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RESEARCH AND SCHOLARSHIP

Synchronous Learning as a Compliment to Online Learning and Its First-Year Impact on Student Pass Rate, Next Course Progression, and Satisfaction

Hazar Shehadeh, PhD*, University of Arizona Global Campus, US, hazar.shehadeh@uagc.edu

Jennifer Robinson, PhD, University of Arizona Global Campus, US, jennifer.robinson@uagc.edu

*Corresponding author.

ABSTRACT

Online universities aim to support students' persistence, particularly in the first year, which is often challenging. Utilizing live or synchronous short sessions as a supplement can significantly impact student success by ensuring essential skills are taught and integrated. This mixed-methods study explored the influence of live and recorded sessions on pass rates, next course progression, and satisfaction levels. The results revealed a significant difference in pass rates and course progression between students attending live sessions and those watching recordings. While recorded sessions show promise, students who attended live sessions demonstrated better outcomes. Both groups, however, outperformed counterparts who did not participate in any live or recorded sessions. Despite technical challenges and time constraints, students appreciated the individualized guidance provided during live sessions.

Keywords: synchronous courses; asynchronous courses; live learning; synchronous learning; student success; persistence; first-year, general education

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INTRODUCTION AND REVIEW OF LITERATURE

In online learning, synchronous and asynchronous environments are utilized depending on institution policies and learning activities (Broadbent & Lodge, 2021; Delaney & Betts, 2021; Yamagata-Lynch 2014). Synchronous learning offers real-time communication with peers and faculty and provides immediate feedback and support to increase personalization, task motivation, interaction, and commitment (Blau et al., 2017; Fabriz et al., 2021; Nsa et al., 2012; Malkin et al., 2016; Ogbonna et al., 2019). Other studies determined that synchronous learning decreased attention, interaction, cognitive effort, and achievement as well as increased distraction (Hrastinski, 2008; Rapanta et al., 2020). Recent studies also indicated no significant difference between synchronous and asynchronous teaching in online courses on student academic achievement (Olson & McCracken, 2015; Nieuwoudt, 2020). The effectiveness of synchronous sessions in online courses depends on many factors, including students' sense of control, social interaction with peers, and ability to comply with a session's tasks (Fabriz et al., 2021; Ryan & Deci, 2000). These psychological needs, when present in the social context of the synchronous sessions, can lead to better performance and persistence (Chiu, 2021; Fabriz et al., 2021; Hartnett, 2015; Hsu et al., 2019). The lack of an instructor's guidance, participation and feedback, and irrelevance of materials may weaken these psychological needs (Hartnett, 2015).

Some instructors use live, synchronous chat during office hours to address students' questions and concerns and engage in a live chat while others use it as a pedagogical tool for teaching with the learning management system requirements. Previous studies indicated that synchronous sessions in online courses aid instructors in directing students to important class concepts, engage in workshops and breakout rooms, and support students who are in need of individualized instruction and guidance (Robinson et al., 2022). Despite these advantages, synchronous sessions pose challenges, such as those related to different time zones, scheduling problems, and technical issues (Fabriz et al., 2021).

Many schools adapted to synchronous sessions in face-to-face courses in response to the COVID-19 pandemic (Fabriz et al., 2021; Shehadeh, 2022). Some studies indicated that student engagement, presence, and competence support increased in synchronous sessions (Blau et al., 2017; Ogbonna et al., 2019) while other researchers indicated that synchronous sessions may lead to communication ambiguity, lower attention rate, and high cognitive load (Nieuwoudt, 2020; van der Keylen et al., 2020). While previous data indicated that live learning users outperform nonusers, there is a need to track the impact of live learning on those who watch the recorded sessions as compared to those who attend the live sessions, and this is what this study attempted to assess.

LIVE LEARNING INITIATIVE

Live learning, at the university in this study, is a centralized approach to provide synchronous sessions that support academic content and build skills. While live learning sessions can be conducted differently across courses, all sections contain a graded activity that measures students' learning and understanding of the content in the synchronous sessions. This initiative allows students in first-year courses to simultaneously meet with other peers and instructors across many time zones. They must attend one session during a five-week course period and each session focuses on skills tied to specific course learning outcomes. From a 2023 institutional analysis, students who attended these sessions significantly outperformed and persisted in their courses more than students who did not attend the live sessions. For example, for the two courses used in this study, **Table 1** shows persistence and performance for students who attended live sessions.

Course	Pass Rate for Attendees	Pass Rate for Nonattendees	Next course Progression for Attendees	Next course Progression for Nonattendees	Drop Rate for Attendees	Drop Rate for Nonattendees
GEN101	98.6%	93%	90.7%	69.4%	.8%	2.7%
GEN103	95.9%	62.2%	85.5%	62.7%	7.9%	19.3%

Table 1: Synchronous Zoom Session Student Results.

Students who attended live sessions had higher pass rates, progressed to the next course at higher rates, and had lower drop rates. While the university has excellent and positive data about students who attend live, the gap remains about those students who cannot attend the live sessions. That student group falls into two categories: those who view a recording of the live sessions and those who do not attend the live session nor view the recording.

PROBLEM STATEMENT

Continuing to understand students' satisfaction, persistence, and retention of these live sessions is crucial to future revisions. The specific problem is the lack of tracking students who watch the live learning recordings. To maintain a complete focus on students, it is essential to understand how the video version of the live learning sessions impacts pass rate and persistence (Saba & Shearer, 2018; Stella & Corry, 2013). In addition, understanding the students' experience can have an impact on future decision-making about a required live learning component in asynchronous courses. By combining this information with what we already know about students who attend the live sessions, wiser decisions can be made about this initiative.

SIGNIFICANCE STATEMENT

The presented problem's significance extends from online programs being delivered via a learning management system where students typically do not attend face-to-face/live instruction. This experience can work for some adult learners, but other students tend to struggle, leading to lower achievement, retention, and graduation rates (Hase & Kenyon, 2000). Live sessions, as interventions and pedagogical supplements, are needed to support students. With first-year students, these sessions also act as a high-impact practice as defined by the American Association of Colleges and Universities (2023). Still, understanding pass rate and persistence rate can begin a program review of such an initiative and its appropriateness in otherwise completely online universities.

THEORETICAL PERSPECTIVE

Live learning is one method through which students construct knowledge and build paradigms of the resources and skills needed to be successful in online education. In this way, constructivism is a central learning theory coupled with Vygotsky's (1962) proposal that students learn from more knowledgeable others (MKO). The purpose of live learning is in line with Glasersfeld's (1995) advice that learning requires self-regulation and the development of schema through reflection. These are purposefully integrated into live learning lesson plans. Constructivism requires students to create mental models that integrate new information into academic funds of knowledge brought to the online classroom (Driscoll, 2000; Gonzalez et al., 2005). However, the integration of new information in a supportive and meaningful environment with an MKO is the important piece. Live learning supports students' continued mental models of school, academic work, and resources needed to be successful in a sometimes isolating online environment. Engaging in live

learning and then completing a gradable activity based on the live learning session allow students not only to construct knowledge but also to have time to reflect on, accommodate to, and assimilate the new information (Driscoll, 2000). Live learning embodies constructivism in various measures across the general education courses. Likewise, students are learning how and what to process from MKOs as guides to connect isolated ideas with global concepts and themes presented in general education courses in a low-stress session to maximize learning (Bada, 2015). The researchers in this study examined the impact of watching recorded live learning sessions as opposed to attending live sessions on student pass rate and next course progression in two courses and assess students' perceptions of the live learning components.

RESEARCH QUESTIONS

Resarch Question 1. Is there a significant difference in pass rate and next course progression rate between students who watch recorded live learning sessions and those who attend the live sessions?

Resarch Question 2. To what extent are students satisfied with different components of the required live learning sessions?

RESEARCH METHOD

Mixed methods were used in this study. To establish a statistical relationship between the variables, this research study applied quantitative methods (Kruskal–Wallis test) for the first research question. The researchers worked with institutional statisticians to manually track the pass rate and next course progression rate of those students in the two focus courses who attended live and those who viewed the recorded live learning sessions. For the second research question, students' satisfaction with different components of the required live learning sessions were measured on a Likert scale survey and coded for themes. Qualitative data was manually conducted using a deductive and inductive thematic analysis (Braun & Clarke, 2006; Fereday & Muir-Chocrane, 2006; Proudfoot, 2023). Themes were established through initial reviews of the data and then used to continue reviews. Revisions to the coding were made until final codes were established.

PARTICIPANTS AND DATA ANALYSIS

The sample population was students who simultaneously attended live learning sessions via Zoom from across several many time zones and those who asynchronously viewed the recorded live learning sessions while enrolled in GEN101 and GEN103 (asynchronous via the Canvas learning management system) from January 2023 to July 2023 (**Tables 2** and **3**).

Participant Type	Associate Degree	Bachelor Degree	Female	Minority	First Generation	Average Age
Nonattendee	64	1,646	58.4%	67.4%	45.3%	33.4
Recording Attendee	4	206	58.1%	56.7%	48.7%	33.4
Live Attendee	46	1,680	62.2%	57.5%	41.9%	35.4

Table 2: Live Learning Participants GEN101.

Participant Type	Associate Degree	Bachelor Degree	Female	Minority	First Generation	Average Age
Nonattendee	90	2,106	61.9%	67.8%	45.1%	33.2
Recording Attendee	43	1,059	61.4%	61.4%	43.8%	32.3
Live Attendee	60	2,368	60.9%	55.6%	42.2%	36

Table 3: Live Learning Participants GEN103.

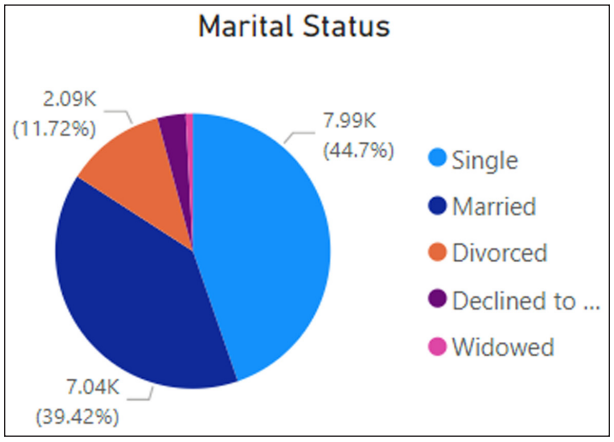

Figure 1: Marital Status of Participants.

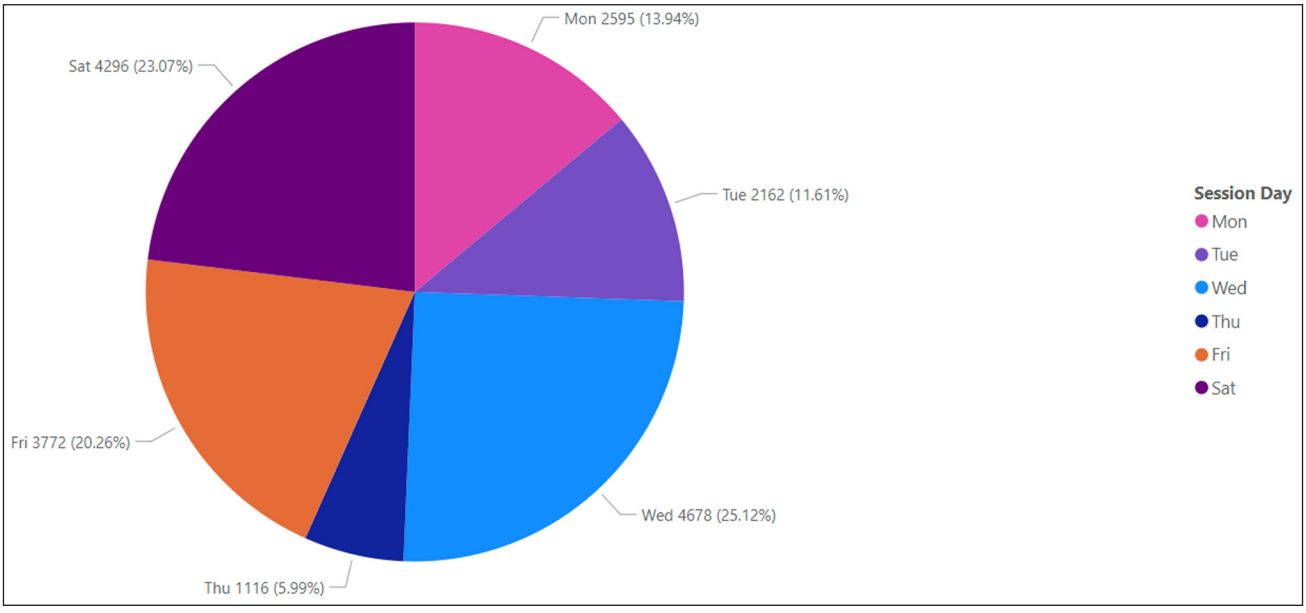

Figure 2: Overall Day and Time Preference for Live Sessions.

Both courses enrolled students who were pursuing either an associate's degree or a bachelor's degree. A high female population matches the national trend in the United States of more women enrolling in university (Hanson, 2023). The majority of students were also identified as historically marginalized or minority students, which matches the

national trend (Hanson, 2023). The percentage of first-generation students was in the minority for this population, and the average age was the lower thirties for all participants. The student body of the institution in this study, which is an open-access school, is 41% white and 59% minority students, 35% male and 65% female, with an average age of 25. In addition, 50% of students utilize financial aid. Additionally, the majority of students who attended live sessions were single or married (**Figure 1**). Students who attended live sessions preferred Mondays, Wednesdays, Fridays, and Saturdays (**Figure 2**). Thus, the sample selected for this study is representative of other student populations in the region, and the results can be generalized to other institutions with a similar student body.

RESULTS

To test the significance in course completion (pass rate) and next course progression, a Kruskal–Wallis test was performed. There was a statistically significant difference in successful course completion (pass rate; $p < 0.001$). Likewise, A Kruskal–Wallis test found significant difference in next course progression ($p < 0.001$). Post hoc comparison identified significant differences between each of the three groups (live attendees, recording attendees, and nonattendees), on the two measures of pass rate, and next course progression. In GEN101, students who viewed the recording had a higher pass rate and lower next course progression rate than those who attended live sessions. In GEN103, those who attended the synchronous sessions outperformed those who viewed the recording in course pass rate and next course progression (**Table 4**).

Course	Pass Rate for Live Attendees	Pass Rate for Recording Attendees	Pass Rate for Nonattendees	Next Course Progression for Attendees	Next Course Progression for Recording Attendees	Next Course Progression for Nonattendees
GEN101	98.6%	99.5%	82.5%	91.2%	83.3%	66.2%
GEN103	93.4%	88%	50.3%	85.6%	77.9%	56.2%

Table 4: Comparison of Students Based on Live Attendance vs. Recording.

Average GPA	GEN101	GEN103
Nonattendee	2.80	2.03
Recording Attendee	3.61	2.79
Live Attendee via Zoom	3.76	3.46

Table 5: Average GPA for the Three Groups.

In **Table 5**, the three groups showed the potential impact the live and recorded sessions had on students' overall GPA. Students who attended the live sessions in GEN101 and GEN103 had the highest GPA average compared to students who viewed the recording and those who did not attend live sessions or view the recording.

In addition to the qualitative analysis, data from an ongoing survey were coded. The survey was a combination of the Likert scale and short answer questions and was sent to students at the end of their courses. During the period of January 1 to June 30, 2023, 2,382 surveys were sent for GEN101 students and 1,014 surveys were sent for GEN103 students for a total of 3,396 surveys. Of those, 345 were returned for a 10% return rate. Of the surveys returned, five respondents indicated that they did not attend a live learning session or view a recording and 63 viewed the recording of the live learning session (**Table 6**).

Responded did not attend	1.4%
Responded attended via recording	18.4%
Responded attended live via Zoom	80%

Table 6: Survey Responses.

N = 3.396 total surveys sent; N = 345 surveys returned.

The surveys for both GEN101 and GEN103 returned valuable information meant to break apart the specific components of the live learning sessions and gauge their usefulness from the student perspective. Likewise, students were given the opportunity to share any thoughts they had through an open-ended question. Additional questions helped the live learning initiative leaders better understand the population to revise sessions to meet students' needs. For example, survey respondents were asked how they attend live learning (**Figure 3**).

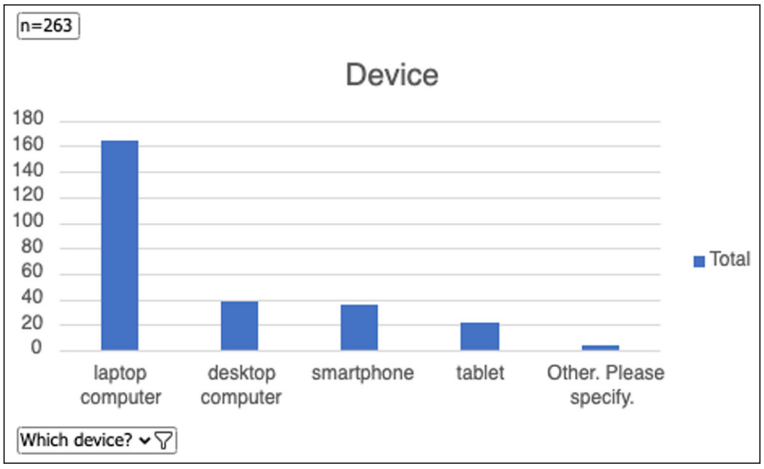

Figure 3: Device Used to Attend Live Learning.

Since we know Zoom might be a different experience based on devices (phone versus computer), we want to ensure that we provide the correct IT support to assist students who are attending sessions.

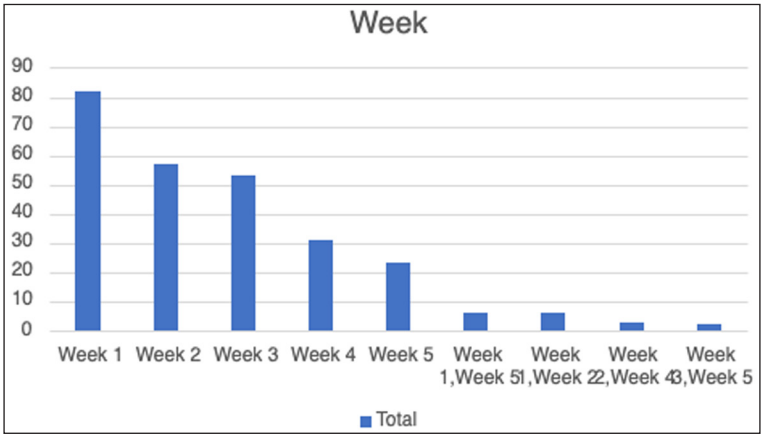

Figure 4: Weeks Attended Live Learning.

Students attend live sessions in the first three weeks for various reasons, such as course communication emphasizing their importance and a required quiz in week two for attendance in GEN103. In GEN101, where live attendance is not discussed until the final paper, the hypothesis suggests that the initial excitement of being in school and the motivation to perform well prompt students to attend in the early weeks (**Figure 4**).

The survey also asks questions that are specific to each course to understand how the activities and information support students' learning. For example, **Figure 5** show students' measure of usefulness for items shared in the GEN101 live learning session.

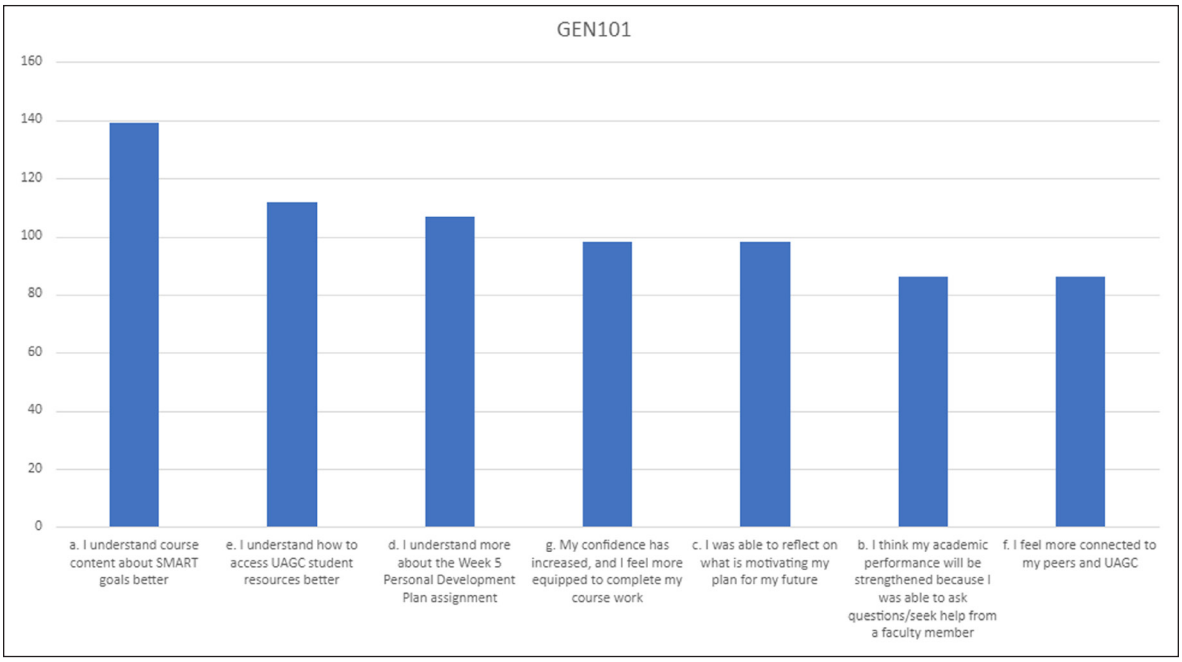

Figure 5: GEN101 Live Learning Components.

From the results of this portion of the survey, it is clear that students feel the session most supported (in order): their development of SMART goals, how to access online student support resources, how to develop a personal development plan, supported increasing confidence to complete coursework, reflection about future plans, strengthening academic performance, and connection to the university and peers.

GEN103 broke apart each skill taught to gauge its usefulness. **Figures 6** through **10** share those results.

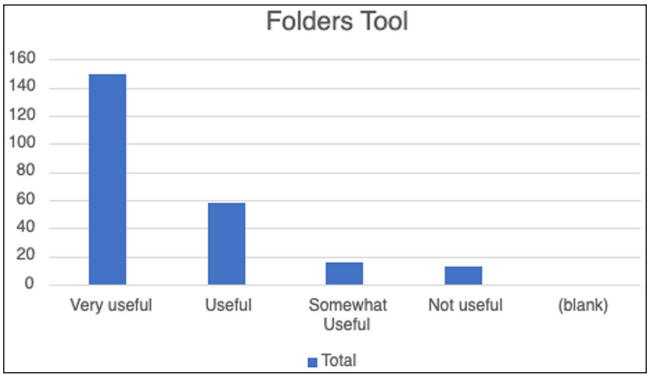

Figure 6: Usefulness of the Folders Tool.

In the GEN103 live learning session, students are taught several skills needed to navigate the library as well as useful tools that support maximizing their research time. One of the tools is the folders tool, which allows students to save their research in a reliable online cloud space.

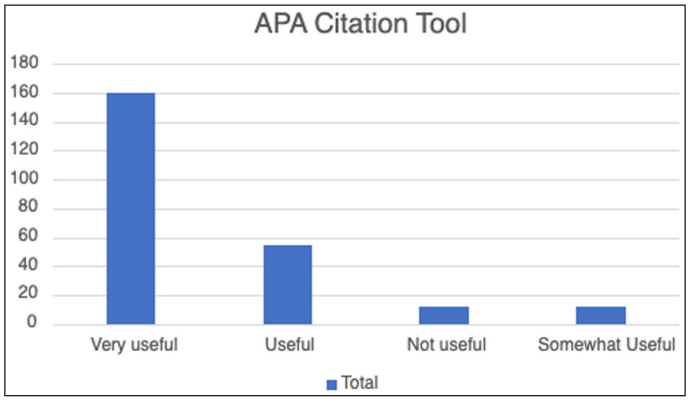

Figure 7: Citation Tool.

The citation tool in the library provides the APA formatting for chosen articles supporting students in academic referencing development.

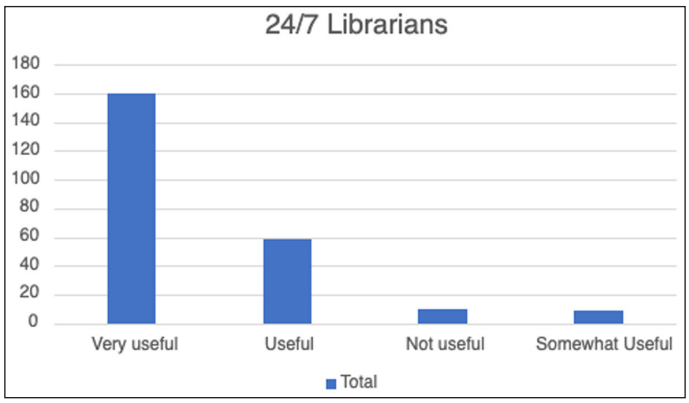

Figure 8: 24/7 Librarians.

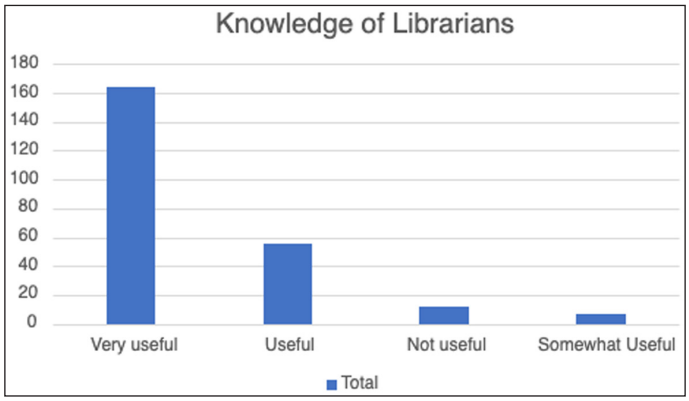

Figure 9: Live Human Librarians.

Overwhelmingly, students found knowledge of the online university librarians very useful.

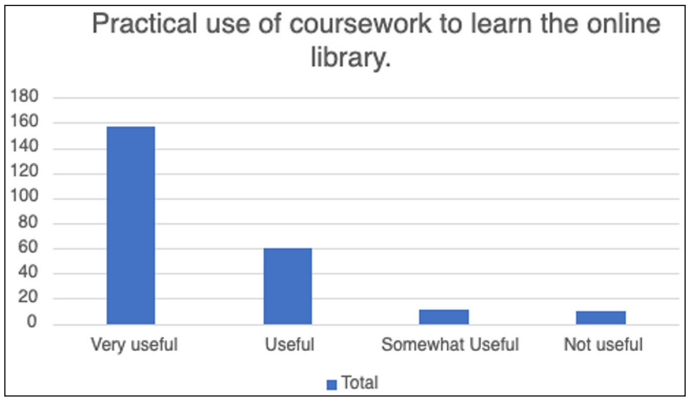

Figure 10: Using Coursework to Teach Library Skills and Navigation.

To teach library skills and tools during a live session, GEN103 instructors used the coursework and requirements as a vehicle for making connections between using the library and its practical applications to coursework in all courses.

Finally, the survey asked students for their own perspectives about the live learning sessions. **Tables 7** and **8** share the themes garnered from the short answer portion of the surveys.

Theme	Specific Content
Satisfaction and Benefits	• Positive feedback on the live learning experience. • Satisfaction with the instructors and peers. • Enjoyment and learning from the sessions. • Feeling of togetherness and interaction with faculty and students. • Real-time assistance and help during live sessions. • Useful for the transition back into school. • Encouragement for everyone to try live learning. • Positive experiences with the professors and the information provided. • Desire for more live learning in every class.
Suggestions for Improvement	• Proposals for integrating live learning into the first week of every course. • Request for optional Friday study sessions for additional help. • Desire for more live learning sessions or availability of recorded sessions. • Suggestions for managing large groups during live sessions (RSVP, limited participants). • Suggestions for clarifying expectations for each class during live sessions.

Table 7: GEN101 Student Voice.

Overall, the student feedback from GEN101, the first course all students take, provides a picture of what students are experiencing and how the sessions support their growth.

Theme	Description
Specific Library Tools	• Many find the folders in the online library useful for saving and organizing research materials. • The folder function aids in easy access to articles and information from anywhere. • The citation tool is highlighted as a valuable resource for correctly citing sources and organizing references. • Learning how to cite in APA style is mentioned as an essential skill acquired. • Understanding how to navigate the library and use different search avenues is considered valuable. • Advanced search methods and proper terms for searching are highlighted as beneficial. • The use of folders for saving and organizing articles is emphasized for effective research paper preparation. • Knowledge and skills related to APA format, proper citations, and referencing are consistently mentioned.
Suggestions to Improve Sessions	• Mixed feelings about live learning sessions are expressed. Some find them beneficial while others consider them a waste of time. • Concerns about the pace of live sessions and the challenge of grasping information within the limited time are mentioned. • Some individuals express issues with disruptive participants in live learning sessions. • The challenge of attending live sessions due to technical issues is mentioned.
24/7 Access and Support	• The availability of 24/7 live tutoring and access to real librarians is seen as a positive aspect. • The assurance of assistance from librarians contributes to a sense of support.

Table 8: GEN103 Student Voice.

The open-ended responses on the survey mirrored much of the Likert scale responses represented in **Figures 8, 9**, and **10**. Students find the session resources valuable for learning but note disruptions due to the session pace and some students not using mute on Zoom. GEN101 open-ended responses show that GEN103 live session attendees appreciate resource introductions and 24/7 support. The study's open-ended answers consistently mention the demonstrated tools, confirming that students are learning the intended content focused on the tools connected to coursework.

Survey results from GEN103 continue to align with a previous study when the live learning sessions as required components were in their infancy (Robinson et al., 2022). In the previous study, students reported that learning about the library tools and services could support their learning. Likewise, they reported some technical issues and that the pacing of the sessions could be revised. Between the iterations and due to this feedback, faculty have attended professional development to address pacing and how to work with disruptive students during the sessions.

DISCUSSIONS AND CONCLUSIONS

This study examined the differences in pass rate and next course progression rates between students who viewed the recording of live learning sessions and those who attended live and analyzed the satisfaction levels of students with the components of these sessions. For the first research question, there was a significant difference in pass rate and next course progression between students who attended live sessions and those who watched a recording. This can be interpreted in terms of students' interaction with instructors and direct exposure to resources and course lessons in real time, addressing any questions or concerns they might have (Schunk & Zimmerman, 2012). This finding aligns with

previous research studies that indicated the effectiveness of synchronous sessions in online courses and their impact on student engagement and course comprehension (Blau et al., 2017; Fabriz et al., 2021; Robinson et al., 2022). In the GEN101 course, students who viewed the recording passed the course at a higher rate than those who participated in live sessions. An explanation is that many GEN101 students watch recordings due to confidence or comfort issues in live sessions. After viewing, they gain predictability, increasing their likelihood of attending live sessions in subsequent courses like GEN103. Additionally, watching recordings provides the flexibility to pause and rewind as needed. However, students who participated in live sessions had a higher course progression rate than students who viewed a recording. In the GEN103 course, students who participated in live sessions had a higher pass rate and next course progression rate than those who viewed a recording of the live sessions. In GEN101 and GEN103, students who attended live sessions had a higher average GPA compared to students who viewed the recording and nonparticipants.

For the second research question, data collected from a university-wide survey yielded helpful information for revising the sessions. Students in the GEN101 course explained the relevance of the live learning sessions to the development of their SMART goals, accessing online support resources, creating a personal development plan, increasing confidence to complete coursework, reflecting on future plans, strengthening academic performance, and connecting to the university and peers, respectively. Students in GEN103 course found the e-library folder tool, citation tool, 24/7 librarian service, and live human librarians with office hours as the most valuable lessons discussed in the live learning sessions. By viewing these findings in light of Broadbent and Lodge (2021), Faulconer et al. (2018), Yamagata-Lynch (2014), Smailes and Gannon-Leary (2011), and Purnell et al. (2010), it is easy to conclude that the live sessions, coupled with asynchronous coursework examples, support students. This body of literature demonstrates that online learners find live interaction supportive and helpful (Smailes and Gannon-Leary, 2011; Purnell et al., 2010). Students in synchronous sessions benefit from natural language, immediate feedback, and a sense of personalization that might not be felt in the asynchronous learning management system-based content (Fabriz et al., 2021). During such sessions, students also gain skills through demonstration that positively impact their motivation (as seen in the persistence scores of those who attended the live sessions). While recordings of the sessions are helpful and can be just as beneficial (Nieuwoudt, 2020), it is the active engagement and presence that impact engagement for better outcomes (Fabriz et al., 2021). Additionally, as was the case for the two courses in this study, using course content during the synchronous sessions supports learning and motivation and helps overcome the social presence gap (Daigle & Stuvland, 2020).

Supporting students by overtly demonstrating how to access university resources needed to succeed in their present and future courses can increase help-seeking and academic behaviors that are often present in successfully persistent students (Broadbent & Lodge, 2021; Broadbent & Poon, 2015; Chyr et al., 2017; Schunk & Zimmerman, 2012). As suggested by Koc and Liu (2016), this university is striving for creative problem solving for a solution to increasing students' help-seeking behaviors (e.g., reaching out to librarians, tutors, advisors, etc.) while also increasing metacognitive mapping of when and how to seek out the appropriate support to reduce frustration and increase persistence. The live sessions also have live chat with instructors. While a main instructor is leading the lesson, one or two other instructors are engaging in live chat with students in the Zoom chat feature. Klein et al. (2018) and Matteson et al. (2011) shared that a live chat feature can increase student-to-student and student-to-instructor engagement while providing high levels of support. This timely interaction allows students to seek help and support in real time from course instructors.

The survey results align with previous studies that supported the efficacy of synchronous sessions in online courses in terms of exposing students to class resources and concepts via individualized guidance (Blau et al., 2017; Fabriz et al., 2021; Robinson et al., 2022). However, there were some challenges. Through the survey, students reported encountering technical issues during the live learning sessions along with time constraints related to the limited time and fast pace of the sessions. They also reported disruption in the learning process because of disruptive participants (e.g., a peer who

was not on mute during the session). These challenges are consistent with what previous researchers found and indicated as potential technical difficulties, scheduling conflicts, and time zone issues in synchronous sessions in online courses (Fabriz et al., 2021). While synchronous, live sessions provide a solid foundation to support persistence, there remains room for improvement for those students who struggle with technology or have academic gaps or time constraints for attending live sessions. Viewing a recording of the live session does show promise, but those students did appear to struggle more than those who attended live.

LIMITATIONS

The existing procedure holds students who cannot join at least one of the live sessions responsible for contacting their instructors to obtain a recording. Some students may not be as proactive with reaching out for missed content. In addition, the researchers of this study made the assumption that students who actively sought out the live learning session recordings not only accessed them but also watched the entire recording. This is a potential limitation to this study and may not reflect the actual engagement level of or viewing time for those students. Another limitation of this study is the survey. The survey must be updated to be more reflective of the students' experiences and satisfaction to provide a more accurate representation of their perceptions. The survey return numbers were low, impacting the generalizability of the findings of this study. A possible explanation of the low response rate is relying on faculty members to distribute the survey at the end of each course. This inconsistent survey distribution may lead to underrepresentation of student perspectives and feedback.

Understanding the impact of attendance based on time zones was not something explored in this study. While students joined from across the world, the available time may have been in the morning for one student and the evening for another. Since this university has around a 24% military enrollment, students who are deployed may join sessions in the early morning or very late at night. Students' perspectives about this time difference is not included in the survey questions.

RECOMMENDATIONS FOR FUTURE RESEARCH

The results of this study indicated that live learning participants outperform nonparticipants in pass rate, next course progression, and course GPA. There is a need to encourage less performant students to attend live sessions or view the recording if attendance is not possible. More analysis of effective strategies to increase student participation in these sessions is needed; examine the session content and how it ties to course learning objectives; and assess effective types of student interactions and engagement with learning materials, faculty, and peers. Further research is also needed to study the impact of synchronous sessions in online courses on student academic achievement and institutional investment (Olson & McCracken, 2015). Interestingly, the average live session participants in this study were slightly older than students who watched the recording and students who did not attend live sessions nor watch a recording. Also, the majority of the participants in both live sessions and recorded sessions were minority female students. Therefore, future studies can examine the possible factors leading to the age difference and to investigate the experiences, challenges, and needs of minority female students. Ultimately, age and gender differences in live session participation and their possible impact on course learning outcomes, retention, and satisfaction need to be examined to offer insight on the best educational methods, instructional strategies, and support resources to address the needs of the diverse student population. To increase student exposure to concepts discussed in the live sessions, adapting a flexible and/or hybrid model should be carefully examined. Courses can offer live sessions for those who can attend and recorded sessions accessible at any time and enhanced with interactives to create a sese of engagement. Finally, understanding the impact of students' attendance based on their time zones should be explored. If time zones are a factor in students not attending, more attention would need to be paid to the schedule.

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AUTHOR AFFILIATIONS

Hazar Shehadeh, PhD orcid.org/0009-0003-0352-2621
University of Arizona Global Campus, US

Jennifer Robinson, PhD orcid.org/0000-0003-1721-9466
University of Arizona Global Campus, US

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BIOGRAPHIES

Dr. Hazar Shehadeh is associate professor in the School of General Studies at the University of Arizona Global Campus (UAGC). She has taught different courses working and supporting undergraduate and graduate learners since 2009. She has served in and led different committees to review, revise, and design curricula, and she has developed and reviewed online and hybrid courses for different institutions. Her research focuses on improving minority students' academic performance and examining different instructional methods to increase student academic achievement and retention.

Dr. Jennifer Robinson is program chair and associate professor in the School for General Studies at the University of Arizona Global Campus. She earned a PhD in education with specializations in literacy and English as a second language from Washington State University. Her research interests include using professional learning communities in online teaching environments, supporting online students, English language learners' reading and writing, and providing successful feedback to support students' learning.