

PAPER

Exploring English Major Students' Self-Directed Technology Use for Language Learning

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ABSTRACT

English, as a foreign language education, requires students to be taught in the classroom and participate in additional hands-on activities outside the classroom using technology resources or non-technology. However, language learners rarely use technology to learn outside the classroom, and types of technology have been limited. Therefore, it is crucial to provide language learners with various technology resources to enhance their learning experience and motivate them to continue practicing outside the classroom. The study aimed to provide insights into factors influencing students' self-directed technology use for language learning. The study findings can help design effective language-learning programs integrating technology and enhancing self-directed learning. The study, which included 167 English major students, employed quantitative methods and an adapted questionnaire. Multiple Linear Regression, Pearson Correlation, and descriptive statistics helped quantitatively analyze the data. The findings show that the three factors—attitude toward an act or behavior, subjective norm, and perceived behavioral control—are highly correlated. Furthermore, the subjective norm was the most significant influence, and attitude toward action or behavior was the least. Teachers should focus on creating a positive social norm around self-directed technology use for language learning and encourage students to perceive it as socially desirable. Additionally, they can work on improving students' attitudes toward technology by highlighting its benefits and providing opportunities for hands-on practice.

KEYWORDS

self-directed learning, theory of planned behavior, higher education

1 INTRODUCTION

Communicating across cultures and countries effectively through language is more crucial than ever. In today's globalized world, English is considered a necessary lingua franca for people's lives worldwide. However, inappropriate learning strategies and a lack of initiative in language learning prevent language learners from achieving their full potential. Lai et al. [1] claim that there are very few

Pham, C.K., Tuyet Nguyen, N.N., Tuong Nguyen, A.T., Phan, N.Y., Kha Nguyen, H.H. (2023). Exploring English Major Students' Self-Directed Technology Use for Language Learning. *International Journal of Emerging Technologies in Learning (iJET)*, 18(15), pp. 120–132. <https://doi.org/10.3991/ijet.v18i15.40711>

Article submitted 2023-04-20. Resubmitted 2023-05-29. Final acceptance 2023-05-29. Final version published as submitted by the authors.

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chances for students in higher education to study languages as part of their curricula. Therefore, practicing English outside the classroom is necessary for language learners [2]. While there are ways to help English major students use the language more effectively, technology is especially crucial to assisting students in becoming proficient in English [3]. The advent of technology has led to a transformation in language learning from traditional classroom settings to digital and self-directed approaches [4]. To address this issue, Lai et al. [5] emphasize using technology in language learning to maximize its prospects. Self-directed technology use has emerged as an essential tool for language learning, enabling learners to engage with authentic materials and practice language skills flexibly and individually [6]. Self-directedness is a fundamental factor that determines students' success in language learning and helps achieve the best learning outcomes [7].

There is much research on language learning in the classroom, but there still needs to be more concern about English language learning in contexts other than the classroom [8]. In addition, technology is one of the tools expected to bring a breakthrough to education, in general, and language learning, in particular; however, the number of studies on Vietnamese students' self-directed foreign language learning based on technology is still relatively small [9]. Lai's [10] framework for self-directed technology use for language learning has been used to investigate learners' self-directed utilization of technology for learning a language. However, few studies use this framework to examine which key constructs impact students' use of self-directed technology for language learning, especially in the Vietnamese context.

The present study aims to:

1. Investigate the inter-relationship among attitudes toward behavior, subjective norm, perceived behavioral control, and English major students' self-directed technology use for language learning.
2. Find out the key factor influencing English major students' self-directed technology use for language learning.

The following research questions are framed as follows:

1. What is the inter-relationship among attitude toward behavior, subjective norm, perceived behavioral control, and English major students' self-directed technology use for language learning?
2. What is the key factor influencing English major students' self-directed technology use for language learning?

2 LITERATURE REVIEW

2.1 Theory of planned behavior

The theory of planned behavior (TPB) is a social psychological model proposed by Trang et al. [11] that expands upon the theory of reasoned action by incorporating the concept of perceived behavioral control. Both theories postulate that intentions directly influence behavior. The theory attempts to explain and predict human behavior in specific situations by focusing on the influence of three key factors as key constructs: attitude toward act or behavior (ATAB), subjective norm (SN), and perceived behavioral control (PBC). The TPB has been widely used in various fields, such as health, education, and marketing, to understand and predict human behavior.

2.2 Theoretical constructs

Attitude toward act or behavior. The TPB was developed to forecast and clarify human behavior under particular circumstances [11]. ATAB refers to the degree to which a person views the behavior of interest positively or negatively. It is intended to make the person performing the behavior consider the results before performing a specific behavior [11].

Perceived usefulness. Perceived usefulness (PU) is the degree to which a person believes using a particular system will improve their job performance [12]. It refers to whether someone considers the valuable technology for the purposes they want to accomplish. Operators' personal opinions on whether using a particular technology improves performance reflect PU [13]. PU is the subjective ability of future users, which indicates the possibility that the technology used will increase the performance of individuals or teams from an organizational perspective [14]. The perceived usefulness of technology refers to the extent to which people think the technology they use may be the only thing that helps them achieve their learning goals.

Lai [10] found that the PU significantly impacts language learners' tendency to use technology for language learning and their adoption of self-directed learning technology. Research also found that PU is influenced by students' positive attitudes towards language learning, which value opportunities for language use outside the classroom, and experiential learning, as well as their perceptions of language learning and the expectations and support of teachers and peers about the use of technology for learning. Lai et al. [15] found that perceived ease of use indirectly affected users' intentions to utilize technology through PU rather than directly impacting their behavioral intentions. Students' self-directed language learning can be facilitated by directly enhancing their perceived usefulness and indirectly bolstering their perception of ease of use. PU and attitude toward technology use are effective predictors of an individual's intention to use technology [10]. Lai [10] also argued that the perceived utility of technology has emerged as the most powerful factor influencing users' intentions to adopt the technology.

Language learning motivation. Language learning motivation (LLM) is an essential learner characteristic affecting different language learning aspects [16]. Motivation is also essential to successful language learning [17]. Motivation, as one of the most crucial aspects of language learning, can be viewed as a "device" utilized by learners to learn languages, given the growing importance of language acquisition in today's world. Researchers have proven that learner motivation effectively improves language learning [18].

Educational compatibility. Educational compatibility (EC) is considered one of the attitudinal factors influencing students' use of self-directed technology for language learning. Compatibility refers to the extent to which technology is perceived as consistent with learners' values, needs, and existing practices [10]. It is crucial to consider compatibility when designing technology-enhanced learning environments to ensure they align with learners' preferences and goals. Therefore, it is crucial for online educators to understand their students' expectations and needs in order to provide a suitable learning environment that promotes engagement and motivation. This understanding can also help educators tailor their teaching strategies to enhance student-learning experiences.

Language-learning strategies. Language learners, whether inadvertent or deliberate, use language-learning strategies (LLS) to make language learning more efficient and convenient [19]. LLS are essential for language learners to enhance their learning process and achieve their language goals effectively. They include cognitive,

metacognitive, and social strategies that enable learners to comprehend, retain, and produce the target language. LLS involve learning planning, constant reflection on the learning process, as well as self-monitoring and self-assessment of learning outcomes [20]. Therefore, it is essential for educators to carefully select and integrate appropriate technological tools into language learning to make sure learners have enough options. Additionally, foreign language-learning strategies can help students effectively use these tools to achieve their language learning goals.

Situated interpretation. Situated interpretation, mentioned in the research of Kelly and Gero [21], is considered the ability to use the existing human perspective in each person, the things accumulated from past experiences, and the present context to evaluate and analyze a problem meticulously based on many aspects. Goodyear and Ellis [22] found that many learners do not value the core of learning and instead focus on the outcomes. Moreover, how they perceive the nature of regular assessment tests will impact their learning, such as rote learning to pass the subject without understanding the content of the knowledge being conveyed. Accordingly, the knowledge and experience gained from past, present, and future predictions serves as the foundation for forming a mindset and interpreting an individual's learning situation in general and students' self-directed technology use for language learning. For example, when learners understand the significance of selecting an appropriate technology, which will significantly aid in self-directed learning at the university, they will learn about technologies, seek outside advice, and make decisions to make expectations a reality.

Subjective norm. In TPB, an SN is characterized as understanding the societal expectation to engage in or refrain from a particular behavior [11]. TPB suggests that a person's beliefs determine SNs. As a result, a person's intention to perform a behavior will be impacted if they believe someone significant in their life thinks the behavior should or should not be performed [38].

The impact of instructors and peers on successful online learning has been the subject of recent research [23]. The teachers' influence on technology adoption decisions, active encouragement and suggestions, and various types of support contribute to a favorable perception of technology use. Studies highlight the importance of considering the technical aspects and the human factors that impact students' motivation and engagement in technology use. Thus, teachers are crucial in creating a positive learning environment that fosters students' autonomy, competence, and relatedness toward technology.

According to Lai [10], self-motivated students tend to study with peers and seek assistance from their teachers when necessary. Huang et al. [24] stated that the importance of peer support for language learners is highlighted in the text as students spend significant time together and encounter similar challenges in language learning. Peer support is provided through friendship and in ways that facilitate learning, and because peers are on an equal footing, this support is more freely given in return. Both types of support are essential for language learners, even though teacher support stems from an authoritative relationship.

Perceived behavioral control. PBC is considered a person's estimate when considering how fluent or hard it is to do a behavior [25]. According to Ajzen [11], if a person keeps the strength of intention constant, PBC will determine how much effort the person will expend to carry out the anticipated conduct. In simpler terms, PBC is a measure of how easy or difficult it is for someone to perform a behavior, and it can influence the amount of effort they put into carrying out that behavior. This concept is essential in understanding why some people struggle to follow through with their intentions, even if they strongly desire to do so.

Computer self-efficacy. Computer self-efficacy (CSE) is the user's perception of their ability to use their computer to perform actions that achieve an intended result.

Regarding usefulness, CSE remains a significant determinant in computer-aided language learning. Lai and Gu [26] found that a lack of understanding and skills in practical choice and using technology are significant obstacles to self-regulation in language learning. Levy [27] also emphasizes the significance of supporting students in making knowledgeable decisions about using technology in their learning to avoid being overwhelmed by its diversity. In addition, CSE is believed to positively influence the acceptance and use of computers [28]. CSE is a proxy for controlling individuals' beliefs in technology usage [29]. CSE was also discovered to positively affect students' choices to employ technology [10].

Self-regulation. Self-regulation (SR) is an active, constructive process in which learners establish learning objectives, then strive to pursue, adjust, and administer cognitive and incentive interventions to attain the goals [30]. In addition, Hagger [31] reported that behavior change often requires individuals to make considerable effort and plan to engage in self-regulating action. Self-regulation is a crucial skill for academic success and personal growth, as it enables individuals to take control of their learning and behavior. Developing effective self-regulation strategies can lead to better academic performance, increased motivation, and improved well-being.

Accordingly, SR affects students' learning behaviors, so students with good SR skills are likelier to join in learning behaviors than students with low SR skills [32]. Similarly, SR has been demonstrated to be substantially related to learners' initiation of using technology [10]. Research by Lai et al. [5] reported that study participants positively assessed their ability to use technology successfully in language learning and their ability to self-regulate their English learning.

Facilitating conditions. Facilitating conditions (FC) refers to the support available in a setting that promotes and facilitates technology adoption [10]. Specifically, FC is a person's conviction that using a new system or technology may be facilitated by available organizational and technical resources. FC indirectly influences technology adoption by encouraging positive attitudes regarding technology use [15].

Research from Margaryan and Littlejohn [33] observed that teachers and peers impact students' technology usage. Instructor evaluation and suggestions on technology-enhanced learning materials are beneficial in enhancing learners' ability in self-directed learning. Besides, students may seek out beneficial tools to understand how technology and learning can coexist. Supporting tools can also help students understand the importance and compatibility of technology for learning. Tools available in peer-to-peer networks with which learners are in immediate contact were also discovered to influence how often language learners use technology to learn [10].

Self-directed technology use for language learning (SDL). Self-directed learning (SDL) is a learning process in which learners take charge of their education [34]. Knowles [35], a pioneer in SDL research, characterizes SDL as a procedure of lifelong schooling in adult education, [35] defining SDL as the process by which learners actively consider their learning needs, including setting learning objectives, identifying appropriate resources and equipment for learning, selecting and executing appropriate learning strategies, and assessing learning outcomes. Simultaneously, SDL typically occurs outside the classroom, where students must take responsibility for their self-learning. Since class time for language is highly restricted, it is critical to use the facilities available beyond the classroom [36].

Nevertheless, it should be remembered that learning can be achieved only with additional connections [36]. SDL necessitates a classroom atmosphere where the instructor encourages learner autonomy [36]. As a result, learners will be able to effectively exploit the accurate available resources outside the classroom, which is the essence of SDL. According to Jennett [37], individuals who are self-directed in their learning have several traits, including a sense of openness, curiosity,

organization, motivation, and enthusiasm. To become self-directed learners, students should adopt multiple learning strategies by accepting constructive instructor comments, achieving peer fortification, and participating in autonomous and advised practices [34]. Students must find learning methodologies by making responsible choices to meet their learning needs [34]. Therefore, the most crucial step to improving students' self-directed language learning is to understand the essence of self-directed language learners using technology outside language classes.

2.3 Conceptual model

A conceptual model is presented as below (see Figure 1).

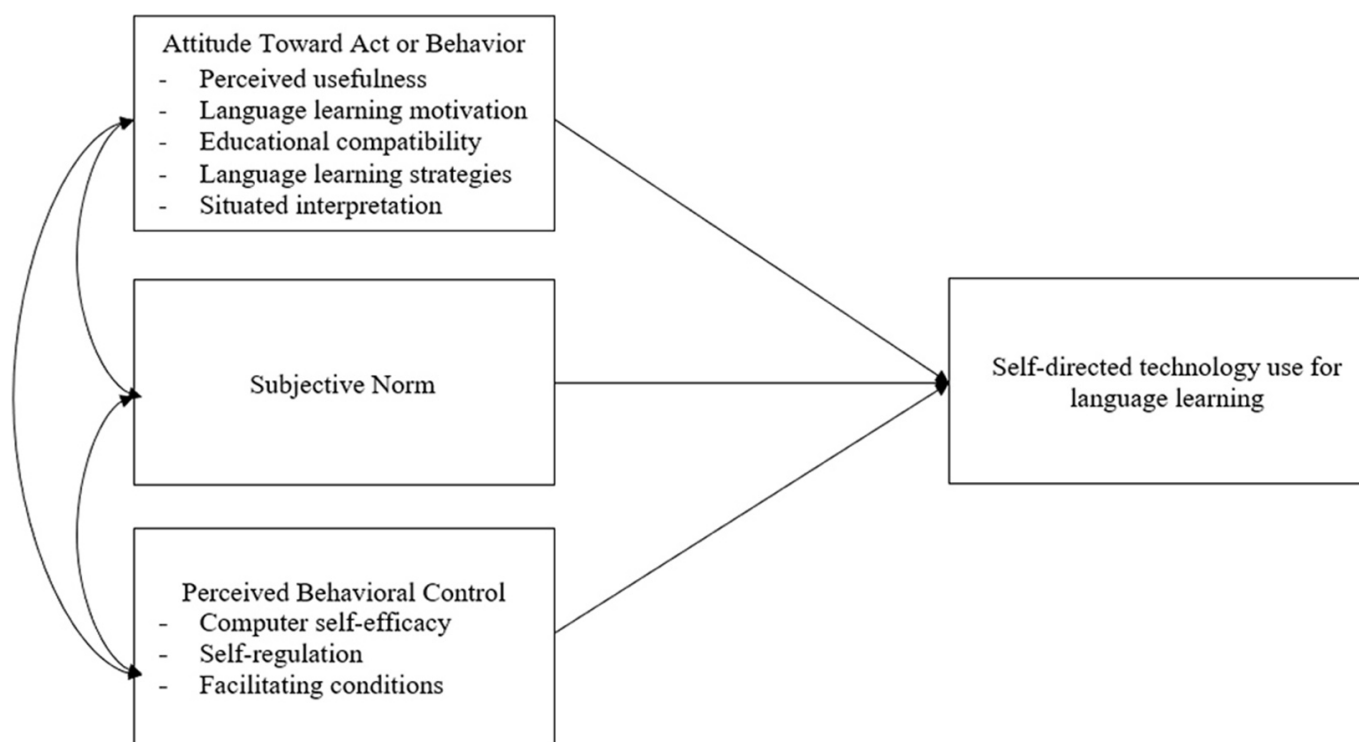


Fig. 1. Conceptual model

3 METHOD

3.1 Research instruments

The 35 questions in the survey adapted from Lai [10] were divided into (1) ATAB, 16 items, (2) SN, 3 items, (3) PBC, 11 items, and (4) SDL, 5 items. All constructs were rated on a 6-point Likert-type scale, with 1 being *strongly disagree* and 6 being *strongly agree*.

3.2 Research sampling

The researchers used a simple random-sampling technique to assign a number to each student on the list and then used a table of random numbers to choose which

participant to include. The process was repeated until the expected number of participants was reached. The quantitative data-collection stage, which was accomplished through the completion of the questionnaire, had 167 responses for data analysis.

3.3 Research procedures

The subjects of the study were students majoring in English. After gaining ethical clearance-form approval, we emailed lecturers for permission to access students. The process was maintained until the expected number of participants was reached.

3.4 Data analysis

The Statistical Package for the Social Sciences (SPSS) version 25 was used to answer Research Question 1. Cronbach's alpha measured the reliability of the questionnaire. Table 1 provides illustration for statistical analysis used in this study.

Table 1. Statistical analysis used in the research

Research Questions	Research Objective	Type of Statistical Theory	Possible Method
What is the inter-relationship among attitude toward act or behavior, subjective norm, perceived behavioral control, and English major students' self-directed technology use for language learning?	To determine the significant bivariate relationship between two continuous variables of interest	Univariate Correlation analysis	Pearson Correlation analysis
What is the key factor influencing English major students' self-directed technology use for language learning?	To examine cause-and-effect relationship between a set of independent variables paired with one continuous dependent variable	Multivariate Correlation analysis	Multiple Linear Regression analysis

4 RESULTS

4.1 Responses related to Research Question 1

The reliability of the questionnaire with Cronbach's alpha was .955, and the four constructs was ATAB .915, SN .819, PBC .908, and SDL .896. Refer to Table 2 for details.

Table 2. Reliability

Constructs	Question Items	Cronbach's Alpha
ATAB	1–16	.915
SN	17–19	.819
PBC	20–30	.908
SDL	31–35	.896

To assess the relationship between dependent and independent variables, the researchers utilized the Pearson Correlation coefficient. The results showed that all

pairs of variables had a high correlation, with $p = .000$ ($p < .001$): For the pairs of ATAB and SN ($p = .000$), ATAB and PBC ($p = .000$), SN and PBC ($p = .000$); and for the pairs of ATAB and SDL ($p = .000$), SN and SDL ($p = .000$), PBC and SDL ($p = .000$). Refer to Table 3 for details.

Table 3. Pearson correlations

		ATAB	SN	PBC	SDL
ATAB	Pearson Correlation	1	.614**	.599**	.653**
	Sig. (2-tailed)		.000	.000	.000
	N	167	167	167	167
SN	Pearson Correlation	.614**	1	.680**	.719**
	Sig. (2-tailed)	.000		.000	.000
	N	167	167	167	167
PBC	Pearson Correlation	.599**	.680**	1	.719**
	Sig. (2-tailed)	.000	.000		.000
	N	167	167	167	167
SDL	Pearson Correlation	.653**	.719**	.719**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	167	167	167	167

Notes: **Correlation is significant at the 0.01 level (2-tailed).

4.2 Responses related to Research Question 2

The result shows that ATAB, SN, and PBC were statistically correlated ($R^2 = .647$, $p = .000$, $p < .001$), which suggests that 64.7% of the variance in SDL can be explained by ATAB, SN, PBC. R^2 has a significant explanatory power ($F = 99.681$, $p = .000$). Refer to Table 4 for details.

Table 4. Model summary of ATAB, SN, and PBC on SDL

R	R ²	Adjusted R ²	Std. Error of the Estimate	R ² Change	F Change	df1	df2	Sig. F Change
.804	.647	.641	.51480	.647	99.681	3	163	.000

Notes: Independent variable: PBC, SN, ATAB; Dependent variable: SDL.

ATAB ($R^2 = .426$, $p = .000 < .001$) has a greater influence on SDL. 42.6% of the variance in SDL can be explained by ATAB. R^2 has a significant explanatory power ($F = 122.578$, $p = .000$). Refer to Table 5 for details.

Table 5. Model summary of ATAB on SDL

R	R ²	Adjusted R ²	Std. Error of the Estimate	R ² Change	F Change	df1	df2	Sig. F Change
.653	.426	.423	.65253	.426	122.578	1	165	.000

Notes: Independent variable: ATAB; Dependent variable: SDL.

SN ($R_2 = .518, p = .000 < .001$) has a greater influence on SDL. 51.8 percent of variance in SDL can be explained by SN. R_2 has a significant explanatory power ($F = 177.050, p = .000$). Refer to Table 6 for details.

Table 6. Model summary of SN on SDL

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
.719	.518	.515	.59832	.518	177.050	1	165	.000

Notes: Independent variable: SN; Dependent Variable: SDL.

PBC ($R_2 = .516, p = .000 < .001$) has a greater influence on SDL. 51.6 percent of the variance in SDL can be explained by PBC. R_2 has a significant explanatory power ($F = 176.089, p = .000$). Refer to Table 7 for details.

Table 7. Model summary of PBC on SDL

R	R ²	Adjusted R ²	Std. Error of the Estimate	R ² Change	F Change	df1	df2	Sig. F Change
.719	.516	.513	.59916	.516	176.089	1	165	.000

Notes: Independent variable: PBC; Dependent Variable: SDL.

The model below is for Multiple Linear Regression analysis. Refer to Figure 2 for a demonstration.

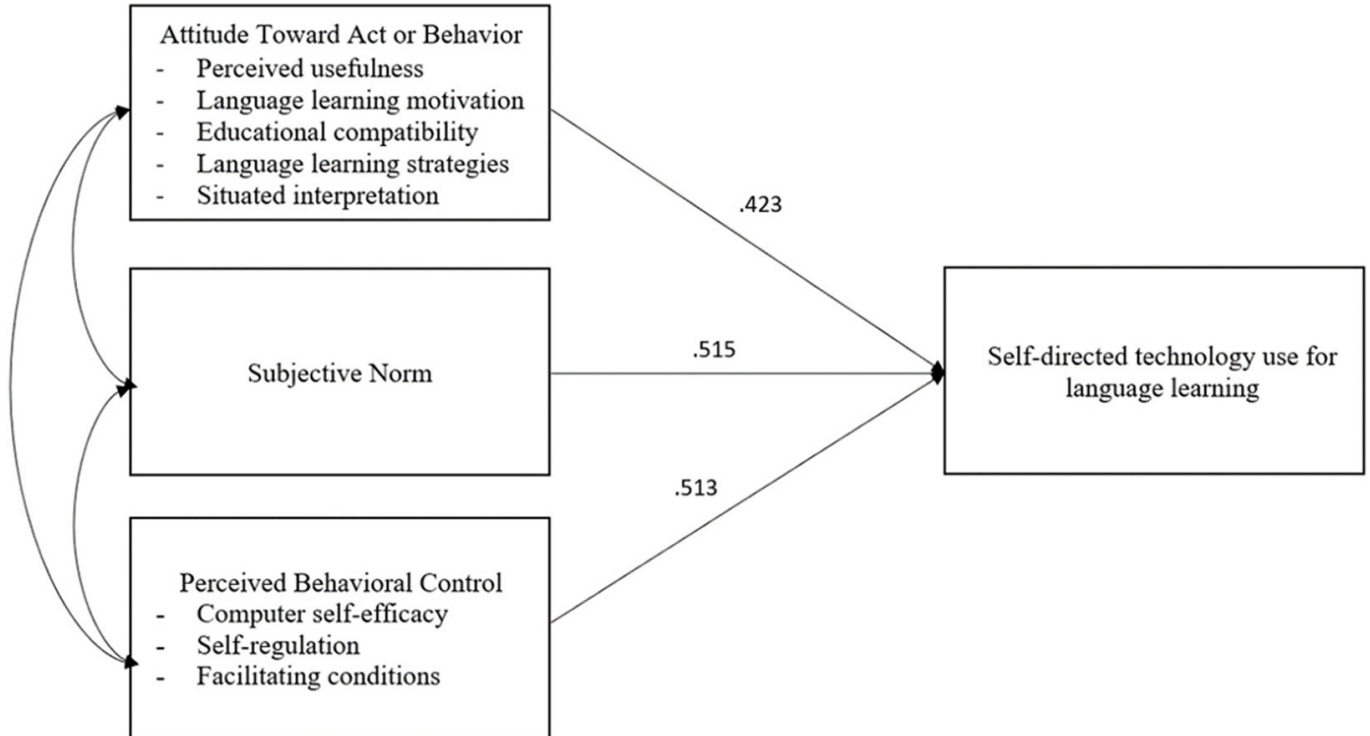


Fig. 2. Conceptual model summary

The results from the model summary show that the subjective norm is a key factor influencing students' self-directed technology use for language learning.

5 DISCUSSION

Subjective norms play a crucial role in students' self-direction in using technology. Teachers and peers are essential in encouraging students to utilize technology outside the classroom; therefore, teachers should be aware of their essential role as facilitators and put effort into assisting students' language-learning process with technology. Learners believed that teachers' and peers' knowledge will provide them with practical and valuable information for their academic development and motivation to engage in language learning processes with technology.

Perceived behavioral control is essential in students' self-direction in technology use. This finding fits with the results from Lai [10] and Straub [28]. Subjective norm and perceived behavioral control affect the dependent variable approximately the same, at $\beta = .515$ and $\beta = .513$. This implies that facilitating conditions for perceived behavioral control have interacted with the subjective norm. Facilitating conditions for perceived behavioral control are considered factors that resonate with the subjective norm. In addition to the importance of teachers and peers, they are expected to provide technology resources and strategies to maximize the effectiveness of students' technology use for language learning. Furthermore, teachers should have positive perceptions of the technology used to facilitate students' ability to apply technology to support learning in various ways. Both constructs emphasize the collaborative role of teachers and peers as being of primary importance as a driving force for students' self-directed technology use for language learning.

Besides the help of teachers and friends, learners also need to be aware of the importance of self-regulation. Accordingly, equipping themselves with knowledge and skills is also an essential foundation for students to self-direct the use of technology to learn languages. When students have self-awareness, it is easier to analyze, evaluate, and select what suits them best from the suggestions and advice from teachers and peers. This complements the results of Lai et al. [5], who claim that students significantly improve when they perceive the utility and importance of using technology in the foreign language-learning process. Accordingly, the study confirms the importance of learners' abilities and skills to use technology to support language learning.

6 CONCLUSION

The findings capture the factors that influence students' self-directed technology used for language learning. Factors mentioned play an essential role and positively impact the self-directed technology used for language learning.

The results demonstrated that subjective norms significantly impact English students' ability to self-direct using technology to learn languages, followed by perceived behavioral control and attitude toward acts or behaviors. The findings of this study highlight the significance of subjective norms in shaping students' self-directed use of technology for language learning. They emphasize the need for additional research to develop effective strategies for increasing students' self-directed technology use for language learning.

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