



AN ANALYSIS ON ESP STUDENTS' ONLINE LEARNING NEEDS: BASIS FOR DEVELOPING A TAILORED ONLINE LEARNING PLATFORM

Fitria Rahmawati¹, Dewanti Ratna Pertiwi², Sittie Noffaisah B. Pasandalan³

¹English Language Education Department, Faculty of Language Education
Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia

²Department of Mechanical Engineering, Faculty of Aerospace Technology
Institut Teknologi Dirgantara Adisutjipto, Yogyakarta, Indonesia

³Department of English, College of Arts and Social Sciences,
Mindanao State University-Iligan Institute of Technology, Iligan City, Philippines

*Corresponding author: fitriarahmawati@umy.ac.id

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Abstract: This study aims to analyze the needs of Adisutjipto-Aerospace Institute of Technology (ITDA) Yogyakarta students on online learning as the basis for the creation of an online learning platform. The research focused on and investigated 1) how students perceive the implementation of synchronous and asynchronous online learning in terms of content and structure; and 2) the students' learning needs regarding learning mode and activity, teacher aspect, and technical aspect of the online learning implementation. A survey design and a questionnaire were employed for a total of 146 students from one Mechanical Engineering class and three Aerospace Engineering classes who were all enrolled in an English course. The number of samples taken from the entire population was 119, with a confidence level of 5% and randomly selected. It was found that the three most important aspects in online learning are that of teachers with a mean value of 3.266 (very high), followed by learning content and structure (mean value of 3.153) and technical (mean value of 3.127) which are high. The research revealed in an online learning platform, teachers have a crucial role in the learning process of the students and in having a holistic online learning implementation. The results became the basis for further developing the content and structure of ITDA's online learning platform, ELENA.

Keywords: needs analysis, English learning, online mode, delivery, content

INTRODUCTION

Online learning has become a key part of education, offering flexible and accessible ways for students to learn. As more institutions use online platforms, it is important to understand what students need to succeed in this environment. Students' success in online learning environments greatly depends on how well these platforms support engagement, communication, and comprehension. Teachers also play an important role by maintaining good communication, which helps students stay engaged and feel connected (Abumalloh et al., 2021). Without attention to these varying needs, some students may struggle with online learning (Romadhon, 2023).

Dhawan (in Lu and Caballes, 2022) defined online learning as any tool that provides flexibility and innovation in the teaching-learning process. Online learning has long been adopted and implemented in higher education in Indonesia to facilitate students to better understand the learning materials, including foreign language learning such as English. Studies show that both students and teachers generally have positive perceptions towards online learning, recognizing its benefits in providing flexibility and fostering independent learning (Fadhilah & Hamzah, 2022; Isma et al., 2024; Madehang et al., 2024). In addition, it has been perceived to be an effective tool by both teachers and students to enhance delivery of

instruction and development of knowledge acquisition skills (Encarnacion, Galang, and Hallar, 2021). Teachers consider online learning important for providing flexible teaching schedules and long-term access to materials (Pamungkas, 2023).

Moreover, a study found that students' online class involvement was enhanced by using more asynchronous techniques, assessing active participation, and not providing non-doable homework (Iswati, 2021). It was also revealed that online learning is as effective as face to face in a study by Kusumawati (2020) that contrasted face-to-face with online learning, both synchronous and asynchronous; the performance of students in speaking activity is the same. Generally, both synchronous and asynchronous online learning modes are viewed positively by students (Hosseini & Amirkhani, 2023b; Siregar et al., 2023). Research on online learning can provide valuable insights for educators and policymakers to improve the effectiveness of online learning platforms and enhance English language proficiency among Indonesian students (Isma et al., 2024).

Considering that the learners of the 21st century are mostly digital natives, online learning shows great potential to be the best strategy for teaching and learning, shaping the future of education. Although studies concerning the implementation of students' perceptions of online learning already exist, most of them focus on the activities of online learning (Kusumawati, 2020), its positive influence on online teaching and learning (Anwar & Wahid, 2021), and its challenges (Agung et al., 2020). There are still limited studies focused on analysis of the students' needs in the context of learning English for Specific Purposes (ESP), specifically on the learning mode and activity, the teacher aspect, and the technical aspect of online learning.

Having established that online learning is already an essential platform for students to continue education, studies on the needs of students must be undertaken to make online learning more responsive especially that some learners still prefer the traditional method or face to face classes (Lu and Caballes, 2022). While, generally perceived as beneficial, some students remark that materials used are not as effective as those used in traditional learning (Pallavi, Ramachandran, & Chinnasamy (2022). Students appreciate easy-to-understand material, interesting tutorials, features, and animated videos in online learning platforms (Oktradiksa et al., 2023). Therefore, teachers should optimize their role in

online learning by considering the needs of the students, especially in the ESP context. With the goal to investigate the needs of students on online learning to create a more effective and responsive online learning platform, this study explores the needs of students taking English language classes to meet the demands of the aviation industry.

The Adisutjipto-Aerospace Institute of Technology (ITDA) Yogyakarta is a private institute under the Indonesian Air Force Foundation serving the society in engineering education. ITDA has an online learning platform known as ELENA, which is accessible at <https://elena2.itda.ac.id/>. Despite its availability since 2017, the implementation of ELENA only became more popular and frequently used when the Covid-19 Pandemic happened in 2020 especially with Indonesia's policy on large scale social restrictions. Having great experience of the use of ELENA, the institution continues to adopt the use of online learning and will build it to be more responsive to the needs of the students.

Examining ELENA, the research aims at 1) investigating how the students perceive the ideal online learning implementation with regards to its content and structure; and 2) identifying the students' learning needs on the learning mode and activity, the teacher aspect, and the technical aspect of the online learning implementation. This research can help teachers understand the needs of their students during online learning. Furthermore, the result of this study provides reflection and feedback for the institution about the platform being used towards improving the online learning implementation to the students, especially the freshmen.

Online Learning Implementation in an ESP Context

Language training in the new era enables general EFL/ESL students to comprehend the language of various specialised subjects. With the growing popularity of English for Specific Purposes (ESP) classes, it appears that there is an increasing demand for more qualified teachers who are skilled in many elements of ESP, including academics, vocational training, and professional training. ESP courses are more concentrated than traditional ELT courses since they focus on analysing learners' requirements. The claims show that ESP views students in terms of their work or study responsibilities. ESP courses are more concerned with job or study-related obligations than with personal or general interests (Basturkmen, 2010).

ESP arose in General English (GE) when people recognized that GE could not suit their communication demands in their fields of work. In the ESP setting, it is necessary to require more specific English. The growing appreciation for ESP originates from the fundamental notion that a language is a tool for communication rather than a collection of phonological, grammatical, and lexical items to be memorized. As a result, it is vital to tailor instruction to the students' needs. Nonetheless, learning GE will aid in the development of ESP (Sari, et al., 2021). ESP is difficult to achieve because of this situation. ESP teachers encountered numerous challenges, including a lack of knowledge about their students' fields of study, ESP instruction, practical needs analysis, large classrooms, and a wide range of English abilities (Iswati & Triastuti, 2021).

In the last few decades, online learning has evolved and its potential to be the future of learning has been established. Accordingly, attention should be given to ESP online teaching, not only on technical aspects but also on human aspects in which teachers should carefully design the online learning environment for their students in consideration of accessibility, cost, and personalized learning (Iswati, 2021). Teachers must wisely choose its modality and course design technique suitable for the students' needs. While hybrid and microlearning approaches show promise in enhancing student engagement and language competence (Adi, 2023; Caroline et al., 2023), several challenges persist. Some of the challenges encountered are unstable internet connections, students' time constraints, and teachers' unfamiliarity with technology (Adi, 2023; Caroline et al., 2023; Romadhon, 2023).

Studies on online English for Specific Purposes (ESP) classes reveal mixed student perceptions. For some students, synchronous learning is more effective (Hosseini & Amirkhani, 2023) but others preferred asynchronous activities like video projects and digital storytelling (Otodu & Khoiriyah, 2023). It has also been found that mentioning mistakes, giving challenging tasks, and creating group work have been perceived by some students as demotivating (Mauludin & Prasetyo, 2024). This underscores that successful online ESP teaching strategies include clear instructions, using various learning platforms, and incorporating authentic materials (Gayatri et al., 2024).

In a study on Students' Perception of Online Learning by Agung, et al. (2020), it was found that most students found the materials provided were simple to understand but several students claimed

that offline classes were more enjoyable than online classes. The study also revealed that all the instructors gave the students homework which was all related to the materials. The results of comprehensive direction showed that while some students comprehended the supplied principle, others needed further explanation and guidance from the teachers during the online learning synchronous session. On the other hand, a study by Iswati (2021) found that the strategies employed by ESP teachers included giving clear instructions, utilizing different learning platforms, using authentic materials, and group work. For speaking activities, video conferencing tools like Zoom and Google Meet were found to be the most preferred (Otodu & Khoiriyah, 2023).

Prudnikova (2021) evaluated the use of Moodle for online learning, and it was found that Moodle is advantageous for teaching ESP due to its flexibility, personalized learning, interaction of various learning activities, automated assessment, and its support for flipped learning model among others. Although largely viewed to be a synchronous mode, online learning can be supplemented by asynchronous. Thus, Prudnikova (2021) described blended learning or flipped learning as the most efficient options of teaching ESP.

The value of ESP is undeniable as learning the English language can differ depending on the students' backgrounds focusing on which students must concentrate during the course. In the field of medicine, ESP plays a crucial role as there is a constant need to communicate with medical professionals around the globe in English and learning English medical terminologies, in addition to developing listening and speaking skills since a patient's life is at stake (Azzhrani & Alghamdi, 2020). To maximize the benefits of online ESP learning, careful consideration must be given to course design, incorporating multimedia elements, and addressing technological and pedagogical challenges (Caroline et al., 2023; Romadhon, 2023). Overall, effective online ESP instruction requires a balance of synchronous and asynchronous activities, consideration of student preferences, and adaptation of teaching strategies to the online environment (Gayatri et al., 2024; Hosseini & Amirkhani, 2023).

In online learning, students in ESP have distinct needs that demand careful attention. Addressing the needs of students is vital to fostering their growth and success in addition to enhancing their learning outcomes. Reaves (2019) posits that online education should not end with translating

subject matters and materials to digital platforms since these can also become obsolete so teachers must be aware that a previously structured curriculum may no longer be responsive at present, so unlearning is as important as learning.

An effective online learning also requires clear instructional materials, strong communication channels, and flexible support systems to address diverse needs of students and their learning paces. Nasrulloh, et al. (2023) identified diverse learning resources, technology testing, and appropriate pedagogical models as key factors for effective online learning. Lu & Caballes (2022) identified that in online learning students need clear learning materials that can effectively guide them in addition to having an effective communication channel for question-and-answer sessions. Online learning should provide for a flexible learning environment to allow students to learn at their pace considering that some may need support for technical skills (Lu & Caballes, 2022; Reaves, 2019; Andries & Lengkoan, 2023).

Research have established that English language proficiency is crucial for students as it offers benefits like enhanced employability and improved communication skills (Dunakhir & Osman, 2023). However, balancing language learning with technical skills development can be challenging (Dunakhir & Osman, 2023). Studies suggest that ESP teaching for instance, accounting students should focus on speaking skills through active, student-centered learning (Prasongko, 2023). On the other hand, ELT students perceive critical thinking, problem-solving, collaboration, creativity, and effective communication as essential 21st-century skills, emphasizing the need for engaging learning environments incorporating technology and real-world applications (Feyza & Seyda, 2023). To address language challenges in other study programs, tailored English learning materials and collaboration between language instructors and professional experts are recommended (Refa'i, 2023). The integration of language and specialized or technical education is important to prepare students for global business demands and improve their employability (Refa'i, 2023).

In another study to develop ESP massive open online courses by Soraya, et al., (2024), they found that students' desire comprehensive speaking skills development in addition to the need to have integrated learning experience and to have supportive learning environments and user-friendly technology platforms. Additionally, students enrolled at a police university also

revealed the students perceived writing and reading to be critical English skills for their profession thus needing more access to learning resources that allow them to master technical term (Nhung & Hoa, 2021). Similarly, studies found that due to a lack of knowledge of accounting students' target language expectations, they focus on communicative activities and English accounting registers in workplace accounting practice (Nartiningrum & Nugroho, 2020).

Mastering English is also vital for engineering students whose first language is not English, not just for academic purposes but also for their future careers. Non-English majors, such as engineering, have a minimal number of English class hours per week in a curriculum, with only about 100 minutes each week. This present study focused on ESP majors in English for Aerospace Engineering and English for Mechanical Engineering.

Most of the students now are Generation Z students who have been widely exposed to a global multimedia such as YouTube in which they have ready access to thousands of videos that cover almost any topic. Since YouTube is deemed a sustainable resource for learning (Rahmawati, et al, 2024), teachers must ascertain that the material they are developing is not already available online. Adi (2023) emphasized innovative approaches like the 'everybody is a YouTuber' program have shown potential in encouraging student participation. The 21st century learners need access to quality content, and this puts the teacher in a position to either develop their own quality material or make use of readily available materials and supplements such with activities.

The need for an effective communication tool, rich media resources, support and assistance, and easy accessibility and usability among others were also found in a study by Gee (2022) that proposed the integration of four tools categories: sharing, searching, organizing, and networking in any online learning platform. These tools enhance the students' learning experience.

Online learning requires the integration of technology into ESL/EFL instruction. An approach called Technological Pedagogical and Content Knowledge (TPACK) aids teachers in incorporating technology into the classroom. For teachers to successfully implement this approach, they need to have knowledge of not only what to teach (content knowledge), but also how to teach (pedagogical knowledge), and what technology is currently available (technological knowledge). Technological Pedagogical and Content Knowledge (TPACK) (Mishra & Koehler, 2006) is

one of the frameworks that is used to integrate technology in the classroom. In this framework, technology is viewed as a tool that enhances the learning process; it is not the final goal, nor does it replace interaction for mastery of the target language. Rather, technology is seen as a tool that enhances the learning process. Fahadi and Khan (2022) express that TPACK represents a new direction in understanding the complex interactions among content, pedagogy and technology that can result in successful integration of technology in the classroom. Thus, this study adopted the use of TPACK as a technology integration model framework, especially in an online learning environment of the English for Specific Purposes (ESP) setting.

Recent studies have explored the integration of TPACK in online English as a Foreign Language (EFL) teaching and results indicate that EFL teachers vary significantly in their TPACK skills, with some demonstrating adequate to high levels of knowledge across most TPACK domains (Nguyen et al., 2023; Darsih et al., 2023). However, it is evident that teachers may need to further develop their ability to combine technological, pedagogical, and content knowledge for meaningful integration (Nguyen et al., 2023).

A study by Sherouk and Raad (2020) that investigated teachers on their use of online learning found that teachers exhibited a lack of some skills and abilities to fully carry out online learning. The same study underscored information and communication technology as crucial to the learning of the students since digitally literate teachers are able to integrate digital tools to their instruction. The same findings were also found in a study that compared experienced online lecturers and those who had to shift to online learning in which teachers with online teaching experience met fewer obstacles and used a vast array of communication channels and activities but both experienced and novice agree that online learning is beneficial (Bailey & Lee, 2020).

Meanwhile, some studies have also examined students' perceptions of their teachers' TPACK. Findings reveal that while teachers generally have sufficient content knowledge, their TPACK skills may require improvement (Ilmi et al., 2023). Despite that, the implementation of TPACK in online learning environments has shown promise, with teachers using various learning media and educational platforms to create engaging lessons (Ariyani et al., 2023).

The study of Major and McDonald (2021) that

examined 13 studies to determine practices related to TPACK, revealed that education institutions are primarily invested in the development of teachers' TPACK by conducting instructional consultations and training which boosted the confidence of teachers and equipped them with new teaching techniques. As pointed out by Ilmi et al. (2023), there is a need for TPACK-based professional development programs to enhance teachers' proficiency in technology-enhanced language teaching..

METHOD

This study aims to analyze the needs of students in online learning at the Adisutjipto-Aerospace Institute of Technology (ITDA) Yogyakarta. The institution's policy for implementing online learning through the development of ELENA (<https://elena2.itda.ac.id>) has never been evaluated since the start of implementation. Therefore, this study which is a critical evaluation was carried out as a material and basis for the online learning platform's system improvement and a mechanism to improve implementing online learning programs by the Civitas Academica of ITDA.

To answer the research questions, this study adopted a cross-sectional survey design by utilizing a questionnaire to describe the profile of ITDA students' learning needs and preferences concerning the online learning mode and activity, the teacher aspect, and the technical aspect of the online learning implementation. Analyzing students' learning needs and preferences can be carried out in various ways, which can be classified as inductive (case study and observation) or deductive (questionnaire and survey) (Berwick in Urun & Yarar, 2015). Thus, the study employed deductive ways of data gathering.

Research Participants

Population. The subjects of this study were ITDA students majoring in Mechanical Engineering (Teknik Mesin or TM) and Aerospace Engineering (Teknik Dirgantara or TD), with details of one TM class and three TD classes. The students were all enrolled in an English language class for the aerospace industry. The total number of this target population was 146 active students.

Sampling Technique. This study utilized Quota sampling; a technique used for survey purposes. Quota sampling is a technique for determining a sample from a population with specific characteristics to the desired number (quota) (Bluman, 2009). In this technique, the population is not considered but is classified into several

groups. Samples are taken by giving a certain quota or quorum to the group. Data collection was carried out directly on the sampling unit. After the quota was met, the data collection was stopped. Thus, the research team determined the group being the subject of the study, then distributed the questionnaire to the group members until the

minimum number of samples was met. The selected student groups were students from the Departments of Mechanical Engineering (TM) and Aerospace Engineering (TD). The number of samples taken from the total target population was 119 participants, with a confidence level of 5% and randomly selected.

Table 1. *Number of ITDA student samples filling out the questionnaire*

No.	DepartmentClass	Number of Students Filling in the Questionnaire
1	Mechanical Engineering (TM)	40
2.	Aerospace Engineering (TD)A	14
3.	Aerospace Engineering (TD)B	28
4.	Aerospace Engineering (TD)C	37
	Total	119

The survey was expected to provide an overview of related information, attitudes, experiences, and tendencies of action concerning online learning at ITDA. The survey was carried out by distributing research questionnaires. Using a questionnaire allows researchers to collect data about facts, behaviors, and attitudes. The questionnaire contained several questions of learning preferences, specifically regarding the online learning mode and activity, the teacher aspect, and the technical aspect of the online learning implementation. This research questionnaire was adapted from two previous studies: (1) Online Students' Satisfaction with Blended Learning conducted by Julio Cabero, Carmen Llorente and Angel Puentes (2012) in Seville (Spain) and República Dominicana, and (2) An Exploratory Study of Effective Online Learning: Assessing Satisfaction Levels of Graduate Students of Mathematics Education Associated with Human and Design Factors of an Online Course conducted by Joohee Lee (2014) at University of Texas Arlington, USA.

The questionnaire consisted of four parts: demographic information (Part A), online learning evaluation (Part B), online learning needs for synchronous mode (Part C), and online learning needs for asynchronous mode related to teachers, content or learning structure, and technical aspects of delivery (Part D). The first part of the questionnaire was demographic information, comprising nine questions identifying the student number/department, gender, area of origin, high school background, online learning experience in SMA/SMK/MA, online learning support tools, the experience of informal English courses or training, and aspirations after graduating from college. The

second part of the questionnaire focused on analyzing the synchronous mode of online learning needs to get an overview of student attitudes regarding (1) What interactions are considered more suitable for online learning (synchronous, asynchronous, or both) and (2) Direct interaction in online learning (synchronous online learning mode) with video conferencing activities, live small group discussions, polls, and live chat. The last part of the questionnaire included questions about the need for asynchronous online learning and online learning categories, especially on asynchronous mode including teachers, content and learning structure, and technical aspects.

Apart from closed-ended questions in each category, essay questions were also given to provide space for students to elaborate their opinions. The questionnaire had been validated by four TEFL professionals, and Aiken Test analysis was run to check the validity. The results showed that the instruments were valid to measure students' needs in an online learning mode.

The data gathered from the demographic survey questions were tabulated and analyzed descriptively to describe the participants' department, gender, area of origin, high school background, online learning experience in SMA/SMK/MA, online learning support tools, experience of informal English courses or training, and aspirations after graduating from college. Meanwhile, the data from the other sections of the questionnaire were analyzed. The descriptive statistics were tabulated to enumerate the percentage of ITDA students' learning needs and preferences concerning the online learning mode and activity, the teacher aspect, and the technical aspect of the online learning implementation in

responding to the questionnaire.

RESULTS AND DISCUSSION

Demographic information of the student

A total of 119 respondents involved in this study came from two different departments, the

Mechanical Engineering and Aerospace Engineering Departments of Adisutjipto Aerospace Technology Institute (ITDA). The following table shows the respondent demographic information.

Table 2. *The respondent demographic information*

No.	Category	Sub-category	Frequency	Percentage (%)
1.	Gender	Male	91	76.5
		Female	28	23.5
2.	Educational Background	Senior High School	48	40.3
		Vocational School	23	19.32
		Aviation Vocational High School	47	39.49
		Islamic School	1	0.84
3.	Online Learning Experience	Once	20	16.8
		Never	99	83.2
4.	Aspirations after Graduation	Working in a National Company	82	68.9
		Working in a Foreign Company	22	18.5
		Master's Degree	6	5.0
		Entrepreneur	8	6.7
		Others	1	0.8
5.	Taking English Training	Once	15	12.6
		Never	104	87.4

As shown on the table, 76.5% or 91 of the respondents are males, while there are only 23.5% or 28 female respondents. The respondents come from various regions in Indonesia with different educational backgrounds. There are 40.3% or 48 respondents with senior high school, 39.2% or 47 respondents with aviation vocational school, 19.32% or 23 respondents with vocational school, and 0.84% or one respondent with Islamic high school background. Furthermore, most of the respondents had never experienced online learning and most also had never attended an English language training course or program prior to their study at ITDA.

Table 3. *Category of questions*

No.	Category	Items
1	Learning	3, 4, 5, 6, 8, 9,

2	Content	10, 11, 12
	Learning Structure	1, 2, 7, 13, 14

The learning content

With the students' exposure to the internet, they have access to learning content from other sources than their teachers. This necessitates the need to determine whether learning content given to students in online learning is responsive to their needs and preferences.

As shown in Table 4, of the nine items on learning content, Item No. 10 which is on quizzes/practices following topics studies has the highest mean value ($M = 3.29$, $SD 0.61$), classified as very high indicating that the respondents deem that their assessments should be adhering to topics and content studied or taught to them. On the other

hand, Item No. 12 on the provision of a discussion forum for teachers and students has the second highest mean value ($M = 3.27, SD = 0.53$) classified as high. This reveals that respondents strongly agree that online learning should have a discussion forum for teachers and students to interact especially on learning content or topics discussed. Having a discussion forum has a semblance of personalized learning which students consider is an effective online learning as found by Iswati (2021).

Item No. 8 on content being up to date has the third highest mean value ($M = 3.24, SD = 0.578$) categorized as high. This implies that students demand learning content that is up to date with trends and developments even if such might at first be difficult. This result is corroborated by the

respondents' answer pertaining to Item No. 3 on the provision of materials to facilitate understanding, with the lowest mean value ($M = 2.9, SD = 0.752$) classified as high. Results on both items highlight the need for knowledge over facilitation of understanding. These findings are in congruence with the needs of students to have clear learning materials (Lu & Caballes, 2022; Reaves, 2019).

Overall, the average mean value of the items on learning content is 3.15, classified as high. With online learning, countless learning content options for students and teachers are provided and available. It is even advantageous to offer additional material such as more detailed background content on a topic for the students to read or listen to.

Table 4. Aspects of learning content

No	Statements	Mean	Std. Dev	Category
3.	Online learning provides learning materials that can facilitate my understanding.	2.9	0.752	High
4.	The content presented in online learning is up to date.	3.24	0.578	High
5.	Content in online learning supports the competence of my graduate profile.	3.06	0.693	High
6.	The content in online learning supports my future work.	3.04	0.741	High
8.	Assignments in online learning are provided with clear instructions.	3.24	0.66	High
9.	Online learning provides examples for assigned tasks.	3.08	0.715	High
10.	Online learning provides quizzes/practices following the topics studied.	3.29	0.616	Very High
11.	The assignments in online learning are provided with a clear assessment rubric.	3.23	0.574	High
12.	Online learning provides a discussion forum for teachers and students on the topics discussed.	3.27	0.532	High
Overall mean			3.15	High

The learning structure

Learning structure is important as it provides clarity and order to the learning content. In addition, learning structure helps promote self-discipline and minimizes being overwhelmed with course work. Thus, the ideal learning structure of online learning is equally important as that of

learning content. Research indicates that students value the flexibility and accessibility of online content, particularly the ability to replay lectures and access materials at their convenience (Mohammad, et al., 2023; Kesumawati et al., 2024). However, challenges such as maintaining concentration and self-discipline were also

identified (Mohammad et al., 2023).

When asked about the learning structure, the respondents as shown on Table 5 revealed that online learning being carried out structurally following course objective (Item No. 2) is very important as proven with the highest mean value ($M = 3.27$, $SD = 0.60$) among the five items on learning structure. A 60-minute duration is ideal for synchronous learning due to its tendency to have lower cognitive load (Hung et al., 2024) and higher student satisfaction in some cases (Siregar et al., 2023).

The second item with highest mean value is Item No. 14 on students being able to review materials learned at any time ($M = 3.22$, $SD = 0.678$). These two highest items imply the need to allow students to progress at their chosen pace, independently of one another, leading to motivated and discipline students (Kuzminska, Morze,

Mazorchuk, Barna & Dobriak, 2021; Moorhouse & Wong, 2021; and Cahyani, Suwastini, Dantes, Jayantini & Susanthi, 2021).

Remarkably, Item No. 13 on online learning facilitating group study has the lowest mean value ($M = 2.99$, $SD = 0.731$). The response of the students implies the need to provide opportunities to study in groups. This demands that online learning platforms should have features that allow students to study or work in groups.

It can be gleamed from the responses on learning structure that ESP teachers could integrate online learning technology with cooperative learning principles. In addition, both modes of interaction should be utilized as teachers can provide content during the online instructions, and the students can access it anytime. This means that online learning makes the content available on demand, regardless of teacher availability.

Table 5. *Aspects of Learning Structure*

No	Statements	Mean	Std. Dev	Category
1.	Online learning has clear guidelines on its implementation.	3.1	0.681	High
2.	Online learning is carried out structurally following the course objectives in the syllabus.	3.27	0.606	Very High
7.	Online learning activities are delivered and arranged logically and systematically.	3.21	0.58	High
13.	Online learning facilitates students to study in groups.	2.99	0.731	High
14.	I can review the material learned at any time through online learning.	3.22	0.678	High
Overall mean			3.15	High

The insights gathered from the students on implementation of synchronous and asynchronous online learning specifically in relation to learning content and learning structure as detailed on Tables 4 and 5, provide valuable recommendations. These perspectives should be considered students' recommendations on the improvement of ELENA and the online learning modality of ITDA. As students are the main users and end-users of ELENA, their insights can be integrated into the improvement of ITDA's overall curriculum. Acknowledging and addressing students' feedback enhances education institutions' learning experience ensuring that such is more engaging, relevant, and aligned with the academic and personal needs of students. This process fosters

better learning outcomes and promotes a more student-centered approach to education.

Analysis on the students' learning needs of the online learning implementation

Addressing the learning needs of students on the learning mode and activity, the teacher aspect, and the technical aspect is vital as it ensures a more effective learning experience, empowers students to reach their potentials, and provides a strong foundation for their growth. Conducting a requirements analysis will reveal the most critical factors to consider when deciding what should be included in ESP courses to facilitate better implementation of online learning. Thus, the study explores the needs analysis in regards of teachers,

content and learning structures, and its technical aspects.

Learning modes and activities

There are two different delivery modes in online learning, namely synchronous and asynchronous modes of delivery. The selection of the online learning mode influences the activities and interactions in online learning. The effectiveness of synchronous and asynchronous mode may vary depending on factors such as discipline and educational level (Zeng & Luo, 2023). But studies have shown that students generally show improvement in learning outcomes with both methods (Hung et al., 2024).

To investigate the activities needed in synchronous mode, four items were analyzed, including video conference, small group discussion (break-out rooms), polling activity, and discussion room (chat room). As shown on Table 5, the item with the highest mean value was Item No. 4 (M = 3.16, SD = 0.61) showing that the respondents put a premium on online learning discussion room facilities namely chat rooms such as Zoom or Google Meet. The second highest mean value was item No. 1 (M = 3.08, SD = 0.70), implying that the respondents consented to online

learning using video devices to interact directly, such as Zoom and Google Meet via video conference. On synchronous mode implementation, the accumulated mean value of the overall items obtained 3.083 (>3,00), classified as high. The result is in line with the previous studies that found video conferences become more participatory by using surveys, polls, question-and-answer sessions and other similar communication channels (Bailey & Lee, 2020; Lu & Caballes, 2022).

Synchronous schooling has some drawbacks, such as requiring students to be accessible at a specific time, requiring a high-bandwidth internet connection, in addition to difficulties on time management, financial constraints, and isolation (Joshi et al., 2024). Further, when students face technical issues, learning experiences are hindered which can lead to disillusionment (Mohammad et al., 2024).

The result of the study depicts that the respondents concurred with online learning providing direct interaction through video conference, including all the convenience facilities such as live discussions, polls, and chat rooms. The following table displays respondents' responses to aspects of online learning needs

Table 6. Online learning activity (synchronous mode)

No	Statements	Mean	Std. Dev	Category
1.	What is your opinion regarding online learning with direct interaction using video devices (example: Zoom, Google Meet) with Video Conference mode?	3.08	0.703	High
2.	What is your opinion concerning Small Group Discussion activities during direct interaction through Synchronous Learning?	3.03	0.61	High
3.	What is your opinion about polling activities on online learning?	3.06	0.642	High
4.	What is your opinion about the Discussion Room facility (chatroom on Zoom or Google Meet)?	3.16	0.61	High
Overall mean			3.083	High

Despite its flexibility, asynchronous learning intervention. To identify the expected activities of may result in slightly better knowledge retention students during asynchronous mode, they were (Zeng & Luo, 2023). However, it can lack social asked open-ended questions.

presence and connectivity compared to Table 7 shows the learning activities students synchronous modes (Zadeh, et al., 2023). expect in online learning for it to be effective. Thoroughly designed asynchronous activities is Unexpectedly, lessons are mostly preferred activity crucial to maintain student engagement and expected by 38 (31.9%) students, followed by continued learning without teacher presence and quizzes expected by 26 (21.8) students and forums

expected by 14 (11.8%) students. Moreover, only students, post videos, create assignments, make eight (6.7%) students expected assignments, while quizzes, exercises, and survey, and link students to four (3.4%) expected chats indicating that these other resources and online multi-media. The results were less favored.

Through online learning, teachers can provide various learning activities for students such as activity choices of students when taking part in quizzes, watching videos, listening to audios, and online learning, especially towards the various group discussions (Yadav, Para, Singh, Gupta, Sarin & Singh, 2021; Nejad, Golshan & Naeimi, 2021). With online learning, teachers can group

Table 7. *Online learning activity expected by students (asynchronous mode)*

No.	Aspect	Frequency	Percentage (%)
1.	Assignments	8	6.7
2.	Chat	4	3.4
3.	Forums	14	11.8
4.	Lessons	38	31.9
5.	Quizzes	26	21.8

Teacher aspect

The role of a teacher is pivotal in online learning not only because teachers provide cognitive support through learning assistance and recommendations (Christiani et al., 2023) but they also function in managerial and affective roles to create a positive learning environment (Christiani et al., 2023; Sason et al., 2023) by providing guidance, motivation, and connection with students. The teachers bridge the gap between technology and human touch ensuring that online learning is both effective and meaningful. Student engagement has increased with teachers' ongoing efforts to improve online pedagogies (Kaphle & Rana, 2023).

To get the perspective of the students on their teachers, they were given a 14-item questionnaire that examines the teacher's ability to organize online classes. The results reveal that all items acquired mean values categorized as high. The item with the highest mean value ($M = 3.43$, $SD = 0.60$) was Item No. 10 on the use of technology which translates to the respondents' putting importance on the ability of teachers to utilize technology to support their conduct of online learning. Item No. 7 on encouraging students to participate obtained the second-highest mean value ($M = 3.40$, $SD = 0.63$), implying that the respondents agreed that teachers must be able to encourage students to actively participate during

online learning. The findings are similar to the studies of Soraya, et al., (2024), Nhung & Hoa (2021), and Rahmawati, et al., (2024) that students need a variety of activities on to develop comprehensive communication skills through speaking, writing, and reading and the use and access of varied learning materials available online.

The calculation of the mean value of all items acquired an average value of 3.26, classified as very high. This signifies that the respondents strongly agreed that teachers must have adequate class organizing skills by providing qualified learning facilities and in-depth knowledge of the material being taught. According to Nurteti et al., (2024), the quality and relevance of learning materials to curriculum standards and students' needs significantly influence preferences for online learning. Additionally, lecturer responsiveness, characterized by availability, accessibility, and flexibility, is perceived as a form of kindness in online settings and contributes to student satisfaction (Levenberg, 2023). These findings underscore the importance of tailoring online learning content and delivery to meet students' needs and preferences for effective education. Table 8 displays students' responses to the aspects of teachers.

Table 8. *Teacher aspect*

No.	Statements	Mean	Std. Dev	Category
1.	Teachers explain the course syllabus containing face-to-face and online learning at the beginning of the teacher.	3.24	0.62	High
2.	Teachers provide technical explanation on how to access and operate online learning at the beginning of the teacher.	3.28	0.637	High
3.	Teachers provide various qualified online reference sources in online learning.	3.18	0.672	High
4.	Teachers present a variety of activities in online learning.	3.18	0.721	High
5.	Teachers provide constructive feedback on student assignments during online learning.	3.11	0.779	High
6.	Teachers provide adequate assessments for activities/tasks during online learning.	3.19	0.641	High
7.	Teachers encourage students to actively participate during online learning.	3.4	0.629	High
8.	Teachers provide information and explain the content presented during online learning when required.	3.3	0.576	High
9.	Teachers have knowledge of the material being studied.	3.35	0.578	High
10.	Teachers can use technology supporting online teachers.	3.43	0.605	High
	Overall mean	3.266		Very High

TPACK

Technological Pedagogical Content Knowledge is crucial in online learning since it provides comprehensive framework for effective teaching. The framework helps understand EFL teachers' knowledge and skills needed to integrate technology into classroom teaching (Nguyen, et al., 2023; Darsih et. al, 2023). To capture the insights of students on technical aspects, open-ended questions were asked, and the responses were coded and categorized following the theory or concept. The responses of the students on what

teachers need to have to make online learning effective and satisfying were categorized thematically into technological knowledge, pedagogical knowledge, and content knowledge.

As shown on Table 9, the statistical analysis of the responses showed that pedagogical knowledge is still the most important ability that teachers must possess which is contradictory to the study of Santos (2021) that identified technological knowledge as the most fundamental factor in all aspects of the teaching and learning process. Interestingly, content knowledge is the lowest.

Table 9. *Knowledge/abilities of teachers*

No.	Aspect	Frequency	Percentage (%)
1.	Technological Knowledge	14	11.8
2.	Pedagogical Knowledge	80	67.2
3.	Content Knowledge	4	3.4

Technical aspects

Technical aspects pertain to the technology and infrastructure that make online learning experience positive and effective. To determine the students' insights into ELENA's technical aspects, they were asked 12 questions. The responses show that item

Nos. 4, 7, and 8 are categorized as very high while item Nos. 1, 3, 5, 6, 9, 10, 11, and 12 were categorized as high and item No. 2 was categorized as low.

Item No. 4 on ELENA's accessibility has the highest mean score (M = 3.51, SD = 0.53), which

indicates that the respondents strongly agreed that ELENA could be accessed via mobile phones or computer browsers. The next two items with the highest scores are Item No. 7 (M = 0.32, SD = 0.634) on neat organization and Item No. 8 (M = 3.25, SD = 0.61) on accessibility of learning materials. This implies that the respondents strongly agreed that the content on ELENA was neatly organized, and the available content could be accessed easily.

In contrast, Item No. 2 on stable accessibility with the lowest mean value (M = 2.45, SD = 0.946), indicates that the respondents disagreed

that many users could stably access ELENA. This demands for ITDA to improve infrastructure to support stable internet connection and continued upgrading of ELENA.

However, the overall mean value (3.12), classified as high, indicates that the respondents agreed that ELENA provided convenience for online learning because it was easy to access, simple, and well organized, although some aspects still required attention and evaluation. Table 10 exhibits students' responses to the technical aspects of the ELENA at ITDA.

Table 10. *Technical aspects of ELENA*

No.	Statements	Mean	Std. Dev	Category
1.	ELENA is easily accessible.	2.97	0.807	High
2.	ELENA can be stably accessed by many users.	2.45	0.946	Low
3.	ELENA has a fast-loading speed.	2.6	0.816	High
4.	ELENA can be accessed through mobile phones or computer browsers.	3.51	0.535	Very High
5.	ELENA has simple navigation.	3.25	0.6	High
6.	ELENA has a clear information structure.	3.34	0.574	High
7.	The content on ELENA is neatly organized.	3.32	0.637	Very High
8.	Learning materials in online learning can be easily accessed.	3.25	0.614	Very High
9.	Online learning utilizes interesting multimedia (such as audio or video).	3.18	0.676	High
10.	Online learning communication between teachers and students can be performed through communication features, such as discussion forums and chat.	3.23	0.617	High
11.	I receive technical assistance from teachers if I encounter obstacles during online learning.	3.24	0.62	High
12.	I receive services from ICT administrators if I face problems during online learning.	3.18	0.688	High
Overall mean		3.127		High

Online learning offers flexibility and accessibility, allowing students to learn at their own pace and accommodate various commitments (Agbarakwe & Uwadia, 2024). Technical characteristics of online learning include virtuality, interactivity, and ease of content updating (Mykhalchuk et al., 2023). The students were also asked what technical aspects are necessary for online learning to be effective and efficient, and their responses were thematically categorized as shown on Table 11 into service, cost, user-friendly,

flexibility, and reliability. The analysis shows that 57 (47.9%) of the students mentioned user-friendliness as the most important aspect of effective and efficient online learning. This aspect is largely related to the ease of using an LMS, such as ELENA.

The results confirm previous studies that found essential components for effective online learning include robust learning management systems, courseware development, and technical support (Agbarakwe & Uwadia, 2024). Therefore, online

learning is beneficial as it allows students to work whenever and wherever they want, at their own pace leading to more time to reflect on their ideas and encourage critical thinking and the needs of students to have instant interaction with teachers through communication channels such as discussion forum (Azzhrani & Alghamdi, 2020; Bailey & Lee, 2020; Prudnikova, 2021; Lu & Caballes, 2022.).

As previously mentioned, time management, financial constraints, and isolation (Joshi et al., 2024) as well as the feeling of being overburdened because of the technical difficulties (Mohammad et al., 2024) can be drawbacks on synchronous mode. A community of learning that can foster interaction by providing timely feedback, and improving instructor-student relationships contributes to a successful online synchronous teaching (Mallon et al., 2023; Joshi et al., 2024). Meanwhile, asynchronous online learning can be challenging to keep students involved and interested. Asynchronous activities like video projects and digital storytelling (Otodu & Khoiriyah, 2023) may

result in better knowledge retention (Zeng & Luo, 2023). Further, having online forums that can keep students occupied and engaged with the topic is another mechanism as previously reported by Bailey & Lee (2020) that online discussion forum is the most popular communication channel and activity that EFL teachers expect to use.

While online platforms foster diversity and accommodate various learning preferences, the lack of face-to-face interaction can hinder teacher-student connections and can limit sensory experiences and lead to distracted attention (Mykhalchuk et al., 2023; Zhang, 2023). Developing interactional competence is essential for effective communication in virtual environments and positively impacts learning outcomes (Zhang, 2023). Interactivity, timely feedback, and synchronous sessions are crucial for student engagement and motivation (Kozak et al., 2023). Recognizing these effects is crucial for improving online education quality and overcoming its limitations.

Table 11. *Technical Aspects in Online Learning*

No.	Aspect	Frequency	Percentage (%)
1.	Service	4	3.4
2.	Cost	11	9.2
3.	User-friendly	57	47.9
4.	Flexibility	3	2.5
5.	Reliability	11	9.2

CONCLUSION

In summary, the students' learning needs are categorized as high as revealed through overall mean value of the aspects of online learning needs (3.083), the learning content and structure (3.153), and the technical aspect (3.127). These results demonstrate that students agree that implementation of online learning must have a capable system in which there is the availability of various online learning activities; collaboration and communication facilities not only between students and teachers but also between students themselves; and ease of access and user-friendly navigation.

In addition, there is also the need to adjust duration of time for different types of activities to ensure optimum student engagement and focus. Similarly, learning materials must adhere to and support the course syllabus. There should be a variety in the materials provided as well as in the assignments and activities. Students perceive aspects of teachers as very high (3.266) demand

that teachers are responsible for curating content and activities. Therefore, teachers must have the ability to master technology in organizing classes and adequate knowledge of the material being taught (TPACK).

The findings of the study are also recommendations for further development of ELENA. Moreover, these can be utilized as basis for the development of other ESP online learning system. The results highlight education institutions to prioritize developing a robust and user-friendly online learning system that has easy accessibility ensuring ease of navigation. The system should also support diverse learning activities and provide seamless avenues for communication and collaboration. Significant emphasis is placed on the role of teachers, and this demands for education institutions to invest in professional development programs such as comprehensive training in technological, pedagogical, and content knowledge to ensure teachers are well-prepared to meet the needs of ESP students. These strategies

can foster a dynamic and supportive online learning environment that fulfills the identified needs of students.

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