



VNU Journal of Foreign Studies

Journal homepage: <https://jfs.ulis.vnu.edu.vn/>

BLENDING LEARNING IN EXTENSIVE READING PROGRAMS: TEACHERS' AND STUDENTS' PERCEPTIONS

Nguyen Thanh Thuy*

Military University of Culture and Arts, No. 101 Nguyen Chi Thanh, Lang Ward, Hanoi, Vietnam

Received 04 December 2025

Revised 26 January 2026; Accepted 24 August 2026

Abstract: The study examined teachers' and students' perceptions of blended learning in extensive reading programs at a military university in Vietnam. A mixed methodology was employed, collecting quantitative data from 74 non-English major students and qualitative data from six English lecturers. The quantitative statistics indicated strong support for engaging in online and offline group activities ($M=4.42$, $SD=0.497$) and reported experiencing higher motivation for reading extensively ($M=4.18$, $SD=0.383$). However, several obstacles were listed, such as technical difficulties ($M=4.47$, $SD=0.503$), digital reading fatigue ($M=4.32$, $SD=0.471$), and constraints associated with the military educational structure ($M=4.34$, $SD=0.407$). Even with these challenges, the students generally liked the program and suggested a blended learning experience in the future ($M=4.51$, $SD=0.503$). The qualitative findings from the teacher interviews revealed how using the digital platform made reading materials available to more students and motivated them to learn anonymously. The research additionally proposes several recommendations for teachers to adapt their teaching and to invest in professional development to succeed in using blended extensive reading.

Keywords: blended learning, extensive reading program, perceptions

* Corresponding author.

Email address: ntthuy.vnq@gmail.com

<https://doi.org/10.63023/2525-2445/jfs.ulis.5679>

HỌC TẬP KẾT HỢP TRONG CÁC CHƯƠNG TRÌNH ĐỌC MỞ RỘNG: NHẬN THỨC CỦA GIẢNG VIÊN VÀ SINH VIÊN

Nguyễn Thanh Thủy

Trường Đại học Văn hóa Nghệ thuật Quân đội, Số 101 Nguyễn Chí Thanh, Phường Láng, Hà Nội, Việt Nam

Nhận bài ngày 04 tháng 12 năm 2025

Chỉnh sửa ngày 26 tháng 01 năm 2026; Chấp nhận đăng ngày 24 tháng 8 năm 2026

Tóm tắt: Nghiên cứu khảo sát nhận thức của giảng viên và sinh viên về mô hình học tập kết hợp trong các chương trình đọc mở rộng tại một trường đại học quân đội ở Việt Nam. Phương pháp nghiên cứu hỗn hợp được áp dụng, thu thập dữ liệu định lượng từ 74 sinh viên không chuyên tiếng Anh và dữ liệu định tính từ sáu giảng viên tiếng Anh. Kết quả phân tích định lượng cho thấy sinh viên đánh giá cao việc tham gia các hoạt động nhóm trực tuyến và trực tiếp ($M=4.42$, $SD=0.497$) và ghi nhận sự gia tăng động lực đọc mở rộng ($M=4.18$, $SD=0.383$). Tuy nhiên, một số khó khăn cũng được liệt kê, bao gồm: lỗi kỹ thuật ($M=4.47$, $SD=0.503$), mệt mỏi khi đọc tài liệu số ($M=4.32$, $SD=0.471$), và những hạn chế phát sinh từ giáo dục trong môi trường quân đội ($M=4.34$, $SD=0.407$). Dù vậy, nhìn chung, sinh viên vẫn đánh giá tích cực chương trình và đề xuất tiếp tục áp dụng mô hình học tập kết hợp trong tương lai ($M=4.51$, $SD=0.503$). Kết quả định tính từ phỏng vấn giảng viên cho thấy việc sử dụng nền tảng số đã tăng khả năng tiếp cận tài liệu đọc đến nhiều sinh viên hơn và thúc đẩy động lực học tập nhờ tính ẩn danh. Nghiên cứu cũng đề xuất một số khuyến nghị nhằm giúp giảng viên điều chỉnh phương pháp giảng dạy và đầu tư vào phát triển chuyên môn nhằm triển khai hiệu quả chương trình đọc mở rộng theo mô hình học tập kết hợp.

Từ khóa: học tập kết hợp, chương trình đọc mở rộng, nhận thức

1. Introduction

Being proficient in reading is fundamental to learning a new language, contributing to both the process and the result of mastering a language (Grabe & Stoller, 2020). Reading a large volume of material can enable English-as-a-foreign-language (EFL) learners to improve their language ability. In their foundational paper, Day and Bamford (2002) describe extensive reading as reading enormous volumes of materials that students can easily comprehend and enjoy. The strategy has consistently helped students acquire knowledge of words, read more fluently, and improve all aspects of language learning (Nakanishi, 2015).

With technology becoming an integral part of education, the approach to extensive reading has undergone significant development. Using blended learning, which combines classroom and online instruction, can address major issues in extensive reading programs (Poon, 2013). In this way, blended methods can surpass previous limitations in implementing extensive reading due to the literature (Ma & Zhao, 2025). This process becomes particularly important when instructional or financial constraints limit the use of traditional instructional methods.

Traditional extensive reading programs encounter ongoing problems that may reduce their effectiveness. A key challenge is limited access to educational materials because purchasing many types of books becomes too costly in low-income countries (Robb & Kano, 2013). Educators may find it challenging to manage and monitor students' participation and progress in extensive reading, especially when groups are large, or teachers do not spend much time with each group. Motivation also poses challenges, as maintaining student interest in

voluntary reading requires ongoing support and encouragement (Mori, 2015). The blended learning approach can be considered as one solution for overcoming many of these challenges. New technology has made it easier for more students to participate in reading programs, helping them manage the difficulties caused by a limited number of materials (Karaarslan & Polat, 2025). With automated systems, everyone can quickly check how much students have improved their reading skills. Even so, using technology presents its difficulties, including the need for suitable infrastructure, support from technical staff, and the risk of eye strain from prolonged screen use (Ghazizadeh & Fatemipour, 2017). Additionally, the way blended approaches are implemented in schools depends on the structure and traditional style of the organization (Garrison & Vaughan, 2013).

Although the use of blended learning has increased in Vietnam over the past few years, its implementation has varied across different educational environments (Dinh et al., 2024; Do & Phan, 2024; Nguyen et al., 2026). At Military University of Culture and Arts (VNQ), language teachers have utilized technology, and initial results have shown potential. However, the regular use of blended extensive reading programs is still in its nascent stage. According to Chanthap and Wasanasomsithi (2019), the use of a blended learning approach depends heavily on the structure and management of institutions in Southeast Asia. There have been significant improvements in technology at VNQ over the past few years as digital platforms and internet access on campus sites have expanded. Nevertheless, not every dormitory has good connectivity, and dedicated language-learning laboratories are limited in some parts of the campus (Huynh et al., 2018). These infrastructure barriers may hinder the regular use of digital features in the mixed-mode learning model. Moreover, the specialized setup of military education at VNQ means that online learning brings different concerns about selecting suitable content and ensuring security.

Although these problems exist, the initially adopted digital resources used in language classes at VNQ have produced positive results. Digital graded readers, tested with students in some English courses, led to more student interest and better completion rates than print books (Nguyen & Pham, 2022). However, these initial efforts have not yet developed into a standardized, institution-wide practice to blended learning in extensive reading programs. To implement blended approaches effectively, VNQ needs to gain a deeper understanding of how they operate in their unique setting.

While Vietnamese scholars have produced a substantial body of research on blended learning, little attention has so far been paid to blended extensive reading in contexts such as VNQ. The particular structure of military universities, their student body, and their mission may affect how blended learning is implemented in actual use. Garrison and Kanuka (2004) note that blended learning is most effective when it aligns with the context and perspectives of those involved within an institution. Currently, very little research has been conducted on how military students and instructors perceive and experience blended extensive reading programs in their field of study. This lack of research is significant, as strong reading skills are highly valuable for soldiers who study foreign languages to quickly access information and stay informed about the armed forces worldwide (Solak, 2014). Understanding how both teachers and students perceive blended extensive reading programs allows instructional planning to be better aligned with existing campus conditions and institutional constraints. As a result, this research explores the following questions:

1. *What are students' perceptions of blended learning in extensive reading programs at VNQ?*
2. *What are teachers' perceptions of blended learning in extensive reading programs at VNQ?*

2. Literature Review

2.1. Extensive Reading

Extensive reading refers to reading large amounts of texts across various fields for pleasure and general knowledge rather than for detailed study (Nation, 1997; Renandya & Jacobs, 2002). Although some definitions differ in the various studies, certain core characteristics appear repeatedly. Extensive reading refers to texts that are sufficiently accessible for learners to understand and enjoy by using their existing language knowledge (Lee & Hsu, 2009; Nation & Waring, 2019). Extensive reading stands out because it can be done flexibly, at learners' own pace, and in locations of their choice, and they can read about what they enjoy (Levy, 2016). In contrast to intensive reading, this approach involves reading larger sections slowly. Learners are urged to read a lot, regardless of how much they remember, since the main aim is to receive substantial comprehensive input they can understand (Yamashita, 2013; Nishizawa et al., 2018).

Research consistently shows that a lot of reading benefits language learners. Most fundamentally, reading a lot makes it easier and faster for learners to understand what they read (Nation, 1997; Levy, 2016). Since learners obtain new vocabulary repeatedly as they encounter words repeatedly while reading, they learn and remember them with less effort (Nishizawa et al., 2018). The value of learning to read lasts beyond just reading itself. Studies have reported that extensive reading programs can benefit learners' writing abilities (Lee & Hsu, 2009). It seems that extensive reading exposes learners to many forms of writing, grammar, and discourse styles they can adopt in their writing. Furthermore, reading in a foreign language can motivate learners, reduces their anxiety and then improves their view on the new language (Yamashita, 2013). Several studies indicate that noticeable gains from extensive reading often emerge over extended periods. Nishizawa et al. (2018) note that extensive reading develops learners' reading habits over months or years rather than days or weeks.

Many different models for putting extensive reading into practice have appeared in the research literature. In sustained silent reading, regular reading time is allotted so that students can do their reading, and there are no specific accountability measures (Lee & Hsu, 2009). This model is designed to give students a peaceful space to learn how to read without pressure. Some approaches are more structured by adding accountability methods, and at the same time, they preserve what makes extensive reading important. They may consist of book reports, reading logs, or brief response activities that keep the learning simple and low-pressure (Nation & Waring, 2019). Some programs use graded readers, which contain vocabulary and grammar suitable for learners' proficiency levels. New models using technology, such as digital libraries, e-readers, and online groups for discussion, have helped increase readers' access to materials (Arnold, 2009). These approaches are particularly beneficial when learning takes place remotely or when learners are digitally literate. Teaching beginning readers how to read with structure first might help them become successful independent readers. The approach makes it clear that the goals of a reading program should match the learners' current abilities and needs throughout their development.

Despite their many positive effects, reading programs still encounter several problems when they are implemented. Building and sustaining a range of valuable materials for students takes many resources (Renandya & Jacobs, 2002). The problem is most severe in resource-short schools or when languages are less widely taught. Aligning reading activities with other subjects is difficult since reading takes much time, which teachers may need for other things

(Renandya & Jacobs, 2002). Schools that focus entirely on tests and language parts may have trouble giving students enough opportunities to read extensively. Assessment is also hard, as the main benefits of extensive reading usually develop slowly and may lack connection with standard testing (Nation & Waring, 2019). Evaluating and showing success in extensive reading programs can be tough for teachers in systems that mainly focus on results that can be counted. Beliefs about language learning help generate more obstacles for both teachers and students. There is a mistaken belief amongst some educators and learners that language learning should depend on many hours of tough study while simple exposure is not enough (Renandya & Jacobs, 2002). To deal with these perception issues, researchers and educators should agree on and explain the benefits of regular reading.

2.2. Blended Learning

Blended learning in foreign language education is a pedagogical approach that combines traditional face-to-face instruction with technology-mediated learning experiences. According to Bryan and Volchenkova (2016), blended learning integrates collaborative visions of learning where online group discussions become crucial course design features. This integration creates a synergistic environment where the strengths of both modalities complement each other to enhance language acquisition processes. The concept has evolved across multiple domains, including corporate training, higher education, and specifically within foreign language instruction contexts (Bojović, 2017). The fundamental characteristic of blended learning is its concurrent nature, where traditional and technology-enhanced approaches operate simultaneously rather than sequentially (Kudryashova et al., 2016).

Experts have designed blended learning models to suit language teaching contexts. Neumeier (2005) points out that combining various components of socio-affective character is important when setting up blended learning for language classes. Effective design should incorporate several communication techniques and materials that support many ways of teaching language. In blended learning, the flipped classroom stands out by having students study materials beforehand and practice during face-to-face lessons (Yaroslavova et al., 2020). The instructional model helps foreign language learners communicate effectively in the target language. Studies have shown that blended learning greatly helps particular language abilities. Bojović (2017) concludes that using both online and classroom elements helps students reading in a foreign language to progress faster than only the classroom instruction. These results suggest that using blended learning, with its variety of ways to present language, supports the development of language skills better than other types of learning. Furthermore, using the flipped classroom approach in blended learning has improved students' communicative abilities by encouraging them to use language interactively (Yaroslavova et al., 2020). The results of studies show that blended learning can improve many areas of language competency.

Effective use of blended learning in language teaching requires careful consideration of learners' needs. Sun and Qiu (2017) state that analyzing learners is the most important step when planning blended learning for English as a Foreign Language (EFL) contexts. Learner-centered instruction enables learners to receive appropriate support for their learning styles, proficiency levels, and English-learning goals. Studies show that these individual differences may improve instructional design and learner outcomes (Velushchak et al., 2021). This flexibility is especially valuable because it is less common in traditional language teaching methods. Blended learning methods have been used successfully in various kinds of school settings. Some studies have explored the use of blended learning for foreign languages in engineering institutions, showing that it can meet the unique requirements of technical

education. In the same way, Karkour (2014) introduces a reading model designed for English as a foreign language in Egyptian schools, considering all important contextual factors and learners' characteristics. The study suggests that blended learning is adaptable to many schools and suits educational goals for different groups of students.

2.3. Blended Learning in Extensive Reading Programs in Previous Studies

Several studies have demonstrated that blended learning and reading extensively can effectively support language learning. However, the focus of this study is specifically on blended learning as a teaching approach integrated within extensive reading programs, not separately. Poon (2013) and Karaarslan and Polat (2025) argue that blended learning that combines online and face-to-face instruction, enhances learner autonomy and engagement. Besides, Day and Bamford (1998) state that extensive reading encourages large amounts of reading for meaning and pleasure and it supports vocabulary acquisition and reading fluency. When these approaches are integrated, they can promote a flexible learning environment to motivate learners and make the materials accessible. Previous research has explored how blended extensive reading programs can improve students' reading habits and skills with the support of diverse reading materials via digital platforms and traditional print resources.

Chanthap and Wasanasomsithi (2019) show that mixing blended learning and extensive reading leads to greater autonomy among Thai EFL undergraduate students. The pre-test and post-test study involving 40 English majors showed that this approach encourages learning independence, an important quality for acquiring reading skills. Reading extensively in a blended way helps learners take greater control of what and how they learn and promotes substantial progress when appropriate guidance is provided.

Cancino and Gonzalez (2023) investigate how affective variables, such as parental support, are linked to reading proficiency in blended learning environments. According to their work, positive attitudes and self-assurance in reading strongly influence EFL learners' participation in reading activities set up in both physical and virtual settings. A positive attitude toward digital reading is associated with higher reading engagement and better understanding among participants. This suggests that blended learning may help to activate functional, psychological factors that support successful extensive reading.

Flores-González (2019) specifically explores students' views on extensive reading programs that were carried out using a blended learning format. Most students liked the approach because they can easily read from printed books or digital resources. Still, the research points out that it is often difficult for users to choose between traditional and digital reading methods without clear guidance. The finding demonstrates that both teaching approaches should be implemented carefully together. Furthermore, traditional classroom functions need to be adjusted when blended learning is integrated with extensive reading.

Schechter et al. (2017) notice that teacher engagement is key in successful blended learning reading programs, with teachers balancing technology with lessons achieving the most outstanding results. Results indicate teachers are better off shifting from giving out facts to serving as guides as students explore different reading materials and keep track of performance data.

Tonsun and Gönen (2024) design a structured, extensive reading program that uses blended learning techniques for students learning English at the university level. It aims to help learners interact with electronic texts chosen according to what they like and how much they already know. Research from extensive reading and blended learning is used to design the program so that students learn the most from online and face-to-face sessions. Thanks to the

Internet, students and teachers have digital books, and Google Classroom and Padlet have helped to build a virtual library that includes reading logs. Additionally, students would come together each week to talk about what they read using the following formats. After getting participant input, researchers agree that a blend of formal extensive reading and real-world boosts second language reading by giving participants many valuable ways to get involved.

The main research gap discussed in this study is related to education in Vietnam. Even though interest in educational technology is growing worldwide, little attention has been given to blended learning approaches related to extensive reading in Vietnam's EFL classes. It is particularly notable because Vietnam is developing quickly in technology and education. Schechter et al. (2017) report strong connections between teacher involvement and outcomes in blended learning reading classes. However, such results may not be directly applicable to Vietnamese educational environments because teaching traditions, technological conditions, and reading practices differ. A complete lack of Vietnam-based research on this topic is a substantial problem when designing and adopting effective blended extensive reading programs. In teaching English as a foreign language in Vietnam, large, fixed class sizes, an emphasis on taking tests, and differing technological skills among learners and schools may affect the use of Tonsun and Gönen's (2024) model. If blended extensive reading programs are not sufficiently adapted to local conditions, educators in Vietnam have limited guidance for implementation.

3. Methodology

3.1. Research Design

Studying students' and teachers' views on blended learning in extensive reading is more efficient with a mixed-methods approach. Both the quantitative and qualitative approach can capture the whole picture of the complex phenomenon. Measuring statistics and patterns of perceptions with quantitative tools and exploring their nuances, meaning, and context through qualitative research creates a more comprehensive insight.

There are several reasons why the use of a mixed-methods approach is justified in this research. First, perceptions are complex ideas that can be better understood from multiple perspectives. Large-scale patterns can be well measured using quantitative methods, but their reasons, backgrounds, and meanings can be best understood through qualitative approach. Schechter et al. (2017) find that analyzing how faithfully the reading program is followed through both measurements and interviews with teachers provided a better understanding of what happened within the program. Additionally, a blended design demonstrates the drawbacks associated with applying only one type of method. A survey typically does not capture contextual information or unexpected angles as effectively as interviews or observations do. Alternatively, with only qualitative findings, it may be impossible to show the overall spread of particular points of view among participants. Flores-González (2019) points out that combining surveys and interviews allows them to understand and describe a wide range of students' and teachers' perceptions of extensive reading in blended learning. The unique requirements of VNQ's military educational environment, where academics and military communication are both important, suit the style of using multiple research methods. The special features of such tertiary institution can produce changes that do not always appear when using solely standardized tests. Cancino and Gonzalez (2023) note that examining contextual factors is particularly beneficial in blended learning, making mixed methods essential for investigating educational innovations in such organizations.

3.2. Setting and Participants

At VNQ, investigating blended learning in extensive reading programs occurred within a distinctive institutional framework. By focusing on military education, VNQ not only prepares researchers for many sectors but also strengthens national defense with cultural and ideological efforts. Given the specialized characteristics, teaching English involves not only advancing educational skills but also improving how students communicate in the military contexts. Blended learning for extensive reading benefited from and addressed the constraints set by VNQ institution. Even though the university has recently adopted technology in education, it has simultaneously preserved traditional elements of military education that could impact the adoption of innovative teaching methods. The challenges of combining tradition and innovative teaching approach made VNQ a suitable setting for studying how blended extensive reading could be applied in various types of teaching contexts.

Seventy-four second-year students who enrolled in Basic English 2, primarily from journalism, visual arts, music, and theater programs, participated in the current research. Each student completed Basic English 1, which was equivalent to a level A2 in the Common European Framework of Reference (CEFR). Most students were male, aged 19-22, and studied English not as their major course but required by all Vietnamese military universities. Within this setting, the chosen material, "*New English File - Pre-intermediate*" (Latham-Koenig et al., 2019), comprised a comprehensive set of lessons that covered both writing and various language skills. Learning materials in the coursebook were adapted to meet the outcome standards and the specific demands of military students (Nguyen & Pham, 2022). The curriculum demonstrated the institution's effort to blend traditional language learning with skills relevant to military careers. In addition, six English lecturers with at least seven years of teaching experience were the second population who voluntarily expressed their perceptions of blended learning in extensive reading programs at VNQ. All of them not only achieved a master's degree in English language teaching but also were certified in applying technology to teaching.

3.3. Data Collection Instruments

3.3.1. Questionnaire

The questionnaire items were adapted and revised from Flores-González (2019), which gathered students' views on extensive reading in blended learning. It maintained the structure of previous research studies and enabled suitable modifications for use in the military educational institution at VNQ. Several essential steps were taken during the adaptation process to confirm the instrument's relevance. First, the items from the original scale by Flores-González (2019) were checked to see if they would be suitable for the Vietnamese military education introduction environment. Anything related to blended learning and extended reading was retained, but parts that depended on the type of learning environment were either modified or removed. For example, inquiries about institutional structures were modified to consider how factors such as the army's traditional structure and code of discipline may impact students' involvement in self-study activities.

The survey employed a 5-point Likert scale, allowing individuals to respond easily while providing sufficient variation. The scale provided detailed ratings that also enabled quantitative analysis. Since the scale format aligned with past studies, it enabled comparative analysis across different educational systems. The questionnaire consisted of five main sections systematically. The personal information section examined demographic statistics and

background details about each participant's experience with blended learning, making these facts essential for the study. In the second section, after discussing benefits, problems, and satisfaction, the suggestions for improvements encouraged participants' answers for the main research questions and complement the results from the survey questions. The questionnaire was verified for accuracy and proper use of several measures. The other three experienced researchers at the same institution reviewed the materials to confirm both their relevance and the comprehensiveness of the information. A group of students with similar background as the participants (about 25 students) was chosen to pilot the instrument, allowing its wording to be improved, unclear parts to be clarified, and the ideal time needed to complete it to be determined.

3.3.2. Semi-Structured Interview

The interview guide for teachers was created to support the student questionnaire by gathering more information on the program's operation and related issues at VNQ. An interview provided an opportunity to explore teachers' experiences and thoughts about the military educational setting, as these issues were challenging to measure with standard questionnaires. The interview guide divided the discussion into implementation, experiences, benefits, difficulties, required support, and solutions. The structure covered the research questions thoroughly and also provided space to follow new trends. With interview, the researcher could collect rich qualitative data to deepen what the student questionnaires revealed. When creating the interview guide, the researcher asked for cross-checking and editing from the other three researchers in the same faculty to ensure that the questions were clear, non-leading, and would elicit meaningful responses. The refined version of the interviewing guide was tested with two non-participating teachers to verify that the questions were written correctly and in a proper sequence and to identify potential follow-up areas that could be added.

3.4. Data Analysis

To analyze the numbers obtained from the student questionnaire, the researcher used the program SPSS. Descriptive methods, means, standard deviations, and frequency distributions were employed to identify central tendencies and detect patterns among students across the various dimensions considered. The results gave a summary of how students generally viewed the advantages, disadvantages, and their overall satisfaction with blended extensive reading.

To analyze the qualitative data, the thematic analysis approach developed by Braun and Clarke (2006) was used on the content from the open-ended questions and teacher interviews. First, the researcher had to understand the data by reading it multiple times and then using a system to label the important areas. The codes were gathered to form various themes, and these themes were examined and refined until they aligned with the data. Themes were identified, named, and explained using significant examples gathered in the report.

The quantitative and qualitative analyses were used in conjunction, with each approach complementing and enhancing the findings of the other. The study linked statistical patterns in the surveys with insights from interviews. It explored the frequency of qualitative themes in the survey data and a combination of different approaches allowed for a deeper understanding of the situation.

4. Findings and Discussions

4.1. Students' Perceptions of Blended Learning in Extensive Reading Program

The study highlights what students notice about the positive aspects of using blended learning in extensive reading programs in the military (Table 1).

Table 1

Perceived Benefits of Blended Learning in Extensive Reading Program

	N	Mean	SD
The blended extensive reading program has improved my overall reading skills.	74	2.72	0.562
I find it easier to access a variety of reading materials through the digital platform.	74	3.95	0.327
The combination of online and face-to-face activities enhances my learning experience.	74	4.42	0.497
Digital reading materials are more engaging than traditional printed texts.	74	3.14	0.505
The blended approach helps me develop better time management skills for my reading.	74	4.08	0.275
I feel more motivated to read extensively because of the blended learning approach.	74	4.18	0.383
The digital platform helps me track my reading progress effectively.	74	3.47	0.503
Face-to-face discussions about my readings deepen my understanding of the texts.	74	3.77	0.424
Valid N (listwise)	74		

Those students preferred the blended model, especially the mix of remote and face-to-face activities, which they perceived as greatly enhancing their learning experience ($M=4.42$, $SD=0.497$). As Poon (2013) claims, the benefit of blended learning lies in utilizing the strengths of each method while simultaneously avoiding their disadvantages. According to the high mark, students appreciate that digital and traditional methods of learning are combined in the structured environment of military education. Most students felt more motivated to read extensively because of using the blended approach ($M=4.18$, $SD=0.383$), which is notable considering the difficulties of maintaining reading habits among those who study languages other than English. This additional motivation could be due to the novelty of technology in the classroom, as Karaarslan and Polat (2025) explain, which could momentarily stimulate students' interest. Still, the stable benefit in motivation throughout the program demonstrates a better chance of this effect lasting beyond initial excitement. This learning method was also given credit by participants for helping them learn to manage their time when reading ($M=4.08$, $SD=0.275$), pointing out how the specific online tasks may prepare them to monitor and manage their own learning in the military. Surprisingly, students liked the new opportunities for finding reading materials online but were not as confident that the program helped them get better at reading ($M=2.72$, $SD=0.562$). Reasonably, while blended learning solved some issues related to participation, it did not always link the added conveniences to reading fluency for students. More reflection on the issues surrounding the acquisition of reading skills should be raised in blended learning contexts. Although students saw the benefits of digital resources as flexibility and accessibility, these benefits did not necessarily lead to an increase in reading proficiency. Hence, the presence of online resources and combined activities was not sufficient without the

specific design of instructions for the blended-learning environment and reading skills. Also, the similarity in engagement rates between print and digital materials might suggest that students' preferences were determined more by the relevance of the content and the design of the tasks than by the format. The cognitive load and fatigue that could be linked to digital reading will likely outweigh the benefits of some positive digital convenience. Thus, teachers should incorporate scaffolded instruction and interaction in blended extensive reading programs to promote reading fluency successfully. In addition, it may be helpful to close the gap between participation and skill improvement through continuous assessment and feedback. The finding matches Cancino and Gonzalez (2023) that technological use in language learning only appeared useful if it supported specific goals for skill mastery. The data for this study shows that students thought there was not much difference between print and digital materials in terms of engagement ($M=3.14$, $SD=0.505$).

However, students reported facing a number of important difficulties in introducing blended learning into extensive reading, which is demonstrated in Table 2.

Table 2

Perceived Challenges of Blended Learning in Extensive Reading Program

	N	Mean	SD
I experience technical difficulties when using the digital platform.	74	4.47	0.503
I have difficulty maintaining consistent participation in online activities.	74	4.05	0.228
The military educational structure makes it challenging to engage in self-directed reading.	74	3.58	0.497
I find it difficult to balance online reading with face-to-face class requirements.	74	3.88	0.467
Reading extensively on digital devices causes eye strain or fatigue.	74	4.32	0.471
I struggle to stay focused when reading digitally compared to printed texts.	74	4.47	0.503
Limited internet access affects my participation in the online component.	74	3.66	0.476
I find it difficult to adapt to the blended learning approach.	74	3.55	0.500
Valid N (listwise)	74		

Technical trouble using the platform was a top issue for participants, along with being distracted while reading digitally ($M=4.47$ for both questions, $SD=0.503$). Because technical barriers and reading difficulties are often linked, implementation can be more difficult because of this. Because the standard deviation is quite high, it appears that different experiences are influenced by having access to technology or being familiar with it. According to Ghazizadeh and Fatemipour (2017), technical barriers are major obstacles to achieving the benefits of educational technology when technical support is lacking. A common challenge was eye strain or fatigue brought on by too much reading from screens ($M=4.32$, $SD=0.471$), indicating that physical factors make a big difference in students' experiences. Keeping up with online activities continues to be a problem ($M=4.05$, $SD=0.228$) because self-control can still be a challenge, even under a blended learning method, mainly for students with many other duties in the military. It was found that the structure of military education moderately affected students' ability to read for themselves, and students also experienced difficulties combining

conducting online reading with in-person classes ($M=3.88$, $SD=0.467$). Such problems point out that blended learning requires careful consideration in each specialized school environment. Chanthap and Wasanasomsithi (2019) point out that how well-blended learning works often depends on how it fits with the expectations and setup of the institution. The moderate results suggest students recognized possible problems, yet they feel the approach is compatible with learning and the military setting.

Nevertheless, it is essential to highlight that the military educational setting at VNQ is a significant moderating variable that affects these results. Combining these two requirements of academic excellence and military service provides a unique learning context that students have to juggle between a high level of discipline, hierarchy, and various non-academic demands on them, in addition to their education. This background probably contributes to problems such as regulating online use and concentrating while reading online, because military requirements might limit students' time and mental energy. Moreover, the culture and institutions of the military training program can influence students' flexibility towards blended learning, particularly when incorporating flexible digital learning elements into strict face-to-face programs. These situational considerations might explain why technical problems and distractions were among the most salient issues, and why students indicated moderate effects of the military structure on their independent reading activities. Further studies may offer a better understanding of the effectiveness of blended learning programs in the context of institutional culture and organizational needs by treating the military context as a central analytical element. Founding blended extensive reading programs that are more responsive to the context and demands of military learning might be beneficial for student engagement and learning outcomes.

In spite of the issues, most of the participants expressed high satisfaction with the ways the blended reading program was organized.

Table 3

Satisfaction With Blended Learning in Extensive Reading Program

	N	Mean	SD
I am satisfied with the quality of digital reading materials provided.	74	3.92	0.275
The face-to-face components effectively complement the online reading activities.	74	3.81	0.394
The digital platform is user-friendly and easy to navigate.	74	4.12	0.329
The program provides adequate support for my extensive reading needs.	74	4.14	0.344
The blended approach is appropriate for the military educational context.	74	3.84	0.371
The program's structure helps me develop autonomous reading habits.	74	4.01	0.351
The blended extensive reading program meets my expectations.	74	4.12	0.467
I would recommend this blended approach to other students.	74	4.51	0.503
Valid N (listwise)	74		

Most strikingly, students reported a high level of trust in recommending the blended approach to other students ($M=4.51$, $SD=0.503$), which reflects the general satisfaction they

feel despite some problems. The finding correlates with Flores-González (2019) that students appreciated using an online textbook. Participants mentioned being able to read what they wanted with little effort, and they also confirmed that the platform was simple to understand and use ($M=4.13$, $SD=0.325$). The good findings on usability and accessibility indicate that despite its early issues, the technical side did make the site easy for students to access and use. The fact that students agreed that the program met expectations ($M=4.12$, $SD=0.467$) shows the blended approach accomplished what was promised by students. Because of the program's design, students reported creating habits. The study results agree with Schechter et al. (2017) that blended learning set up properly can enable students organize their own learning in highly structured environments. Teachers also seemed satisfied with the usefulness of a blended approach in the military setting ($M=3.84$, $SD=0.371$) and the effectiveness of personal meetings in supporting online materials ($M=3.81$, $SD=0.394$). The study found that blended learning works well in the military, but some changes could improve its alignment with the specific traits of each institution. Digital reading materials gave students a good level of satisfaction ($M=3.92$, $SD=0.275$), though the small standard deviation means they were happy in a predictable rather than overly enthused way. Since students were fairly content with the materials and strongly support the approach, working to improve the way materials were selected could actually make students feel more positive about the program.

4.2. Teachers' Perceptions of Blended Learning in Extensive Reading Program

Strong agreement was found among six English lecturers in semi-structured interviews on the benefits of blended learning in extensive reading for the military. Teachers consistently mentioned that the ability to read anywhere and a greater selection of materials were important highlights, and several added that digital resources can help students who lack physical reading materials. T.3 explained this topic:

"The way we learn through extensive reading in the military has been modified by the digital platform. Before, all we had was a small collection of older books that couldn't answer most of our questions. Now, students can find and use hundreds of graded readers that are appropriate for their ability. For cadets used to only seeing English material in textbooks, this broader accessibility has become a real game changer." (T.3)

Ma and Zhao (2025) found this idea is supported by evidence that using digital technology expands the selection of materials for extensive reading in places with limited resources. Educators in this study shared Poon's (2013) view that combining online and offline methods increases equity in education. It was clear to instructors that using a blended method helped train the military students to learn on their own, a skill crucial for their future as professionals. One lecturer made this link obvious.

"All officers should learn how to guide and direct their own learning because it will benefit them throughout their time in the military. Giving students options about texts, their stages of reading, and how to interact with them promotes independence in the blended extensive reading program. Noticing improved student skills in managing their own education, I observe these abilities being useful also in other areas of their training." (T.1)

The study's contribution lies in applying these findings to military education for the first time. In addition to the statistical findings, the emphasis on autonomy by the lecturers adds quality to the idea that students appreciated how the program supported autonomous reading routines.

While they saw many benefits, the six lecturers pointed out several implementation barriers that influenced their involvement in the blended extensive reading program. The main issue was that technical systems could not handle the workload, as some participants did not

have stable internet or the devices needed for full access. How these constraints operate was fully explained by T.5.

"Sometimes, technical challenges make it harder for us to succeed. The internet in the dorms is unreliable, and many students have computers or tablets that aren't designed for reading for long periods. Since fewer students can come to labs at once, we have had to offer resources they can access offline, but these systems still have problems and create more work for the teachers." (T.5)

This result agrees with Ghazizadeh and Fatemipour (2017), which shows how infrastructure issues can seriously reduce the success of blended learning at specialized institutions. The experiences of the lecturers could explain why students rated technical problems and connectivity as difficult tasks. Lecturers mentioned that because of the military's methodical and orderly structure, extensive reading often found it difficult to fit into the timetable. T.4 went on to explain this problem.

"Cadets in the military have every part of their day scheduled so that time is used efficiently. There have been many challenges to including time for independent reading in the curriculum. We've had to convince military commanders that reading during free time should be considered work related to education rather than leisure. Both sides are always negotiating, and the department's English staff must make significant efforts to keep the negotiations going." (T.4)

The result adds to Chanthap and Wasanasomsithi's (2019) study by stressing the specific challenges of applying blended learning in military education. The lecturers discuss the elements within the institution that make students view self-directed reading in the military as challenging.

It was clear from the interviews that successful implementation of blended extensive reading programs depends on continuous changes and professional development.

"Our methodology has replaced older approaches in the last three semesters. We first worried about tech issues, getting our platform online, and letting students access their information. Now, we pay close attention to how the online and face-to-face parts of education are connected. We now have established discussion patterns that tie digital reading to work in the classroom, making students both more active and better able to understand the material." (T.2)

This result agrees with Garrison and Vaughan (2013), who emphasize the need to keep improving blended learning implementation after examining contextual feedback. Hearing about how the lecturers adapted shows how the findings regarding satisfaction with face-to-face and online lessons became even stronger with further pedagogical updates.

All six explained that having specialized development is important for good use of blended extensive reading since their past training did not include its technological and teaching requirements. One lecturer in class clearly pointed out this requirement.

"We were taught traditional ways to teach languages and have had to try and figure out digital methods along the way. Development efforts should focus on technical abilities as well as the ways particular teaching techniques help in successful blended extensive reading. Scaffolding reading online, guiding valuable online discussions, and mixing digital and regular lessons all rely on expertise many of us are still working on." (T5)

The work proposes mechanisms that can lead to poverty reduction by using global data sets. The results emphasized teacher education for blended language learning, revealing important gaps in existing programs. The request by lecturers for focused continuing education adds to the literature by pinpointing the knowledge domains key to educational work in the military.

Crosschecking students' and teachers' views, there are both similar and different aspects in their experiences with the blended extensive reading program. The students have expressed

high motivation and satisfaction with the blended format, citing the availability of various materials and the flexibility it offered. On the same note, educators noted that the online platform increased access to reading materials and promoted independence among learners, deemed valid for military career building. It implies a mutual acknowledgment of the program's strengths, which help promote engagement and self-directed learning. Nevertheless, variations were also noted. Although students raised concerns about technical complexities and the balance between online and face-to-face elements, the teachers were more concerned about the necessity of a lifelong learning process of continuous professional development to successfully introduce blended learning into the narrow military educational system. The anxiety among teachers to change teaching processes and to negotiate self-directed reading in a highly hierarchical system is an indicator of institutional problems that might not be entirely realized by students. These differences highlight the need to consider learners' experience and instructors' willingness to maximize blended extensive reading in military settings. By combining these perspectives, a more thorough insight into the workings of blended learning in this distinct environment is provided. It can be used to make appropriate adjustments in future applications.

5. Conclusion

The research explored the perceptions of students and teachers about how blended learning applies to extensive reading in military education. While participants saw many good results, they also faced some challenges along the way. Quantitative analysis showed that both online and printed materials motivated students to read extensively and address the engagement issues in traditional settings. However, the students rated the program's influence on their overall reading skills as moderate. It indicates that there is a gap between experience and perceived improvement. The main barriers included electronic problems and reading online, as well as restrictions set by military education. Importantly, the strict hierarchical structure and additional military duties influenced students' time management and adaptability to blended learning. As a result, it highlights the significant role of the military environment on these outcomes. Despite challenges, most students expressed satisfaction with the program and willingness to recommend it. Teachers noted that the digital platform expanded access to reading materials and encouraged self-directed learning. They also emphasized the need for ongoing training to improve blended extended reading at the military level. In summary, blended learning can effectively support reading programs in military contexts

However, there are limits to this study that should be considered while looking over the results. First, all the research was undertaken in the same military school, which could limit how widely results apply to other military schools built differently or using different technology. Additionally, the study used a cross-sectional design to gather information about opinions at a specific moment instead of looking at how they developed as the participants used both methods more often. This shortcoming counts because many teachers said their implementation techniques improved a lot as each semester unfolded. Furthermore, since the study did not use tests to assess reading skills or check how much reading was done, it was impossible to say if anything mentioned as a benefit really helped students excel. Even with only six teachers, the study suggests that the insights gained during the interviews remain relevant for thorough understanding.

The research results are significant for practice in several respects. Dealing with obstacles caused by technical infrastructure should be the main effort for implementing blended extensive reading projects in military settings because it is the most challenging issue faced.

Improving internet access, supplying useful technology, and offering technical support would greatly enhance what students experience. Second, students' optimistic views on engagement in reading look different from their low scores for skill advancement, so more work should be done to highlight how reading fits with language development. Programs ought to encourage students to see how their extensive reading trains their abilities. Third, it shows that for blended learning to succeed in specialized situations, institutions must adapt themselves. It is important for military institutions to see if rigid routines and the hierarchical setup can be made flexible, taking into account how necessary reading is for development, by officially making spending time reading a respected part of their studies. Researchers could conduct research studies that continue over a period to measure both students' attitudes and real reading gains to find out how effective these programs are in the long run. Examining different military institutions would reveal what implementation strategies are the best fit in different settings. Research on particular teaching methods for integrating online and face-to-face teaching could answer teachers' requests to know more about this subject.

References

- Arnold, N. (2009). Online extensive reading for advanced foreign language learners: An evaluation study. *Foreign Language Annals*, 42(2), 340-366. <https://doi.org/10.1111/j.1944-9720.2009.01024.x>
- Bojović, M. D. (2017). Blended learning as a foreign language learning environment. *Teme-Časopis za Društvene Nauke*, XLI(4), 1017-1036. <https://doi.org/10.22190/TEME1704017B>
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <http://dx.doi.org/10.1191/1478088706qp0630a>
- Bryan, A., & Volchenkova, K. N. (2016). Blended learning: definition, models, implications for higher education. *Bulletin of the South Ural State University Series "Education. Education Sciences"*, 8(2), 24-30. <https://doi.org/10.14529/ped160204>
- Cancino, M., & Gonzalez, N. (2023). Exploring reading attitudes, reading self-efficacy, and reading proficiency in a blended learning context among EFL learners. *Journal of Language and Education*, 9(4), 31-45. <https://doi.org/10.17323/jle.2023.16303>
- Chanthap, N., & Wasanasomsithi, P. (2019). The effect of integration of a blended learning and extensive reading instructional model on Thai EFL undergraduate students' learner autonomy. *LEARN Journal: Language Education and Acquisition Research Network*, 12(2), 76-96. Retrieved from <https://so04.tci-thaijo.org/index.php/LEARN/article/view/205072>
- Day, R. R., & Bamford, J. (2002). Top ten principles for teaching extensive reading. *Reading in a Foreign Language*, 14(2), 136-141. <https://doi.org/10.64152/10125/66761>
- Dinh, T. T. L., Tran, X. T., Le, T. H. T., & Pham, H. T. U. (2024). The implementation of blended learning for English courses at higher education in Vietnam: teachers' perceptions. *AsiaCALL Online Journal*, 15(1), 1-18. <https://doi.org/10.54855/acoj.241511>
- Do, V. Q., & Phan, V. M. (2024). Một số giải pháp sử dụng mô hình dạy học kết hợp phù hợp với đặc thù các nhà trường quân đội (Some solutions for using blended learning model suitable to the characteristics of military schools). *Vietnam Journal of Education*, 24(Special Issue 2), 120-125. Retrieved from <https://tcgd.tapchigiaoduc.edu.vn/index.php/tapchi/article/view/1703>
- Flores-González, N. (2019). Promoting extensive reading in a blended learning modality: Students' perceptions. *Journal of Teaching and Educational Research*, 5(16), 43-54. <https://doi.org/10.35429/JTER.2019.16.5.43.54>
- Grabe, W., & Stoller, F. L. (2020). *Teaching and researching reading* (3rd ed.). Routledge. Retrieved from <https://www.routledge.com/Teaching-and-Researching-Reading/Grabe-Stoller/p/book/9781138847941>
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7(2), 95-105. <https://doi.org/10.1016/j.iheduc.2004.02.001>
- Garrison, D. R., & Vaughan, N. D. (2013). Institutional change and leadership associated with blended learning innovation: Two case studies. *The Internet and Higher Education*, 18, 24-28. <https://doi.org/10.1016/j.iheduc.2012.09.001>

- Ghazizadeh, T. & Fatemipour, H. (2017). The effect of blended learning on EFL learners' reading proficiency. *Journal of Language Teaching and Research*, 8(3), 606-614. <http://dx.doi.org/10.17507/jltr.0803.21>
- Huynh, N. M. K., Pham, T. T. N. & Tan, C. K. (2018). ICT use of teachers in teaching English in Vietnam. *Journal of Information System and Technology Management*, 3(9), 39-49. Retrieved from https://www.researchgate.net/publication/335568797_ICT_Use_of_Teachers_in_Teaching_English_in_Vietnam
- Karaarslan, A., & Polat, E. (2025). The effects of digital reading on third grade EFL students' motivation, attitude, reading comprehension, and vocabulary acquisition. *Computer Assisted Language Learning*, 1–30. <https://doi.org/10.1080/09588221.2025.2599147>
- Karkour, I. (2014). A blended learning model for teaching reading in English as a foreign language. *Teaching English with Technology*, 14(4), 17-32. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1143469.pdf>
- Kudryashova, A.V., Gorbatoeva, T.N., & Rozhkova, N.E. (2016). Developing a blended learning-based model for teaching foreign languages in engineering institutions. *SHS Web of Conferences*, 28, 01128. <https://doi.org/10.1051/shsconf/20162801128>
- Latham-Koenig, C., Oxenden, C. & Lambert, J. (2019). *New English File: Pre-intermediate student's book with Online Practice*. Oxford University Press. Retrieved from <https://www.oup.com.au/books/english-language-teaching/adult-courses/9780194037419>
- Lee, S. Y., & Hsu, Y. (2009). Determining the crucial characteristics of extensive reading programs: The impact of extensive reading on EFL writing. *The International Journal of Foreign Language Teaching*, 5(1), 12-20. Retrieved from <https://www.scirp.org/reference/referencespapers?referenceid=2699860>
- Levy, L. S. (2016). Extensive reading in English as a foreign language/ English as a second language contexts. *Reports from the Faculty of Clinical Psychology*, 9(3), 69-85. Retrieved from <https://fr.scribd.com/document/654875323/Extensive-Reading-in-English-as-a-Foreign-Language-English-as-a-Second-Language-Contexts>
- Ma, L. & Zhao, Z. (2025). Reading motivation and reading comprehension achievement among English majors in China: A descriptive correlational study. *Heliyon*, 11(3), e42427, <https://doi.org/10.1016/j.heliyon.2025.e42427>
- Mori, S. (2015). If you build it, they will come: From a "Field of Dreams" to a more realistic view of extensive reading in an EFL context. *Reading in a Foreign Language*, 27(1), 129-135. <https://doi.org/10.64152/10125/66704>
- Nakanishi, T. (2015). A meta-analysis of extensive reading research. *TESOL Quarterly*, 49(1), 6-37. <https://doi.org/10.1002/tesq.157>
- Nation, P. (1997). The language learning benefits of extensive reading. *The Language Teacher*, 21(5), 13-16. <https://doi.org/10.26686/wgtn.12560378>
- Nation, I. S. P., & Waring, R. (2019). *Teaching extensive reading in another language*. Routledge. Retrieved from <https://www.routledge.com/Teaching-Extensive-Reading-in-Another-Language/Nation-Waring/p/book/9780367408251>
- Nguyen, L. P., Tran, T. C. & Ngo, G. B. (2026). Apply the blended learning model in national defense and security education for university students in Vietnam. *International Journal of Evaluation and Research in Education*, 15(2), 1446-1453. <https://doi.org/10.11591/ijere.v15i2.37236>
- Neumeier, P. (2005). A closer look at blended learning - parameters for designing a blended learning environment for language teaching and learning. *ReCALL*, 17(2), 163-178. <https://doi.org/10.1017/S0958344005000224>
- Nishizawa, H., Yoshioka, T., & Ichikawa, Y. (2018). Benefits of long-term extensive reading program in English as a foreign language. *Journal of International Scientific Publications*, 12, 9-23. Retrieved from <https://www.scientific-publications.net/get/1000032/1537873903489059.pdf>
- Poon, J. (2013). Blended learning: An institutional approach for enhancing students' learning experiences. *Journal of Online Learning and Teaching*, 9(2), 271-288. Retrieved from https://jolt.merlot.org/vol9no2/poon_0613.htm
- Renandya, W. A., & Jacobs, G. M. (2002). Extensive reading: Why aren't we all doing it? In J. C. Richards & W. A. Renandya (Eds.), *Methodology in language teaching: An anthology of current practice* (pp. 295-302). Cambridge University Press. <https://doi.org/10.1017/CBO9780511667190.041>

- Robb, T., & Kano, M. (2013). Effective extensive reading outside the classroom: A large-scale experiment. *Reading in a Foreign Language*, 25(2), 234-247. <https://doi.org/10.64152/10125/66870>
- Schechter, R. L., Kazakoff, E. R., Bundschuh, K., Prescott, J. E., & Macaruso, P. (2017). Exploring the impact of engaged teachers on implementation fidelity and reading skill gains in a blended learning reading program. *Reading Psychology*, 38(6), 553-579. <https://doi.org/10.1080/02702711.2017.1306602>
- Solak, E. (2014). Computer versus paper-based reading: A case study in English language teaching context. *Mevlana International Journal of Education*, 4(1), 202-211. <http://dx.doi.org/10.13054/mije.13.78.4.1>
- Sun, Z., & Qiu, X. (2017). Developing a blended learning model in an EFL class. *International Journal of Continuing Engineering Education and Life Long Learning*, 27(1/2), 4-21. <https://doi.org/10.1504/IJCEELL.2017.080998>
- Tonsun, Z. Y. & Gönen, S. I. K. (2024). Technology meets extensive reading: Design of a blended extensive reading program in an English as a foreign language context. *Proceedings of the International Conference on Research in Teaching and Education*, 1(1), 26-37. <https://doi.org/10.33422/rteconf.v1i1.241>
- Velushchak, M., Kravchenko, T., Havrylenko, K., & Mykhailenko, T. & Sokolovska, L. (2021). Development of foreign language competence of higher education students in the context of blended learning. *Revista Tempos e Espaços em Educação*, 14(33), e16671. Retrieved from <https://dspace.chnu.edu.ua/items/1ea313a4-5261-4256-ac61-0bf1b9d5fd82>
- Yamashita, J. (2013). Effects of extensive reading on reading attitudes in a foreign language. *Reading in a Foreign Language*, 25(2), 248-263. <https://doi.org/10.64152/10125/66872>
- Yaroslavova, E. N., Kolegova, I. A., & Stavtseva, I. V. (2020). Flipped classroom blended learning model for the development of students' foreign language communicative competence. *Perspectives of science and education*, 43(1), 399-412. <https://doi.org/10.32744/pse.2020.1.29>