Study on students' satisfaction with using Chatbot on Facebook's messenger platform to learn Chinese vocabulary

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ABSTRACT

Keywords: Chatbot, Facebook, vocabulary, Chinese vocabulary	In the context of the ever-evolving scientific and technological revolution and the strong globalization trend, proficiency in foreign languages becomes extremely important because this is the bridge between countries in all areas of life. Currently, using some technological applications in learning foreign languages is becoming a new trend in the digital edge. A chat box product (Chatbot) integrated into Facebook's Messenger platform helps students majoring in Chinese language review vocabulary in Boya Chinese textbooks at elementary and intermediate levels, including three main functions: learning vocabulary, checking an online dictionary and reviewing vocabulary. This research is conducted in order to assess students' satisfaction with the functions of Chatbot with the participation of 101 students majoring in the Chinese language at Hanoi University of Industry. The result indicates that Chatbot stimulates students' interest with user-friendly configuration to improve students' academic performance. The higher Chinese proficiency learners have, the more stringent requirements they have for study methods and the capacity to provide vocabulary from Chatbot. This application's preface significantly impacts learners' emotions during their learning progress.

Introduction

In the globalization era, languages can be considered a bridge to connect people all around the world. Therefore, the demand for learning Chinese is increasing and has almost become a "trend". Chinese is becoming increasingly popular because it could help young learners have more opportunities to study overseas and have a better salary in future jobs. Especially, many large Chinese corporations have set up factories in Vietnam, and the cooperation relationship between Vietnamese and Chinese businesses is growing, opening up many job opportunities for people who are fluent in Chinese.

The industrial revolution 4.0 has strongly and profoundly impacted all aspects of life. Currently, the role of technology cannot be denied because it makes life more convenient, assessable, and modern. Many applications and utilities are integrated into smart devices to help people learn a new language easily. Therefore, the trend of applying technology to create intelligence and suitable products for life in general and for foreign language learners is extremely popular.

The Chinese learners in the current period at colleges and universities in general and at Hanoi University of Industry, in particular, are mainly Gen Z. This is the generation of young people who, since birth, have been exposed to modern technology and the strong development of the internet, social networks and mobile devices. Therefore, when Gen Z has the opportunity to study in an information technology environment, they will have the opportunity to promote their logical thinking and sharp mind and achieve more effective learning results than expected.

Previously, the authors successfully researched and developed an integrated chat dialog (Chatbot) on Facebook's Messenger platform to help Chinese learners at Hanoi University of Industry revise vocabulary according to the curriculum program at beginner and intermediate levels named Boya Chinese textbook. The Chatbot includes three main functions: vocabulary learning, dictionary look-up, and vocabulary revision. The Chatbot is called "Chinese Learning Technology" (CLT). Chatbot CLT has provided users with 2,518 Chinese vocabularies at beginner and intermediate levels, 20,850 Chinese characters with favorable strokes, 2,518 vocabulary test sentences, 440,752 audio files pronouncing words, and examples in the dictionary. Currently, Chatbot CLT could be a powerful tool for students to self-study Chinese at all times. In other words, students can interact with Chatbot by visiting the following address: ***https://www.facebook.com/Chinese.learning.technology.*** With a user-friendly interface, Chinese learners could get more knowledge from an extracted piece of information that is automatically replied to through a messenger box. When finishing their study, they could directly see the academic results and a summary of the total assessment. This practice can provide users with an overview of their learning progress step-by-step.

This study was conducted to evaluate the satisfaction level of Chinese language students at Hanoi University of Industry about the functions of Chatbot, and the participants included 101 students. The survey results encouraged authors to improve the chat dialog (Chatbot) to be a better version that helped Chinese language students have experience of learning technology platform at Hanoi University of Industry.

Literature review

Definition of Chatbot

According to Do (2020), an automatic answering system, also known as a Chatbot, is a computer program capable of communicating with humans by automatically answering questions or handling situations. The algorithms of their creators determine the intelligence of Chatbots. Chatbots often communicate with users through messages (Textual) or audio. Chatbots are applied in many fields, such as e-commerce, customer service, finance and banking, entertainment, healthcare, education, etc.

Benefits of Chatbot

Chatbots are mostly developed on the messaging platforms of popular social networks. The popularity of applications such as WhatsApp, Facebook, Messenger, etc, could be easily recognized according to the statistics of the user number of messaging applications worldwide by the website (statista.com) in 2018. In Vietnam, According to Thuy, N. T., Thuy, H. Q., Hieu, P. X., & Thanh, N. T. (2018), Facebook's Messenger has always taken the number 1 position, followed by Zalo. This is also the reason why the research team chose to develop a Chatbot on Facebook's Messenger platform.
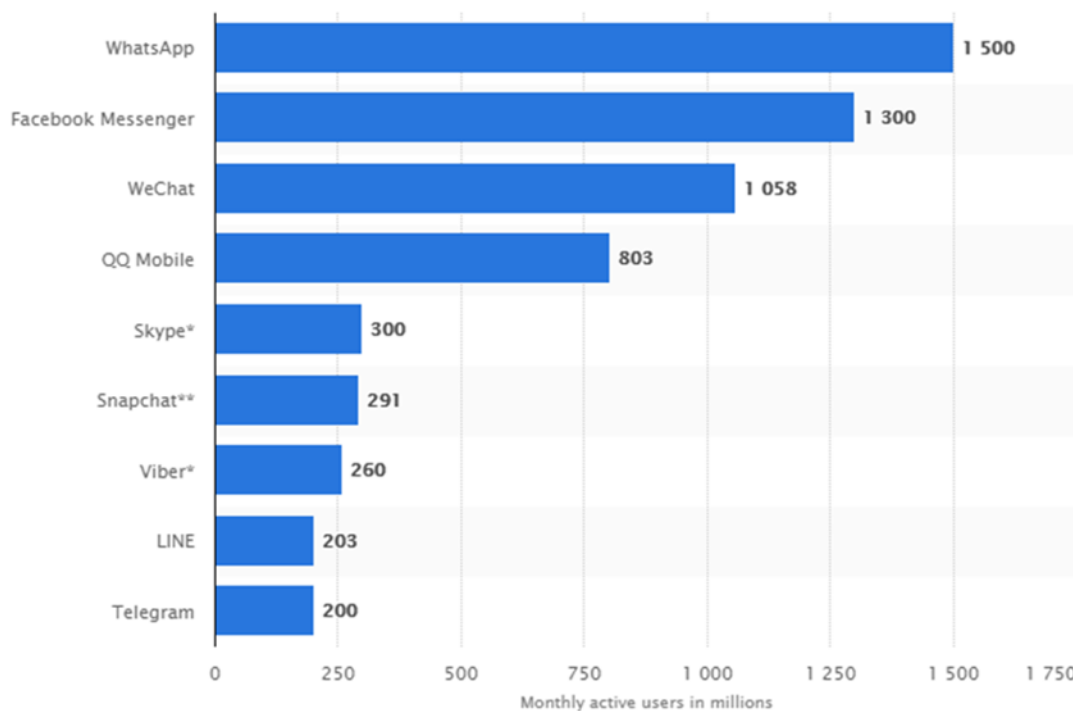
Figure 1: Global social networks ranked by the number of users in 2020 (Clement,2020).

Chatbots have brought many benefits to people in modern life. Also, from the above data, it can be seen that people today often communicate with each other through smart devices. Chatbots that want to communicate with humans must appear on messaging apps. Chatbot activities are always online 24/24 and quickly respond to all human requests because they are robots capable of operating continuously 24h per day, 365 days per year, without break demand.

The Chatbot can handle different requests simultaneously without confuChatbotnlike humans, who can only communicate with one person at a time, Chatbots can converse with thousands of people simultaneously, and each will get an immediate answer (Nguyen, 2019).

Chatbot contributes to improving the level of user satisfaction. Humans have emotions and constantly change. On the contrary, Chatbots are bound by some rules and obey everything they are programmed to do. Chatbots will always treat the customer perfectly no matter how rude the person is or the harsh language they use (Do, 2020).

Chatbot helps to improve work efficiency, reduce costs and save time. It can also help you like a secretary or an assistant at work. Some of the tasks that chatbots can help you accomplish are: searching for information on the internet, setting up appointments and reminders, and automatically aggregating and reporting on purchasing preferences, customer age, revenue, and profit daily or weekly. People will have more time for themselves when using chatbots to do time-consuming and boring tasks.

Although chatbots have many benefits and are widely applied in many aspects of life, they are not widely utilized in education and training. Very few educational institutions are developing Chatbot as a teaching and reviewing tool, but mainly focusing on developing their own Web and App. Some foreign language and soft skills teaching centers have used it, but only for customer care purposes.

The problems of applying information technology to create a Chatbot to learn Chinese vocabulary at elementary and intermediate levels

According to Bellman (1978), there are a lot of problems applied to Chatbot, but the research team selected problems in the field of education to solve learners' difficulties in learning Chinese and especially in word practice. The problem that researchers focused on was the functions to support Chinese learners on Facebook's Messenger platform with the main functions including: (1) Providing Chinese vocabulary level information; (2) Vocabulary queries for users on each level; (3) Providing vocabulary content for each level; (4) Providing answers to the vocabulary review question system in the form of a test.

Therefore, the current research aims to evaluate the effectiveness of using Chatbot (CLT) to help students study Chinese at an elementary and intermediate level with many systematic programming functions. Thus, students could contribute to reflecting and improving this tool to self-study better in the future.

Programming a Chatbot system to learn Chinese vocabulary at elementary and intermediate levels

Facebook's Messenger API Platform

API (Application Programming Interface) is an application programming interface; it is a method to connect with other libraries and applications. Windows, Google, Twitter... all have their own API. This API allows users to create applications with existing features or data on their servers.

Facebook's Messenger API Platform is a new technology introduced by Facebook at the H8 event in April 2016. This platform gives developers a tool to transmit messages directly to users on the platform of Facebook's main page. Thereby, Facebook wants to promote E-commerce development on its own page and contribute to the development of the current Chatbot.

Facebook's Messenger API Platform will communicate with the Chatbot developer's server with the Messenger application by sending messages to Webhook and using RESTful API. Webhook acts as an intermediary to transmit information between the user and the server. Then, the page's changes will be notified directly to the server through Webhook.
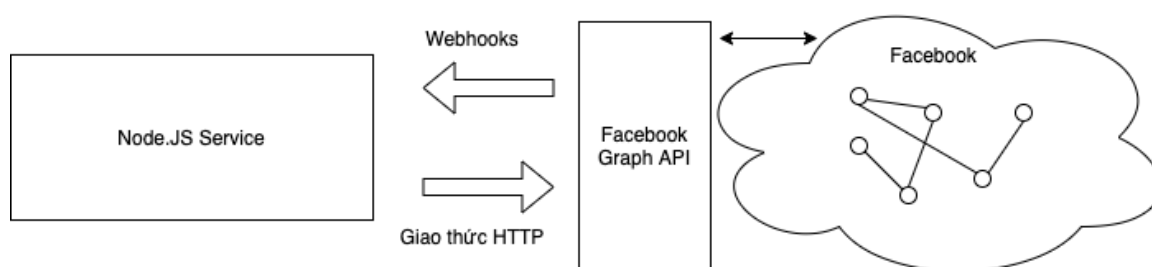

Figure 2. Operation Structure of Facebook's Messenger API Platform

The Messenger platform implements communication through a RESTful API, particularly Facebook's Graph API. Send/Receive API is one of the crucial parts, providing methods for transmitting and receiving information from the user to the server as well as from the server to the user. Therefore, to develop the Chatbot system, the research team has focused on building a server, processing natural language without necessarily developing an application on the phone or an application on the website to communicate with users. The send/receive API is used to reduce development time and costs.

The research team chose to program the system on the Facebook Messenger platform because, in recent years, the phrase "Facebook" has become extremely familiar to everyone because of its unparalleled popularity. Nowadays, it has become an indispensable part of everyone's daily life. Chatbot integrated into Facebook's Messenger is a tool that can communicate and interact with people through pre-programmed artificial intelligence, which can automatically message users. Previously, Chatbot was mainly used as a tool to help customer service be done 24/7 as well as sales and customer care activities be done automatically.

The research team has found out the applicability of Chatbot, took its advantage, and turned it into an ideal foreign language learning environment, as well as tried to fully exploit it. After that, the authors launched the tool "Chinese Vocabulary" to bring more new benefits for Chinese learners, especially those who studied Chinese according to Boya textbooks, to have access to an advanced, convenient, and completely free learning model. This new learning method meets the needs of learners at any time and anywhere while bringing great benefits and great development advantages such as reduced costs and learning time. Besides, students do not need to download additional apps because they are built into Facebook's Messenger platform.

Language developing expectations

The research team chose to use the Javascript language running on the Node.js platform to program the operating system for the Chatbot. The Javascript language on the Node.js platform is open source and is an environment for network servers and applications. Node.js applications are written in JavaScript language. Node.js uses the Google V8 JavaScript engine for code execution, and a large percentage of the underlying modules are written in JavaScript.

Node.js provides an event-driven architecture and non-blocking I/O API, optimizes application throughput, and is highly scalable. Node.js has a fast processing speed thanks to the asynchronous processing mechanism (non-blocking). Therefore, it can easily handle thousands of connections in the shortest amount of time.

Activities of Chatbot to learn Chinese vocabulary at elementary and intermediate levels

The Chatbot for learning elementary and intermediate Chinese vocabularChatbotacts with users via audio or text and uses Facebook's Messenger API platform to communicate with users. The part that the research team needs to develop includes:

 Translator: Translating the user's request to help the computer understand the request that needs to be performed. The intent and entities included in the request are extracted to form the basis for determining the response. Natural language processing techniques are applied to analyze user requests semantically.

Processor: Process user requests based on data provided by Translator. The answer will be retrieved from Chatbot's database. Depending on the technique used, the accuracy of the answer will vary.

Response: Receive output from Processor and return the corresponding result to the user on Facebook's Messenger platform.

Developing Chatbot database

The source of developing data for training Chatbot is the vocabulary data in the Boya books for beginner and intermediate level, volume 1 and volume 2, which are currently being used as teaching textbooks at Hanoi University of Industry and many other universities. A conversation

between a Chatbot and a user to serve the needs of learning and practicing Chinese vocabulary at elementary and intermediate levels is as the following example:

Figure 3. Conversation model between Chatbot and user

Thus, with the problem of developing training data for Chatbot capable of asking questions and assessing learners' answers related to Chinese vocabulary at elementary and intermediate levels, the research team must build a dataset of Chinese vocabulary at elementary and intermediate levels taught in the Boya books for beginner and intermediate level, volume 1 and volume 2. To help users practice the most with the vocabulary contained in the lesson, the team needs to create a list of important vocabulary words from data related to vocabulary such as words, pinyin pronunciation, pronunciation sample sounds, Sino-Vietnamese words, meanings, synonyms, antonyms, compound words, examples, etc. For each vocabulary, it is necessary to build sample questions for users to practice. Question types include: (1) Give a Chinese word, choose the corresponding pinyin pronunciation; (2) Give a word, choose the corresponding meaning; (3) Fill in the blank; (4) Give a Vietnamese meaning, choose the corresponding Chinese word (4) Give the pronunciation of a word, choose the corresponding word.

In addition, for the purpose of helping users in the process of learning Chinese vocabulary, Chatbot also provides a Chinese-Vietnamese dictionary to help users quickly look up words in the Chinese-Vietnamese dictionary. Currently, the team has developed a dictionary data of 151,624 Chinese words, including words of different levels. This vocabulary dataset is taken from Lingoes dictionary - a multilingual online dictionary data source.

Basic functions of Chatbot

ChatBot has the potential as a language learning tool, especially for learning Chinese vocabulary (Kumar, R., & Ali, M. M., 2020). In order to allow users to practice Chinese vocabulary online during their learning, the Chatbot is developed with the following basic functions: Vocabulary Chatboting, Dictionary checking, and vocabulary revising. These functions are also mentioned in other research by Chen, H. L., Vicki Widarso, G., & Sutrisno, H. (2020).

First, vocabulary learning function. With this function, the vocabulary is organized into corresponding lessons in the Boya textbooks for beginner and intermediate levels. Each lesson includes some important vocabulary of the lesson. For each word in the lesson, there may be the following items of information: (1) Words; (2) Pinyin pronunciation; (3) Sino-Vietnamese words; (4) Vietnamese meaning; (5) Synonyms; (6) Antonyms; (7) Compound words; (8) Sample pronunciation.

Second, the dictionary look-up function. Users enter the word they want to look up and send it like sending a Messenger message. Chatbot will look up the dictionary and display the search results in the database, including (1) Words; (2) Pinyin pronunciation; (3) Sino-Vietnamese words; (4) Examples corresponding to each different meaning/field of meaning; (5) Sample pronunciation; (6) Pen strokes order to write letters; (7) Synonyms; (8) Antonyms; (9) Compound words. There is also an option to memorize words to rehearse words later. For words that have not been memorized for practice, there is an option to "save". With words that have been memorized, but the user wants to not need to save to learn again, there will be an option to "skip".

Third, vocabulary practice function. This function will have two options: practice words by lesson and general practice. The method is the same as for practicing vocabulary by lesson. Practice words by lesson: The user chooses a lesson and answers the questions corresponding to the words in that lesson. It will be given 1 point for each correct answer and deducted 1 point for the wrong answer. That score is used to assess the proficiency of the respective vocabulary. General practice: it will choose from the list of words the user has practiced before or the words that the user has memorized while looking up the dictionary or a set of words with the lowest proficiency level to practice. When each exercise is finished, the user will be shown the time to do the test and evaluate the preliminary results of the entire lesson. Users can rehearse what they have just done to improve results if desired.

Using a database management system (database) MySQL

MySQL is the world's most popular free and open-source database management system and is very popular with developers in application development. MySQL is a high-speed, stable, easy-to-use database management system. It is also portable, works on many operating systems, and provides many powerful utility functions. With high speed and security features, MySQL is well suited for applications that access databases on the internet. MySQL has many versions for different operating systems: Win32 version for Windows, Linux, Mac OS X, Unix, FreeBSD, NetBSD, Novell NetWare, SGI Irix, Solaris, SunOS, etc. Users can download MySQL for free from the homepage.

MySQL is one of the very basic examples of a Relational Database Management System using Structured Query Language (SQL). MySQL is used to support NodeJs, PHP, Perl, and many other languages as a place to store information on web pages written in NodeJs, PHP, or Perl,... MySQL is not the only Relational Database Management System (RDBMS) on the market, but it is indeed the most popular one, only after Oracle Database, when it comes to key parameters such as the number of searches and user profiles on LinkedIn, as well as the amount of discussion on internet forums. What is the main reason for the dependence of many tech giants on MySQL? The important reasons are as follows: Flexibility and Ease of use; High performance; Industry standards; Safety.

Using railway.app platform for system deployment

Railway.app is a Cloud platform based on Container as a (Paas) Platform as a Service. Developers use Heroku to deploy, manage, and scale modern apps. The platform is flexible and

easy to use, providing developers with a simple way to bring to market. It helps developers focus on product development without worrying about running servers or hardware. Therefore, the research team chose to use the railway.app platform for system deployment for the research topic.

The Railway.app platform has the following outstanding features. It provides for the smart containers in which the application will be run. Handles all configuration, load balancing, orchestration, backup, logging, security, etc. This is a tool capable of managing teams and combining many programmers together to be able to build better software. Railway.app has the ability to scale the application instantly, both vertically and horizontally.

Add-ons can extend, enhance and manage your applications with built-in services such as New Relic, MongoDB, SendGrid, Searchify, Fastly, Papertrail, ClearDB MySQL, Treasure Data, etc. When integrated with Github, you can easily deploy versions from a pull request, push, commit, etc. Thanks to features of monitoring and integrating traffic, response times, memory, as well as CPU and error loads, you'll always know how your application is doing.

Research gap

It can be seen that Chatbot (CLT) is one of the most powerful tools for helping students to study Chinese easily. Previous studies mainly focused on how to develop the Chatbot system rather than evaluating the effectiveness and satisfaction of Chatbots in teaching and learning. Therefore, this paper will show many good features as a support for learning and revising Chinese vocabulary, particularly at Hanoi University of Industry.

Methodology

This study uses a quantitative research method. The authors use Microsoft Excel to collect and analyze data after questionnaire delivery. The content of the study related to (1) the evaluation of the ability to provide a vocabulary of Chatbot Chinese Learning Technology (Chatbot CLT); (2) the evaluation of the users' satisfaction level with the "vocabulary learning" function of CLT; (3) the evaluation of the users' satisfaction level with the "vocabulary practicing" function of CLT; (4) the evaluation of the users' satisfaction level with the "Chinese-Vietnamese Dictionary" function of CLT; (5) the overall user's rating of learning Chinese vocabulary through CLT. The study's subjects include 101 students majoring in the Chinese Language at Hanoi University of Industry.

Results & Discussion

The study results on the ability to provide a vocabulary of Chatbot CLT

The study's results on the ability to provide a vocabulary of Chatbot were made by analyzing the question "Does Chatbot CLT systChatbotorting Chinese vocabulary learning at elementary and intermediate levels according to the Elementary Chinese Boya curriculum (episodes 1 and 2) and Intermediate Chinese Boya I curriculum (episode 1 and 2) provide vocabulary sufficiently to you?"

Table 1. Students' opinion about the ability to provide a vocabulary of Chatbot (CLT)

No.	Students' opinion	Rate (%)
1	Provide all vocabularies	60,4 %
2	Provide all basic vocabulary	37,62 %
3	Lack many important vocabularies	1,98 %

The results indicate that 37.62% of people surveyed think that Chatbot CLT provides almost all the vocabulary in the lesson. In contrast, the percentage of people surveyed who think that Chatbot CLT fully provides a basic vocabulary in the lesson is 60.40%. Only 1.98% of people surveyed think the Chatbot CLT lacks many important vocabularies. It means that the ability to provide all the basic vocabulary in the lessons of Chatbot CLT is grounded and appreciated by the majority of users.

The study results on the users' satisfaction level with the "vocabulary learning" function of Chatbot CLT

The study's results on the user's satisfaction level towards the "vocabulary learning" function of Chatbot CLT were made by analyzing the question, "Please rate your satisfaction level with the "vocabulary learning " function of Chatbot CLT?"
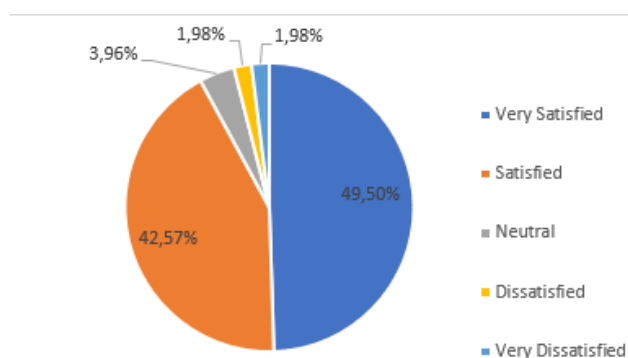
Figure 1. Students' satisfaction with the "vocabulary learning" function of Chatbot (CLT)

The results indicate that: 49.50% and 42.57% of people feel "Extremely Satisfied" and "Satisfied" with the "vocabulary learning" function, respectively (account for 92.07% in total), whereas the proportion of people having "Neutral" evaluation for this function is 3.96%. By contrast, the percentage of people choosing the option of "Dissatisfied" and "Extremely dissatisfied" was 3.96% (with 1.98% for each option). On the 5-point scale, the average "vocabulary learning" function score is 4.36. This score illustrates that the "vocabulary learning" function is assessed at a good level.

Regarding the users' satisfaction level with the "vocabulary learning" function, in cooperation with the evaluation of the ability to provide a vocabulary of Chatbot CLT, the results in the statistical table show that the users who feel "Dissatisfied" and "Extremely dissatisfied" about the "vocabulary learning" function are not in the group of users who rate the Chatbot as lacking in vocabulary. In this way, it could be concluded that the assessment of "vocabulary learning" of users does not depend on the ability to provide a vocabulary of this function but on the users'

actual experience. This is the basis for thesis development, in which the research team focuses more on developing the interfaces and users' experience with this function.

This above assumption is confirmed again when there is a suggestion for improvement in the comments: "It is recommended that it shall apply other approaches instead of this simple method" from a user choosing the "Dissatisfied" option.

In addition, regarding the "vocabulary learning" function, the research team has received many suggestions for improvement, such as users wanting to build vocabulary on more curriculums to meet the diverse learning demand. In particular, users also want the research team to add a variety of vocabulary sets so that users can learn a large number of words. Besides, the vocabulary learning section should improve the interface to be more beautiful and have more images, examples, sentence patterns, word forms, etc.

Based on suggestions to improve Chatbot, the research team will continue to improve the "vocabulary learning" function in the near future to serve the Chinese learning students.

The study results on the users' satisfaction level with the "vocabulary practicing" function of Chatbot CLT

The study's results on the user's satisfaction level towards the "vocabulary practicing" function of Chatbot CLT were made by analyzing the question, "Please rate your satisfaction level with the "vocabulary practicing" function of Chatbot CLT?"
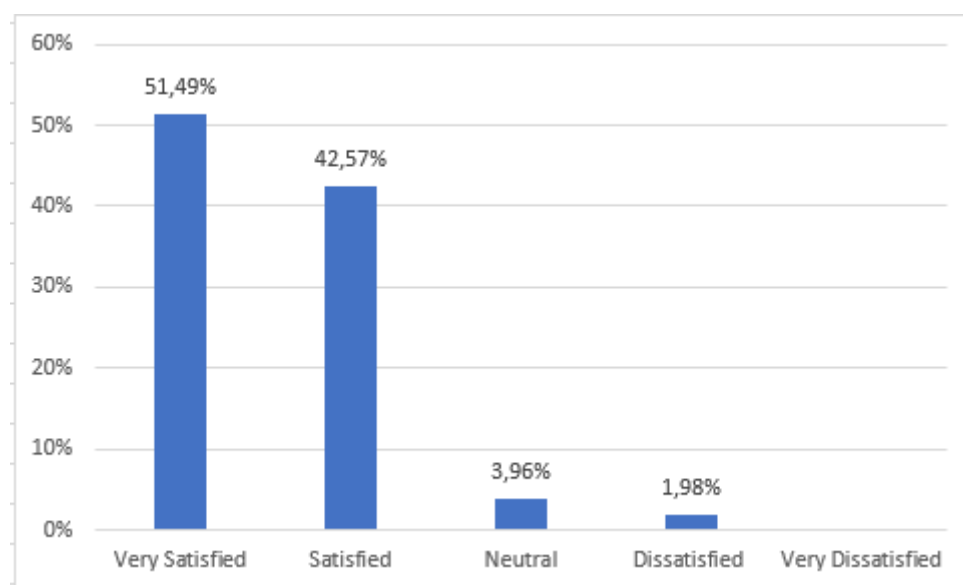

Figure 2. Students' satisfaction with the "vocabulary practicing" function of Chatbot (CLT)

The results indicate that: 51.49% and 42.57% of people feel "Extremely Satisfied" and "Satisfied" with the "vocabulary practicing" function, respectively (account for 94.06% in total), whereas the proportion of people having "Neutral" evaluation for this function is 3.96%. By contrast, the percentage of people choosing the option of "Dissatisfied" was 1.98%. On the 5-point scale, the average "vocabulary practicing" function score is 4.44. This score illustrates that the "vocabulary practicing" function is assessed at a good level.

Considering the relationship of satisfaction between the "vocabulary practicing" function and Chinese proficiency of the respondents, it could be seen that: the majority of those surveyed with "Neutral" and "Dissatisfied" ratings belong to the group with language proficiency at HSK3-4 and HSK5-6 levels. This result shows that, with Chinese vocabulary training, users

with higher HSK levels often have stringent requirements for learning methods. Regarding user contributions to the development of the "vocabulary practicing" function, the research team has received great support and many comments to improve and upgrade for future versions of the product.

Many users evaluate that the sound (pronunciation) function of the "vocabulary practicing" function is not really good and needs to be improved. In addition, this function should create many types of tests to help readers get more effective learning methods. Test items can be divided into many different levels so that users can choose according to their ability. In particular, the research team should add HSK vocabulary tests that are also extremely effective for users

The study results on the users' satisfaction level with the Chinese – Vietnamese dictionary function.

Evaluating the users' satisfaction with the "Chinese- Vietnamese Dictionary" function is carried out by the following question "Please evaluate your satisfaction with the Chinese- Vietnamese Dictionary function of Chatbot CLT?"
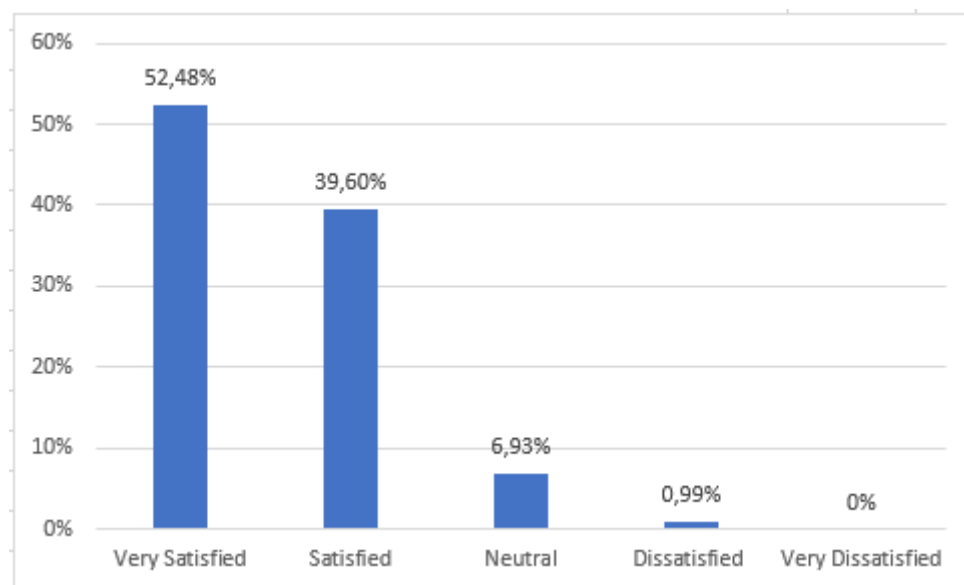

Figure 3. Students' satisfaction with the "Chinese- Vietnamese Dictionary" function of Chatbot (CLT)

The result showed that 52,48% of users felt "Very satisfied" while the proportion of users who felt "Satisfied" reached 39,60%, a total of 92.08%. There are 6,93% of people had a "Neutral" opinion, while only 0,99% of users "Dissatisfied" with this dictionary function. The average result reached 4,4/5 points. This is a high level of user satisfaction.

In terms of satisfaction in a different group of people, the number of people who felt "very satisfied" or "satisfied" made up 97,5 % in HSK 1-2 level, 93,69% in the HSK3-4 level, 80% in the HSK5-6 group. As a result, there was a decrease in users' satisfaction with the dictionary function.

When studying more about the user's constructive feedback through different HSK level groups of people, it can be seen that there is an increase in users' requirements of the dictionary function with their HSK level.

The reason for this phenomenon was that the users wanted more vocabulary, especially difficult vocabulary which were not mentioned in Chatbot CLT.

There is a lot of constructive feedback about improving the dictionary function, such as updating more vocabulary and classifying vocabulary in specific sections. Besides, many people would use this dictionary to translate words easily.

Users' evaluation of learning Chinese vocabulary through Chatbot CLT

In terms of the most favorite function on Chatbot, 45,54% of people chose the learning vocabulary function, 34,65% of users agreed with vocabulary revision, and 19,80% of people liked the dictionary function.

Table 2. Students' opinion about the most favorite function of Chatbot (CLT)

No.	The most favorite function on Chatbot (CLT)	Rate (%)
1	vocabulary learning function	45,54%
2	vocabulary practice function	34,66%
3	Chinese-Vietnamese dictionary function	19,80%

There is a different result compared with the average score on the satisfaction scale (at 4,36; 4,44; 4,44). It showed that although there were some problems related to the "Vocabulary learning" function, it still helped students to study better. Most of the learners were young generation students who were at an elementary and intermediate level. It was very easy to use a smartphone as a vocabulary notebook to study Chinese at all times. The result also contributed to the way of improvement to help Chinese learners in general, and students in particular when using Chatbot CLT.
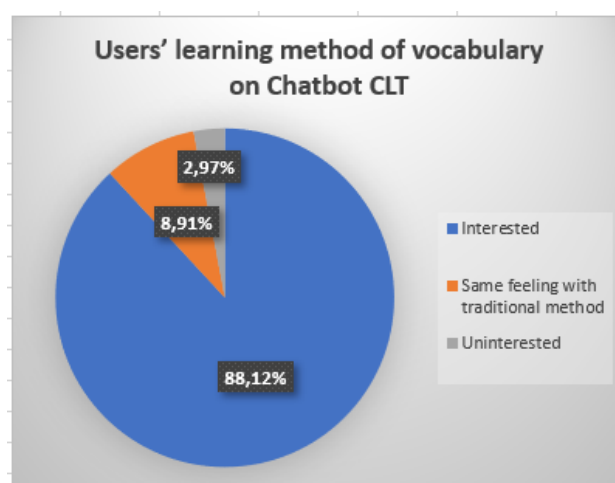

Figure 4. Students' satisfaction with the learning method on Chatbot (CLT)

When evaluating the users' learning method of vocabulary on Chatbot CLT, the result showed that the number of students who felt interested in studying on Chatbot accounted for 88,12% while 8,91% of users had the same feeling compared to the traditional learning method, and 2,97% of users felt uninterested in this method.

With 2,97% of users who were uninterested in learning Chatbot CLT, there were 33% for difficulties in using Chatbot, while 66% of users felt easy to use this app. This result illustrated that users' experience and interface played an important role in exploiting languages and technology.

Regarding the effectiveness of the Chinese learning method, Chatbot CLT was considered a useful way to inspire students when practicing.

Table 3. Students' opinion about the interface of Chatbot (CLT)

No.	Student's opinions	Rate (%)				
		Very satisfied	Satisfied	Neutral	Dissatisfied	Very dissatisfied
1	Users' interaction with Chatbot CLT	58,42%	35,64%	4,95%	0,99%	0%
2	The user-friendly interface of Chatbot CLT	59,41%	34,65%	5,94%	0%	0%
3	Effectiveness of using Chatbot CLT	45,54%	47,52%	4,95%	1,98%	0%
4	Summary of users' satisfaction with Chatbot CLT	48,51%	46,53%	3,69%	0,99%	0,28%

Regarding the way of user interaction, the number of users who agreed with "Very satisfied" were 58,42%; 35,64% of users for "Satisfied", a total of 94,06%. 4,95% of users felt "Neutral" and 0.99% "Dissatisfied". The average score was 4,51/5.

Similarly, the user-friendly interface marked a highlighted point. There was no one felt "Dissatisfied" with Chatbot. In particular, there were 59,41% of users felt "Very satisfied", 34,65% "Satisfied", and 5,94% "neutral". The average score was 4,53/5.

It can be seen that it was easy to use Chatbot because it was integrated into Facebook Messenger. This practice could help students learn Chinese as an online daily communication platform. However, operating on Messenger was a limitation for users because some people have not followed and understand the instruction of this channel, which led to skipping some special functions. The result of the questionnaire showed that it was about 93,06% of users satisfied with Chatbot CLT, including 45,54% with "Very satisfied," 47,52% with "Satisfied," while there were 4,95% of users for "Neutral" and 1,98% for "Dissatisfied" with Chatbot. The average score was 4,37/5.

In general, there were 48,51% of users felt "Very satisfied", 46,53% "Satisfied', 3,96% "Neutral," and 0,99% for "Dissatisfied" with Chatbot CLT. The average score was 4,42/5.

Besides these above evaluation indexes, the Chatbot also received a lot of comments from users. In general, the idea of a Chatbot was highly evaluated. However, there were a lot of recommendations related to add-on functions such as grammar, dictionary, majoring

vocabulary, and even mistakes. Also, many people would like to have a vocabulary revision section to give a better experience on Chatbot. Currently, it is quite inconvenient when users want to revise vocabulary by pressing the exit button. Especially, unlike the smartphone, when studying vocabulary on computers, there were no sweeping functions to move on to other sections.

A lot of users also would like to have more databases related to books in different areas, which would enhance people's interests. Also, some people showed their concerns about interactive Chatbot systems between people. That practice could create competition as well as interest for users.

In general, after conducting a survey with 101 users of Chatbot CLT, the authors received a lot of positive as well as constructive feedback, which could help authors give a more practical improvement in the future. This feedback and comments would be considered to have a better experience in the latest Chatbot version.

Discussion

The research results showed that from the students' perspectives, Chatbot (CLT) generally contributed to improving students' Chinese comprehensibility in terms of both vocabulary and grammar. The most obvious enhancement could be seen in the student's report of the increased employment of such Chinese languages, such as vocabulary practice, user-friendly interface, and user interaction. The positive effects of Chatbot on facilitating the growth of learners' attitudes toward increasing their vocabulary when learning Chinese have also been reported in some previous studies (McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (2006); Rich, E., Knight, K., Winston, P. H., Luger, G. F., Jackson, P., Nilsson, N. J., ... & Schalkolf, R. J. (1991). The findings of these previous studies indicated that the Chatbot using artificial intelligence must consistently establish to build up vocabulary at a different level. In this research, it can be seen that Chatbot (CLT) could be used in order to develop students' vocabulary. In other words, the Chatbot is often used as a platform to get more vocabulary for students when studying the Chinese language.

Conclusion

Through the survey and analysis of information collected from 101 users of different target groups about the level of satisfaction when using Chatbot, it can be found that: (1) Chatbot learning vocabulary brings good inspiration for learners, it is not only easy user-friendly but also practical for learning outcomes; (2) Users are interested in Chatbot's vocabulary and its ability to provide vocabulary so that users can study all the time without carrying books; (3) The higher the level of Chinese the user has, the more rigorous the requirements are in vocabulary practice, especially the requirements for learning forms, as well as the requirements of providing vocabulary when looking up the dictionary; (4) Application interface and user experience have great significance, greatly affecting emotions in the learning process and learning results.

Learning Chinese vocabulary at elementary and intermediate levels according to the Boya Chinese curriculum through Chatbot CLT is a new learning method, catching up with the trend of the 4.0 era and helping users to learn at any time. Chatbot CLT has a variety of review methods and an easy approach. Users do not need to install or download additional software to

a computer. The interface of Chatbot CLT is very friendly and easy to use. It meets the basic needs of users, inspires good learning, and has high learning efficiency. However, to improve Chatbot CLT's effectiveness, the research team needs to focus on developing the corpus, vocabulary resource, and user interface and creating a friendly and flexible approach for people.

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