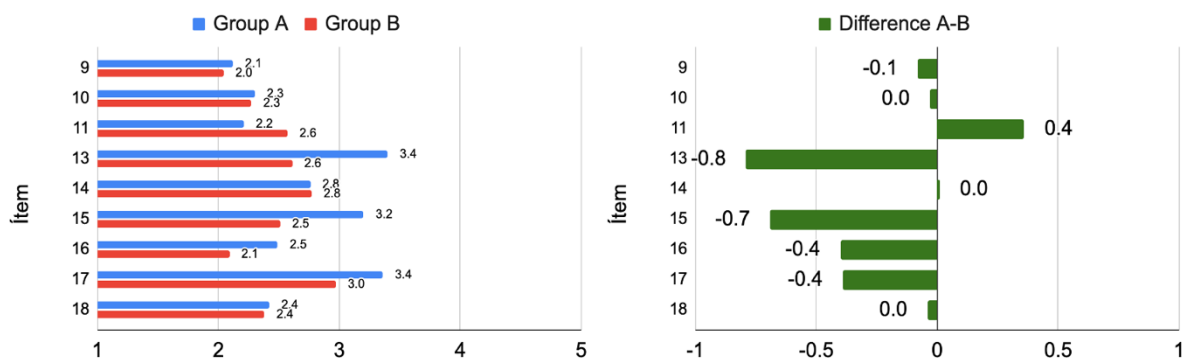


Figure 2: Differences in mean scores on items about indirect perception of online exams.

Conclusions

This study examined how students' perceptions of online exams change as they become more familiar with the digital assessment system. The results indicate a clear student preference for online exams over paper-based exams, especially among those with prior online exam experience. Familiarity also has a positive effect on how students perceive the procedures and requirements of online exams. With increasing experience, students tend to shift from negative to positive views on aspects such as webcam proctoring and the use of digital interfaces to answer questions. In particular, the study reveals a shift in students' perceptions of digital proctoring, with increased familiarity leading to a preference for webcam proctoring over in-person proctoring. Finally, familiarity also drives a preference for digital interfaces, especially for open-ended questions.

These findings provide new insights into students' perceptions of online assessment, emphasizing the dynamic nature of these perceptions and the importance of prior experience and familiarity. This highlights the importance of thoughtful design and implementation to ensure successful student adoption and acceptance of digital assessment systems.

Competing interests

The authors have no competing interests to declare.

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Additional information

An extended version of this research has been published in Domínguez-Figaredo & Gil-Jaurena (2024).

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