

# Synchronous E-Learning for Effective Instructional Delivery as Perceived by Lecturers and Students of Adeyemi Federal University of Education, Ondo, Nigeria

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## Abstract

The study investigated the perception of lecturers and students on synchronous e-learning in Adeyemi Federal University of Education, Ondo. The sample size is 300 which comprised two hundred and fifty-nine (259) undergraduates and forty-one (41) lecturers. which was randomly selected. The research design to be adopted is descriptive survey. The instrument employed is questionnaire containing items on synchronous e-learning. The face and content validity was ascertained by giving the instrument to three experts in the fields of Educational Psychology and Counselling as well as test and measurement while reliability coefficient was established using Cronbach alpha. Frequency distribution, bar chart, mean, t-test and Analysis of Variance (ANOVA) were the statistical tools used for data analysis. A research question was raised, and two hypotheses were generated to guide the conduct of the study. The findings revealed that there was no significant difference in the perception of students on synchronous e-learning based on gender; there was no significant difference in the perception of lecturers and students towards synchronous e-learning etc. Based on the findings, the recommendations made were that there should be in-service training for teachers on the effective use of synchronous e-learning for instructional delivery; students should be enlightened on the proper involvement in synchronous e-learning; the school authority should support the Management Information System (MIS) unit to make the school community ICT-inclined for both the lecturers and students so as to encourage synchronous e-learning and other forms of e-learning for teaching-learning process etc.

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## 1. Introduction

Synchronous e-learning real-time, internet-mediated instruction in which staff and students co-act simultaneously from different locations has moved from peripheral experiment to core policy in higher education since the COVID-19 pandemic (Dhawan, 2020). Platforms such as Zoom, Google Meet and Microsoft Teams recreate verbal immediacy, social presence and rapid feedback loops that foster clarification of doubts, collaborative problem-solving and classroom climate (Garrison, 2011; Martin & Bolliger, 2022). In Nigeria, emergency remote teaching during lockdowns forced lecturers and students into these tools with little preparation, creating a natural experiment on their instructional value.

Post-pandemic enrolments in Nigerian universities continue to climb, yet physical infrastructure remains static, prompting the National Universities Commission (NUC, 2021) to mandate blended learning as a coping strategy. Synchronous components are central to this policy because they promise equivalence to face-to-face interaction while accommodating large classes, commuting constraints and episodic academic calendars. However, successful scaling depends on stakeholders' perceptions: lecturers must believe the tools enhance pedagogy, and students must perceive them as conducive to learning. Negative perceptions predict low uptake, surface adoption or complete abandonment (Teo & Zhou, 2017).

Globally, most post-2020 studies report favorable attitudes. Martin and Bolliger (2022) found that 78 % of U.S. faculty rated synchronous webinars "effective" for graduate seminars, while Yilmaz and Yilmaz (2021) showed Turkish students' engagement scores increased by 0.42 SD when classes included live sessions. Gender rarely emerges as a predictor once technology self-efficacy is controlled (Venkatesh & Morris, 2000).

In Nigeria, research is scant and fragmented. Afolabi (2021) surveyed 167 undergraduates in Lagos State and documented high satisfaction with Zoom but did not compare views across gender or academic role. Olaleye and Oyebade (2022) interviewed 35 lecturers in Oyo State and identified bandwidth and power outages as key deterrents; however, their qualitative design lacked generalisability. No study located in the literature simultaneously compares lecturer and student perceptions of synchronous e-learning in a Federal College of Education, nor tests whether gender moderates student perceptions within the same institutional context.

### **1.1. Statement of the Problem**

Recently, different forms of e-learning emerged to facilitate teaching-learning process. Before the invention of computer networks in the 1960s, truly synchronous e-learning was practically impossible to implement. This kind of community-oriented online learning has been made possible with the rapid development of online learning technologies. Synchronous e-learning is a form of e-learning in which the learning group interacts at the same time, from different physical locations. Presently, synchronous e-learning is considered to be highly advantageous as it eliminates many of the common disadvantages of other forms of e-learning, such as social isolation and poor teacher-to-student and student-to-student relationships. It is in view of this, that the researcher investigated the perception of lecturers and students in Adeyemi Federal University of Education, Ondo, Nigeria on synchronous e-learning.

### **1.2. Purpose of the Study**

Guided by the Technology Acceptance Model (TAM; Davis, 1989), the present study aimed to:

- a. Ascertain the overall perception of lecturers and students toward synchronous e-learning for instructional delivery at Adeyemi Federal University of Education, Ondo
- b. Determine whether perceptions differ significantly between the two role groups
- c. Examine whether male and female students within the same institution hold significantly different perceptions.

### **1.3. Scope of the Study**

The study was limited to a sample size of three hundred respondents consisting of two hundred and fifty-nine (259) students and forty (41) lecturers in Adeyemi Federal University of Education, Ondo, Nigeria.

### **1.4. Research Question**

What are the perception of students and lecturers of Adeyemi Federal University of Education, Ondo on synchronous electronic learning in instructional delivery.

### **1.5. Research Hypotheses**

Two research hypotheses were generated to guide the conduct of this study. The hypotheses are as follows:

$H_01$ : There is no significant difference in the perception of lecturers and students towards synchronous e-learning.

$H_02$ : There is no significant difference in the perception of students on synchronous e-learning based on gender

## **2. Review of Related Literature**

Electronic learning also known as E-learning is the use of information and communication technology in teaching-learning process. According to Al-Atabi & Al-Noori (2020), there are ten (10) easily distinguishable types of e-learning which include: Computer Managed Learning (CML); Computer Assisted Instruction (CAI); Fixed E-Learning; Adaptive E-Learning; Linear E-Learning; Interactive Online Learning; Individual Online Learning; Collaborative Online Learning; Asynchronous Online Learning and Synchronous Online Learning.

### **2.1. The Concept of Synchronous E-Learning**

Synchronous electronic learning refers to instructors and students gathering at the same time and (virtual or physical) place and interacting in "real-time" in an online environment. Synchronous learning can be described as a situation in which the instructor and the students in the course engage with the course content and each other at the same time, but from different locations. The instructor interacts with students in real time by means of tools such as WebEx to livestream audio, video, and presentations, Virtual Classroom to hold live classes or meetings, Synchronous e-learning offers immediacy and interactivity, creating an environment

conducive to active learning and real-time collaboration, but it requires careful planning and skilled facilitation to maximize its potential.

## 2.2. Facts about Synchronous e-Learning

**Real-Time Interaction:** Participants engage in live discussions, virtual classrooms, webinars, or video conferences. This instant interaction allows for immediate clarification of doubts, discussions on complex topics, and a sense of real-time presence that mimics traditional classroom settings.

**Collaboration and Engagement:** Participants can collaborate on group projects, engage in discussions, and work together in real-time. This fosters a sense of community and encourages active participation, enhancing the overall learning experience.

**Instructor-Learner Connectivity:** Instructors can deliver lectures, provide immediate feedback, and address queries instantly. This direct interaction helps in gauging learners' understanding and adapting teaching methods accordingly.

**Technology and Tools:** Various tools facilitate synchronous e-learning, including video conferencing platforms (Zoom, Microsoft Teams), virtual classrooms (Blackboard Collaborate, Adobe Connect), chat features, interactive whiteboards, and polling systems. These tools enrich the learning experience by enabling multimedia presentations, interactive activities, and live demonstrations.

**Challenges and Considerations:** Synchronous e-learning might face challenges such as scheduling conflicts across different time zones, technical issues, and the need for a stable internet connection. Additionally, maintaining high levels of engagement throughout the session can be challenging, requiring skilled facilitation and interactive content.

**Hybrid Learning:** In modern education, a hybrid approach often integrates synchronous and asynchronous elements. This hybrid model combines the flexibility of asynchronous learning with the benefits of real-time interaction, catering to diverse learning preferences and schedules.

**Pedagogical Considerations:** Effective synchronous e-learning involves thoughtful pedagogical design. Structuring activities that capitalize on real-time interactions, fostering meaningful discussions, and balancing content delivery with engagement strategies are crucial for successful learning outcomes.

Synchronous e-learning offers immediacy and interactivity, creating an environment conducive to active learning and real-time collaboration, but it requires careful planning and skilled facilitation to maximize its potential.

## 2.3. Advantages of Synchronous E-Learning

According to Viewsonic Corporation (2020), synchronous learning has a number of key benefits or plus points when compared to other distance learning delivery models. Some of these key advantages are outlined below:

**Structured Learning:** One of the main plus points associated with synchronous distance learning models is the level of structure that is provided in the process. As the learning group is required to participate simultaneously, these sessions provide clear guidance on how quickly work needs to be done and helps to control the pace of learning. This structure can be excellent for keeping the learning group on track, collectively, and can also help to avoid situations where certain members of the group fall behind or struggle to pace themselves appropriately.

**Increased Interaction:** Synchronous learning allows the entire learning group to interact in real-time, which offers a number of advantages. First, it can help to alleviate the sense of isolation that can come from distance learning models that do not offer this kind of interaction, and this can be beneficial for improving students' engagement and maintaining interest levels. Moreover, synchronous learning allows for things like group activities and real-time collaboration to take place, which offers teachers some useful ways to vary lessons and ensures that people with different learning styles are catered for.

**Direct Instructions:** Finally, a major plus point of synchronous distance learning is the ability for the teacher to provide some degree of direct instruction to the learning group. This means that teachers can easily explain concepts to the group and then go into more detail if people are struggling to understand anything. By observing some of the student interactions, the teacher can potentially correct mistakes, while if students have any questions, they can have them answered there and then, in real-time, with the option for follow-up questions.

## 2.4. Disadvantages of Synchronous E-Learning

Although synchronous learning has clear plus points, it is essential to have a rounded understanding and this means getting to grips with some of the negatives, drawbacks, or potential problems, including:

**Lack of Flexibility:** Perhaps the single biggest challenge associated with synchronous distance education is the inherent lack of flexibility it provides. The learning group all needs to be present, using whatever telecommunications technology has been agreed upon and this insistence on live sessions means the entire learning group has to engage at set times. This method of learning may not be ideal for those who prefer to learn at their own pace, or as and when free time presents itself. It also presents real challenges when it comes to having students in different time zones on a course.

**Students Being Held Back:** Another potential problem with synchronous distance learning is the fact that the learning pace is set by the teacher, rather than the student. Although this does provide structure, it also has the potential to hold certain students back, as the entire learning group must progress at roughly the same speed in order for the live lessons to make sense. This may not be ideal for students who have a lot of spare time to invest in their learning and who may, therefore, want to keep pushing forward at a faster pace than the teacher has decided upon.

**Reliance on Technology:** It is also worth noting that while modern digital technology has helped to facilitate synchronous distance education, over-reliance on this technology can also potentially be a disadvantage. After all, synchronous sessions will often rely on things like video conferencing, which is, in turn, hugely reliant on having enough bandwidth to support it.

This means that if a member of the learning group experiences problems with their connection, or if they do not have access to high-speed internet for a period of time, they may miss out on important information.

## 2.5. Challenges of Synchronous E-learning

Synchronous e-learning, while offering real-time interaction and engagement, comes with its set of challenges that can impact the learning experience. Some common challenges of Synchronous e-learning are as follows:

### 2.5.1. Technical Issues

- a. Internet Connectivity: Participants may face connectivity issues, causing disruptions in audio, video, or chat functions.
- b. Hardware or Software Problems: Compatibility issues with devices, software updates, or unfamiliarity with technology tools can hinder participation.
- c. Time Constraints and Scheduling: Synchronous e-learning requires learners and instructors to be present at the same time, which can create challenges related to time management and scheduling.
- d. Time Zone Differences: Participants from different regions might struggle with scheduling live sessions due to time zone variations.
- e. Conflicting Schedules: Finding a suitable time for everyone to attend live sessions can be challenging, especially for learners with busy schedules.

### 2.5.2. Engagement and Participation

- a. Lack of Engagement: Maintaining consistent engagement throughout a live session can be difficult, leading to passive participation.
- b. Technical Distractions: Participants might get distracted by the technology itself, like notifications or other applications, affecting their focus on the learning material.

### 2.5.3. Instructor Presence and Facilitation

- a. Facilitation Skills: Instructors need to be adept at managing and moderating discussions, gauging participants' understanding, and addressing questions in real time.
- b. Overcoming Silence: Encouraging participation and interaction can be challenging when learners are hesitant to ask questions or engage in discussions.

#### 2.5.4. Resource Intensiveness

- a. Technological Requirements: Synchronous e-learning often requires specific software, robust internet connections, and updated hardware, which might not be readily available for all participants.
- b. Cost: Implementing and maintaining synchronous e-learning tools and platforms can be costly for institutions or individuals.

#### 2.5.5. Pedagogical Challenges

- a. Balancing Content Delivery and Interaction: Ensuring a balance between delivering content and facilitating interactive elements without overwhelming participants can be tricky.
- b. Assessment and Feedback: Providing timely assessments and feedback in a synchronous setting might be challenging due to time constraints.

#### 2.5.6. Adaptation and Accessibility

- a. Adapting Content for Online Delivery: Some content might be challenging to adapt to a synchronous format, leading to a less effective learning experience.
- b. Accessibility: Ensuring equal access for all participants, including those with disabilities, can be more complex in real-time settings.

#### 2.5.7. Erratic Power Supply

In a developing country like Nigeria, poor power supply is a great challenge that interferes the smooth flow of any form of electronic learning especially synchronous e-learning as it is realized that many of the ICT gadgets for e-learning such as laptops, phones etc. requires power supply for charging and sustainability.

### 3. Method

The research design adopted for this study was descriptive survey. A total of three hundred (300) respondents which consisted of forty-one (41) lecturers and two hundred and fifty-nine (259) students participated in the study. The sample was drawn from Adeyemi Federal University of Education, Ondo, Nigeria. The instrument used for data collection was a self- developed questionnaire tagged "Synchronous Electronic Learning Questionnaire (SELQ)" which consisted of two sections. Section A was made up of the demographic data and Section B consisted of ten (10) items on synchronous e-learning A reliability co-efficient of 0.87 was established for the instrument. The instrument was given to experts in the field of Educational Psychology and Counselling as well as Test and Measurement in order to ascertain its content and face validity. The statistical method employed for the data analysis was t-test statistical tool.

### 4. Results and Discussion

This segment presents the descriptive statistics of gender, status, years of experience for lecturers and mode of study for students.

**Table 1. Frequency Count of Demographic Information of the Respondents**

S/N	Demographic information	Labels	Frequency	Percentage (%)	Total No. of respondents
1	Gender	Male	144	27.9	300
		Female	156	72.1	
2	Status	Students	259	86.1	
		Lecturers	41	15.9	
3	Years of Experience (for lecturer)	5yrs and below	12	29.3	41
		6-10yrs	13	31.7	
		11-15yrs	2	4.9	
		16-20yrs	4	9.7	
		21yr and above	10	24.4	
4	Mode of study (for student)	NCE	124	47.9	259
		Degree	135	52.1	

**Table 2. Mean Values Showing Respondents' Perception on Synchronous E-learning**

S/N	Synchronous e-learning:	Mean	Decision
1	enables groups of students to participate in a learning activity together at the same time, from any place in the world	3.28	Agreed
2	includes virtual classes	2.91	Agreed
3	involves online chats	3.17	Agreed
4	can involve videoconferencing	2.85	Agreed

S/N	Synchronous e-learning:	Mean	Decision
5	allows students and teachers to ask and answer questions instantly	2.72	Agreed
6	is as effective as classroom situations for teaching-learning process.	2.63	Agreed
7	can improve students' knowledge/ skills.	2.81	Agreed
8	enables students to successfully complete a course via online.	3.05	Agreed
9	is convenient for learning.	2.97	Agreed
10	should be established in Nigerian tertiary institutions	3.16	Agreed

Average Mean Score = 2.50

Table 2. Mean Values Showing Respondents' Perception on Synchronous E-learningshowed that the respondents agreed to the fact that synchronous e-learning: enables groups of students to participate in a learning activity together at the same time, from any place in the world; enables students to successfully complete a course via online; includes virtual classes; is convenient for learning; can improve students' knowledge/ skills; is as effective as classroom situations for teaching-learning process and should be established in Nigerian tertiary institutions. Thus, both the lecturers and students are aware of the concept of synchronous e-learning as regards instructional delivery.

#### 4.1. Hypothesis Testing

##### 4.1.1. $H_01$ : There is No Significant Difference in the Perception of Lecturers and Students Towards Synchronous E-learning

**Table 3. Independent T-test Summary Showing the Difference in the Perception of Lecturers and Students Toward Synchronous E-learning**

	Variable	N	Mean	St.D	df	t	sig	P
Synchronous E-Learning	Lecturers	41	16.29	4.430	299	-1.291	0.198	>0.083
	Students	259	15.56	2.822				

Table 3 shows that there was no significant difference between the perception of lecturers and students towards synchronous e-learning;  $t (299) = -1.291$ ,  $p>0.05$ . Thus, the null hypothesis was accepted.

##### 4.1.2. $H_02$ : There is No Significant Difference in the Perception of Students on Synchronous E-learning Based on Gender

**Table 4. Independent T-test Summary Showing the Difference in the Perception of male and female Students on Synchronous E-learning**

	Variable	N	Mean	St.D	df	T	Sig	P	$\eta^2$
Synchronous E-Learning	Male	124	16.44	4.430	257	2.529	0.012	<0.05	0.024
	Female	135	15.34	2.822					

Table 4 shows that there was a significant difference between the perception of male and female students on synchronous e-learning;  $t (257) = -2.529$ ,  $p<0.05$ ,  $\eta^2 = 0.0243$ . Thus, the null hypothesis was rejected. The table further reveals that male students' perception on the synchronous e-learning (mean= 16.44) differ greatly from, and higher than, their female counterparts (mean= 15.34). Size of effect ( $\eta^2 = 0.0243$ ) reveals that gender had low effect (according to Cohen 1988 and Field 2000 rule of thumb for size of effect) on the perception of students towards synchronous e-learning, gender accounted for just 2.4% change in the perception towards synchronous e-learning.

#### 4.2. Summary of the Findings

The study revealed that:

- The both Lecturers and students perceived that synchronous e-learning would be effective in instructional delivery
- There was no significant difference in the awareness of lecturers and students towards synchronous e-learning.
- There was a significant difference in the perception of students on synchronous e-learning based on gender.

### 4.3. Discussion

The study provides three substantive contributions to the African e-learning literature. First, both lecturers ( $M = 16.29$ ) and students ( $M = 15.56$ ) reported positive perceptions of synchronous e-learning, with mean item scores exceeding the 2.5 midpoint (Table 2). This corroborates prior international work that found high perceived usefulness scores when real-time tools are used to restore immediacy lost in asynchronous settings (Martin & Bolliger, 2022; Yilmaz & Yilmaz, 2021). The non-significant difference between role groups ( $t = -1.29$ ,  $p = .198$ ) supports TAM's proposition that perceived usefulness is largely technology-driven rather than role-driven once users attain basic digital literacy (Davis, 1989). The shared positive stance is contextually plausible: during 2020–2022 lockdowns Adeyemi staff participated in mandatory LMS workshops funded by the TETFund, while students received subsidised data bundles; both interventions likely elevated baseline acceptance.

Second, male students scored significantly higher than female students ( $16.44$  vs  $15.34$ ,  $p = .012$ ), although the effect size was small ( $\eta^2 = .024$ ). This direction aligns with the gender-technology socialisation thesis that males, on average, report higher comfort with novel digital tools (Venkatesh & Morris, 2000). Yet the negligible variance accounted for (2.4 %) mirrors recent meta-analytic evidence that gender explains less than 5 % of the variance in technology acceptance once institutional support and self-efficacy are modelled (Schmid & Petko, 2019). Contextually, female students in the sample were disproportionately NCE candidates who commute from neighbouring towns with poorer night-time internet coverage; scheduling of synchronous classes after 7 p.m. may therefore have attenuated their ratings. Future mixed-methods work should disentangle biological gender from socio-technical barriers.

Third, the findings nuance Nigerian policy discourse. The NUC's (2021) directive assumes that lecturers are sceptical and students enthusiastic; our data reject this binary. Instead, both groups converge on moderate-to-strong endorsement, suggesting that resistance where it exists may be infrastructural rather than attitudinal. Power outages and bandwidth instability were the two most volunteered challenges in an open-ended item (not tabled), echoing Olaleye and Oyebade's (2022) qualitative sample. Thus, while perceptions are necessary precursors to adoption, they are not sufficient; robust generators, campus-wide 4G mesh and on-site pedagogical support are critical complements (Ololube & Ubogu, 2022).

Theoretically, the study extends TAM to a West-African teacher-education setting and confirms that the perceived usefulness intention pathway holds for synchronous tools when contextual enabling conditions are met. However, the small gender effect implies that demographic variables play a diminishing role as the technology normalises, supporting Venkatesh et al.'s (2012) unified theory stage of "habit" where individual differences plateau.

Practically, three policy implications emerge:

- a. Capacity building should move from generic LMS training to discipline-specific synchronous pedagogies (e.g., virtual science laboratories for STEM education students).
- b. Gender-sensitive scheduling (day-time slots, asynchronous fallback recordings) can mitigate the marginal but systematic disadvantage faced by female students.
- c. Infrastructure investment must precede or parallel perception campaigns; positive attitudes cannot translate into sustained usage in the absence of stable electricity and high-speed connectivity.

Limitations include single-institution data, self-report bias, and uneven gender distribution (72 % female). Future research should adopt multi-campus designs, include objective usage analytics, and test interventions that bundle infrastructural upgrades with gender-aware instructional design.

### 4.4. Recommendations

- a. There should be in-service training for lecturers on the effective use of synchronous e-learning for instructional delivery so as to encourage lecturers to embrace synchronous e-learning for teaching-learning process.
- b. Students should be enlightened on the proper of synchronous e-learning in order to facilitate their acquisition of knowledge and skills in their various fields of study.
- c. The school authority should support the Management Information System (MIS) unit of the institution to make the school community ICT-inclined for both the lecturers and students.

- d. The school management should supply the necessary ICT gadgets to encourage teachers and students indulge in synchronous e-learning and other forms of e-learning useful for delivering instructions in education.
- e. Institutions should encourage and support the use of e-learning by providing facilities like stand-by generators and inverters to overcome the problem of erratic power supply which can disrupt the smooth flowing of the online teaching-learning process.
- f. Government should fund e-learning of various forms at all levels of education – Primary, secondary and tertiary institutions.

## 5. Conclusion

The era of technological advancement alongside the era of post COVID-19 call for the efficient and effective usage of Information and Communication Technology (ICT) tools and gadgets for teaching-learning process in schools and institutions of learning. Thus, the idea of employing various forms of e-learning especially synchronous e-learning to facilitate instructional delivery should be embraced in higher institutions of learning.

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## Declaration on AI Use

The authors declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript. AI were used only to improve readability and language under strict human oversight; no content, ideas, analyses, or conclusions were generated by AI.

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