The Journal of Asia TEFL

http://journal.asiatefl.org/

Digital Literacy of ESP Learners:
Voices of Medical Teachers, Learners and Authorities

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Introduction

The massive adoption of digital technology in all educational sectors has changed teachers' and learners' instructional activities. This change has also occurred in the L2 pedagogy, including English for Academic/Specific Purposes (EAP/ESP). In this case, the L2 teacher and learner must be competent in both language and technological skills. ESP is a branch of L2 teaching and learning within applied linguistics, and it aims is to use English in a specific field (Arnó-Macià & Rueda-Ramos, 2011; Liu & Hu, 2021; Paltridge & Starfield, 2013). For example, in the context of ESP, the changes are more extreme since teachers and learners are required to learn three different skills, general English, English for a specific subject, and technology. In the Indonesian L2 context, the ESP course was commonly taught by English teachers who graduated from the English Language Education Department (ELED), who do not have any previous ESP background. Meanwhile, not all Indonesian universities offer ESP as part of their compulsory courses. Therefore, these challenges are more complex because English teachers have to learn both ESP course content and digital literacy at the same time. Since the potential of digital literacy in L2 and EAP/ESP contexts has been acknowledged, teachers and learners are required to be digitally competent in integrating technology and instructional practices (Benesch, 2009; Dashtestani & Hojatpanah, 2020; Lotherington & Jenson, 2011; Mahapatra, 2020; Son et al., 2011). Besides, acquiring adequate digital literacy is necessary for supporting effective ESP instructional practices to help learners learn ESP to support their courses effectively.

Various aspects of the ESP domain and digital literacy implementation have been extensively probed using multiple designs. Merits, demerits, and recommendations of blending digital literacy into ESP instruction have also been echoed from previous studies. However, there is a dearth of well-documented inquiry in the context of ESP instructional practices from a comprehensive perspective involving ESP learners, teachers, and policymakers. A previous study indicates that understanding digital literacy levels seems useful to map learners' and teachers' digital levels, but it could not provide evidence of how they

unravel successful and unsuccessful digital literacy interactions. Research also proves that the use of digital technology influence the quality of L2 teaching and learning (Arifani et al., 2020; Bodnar et al., 2016; Dashtestani & Hojatpanah, 2020).

The research objectives aim to unravel significant differences in perceptions, types of digital tools and applications, digital literacy practices and challenges from the perspectives of ESP teachers, learners, and policymakers.

Literature Review

Digital Literacy Research within the L2 Context

The term "digital literacy" has been widely interpreted from different perspectives. For example, Martin and Grudziecki (2006) analyzed three common digital literacy attributes: awareness, attitude, and ability to integrate digital resources to support educational practices. Similarly, in the specific L2 context, this term also refers to the knowledge and skill of utilizing computer and mobile applications such as computer and mobile assisted language learning into L2 instruction (Dashtestani, 2012; Lotherington & Jenson, 2011; Mahapatra, 2020). Some L2 scholars also endeavor to use the synonymous terms of digital literacy skill into digital literacy levels as the core attributes (Dashtestani & Hojatpanah, 2020; Winke & Goertler, 2008; Haataja et al., 2018; Hartley et al., 2011; Huang et al., 2012)

Under the umbrella of L2 contexts, digital literacy studies around the globe have investigated broad areas of teacher professional development, teaching, and learning with the view to enhance the quality of the teacher, to identify relevant technologies used in instructional practices, to map learners' learning strategies and digital literacy levels from stakeholders' perspectives. (Arifani, 2020; Dashtestani & Hojatpanah, 2020; Kim & Bae, 2020; Liza & Andriyanti, 2020; Palacios et al., 2020). Previous studies presented their limitations and potential research of digital literacy under the L2 context.

Liza and Andriyanti (2020) investigated English pre-service teachers' digital literacy readiness using mixed quantitative and qualitative approaches in the Indonesian EFL context. The results of pre-service teachers' readiness using digital literacy revealed a high readiness level. The previous studies mirrored digital literacy from a single perspective. Consequently, it is very subjective, and the results will not reflect a good portrayal. The seminal works of Dashtestani and Hojatpanah (2020) investigate the more comprehensive aspects of digital literacy under the Iranian secondary context involving learners, teachers, and policymakers. Their work seems to be contributive in mapping Iranian learners' digital literacy level and types of digital tools utilized in the EFL learning context. However, it has been sparse regarding learners' digital literacy level, practices, and challenges under the ESP context.

In the Iranian EAP context, Alavi et al. (2016) studied learners' and teachers' attitudes and perspectives on their literacy levels and challenges using a computer to improve their technological skills. The findings also identified the importance of using computers in EAP learning, such as online dictionaries, emails, search engines, academic forums, and research resources.

Arnó-Macià (2012) investigated the role of technology in the ESP teaching context using a literature review-based article. An exciting finding from the review reveals that ESP teachers have to be equipped with relevant technology to support learners' independent and lifelong learning. The findings implied the importance of technological skills in promoting learners' intercultural communication and autonomy.

However, there is a lacuna of well-documented studies on university students' digital literacy levels, practices, and challenges in promoting ESP learners' digital literacy in the context of Indonesian ESP instructional practices. Therefore, the aims of this study seek to address the following research questions:

1. What are ESP teachers' and learners' perspectives on ESP medical learners' level of digital literacy? Is there a significant difference between ESP teachers' and learners' perspectives?

2. What are ESP teachers' and learners' perspectives on ESP medical learners' purposes of using digital literacy in their ESP course? Is there a significant difference between ESP teachers' and learners' perspectives?
3. What technology tools and applications are commonly utilized by ESP medical learners based on ESP teachers' and learners' perspectives? Is there a significant difference between ESP teachers' and learners' perspectives?
4. What are teachers, learners, and policymakers' perspectives on the practices and challenges of promoting ESP medical learners' digital literacy?

Methods

Participants and Context

Study participants were 150 ESP learners (69 males and 81 females) of the medical department from three State Islamic Universities of Malang, Jakarta, and Makassar. Their ages ranged from 18 to 21 years old. All departments under these three institutions offer a one-year ESP program, including the medical departments. This ESP program features instruction in four English skills (listening, speaking, reading, writing) and TOEIC preparation for two consecutive semesters.

A total of 18 ESP teachers ranging in age from 35 to 44 (8 males and ten females) took part in this study. They have been teaching for more than five years. An interview was also conducted with 18 of these ESP teachers. The last group of participants were three rectors and a Deputy of the Ministry of Education, who accepted the interview invitation for the research.

Instruments

The first and second instruments were two separate questionnaires, one for students, and one for teachers. The first questionnaire created by Dashtestani and Hojatpanah, (2020) was administered to assess ESP medical learners' digital literacy levels based on their own perspective. The teacher questionnaire was similar to the learner questionnaire developed by Dashtestani and Hojatpanah, (2020). It was adapted and simultaneously administered to the 18 ESP teachers to draw out their ESP medical learners' digital literacy levels.

An open-ended question to gauge ESP learner's digital literacy practices and challenges was used to avoid the potential gap between ESP learners and teachers' perceptions. In this case, ESP teachers were asked to address their learners' digital literacy levels, successful and unsuccessful practices, and their challenges in implementing digital literacy instruction. Finally, the research team also interviewed the three rectors, dean, and policymakers to discover their opinions on the digital literacy practices of the three medical departments.

Data Collection and Analysis

The quantitative survey data were collected from both ESP medical learners and teachers as research participants of this study. The non-parametric Mann-Whitney U test was applied to evaluate students' digital literacy levels and draw significant differences between learners' and teachers' responses. Qualitative data in the form of interviews was collected from 18 ESP teachers, three rectors, and one deputy of the Ministry of Education.

Results and Discussion

Results

Research Question 1: What are ESP teachers' and learners' perspectives on ESP medical learners' digital literacy levels? Is there a significant difference between ESP teachers' and learners' perspectives?

Table 1 reveals the results of the perspectives on ESP students' digital literacy levels in terms of the mean, standard deviation, and significant differences. The mean range 1-2.5 shows a low level of digital competence, 2.6-3.5 an average level of digital literacy competence, and 3.6-5 a high digital competence level.

TABLE 1
Teachers' and Learners' Perspectives on Medical ESP Learners' Digital Literacy Level

Category	Research subjects	M	SD	Mann Whitney U test	p
Search engines	ESP teachers	3.69	1.32	2578	0.221
	ESP students	3.91	1.25		
Mobile-based dictionaries	ESP teachers	3.60	1.34	3327	0.275
	ESP students	3.47	0.37		
Social network sites	ESP teachers	3.60	1.34	2255	0.216
	ESP students	3.70	1.69		
Computer games	ESP teachers	3.76	1.59	1607	0.221
	ESP students	3.91	1.25		
Online games	ESP teachers	3.50	1.22	2255	0.354
	ESP students	3.47	0.37		
English websites	ESP teachers	3.40	1.39	3545	0.000
	ESP students	4.70	0.45		
English learning applications	ESP teachers	3.20	1.54	1890	0.001
	ESP students	4.70	0.45		
Online dictionaries	ESP teachers	4.86	0.71	2443	0.911
	ESP students	4.70	0.45		
English videos	ESP teachers	4.45	1.65	1640	0.313
	ESP students	4.70	0.45		
Wikipedia	ESP teachers	2.65	0.83	3526	0.252
	ESP students	2.90	0.79		
Computer-based dictionaries	ESP teachers	2.65	0.83	2339	0.163
	ESP students	3.90	0.91		
Microsoft Office Word	ESP teachers	3.70	1.69	3134	0.167
	ESP students	3.50	1.22		
Microsoft Office PowerPoint	ESP teachers	4.70	0.45	3165	0.543
	ESP students	4.45	1.65		
Podcasts	ESP teachers	1.65	1.90	1761	0.216
	ESP students	1.95	1.72		
Email	ESP teachers	3.50	1.22	3677	0.720
	ESP students	3.70	1.69		

Apart from *English websites*, *online dictionaries,* and *English videos* about which the students perceived a high level of competence, the students were perceived to have an average level of digital literacy in the rest of this category but low digital level in *Podcasts*. Similarly, the ESP teachers perceived their ESP learners' use of *an online dictionary* at the highest level, and *Podcasts* got the lowest level among other categories. In contrast, teachers and learners showed different perspectives in terms of their mastery of *English websites* and *English learning* applications.

Research Question 2: What are ESP teachers' and learners' perspectives on ESP medical learners' purposes of using digital literacy in their ESP course? Is there a significant difference between ESP teachers' and learners' perspectives?

Table 2 shows the results of perspectives on students' purposes of using technology in terms of the mean, standard deviation, and significant differences. The mean range 1-2.5 shows a low level of digital technology use, 2.6-3.5 an average level of digital literacy use, and 3.6-5 a high use of digital technology.

TABLE 2
Teachers' and Learners' Perspectives on Purposes of using Digital Technologies

Category	Research subjects	M	SD	Mann Whitney U test	p
Educational purposes	ESP teachers	4.70	0.45	1676	0.282
	ESP students	4.86	0.71		
English learning purposes	ESP teachers	3.70	1.69	1607	0. 221
	ESP students	3.76	1.59		
Non-educational purposes	ESP teachers	2.65	0.83	3526	0.252
	ESP students	2.90	0.79		

Most of the students were confident and aware of the purposes for which they used technology. Both the teachers and students believed that the practical uses of technology are educational. Table 4 reveals the results of ESP teachers' and students' perspectives regarding the use of digital technology in their ESP course. The results indicated that there were no significant differences of perceptions between ESP teachers and students.

Research Question 3: What technology tools and applications are commonly utilized by ESP medical learners based on the ESP teachers' and learners' perspectives?

TABLE 3
Teachers' and Learners' Perspectives on Digital Devices Commonly Used by ESP Students

Category	Research subjects	M	SD	Mann Whitney U test	p
Smartphones	ESP teachers	4.88	1.29	2219	0.612
	ESP students	4.61	0.55		
Tablets	ESP teachers	4.60	0.60	1042	0.001
	ESP students	2.50	1.39		
Laptops	ESP teachers	4.90	1.45	967	0.912
	ESP students	4.95	0.72		
Desktop computers	ESP teachers	2.50	1.39	1943	0.213
	ESP students	2.47	0.37		

Both groups of participants perceived that laptops and smartphones were the most frequently used devices for ESP students. Based on the Mann-Whitney U test values in Table 3, there were significant differences between the teachers' and students' perspectives about different digital devices for *Tablets* used by the ESP students.

Research Question 4: What are the perspectives of teachers, learners, and policymakers on the practices and challenges of promoting ESP medical learners' digital literacy?

The teachers, learners, and traditional practices and challenges in promoting digital literacy in the ESP course were elaborated using qualitative analysis from the ESP teachers, learners, and authoritative. The qualitative analysis described three vital elements of digital literacy practices during the ESP course, namely successful procedures, unsuccessful practices, and challenges from the study participants. The qualitative results are presented in Table 4.

TABLE 4
EFL Teachers', Learners' and Authoritative Open-ended Responses

Category	Teacher (18 respondents)	Learner (150 respondents)	Authoritative (2 respondents)
Successful attempts with digital technologies	94.4% (They provide videos for explaining English procedures topics of medical practices, vocabulary, grammar, pronunciation, delivering homework, creating a conversation video such as role-play between doctor and patients, browsing a reading text from the internet and asking them to retell, zoom discussion on how to diagnose a patient's health problem effectively).	78.6% (Making a conversation video, poster, drama, and role play, recorded presentations like explaining patient's health problem, video conference discussion, online recorded speaking project, interactive explanation and tasks using recorded video and voices, video presentations, listening activities, and small group work).	100% (All ESP teachers used the medical curriculum and ESP to design the practical learning activities to make recorded role-play between doctors, patients, and family using English, and read English articles).
Unsuccessful attempts with digital technologies	5.6% (explaining grammar using PowerPoint application, discussing learners' language problem using zoom).	19.5% (excessive written task, written test, online grammar, vocabulary test, reading test).	100% (giving too many online tasks make the learners unmotivated).
Challenges with digital technology	88.8% (I feel tired of giving learners' online language feedback) takes time to comment on learners' online writing errors, written test is hard to handle, cheating issues, and the slow response in the question-answer session using zoom and mobile applications.	82.7% (unclear feedback, too long feedback responses, low internet connection, too many assignments, tasks, slow task comments, and feedback return).	100% (Internet connection when all students access the internet, feedbacks on learners' works and tasks).

Table 4 illustrates the qualitative analysis from three different groups of participants. Of the 18 responses, 94.4% of the teachers described their successful efforts to implement digital literacy by providing video sources for teaching language skills, interactive zoom discussion, and creating relevant videotaped tasks in the medical field. In contrast, 5.6% reported grammar explanation using PPT and online language errors discussion as unsuccessful efforts in promoting digital literacy. Meanwhile, 78.6% of students asserted that the use of recorded video, online presentation, small project group, and role play could support their ESP learning using technology.

Discussion

While many studies have dealt with the issue of digital literacy for general education at all levels, this study focused on the picture of the current perceived digital literacy levels, types of digital technology use, practices, and challenges with digital technology under the ESP context.

This study illustrated that the ESP medical students had high levels of digital literacy for their ESP course. The results were different previous studies proposed by Dashtestani and Hojatpanah (2020) and Gharawi and Khoja (2015). In non ESP contexts, previous studies indicated that learners had low digital literacy. There is a prediction in which the ESP students under the medical department are usually selected from high-performing university entrance students. Most of them also come from backgrounds with a high economic status. Therefore, these two critical variables distinguish them from other ESP students from non-medical departments. In a similar study in the EAP setting, Alavi et al. (2016) investigated 641 civil engineering students' and 34 teachers' computer literacy skills in the Iranian context. The study found that the EAP learners' and students' computer literacy skill was low, and they did not have adequate computer skills to support their EAP learning.

Furthermore, based on the questionnaires, the ESP teachers and students believed that the students' use of technology was mainly for educational purposes. Also, there was no significant difference in teachers' and learners' perspectives in terms of ESP learners' technology use for educational and non-educational purposes. This result asserted additional evidence from previous studies in other contexts (e.g., Dashtestani & Hojatpanah, 2020; Gharawi & Khoja, 2015; Moorhouse & Kohnke, 2020; Stockwell, 2008). This issue may imply that medical ESP students are more aware of their learning objectives than other secondary school students. Although this comparison may be unequal in terms of age and education level, at least it provides initial evidence that learners from the medical ESP field can wisely manage their technology literacy to achieve their learning objectives.

Regarding digital technology and applications, the ESP teachers and students perceived that laptops and smartphones were the most commonly used digital devices by ESP learners. There were no significant differences of perceptions except on the knowledge and usage of tablets as perceived higher by the students but lower by the teachers. One of the possible arguments that smartphones and laptops become the priority is the rich features from those two digital devices to support their ESP learning. These findings are commensurate with previous research on machine use for learning purposes. Cote and Milliner (2017) also pointed out that Japanese EFL students commonly used smartphones and tablets. Tablets were not widely used tools since they are not popular among Indonesian learners and are not very flexible when doing online written tasks and projects such as PPT, word documents, and excel files. Arifani (2019) examined the use of WhatsApp and collocation video to improve EFL learners' collocation mastery and scaffolding with technology (Arifani et al., 2021). In another study, Arifani (2020) investigated the use of cartoon videos for vocabulary enhancement; the results were also significant. The result of this study is equal in claiming that the use of videos can foster learners' learning.

The three groups of participants believed that their successful promotion of digital literacy in ESP courses was based on video presentations, online group work, video recorded projects, posters, role plays, and interactive online discussion using Zoom. Meanwhile, the authorities echoed similar opinions and emphasized communication abilities and medical competencies. Promoting the successful implementation of digital literacy in ESP class is more than just teaching a language and assigning tasks using different types of technology; it should promote ESP students' medical competencies and English skills using technology.

Further, excessive online assignments and tasks become a boomerang for the teachers to give feedback and evaluation and these conditions also influence teachers' response time of learners' online tasks and projects. If they cannot return all learners' online assignments in a timely manner, their usage becomes negative.

Conclusion

The research findings of this study on Indonesia ESP medical students' digital literacy suggest that university learners' digital literacy level is an important issue. The discrepancies in perspectives among the three groups of participants might occur across different educational levels from elementary to tertiary. To successfully connect ESP and medical competencies using digital literacy, teachers, students, and authorities must work in tandem on these two objectives. Facilitating the work of ESP medical students through the use of technology has become essential.

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