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Determinants of Learners' Perceived Learning on English Vocabulary Learning Application

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Abstract

Purpose: In the digital information age, English vocabulary learning application, as a mobile learning method, has been widely welcomed by learners. But most products of the same type are very similar in the market. Therefore, how to find the factors that affect learners' perceived learning, and based on these factors, provide learners with more diversified services that match their needs, break the status quo of product homogeneity, is a problem worth thinking and studying at present**. Research Design Data and Methodology:** This study takes learners as the core, constructivism theory as the basis and questionnaire survey as a research instrument to study learners' perceived learning on English vocabulary learning application. Through an extensive review of previous relevant literature, four factors of motivation, dialogue, course design and layout design that may influence perceived learning were selected. 150 University students matching the population requirements were picked as sample on an online questionnaire platform, 150 questionnaires were returned, and all valid data were used to test hypotheses. **Results:** The results show that motivation, dialogue, course design and layout design all have significant influence on perceived learning. **Conclusion:** All of the four factors influenced the students' perceived learning. The motivation was shown to have the most influence and the teachers and application developer should consider how the students' motivation can be improved to enhance their experience of the learning and application.

Keywords: Perceived learning, Student's Motivation, Students' dialogue, Course Design

JEL Classification Code: A22, I23, L86

1. Introduction

In the digital information age, the Internet and technology are integrated into all aspects of our lives, influencing our behavior and way of thinking. Catering to the development of the times, online education has gradually emerged, creating a new way to acquire knowledge. Through the innovation and development of mobile intelligent devices and Internet technology, more and more applications and services have been provided to online education, and the practical field of education has been broadened (Cakmak, 2019).

Under such an era background, a variety of novel learning methods have emerged, and although most of these learning methods are based on the original learning theories, the service learner-centered characteristics are becoming more and more obvious (Cakmak, 2019). This is a great phenomenon for both the education sector and individual learners, as it shows that technology provides a broader choice space to adapt to and meet the different characteristics of learners. If you are a learner with the desire

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to learn, you can always find an application that matches your learning needs in the vast ocean of software applications.

1.1 Statement of Problem

For the use of a non-native language, the coherence and logic of language expression will be limited by the level of grammar. But if your vocabulary is lacking, then you won't be able to understand what is being said, much less speak the language (Wu, 2018).

The accumulation of vocabulary is the cornerstone of learning any language, and its importance does not need to be overstated. Although all learners know this, it still doesn't change the fact that most learners find memorizing words to be boring, tedious, and difficult to stick to in the long run.

Not only that, the learning behavior of memorizing and reciting vocabulary is often carried out outside the classroom, without the supervision of instructors, and by the learners themselves, so it usually lacks an effective learning method, and it is also easy for the learners to get bored and even give up (Wang, 2020). Although the mobile software market provides learners with many targeted and interesting English vocabulary learning applications, this type of products also emerges one after another due to its broad market space, vast potential user base and unpredictable profit value, and the phenomenon of homogeneity is becoming more and more obvious. Although there are many choices for learners, the intrinsic characteristics of their products are similar. Therefore, in such a fierce competitive environment, how developers should find their own product positioning, innovate product features, and create a development path of their own, is a problem worth thinking and discussing at present (Lin & Lou, 2022).

1.2 Research Questions

Based on the above research problems discussion, the current research deals with the following research question: What factors influence learner's perceived learning?

1.3 Research Objectives

Based on above research question, the specific purpose of this study is to reach the following point:

To identify the factors related to the learner's perceived learning – motivation, dialogue, course design, and layout design.

1.4 Significance of the Research

"Without grammar, very little can be delivered; without vocabulary, nothing can be delivered." (Wilkins, 1972) This is a famous quote from Wilkins, a famous linguist from the United Kingdom, who fully affirmed that vocabulary learning is indispensable and vital for learners. Vocabulary acquisition is the core of second language acquisition. An English vocabulary learning applications that can bring good perceptual learning experience to learners can stimulate learners' interest in learning, make them master the initiative, and improve their ability to acquire new knowledge and apply what they have learned. This paper insists that an English vocabulary learning applications with learner-perceived learning experiences as a starting point can have a broader market outlook.

2. Literature Review

2.1 Theories Related to the Variables

The definition characteristics of online learning are derived from the constructivist model of learning. The constructivist model is based on the idea that knowledge is constructed rather than taught by instructor (Piaget, 1977). In English vocabulary learning, learners, as an independent and active learning individual, choose and use Baicizhan application, associate vocabularies with audio and images, integrate them into the original knowledge and experience, and form their own new understanding to build vocabulary knowledge (Zhang, 2022). Such a learning process fits with the constructivist model.

There are also different schools of thought in constructivism, the first constructivist idea is that learning is a process in which students construct their own knowledge. Instead of simply and passively receiving information, students actively and positively construct knowledge. When students take the initiative to discover and learn knowledge, their learning activities tend to be effective and high-quality. Therefore, learners' interest and motivation play key roles in the learning process. The second school of thought is collaborativism, which holds that collaboration occurs throughout the learning process and that knowledge is

constructed through sharing and collaboration. Thus, interaction and dialogue are seen as important factors in the effectiveness of online learning. The third school of thought is based on the cognitive information processing model, where each learner is an independent learner with their own unique learning preferences and styles, and when the course design and the layout design of the platforms they use are designed to meet their preferences, they will learn better and have a more enjoyable perceptual experience of learning (Eom & Ashill, 2016).

2.2 Motivation

Motivation is a mental structure that activates the process of self-mental regulation (Zimmerman, 2008). Motivation is divided into intrinsic motivation and extrinsic motivation. On the one hand, intrinsic motivation is that individuals actively choose and participate in a certain activity to realize the spiritual needs of self-pleasure and self-satisfaction. On the other hand, extrinsic motivation is a certain activity that an individual is motivated to perform by stimuli from outside to gain recognition and rewards from others or to avoid being punished in some way (Eom & Ashill, 2016). In the previous literature, the measurement methods of motivation mostly take the form of questionnaire survey and online diary (Zimmerman, 2008). And in this study, the question options related to internal and external motivation will also be set up to measure the students' motivation by questionnaires.

2.3 Dialogue

Dialogue refers to purposeful, constructive, meaningful interaction that is valued by each party (Muirhead & Juwah, 2004). In the constructivist model, the importance of collaboration is emphasized, and the most important way of collaboration is communication and interaction, also known as "dialogue". In e-learning, positive and constructive interactions can shorten the distance between learners and bring learners a pleasant e-learning experience (Boling et al., 2012). A qualitative study by Boling et al. showed that most participants felt that in both the more and less interactive programs, learners felt more rewarded in courses with more interaction with other students because they were able to connect with other learners and the instructor through the interactions and were more actively engaged in the learning activities. By referring to the measurement methods in previous literatures, this study measured the variable " dialogue " in the form of a questionnaire. Since Baicizhan is a learner-led vocabulary recitation application, this study would focus on measuring learner-learner dialogue.

2.4 Course design

Course design is concerned with the planning and design of the course structure and with the process, engagement, interaction, and evaluation aspects of the course (Eom & Ashill, 2016). First of all, the objectives of the course should be clear and measurable, the structure of the course needs to be logical, the learning modules need to be linked and sequenced, the learning materials should range from simple to difficult, so that students are able to carry out their learning activities from the shallow to the deep, and the richness and diversity of the learning materials are able to stimulate students' interest in learning, which will have a positive impact on the learning experience. Secondly, the importance of post-course feedback and assessment in improving course design should be emphasized, and the assessment of learning outcomes should be in line with the learning objectives and learning levels. In other words, the specific content of the assessment should be related to the content of the course and students' learning activities, and the assessment methods and criteria should be appropriate and reasonable (Jaggars & Xu, 2016). Therefore, through the screening of questionnaire contents in previous literature, this study selected 4 items that fit the characteristic of "course design" of the Baicizhan application to measure this variable.

2.5 Layout design

Layout design can incorporate typographic elements, which can connect meanings. These elements should be related to each other across the mobile screen (Darcey & Conder, 2012). The nature of English vocabulary application is a service-oriented commodity, then usability and user experience are the core elements to consider when doing interface design for this kind of product. Usability aims to create a system that is easier for users to learn and operate. The user experience includes the user's mood, feelings, preferences, and experience when interacting with application components and systems. Therefore, this

requires that the interface design of the product needs to be "user-centered", that is, to design the user, the environment, and the task as the starting point, to improve the usability of the product in the most effective and efficient way (Wong et al., 2012). On the one hand, the size of the application interface needs to be adapted to the size of the mobile device, and the subdivided functional areas, such as menus, navigation and learning areas, should be clearly categorized, and colors can be used to complement and emphasize the information, but the choice of colors should be moderate (Alqahtani & Mohammad, 2015). On the other hand, it is necessary to keep the interface beautiful and concise, the layout is clear and logical, avoid meaningless and unnecessary components, have clear tips in the language and use information, and provide solutions to the actions, status changes and errors of the customer in the use of the process. In this study, four questions related to layout design were selected from previous literature for questionnaire survey to measure the influence of this variable on perceived learning.

2.6 Perceived learning

Perceived learning is the learner's retrospective assessment of learning experience that has already occurred (Caspi & Blau, 2008). According to Caspi and Blau's research, learners' perceptual experience of learning mainly comes from two aspects: individual cognition and social emotion. Individual cognition not only reflects the feeling of learning and harvesting new knowledge, but also reflects the cognition and understanding of old knowledge refreshed through learning based on the original foundation, which are all perceived experiences through learning activities. Social emotion, on the other hand, reflects the psychological experience of learners in such a learning activity, such as whether the learning process is enjoyable or painful, whether the learning participation is active or passive, and whether the learning result is satisfied or disappointed (Caspi & Blau, 2008). In this study, four items were selected from "individual cognitive" and "social emotion" aspects to measure the variable of "perceived learning" by means of a questionnaire through the reference and study of the previous literature.

3. Research Methods and Instruments

3.1 Research Design

This research took a quantitative research approach to investigate students' satisfaction with the synchronous online learning course. Intrinsic motivation for learning, Perceived interactivity, Attitudes, and Perceived ease of use were the independent variables. For the hypotheses testing, the multiple linear regression analysis was employed to test the hypotheses one to eight. The Jamovi software version 2.3.28 on MacIntosh was utilized for all the data analysis of the study.

3.2 Conceptual Framework

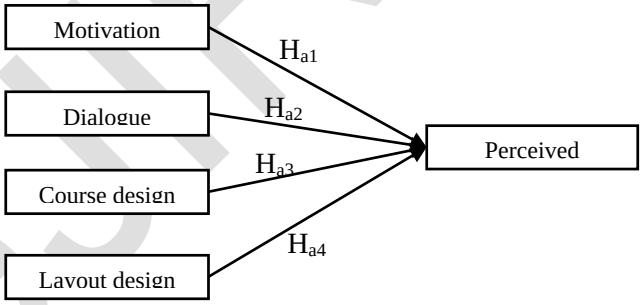

Figure 1: Research Conceptual Framework

3.3 Hypotheses

There were four hypotheses for this study:

Ha1: Learner's motivation positively influences learners' perceived learning.

Ha2: Dialogue of English vocabulary learning application positively influences learners' perceived learning.

Ha3: Course design of English vocabulary learning application positively influences learners' perceived learning.

Ha4: Layout design of English vocabulary learning application positively influences learners' perceived learning.

3.4 Population and Sample

Population: All first to fourth year university learners using the Baicizhan application to learn CET-4 or CET-6 English vocabulary in China.

Sample: 150 first to fourth year university learners using the Baicizhan application to learn CET-4 or CET-6 English vocabulary in China.

3.4.1 Population Characteristics

The population participating in this study was required to be Chinese students who are attending university and are learners of English CET4 or CET6 English vocabulary from the first year to the fourth year, with the learning platform of Baicizhan. The survey did not make any specific restrictions on the school, region, or gender of the population.

3.4.2 Sample Size

This study selected "Wenjuanxing", the professional online questionnaire survey platform in China as the survey platform. Through the platform database, 150 University students with matching demographic characteristics were selected as samples to participate in the online questionnaire survey.

G*Power is utilized to calculated minimum sample size for the study. Using the parameter for the F-Test and Linear Regression, with 0.15 effect size, 0.05 for the error probability, .95 power, and 4 predictors. The result of the calculation showed that a minimum of 129 sample size is needed. The sample size of the research was 150, which was greater than the calculated sample size by G*Power. Thus, the sample size is sufficient for the study.

3.4.3 Sampling Techniques

The sampling method adopted in this study is purposive sampling. Purposive sampling is a non-random sampling technique, which selects participants who can match the required characteristics according to research objectives. In other words, researchers decide what they need to know and then start looking for people who are able and willing to provide information about knowledge or experience in the relevant field (Bernard, 2017).

3.5 Research Instruments

Through an extensive review of previous literature, the study decided to use questionnaire as a research instrument to measure variables. The specific questionnaire items were recreated after reviewing existing instruments and study on motivation, dialogue, course design, layout design, and perceived learning. All items were selected from previous literature, and several items were modified according to specific research objectives. The explanation is as follows:

Three items of motivation (Q1, Q2, Q3), three items of Dialogue (Q4, Q5, Q6), three items of course design (Q7, Q8, Q9, Q10), All the above were selected from Eom and Ashill's study on students' perceived learning outcomes and satisfaction (Eom & Ashill, 2016). Four items of layout design (Q11, Q12, Q13, Q14) were selected from Alqahtani and Mohammad's study on mobile applications (Alqahtani & Mohammad, 2015). Four items of perceived learning (Q15, Q16, Q17, Q18) were selected from Gray and DiLoreto's related study in the field of perceived learning in online learning (Gray & DiLoreto, 2016).

3.5.1 Questionnaire Translation

The questionnaire was translated by English professionals from English version to Chinese version, and the translation process referred to three translation software: Youdao, Deep L and Google Translate. By comparing the three translation results, the best translation version was selected, and the translation was completed by manual proofreading and auditing.

3.6 Data Collection Procedures

Students were asked to volunteer to participate in the study and the purpose of this study was explained in detail in writing and provided to the learners prior to the questionnaire. The students who meet the requirements were selected and issued questionnaires by “Wenjuanxing”, the largest online survey platform in China, provides online questionnaire design and survey functions for enterprises, research institutions and individuals. 150 questionnaires were issued and 150 were recalled. All questionnaires and items were answered, and 150 questionnaires were considered valid.

4. Results

4.1 Internal Consistency Reliability (Cronbach’s Alpha)

Table 1: Results of Cronbach’s Alpha of the research instruments

Variable	Cronbach's α	Items
Motivation	0.819	3
Dialogue	0.735	3
Course design	0.800	4
Layout design	0.831	4
Perceived Learning	0.830	4

Table 1 showed the Cronbach's alpha of variables in the research instruments. The range of the Cronbach's alpha obtained was 0.735 up to .831, which were greater than .7. According to range of reliability and coefficient of Cronbach's alpha (George & Mallery, 2003), the Cronbach's alpha greater than .7 is considered acceptable. Thus, the research instruments were reliable.

4.2 Demographic Information

According to the statistics collected in Table 2, there were 70 male students, which accounted for 46.67% and there were 80 female students, which accounted for 53.33% of the total 150 of students. In Table 3 showed, 31 students were 18 years old which accounted for 20.67%, 48 students were 19 years old which accounted for 32%, 16 students were 20 years old which accounted for 10.67% and 55 students were 21 or older which accounted for 36.66%. There were 50 students in the first year which accounted for 33.33%, 49 students in the second year which accounted for 32.67%, 21 students in third year which accounted for 14%, 30 students in fourth year which accounted for 20% of the total percentage. The detail information is showed in Table 4.

Table 2: Demographic characteristics of participants

Gender	Counts	% of Total	Cumulative %
Male	70	46.67 %	46.67 %
Female	80	53.33%	53.33 %

Note: N=150

Table 3: Demographic characteristics of participants

Age Range	Counts	% of Total	Cumulative %
18	31	20.67 %	20.67 %
19	48	32.00 %	32.00 %
20	16	10.67 %	10.67 %
21 or older	55	36.66 %	36.66 %

Note: N=150

Table 4

Demographic characteristics of participants

Year in school	Counts	% of Total	Cumulative %
Freshman	50	33.33 %	33.33 %
Sophomore	49	32.67 %	32.67 %
Junior	21	14.00 %	14.00 %
Senior	30	20.00 %	20.00 %

Note: N=150

4.3 Hypotheses Testing

Ha1: Learner's motivation positively influences learners' perceived learning.

Ha2: Dialogue of English vocabulary learning application positively influences learners' perceived learning.

Ha3: Course design of English vocabulary learning application positively influences learners' perceived learning.

Ha4: Layout design of English vocabulary learning application positively influences learners' perceived learning.

A multiple linear regression analysis was conducted to design and layout design together have a significant influence to perceived learning. The results showed that these four factors had significant influences on perceived learning.

Table 5 showed the multiple linear regression model. It is showed that the linear combination of independent variables measures was statistically significant related to perceived learning F (6,171) = 133.20, p = <.001. The four variables combined relationship was .786 indicating that approximately 78.6% of the variance of perceived learning can be accounted for by the linear combination of independent variables.

Table 5: ANOVA Omnibus Tests

	SS	df	F	p	η^2p
Model	104.818	4	133.20	< .001	0.786
Motivation	3.040	1	15.45	< .001	0.096
Dialogue	1.972	1	10.03	0.002	0.065
Course design	0.840	1	4.27	0.041	0.029
Layout design	2.871	1	14.59	< .001	0.091
Residuals	28.525	145			
Total	133.343	149			

Table 6 showed the relative strength of the independent variables on the dependent variable. Four of the indices were statistically significant. It is found that motivation has the most significant influence on perceived learning, and it was statistically significant at p <.001 with the Beta value of .280. Layout design was the second strongest influence in perceived learning, and it was statistically significant at p < .001 with the Beta value of .294. Furthermore, the test also found that dialogue (β = 0.231, p = 0.002), course design (β =0 .157, p = 0.041), has significantly influence teachers online teaching readiness.

Table 6: Fixed Effects Parameter Estimates

		95% Confidence Interval						
Names	**Estimate**	**SE**	**Lower**	**Upper**	**β**	**df**	**t**	**p**
(Intercept)	3.873	0.0362	3.80176	3.945	0.000	145	106.95	< .001
Motivation	0.261	0.0663	0.12960	0.392	0.280	145	3.93	< .001
Dialogue	0.241	0.0761	0.09050	0.391	0.231	145	3.17	0.002
Course design	0.172	0.0832	0.00752	0.337	0.157	145	2.07	0.041
Layout design	0.294	0.0770	0.14198	0.446	0.294	145	3.82	< .001

The formula for the model of the independent variables towards perceived learning is:

$\hat{Y} = .280X_1 + .231X_2 + .157X_3 + .294X_4$

5. Discussion and Conclusions

5.1 Answers to the Research Questions

This study explored the question "What factors influence learner's perceived learning?" According to this question, four variables that may affect perceived learning were put forward: motivation, dialogue, course design and layout design. After extensive review of previous literature, theories related to these several variables were found: Based on constructivism, learners tend to be the most effective learners when they actively construct and learn knowledge. This theory provides theoretical basis for the influence of motivation variable on perceived learning in this study. The collaborationist view holds that knowledge is built through sharing and collaboration, and that dialogue has an important impact on the effectiveness of learning. The study result of the influence of dialogue on perceived learning in this study is consistent with the theory. Cognitive information processing model proposes that learners have diversity and individuality, and when course design and layout design fit their preferences, it will bring them better perceived learning. In hypothesis testing in this study, the results are consistent with this model. That is, course design and layout design have a significant impact on perceived learning (Eom & Ashill, 2016).

In general, supported by previous theories, through a series of investigations, data collection and analysis, and hypothesis testing, the results of this study showed that motivation, dialogue, course design and layout design are the factors that influence perceived learning, and they all have a significant impact on perceived learning.

5.2 Implications for Practice

The popularity of English learning applications breaks the restrictions of time and region, not only for the convenience of learners, but also provides the opportunity to learn anytime and anywhere. Compared with traditional paper books, learners only need to download a learning software on their mobile phones, and they can start learning whenever and wherever possible, and they can choose learning materials at will, such as vocabulary, listening, reading, speaking, and broadcasting. Such an approach has played a great role in promoting learners' independent learning. At the same time, Baicizhan has also created interactive spaces for learners, who can create study groups to invite friends to join learning communities to interact with other partners who are learning the same content together and participate in vocabulary competition games to compete words. These functions all arouse learners' enthusiasm and interest in learning and deepen learners' memory of knowledge (Wang, 2020).

On the other hand, combined with the previous literature and the results of this study, the importance of "user-centered design" for an online learning application was emphasized again. In other words, the development of a

product needs to pay attention to the user experience, which includes the user's preferences, feelings and thoughts when interacting with the device. Especially in the human-computer interface, usability is also an important factor affecting the perceived learning experience, so it is necessary to create a system that is easy to learn and use (Samrgandi, 2021).

Lastly and most importantly, the results of this study showed that "motivation" is the most important factor influencing "perceived learning", which also reminds us to pay attention to the influence of "motivation" on learning behavior in practice. The success of learning depends on whether the learner is motivated to learn and the level of motivation. A high level of motivation will enable learners to have higher comprehension, creativity and action, and drive learners to achieve their learning goals. Due to the compulsory nature of the current education system, learning is a boring thing that needs long-term persistence, it can only happen under the premise of motivation, but not all learning behaviors are driven by spontaneous motivation, so it is very necessary for teachers, as instructors, to master the skills of how to stimulate and maintain learners' learning motivation (Filgona et al., 2020).

Considering the influence of "motivation" on learning behavior, teachers can adopt the following strategies in practice: First, set up right objective. Set realistic goals according to students' learning ability, encourage and help students to achieve their goals. In this process, learners should be fully allowed to have the freedom to express ideas, raise questions and solve problems. Second, link the courses to reality. Teachers can integrate teaching topics and contents into daily life scenes, establish links between subjects and real life, and thus stimulate students' learning enthusiasm. Fourth, teachers should take learners as the center, adjust learning tasks according to students' learning progress and status, and give recognition and praise at appropriate times to help learners build self-confidence. When the learner does not do well, the teacher should also give constructive criticism in a positive way and help the learner to solve the problem. Fifth, respect for individual differences. The nature of teaching activity is also a social activity based on communication, so building a relationship of trust is also necessary. Teachers should respect the individuality of each learner, understand their needs and interests, use teaching methods that suit the learners' wishes, develop their motivation to learn (Filgona et al., 2020).

5.3 Future Research

There are still some limitations in this study and viable prospects for further research. Some research related to online education showed that the importance of the role of teachers in online learning is easily underestimated and overlooked (Arbaugh et al., 2010). According to Zimmerman, a social cognitive theorist, students' learning behavior is influenced by both self-factors and external factors. The external influence brought by the teacher, such as the encouragement, supervision, and guidance of learners, is closely related to the learning process and outcome of students (Zimmerman, 1989). The role of teacher also has research value and significance in curriculum design, shortening the physical and mental distance between students and teachers, and promoting the achievement of educational results (Eom & Ashill, 2016). In the study of the variable "dialogue", this paper only focused on testing and analyzing the influence of "student-student" dialogue on perceived learning, ignored the elements of "teacher-student" dialogue, and failed to establish the connection between "teacher-student" dialogue and perceived learning. In this regard, there are shortcomings and improvements need to be made.

In addition, in the chapter of Literature Review, this paper explained the variable "motivation" from two aspects: intrinsic motivation and extrinsic motivation. However, in the questionnaire design, two items were set in intrinsic motivation, while only one item was set in extrinsic motivation. In other words, through the investigation and measurement of the variable "motivation", the investigation results were more focused on "intrinsic motivation". This unbalanced setting of items may lead to deviations in analysis results. In the future research, it is necessary to keep the scientific method of hypothesis verification as much as possible to ensure that the research results are more accurate.

5.4 Conclusion

University students are the main users of English vocabulary learning applications, and they have different preferences and needs for such learning applications. For a learning application, in the increasing market competition, how to provide effective services for users is very necessary. Therefore, this study took learners as the starting point and

centers on learners' learning experience to explore the current situation of using one of the most representative applications of the same type. Questionnaire survey was used as a measuring instrument to investigate the relation between motivation, dialogue, course design, layout design and perceived learning. The result also proved that these four factors have obvious influence on perceived learning. This paper also took this opportunity to put forward development suggestions for learning applications of the same type, hoping that product developers can focus on user feedback and continuously improve product quality so that technology can better serve learners.

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