

Empirical Study on College Students' Positive Emotions in Mobile-Assisted Foreign Language Learning

Congying Zhang¹ & Tianyi Gan¹

¹ School of Foreign Languages, China Three Gorges University, China

Correspondence: Congying Zhang, School of Foreign Languages, China Three Gorges University, Yichang, 443000, China. Tel: 86-139-7197-3060. E-mail: 191917876@qq.com

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Abstract

The integration of digital tech and education is at a critical stage. The informatization of educational environments is an inevitable trend. But there's little research on positive emotions in mobile-assisted foreign language learning. Based on positive psychology, this study surveyed students in Hubei province, China, collecting 66 valid questionnaires. SPSS was used for analyses. It shows two dimensions: from autonomous and teacher support. Further analysis reveals family background has some influence. Further analysis via one-way ANOVA and independent samples t-tests revealed that family background exerts a certain influence on students' positive emotions, though the differences are not statistically significant. Additionally, the frequency of Positive derived from autonomous learning decreases with increased internet usage time, whereas the frequency of Positive from teacher support initially declines and then increases with prolonged internet use. These findings provide valuable evidence and practical guidance for managing emotions in digital learning environments.

Keywords: digital age, mobile-assisted language learning, college students, positive emotions

1. Introduction

In recent years, the rapid development of the internet and mobile technology has significantly accelerated the popularization of smart devices, greatly promoting the development and application of mobile terminals (Yao Huan 2024) [25]. Among them, mobile learning (M-Learning) has gradually become a popular educational method. This learning method is not only convenient and fast but also allows students to efficiently utilize fragmented time, thereby enhancing learning efficiency (Hui Lianghong, 2019). In 2012, Positive Psychology (PP) was introduced into the field of Second Language Acquisition (SLA) (MacIntyre & Gregersen 2012; Lake 2013), and since then, it has sparked a research frenzy in academic circles both domestically and internationally, particularly in the area of emotions, where related studies have been flourishing. Foreign language learning has a positive impact on promoting learners' cognitive levels and innovative thinking, and it can also stimulate them to experience diverse emotional experiences. At the same time, there is an interactive influence between learners' emotional states and their cognitive levels, and these two factors jointly constrain the effectiveness of language acquisition (Wang Jianmei et al. 2024) [22]. However, previous studies have mostly focused on the measurement of foreign language emotions (Jiang Guiying et al. 2017), influencing factors (Fan Kaifang et al. 2023), and intervention measures (Zheng Jianuo et al. 2024) [26]. Research on the characteristics and influencing mechanisms of positive emotional structures in mobile-assisted foreign language learning using smartphones and tablets is still lacking. Based on this, this study conducts an empirical research on college students' positive emotions in mobile-assisted foreign language learning, aiming to provide strategies and suggestions for future research on positive emotions in foreign language learning.

2. Literature Review

2.1 Mobile Assisted Technology

The mobile learning model, by breaking through traditional English learning and teaching methods, has greatly expanded the breadth and depth of English learning.

Mobile Assisted Language Learning (MALL) is an innovative technology that integrates mobile devices into foreign language teaching. It falls under the categories of Computer-Assisted Language Learning and Mobile Learning, but unlike the latter, MALL focuses on using personal portable devices to create a new learning model. These devices are not only portable but also enable continuous or spontaneous access and interaction in

different learning environments, thereby greatly enriching the experience and effectiveness of language learning. Although the concept of Mobile-Assisted Language Learning (MALL) has been proposed, it has only recently seen practical development thanks to the rapid advancement of related technologies (Chen Jiayu, 2021). Research on mobile learning and teaching in China began as early as 2008. Over the past decade, the interest in this field has continued to rise, with a wide range of research focuses, including but not limited to mobile technology, teaching models, autonomous learning, and flipped classrooms (Xi Jing, 2020) [24]. Research on mobile-assisted foreign language learning both domestically and internationally has accumulated a wealth of theoretical achievements and practical experience. Relevant research has proven that mobile-assisted foreign language learning can have a positive impact on learners' motivation and learning outcomes. For example, Lamy and Goodfellow (1999) pointed out that second language learners can effectively stimulate their learning motivation and improve learning efficiency by interacting and communicating through social platforms. Thornton and Houser (2005) conducted an empirical study using mobile devices to assist in English learning. The subjects browsed micro-lessons and engaged in interactive learning on small screens during their spare time. The results showed that the mobile device-assisted method was significantly more effective than traditional learning methods.

Klimanova and Dembovskaya's (2004) empirical research also indicates that extracurricular English activities conducted using social software can increase language learners' exposure to the target language, thereby enhancing their speaking skills. In addition, there have been significant achievements in the theoretical exploration and development of technology related to mobile learning in English (Wang Yanbo, 2018) [23], but research on the positive emotions associated with mobile device-assisted foreign language learning is still lacking.

2.2 Foreign Language Positive Emotions

positive emotions are related to an individual's mental health and well-being, profoundly affecting students' learning outcomes, social skills, and overall development.

MacIntyre and Gregersen (2012) were the first to introduce the concept of positive psychology into the field of second language acquisition research. Based on Fredrickson's broaden-and-build theory, they proposed that positive emotions can broaden learners' attention span, enhance their focus on new things, and facilitate the absorption of language input. Based on Fredrickson's broaden-and-build theory, they propose that positive emotions can broaden learners' attention span, enhance their focus on new things, and facilitate the absorption of language input. They believe that positive emotions not only help learners better absorb language content but also effectively dispel negative emotions, reducing their adverse effects. In current second language acquisition research, the enjoyment (such as enjoyment, fun, interest, etc.) in foreign language learning is considered one of the important manifestations of positive emotions. This sense of Positive is usually associated with the positive emotions that learners experience when they perceive academic activities as having positive value and feel capable of completing tasks. According to the control-value theory of academic emotions (Pekrun & Linnenbrink-Garcia, 2012), enjoyment is considered a high-arousal positive emotion. When learners experience this emotion, they become more engaged in the learning process and exhibit higher levels of learning motivation and outcomes.

MacIntyre and Gregersen's (2012) study provides a new perspective in the field of second language acquisition, emphasizing the positive role of positive emotions in promoting second language learning. Among these, positive emotions are influenced by various factors such as individual differences and the learning environment (Fan Kaifang et al. 2023), but existing research rarely examines learning modes, especially the lack of focus on learning modes in online environments such as technology-assisted learning.

2.3 The Relationship Between Mobile Assistive Technology and the Positive Emotions in English Learning

With the rapid development of emerging technologies, the increasing maturity of intelligent environments, and the vast enrichment of information resources, the field of online learning has experienced unprecedented growth. More and more learners are inclined to use mobile devices such as smartphones and tablets for online learning. In recent years, with the rise of positive psychology, research on positive emotions has gradually gained widespread attention in the academic community, and the impact of mobile devices on the positive emotions of college students in English learning has become a research hotspot. In terms of the educational significance of positive emotions in foreign language learning, these emotions are not only a crucial source of interest in foreign language study but also help create a positive and harmonious foreign language learning environment. They are not only related to learners' academic performance in English but also have a significant impact on their overall development in social, emotional, and cognitive abilities (Li Chengchen et al. 2024).

Since positive psychology was introduced into the field of second language acquisition, there has been a surge in emotional research in this area (Dewaele & Li 2020). Other emotions beyond anxiety have begun to receive attention, such as Positive, shame, guilt, boredom, pride, interest, anger, love, hope, and so on (MacIntyre & Vincze

2017; Teimouri 2018; Li et al. 2021a). Among them, foreign language enjoyment has received considerable attention, and related research can generally be divided into six directions: 1) Exploration of the conceptual structure of foreign language emotions and the development of measurement tools; 2) Causes or predictive factors of foreign language emotions; 3) The predictive role or impact of foreign language emotions on second language learning outcomes; 4) The development and changes of foreign language emotions; 5) Self-regulation and intervention of foreign language emotions; 6) Emotional interaction or contagion between teachers and students (Li Chengchen 2021). However, there has been a lack of empirical research on college students using mobile devices to assist in English learning.

Based on this, this study explores the positive emotions of college students in mobile-assisted foreign language learning and aims to answer three questions: 1) What is the content structure of college students' positive emotions in mobile-assisted foreign language learning? 2) What is the current state and overall characteristics of college students' positive emotions in mobile-assisted foreign language learning? 3) Is there a relationship between family background and the duration of internet use with college students' positive emotions in the mobile-assisted foreign language learning model in the information age?

3. Research Methods

3.1 Research Subjects

This study adopted a convenience sample. Online questionnaires were distributed among college students at a domestic university, and a total of 66 were returned, all of which were valid, with an effective rate of 100%. Among them, 23 were male (34.85%) and 43 were female (65.15%). There were 29 students from science and engineering and 37 from humanities. Each participant had experience using mobile devices such as smartphones and tablets to assist in foreign language learning.

3.2 Research Tools

This study primarily used the Chinese revised version of the Foreign Language Enjoyment Scale. The Chinese version of the Foreign Language Enjoyment Scale (CFLES) is a 5-point Likert scale adapted by Li Chengchen (2018) based on a sample of Chinese high school students from the Foreign Language Enjoyment Scale (Dewaele & MacIntyre 2014). The Chinese version of the scale includes three subscales: personal foreign language enjoyment, teacher-related foreign language enjoyment, and classroom atmosphere-related foreign language enjoyment, with a total of 11 measurement items. The reliability (Cronbach's $\alpha = .830$) and validity (such as construct validity: $\chi^2/df = 72.975/41 < 3$; CFI = $.975 > .90$; TLI = $.967 > .90$; SRMR = $.034 < .08$; RMSEA = $.041 < .08$) of the scale are quite satisfactory.

This study limits the context of the original items to "during the process of using computers, tablets, mobile phones, and other mobile devices to assist in foreign language learning," such as "during the process of using computers, tablets, mobile phones, and other mobile devices to assist in foreign language learning, I do not get tired of learning English." In this study, the reliability of each subscale is quite good (with Cronbach's α coefficients all greater than $.70$, and the composite reliability being $.863$). The factor loadings under each dimension show significant superiority compared to other dimensions, indicating that this survey scale possesses relatively ideal reliability and validity.

3.3 Data Collection and Statistical Analysis

This study utilized SPSS 26.0 to conduct factor analysis, descriptive statistical analysis, one-way ANOVA, and correlation analysis on the data, aiming to explore the content structure, overall situation, and factor levels of college students' positive emotions in mobile-assisted foreign language learning, as well as the influence of family background and internet usage duration on their positive emotions.

4. Research Results

4.1 Content Structure of College Students' Positive Emotions in Mobile-Assisted Foreign Language Learning

Firstly, SPSS 26.0 was used to conduct exploratory factor analysis and descriptive statistical analysis on the questionnaire. Principal component analysis and varimax rotation method were adopted for orthogonal rotation. Through the test of the predicted data sample, the exploratory factor analysis results showed that the KMO value was $0.863 (>0.8)$, and the Bartlett's sphericity test result was significant (approximate chi-square value was 534.865 , degree of freedom was 28 , $p = 0.000 < 0.05$), indicating that the data was suitable for factor analysis. Then, principal component analysis was used to conduct exploratory factor analysis on the data obtained from the sample. According to the factor analysis results, items were eliminated with the criterion that the loading value of each indicator on each factor was higher than 0.6 . The questionnaires that met the conditions could further extract the corresponding research dimensions, and it could also prove that this questionnaire had good convergent validity.

and discriminant validity. Then, the remaining items were renumbered, and the maximum variance analysis method was used to rotate the sample data. Finally, two factors were determined, and the Positive emotions of college students in mobile-assisted foreign language learning were composed of two dimensions: "Foreign Language Enjoyment in Autonomous Learning" and "Foreign Language Enjoyment in Teacher Support".

4.2 The Overall Situation and Factor Levels of Positive Emotions of College Students in Mobile-Assisted Foreign Language Learning

The results of exploratory factor analysis show that the foreign language positive emotions of college students are composed of two factors: "Foreign Language Autonomous Learning Positive Emotions" (3.17 ± 0.94) and "Foreign Language Teacher Support Positive Emotions" (3.34 ± 0.99). According to the results of descriptive statistical analysis, the foreign language positive emotions of college students (3.22 ± 0.79) are relatively high, and they can maintain positive and positive emotions to learn foreign languages under the trend of informatization of educational environment.

4.3 The Influence of Family Background and Internet Usage Duration on the Positive Emotions of College Students in Mobile-Assisted Foreign Language Learning

An independent sample T-test was adopted to explore the differences in family background among college students' positive emotions in mobile-assisted foreign language learning. The analysis results indicated that there were differences in the foreign language autonomous learning positive factor ($P = .402$) and the foreign language teacher support positive factor ($P = .587$) in family background. By comparing the frequency means of positive emotions in foreign language autonomous learning and foreign language teacher support in the two dimensions of urban and rural family backgrounds of college students in mobile-assisted foreign language learning, it was found that college students from urban areas generally had higher foreign language positive emotions than those from rural areas, but the difference was not significant.

Using one-way ANOVA, we explore the impact of internet usage duration on the positive emotions of college students in mobile-assisted foreign language learning (as shown in the table below). Based on the range of internet usage duration among all participants, the researcher divided all participants into three groups: those with internet usage duration of 1-3 hours were named the low-duration group, with a sample size of 3; those with internet usage duration of 3-6 hours were named the medium-duration group, with a sample size of 26; Participants who used the internet for more than 6 hours were designated as the high-duration group, with a sample size of 37. The research results are shown in the table below. The individual effect test of internet usage duration did not show significant differences in the factors of "Foreign Language Enjoyment in Autonomous Learning" and "Foreign Language Enjoyment in Teacher Support". By comparing the mean values of the two factors of college students' positive emotions under mobile-assisted foreign language learning across different groups, it was found that the mean value of college students' positive emotions in autonomous foreign language learning continuously decreases with the increase in internet usage time, while the mean value of positive emotions supported by foreign language teachers shows a trend of first decreasing and then increasing with the increase in internet usage time.

Table 1. Differences in Internet Usage Duration of positive Emotions Among College Students in Mobile-Assisted Foreign Language Learning

Events	P	M1 (Short Time)	M2 (Medium Time)	M3 (Long Time)
Foreign Language Enjoyment in Autonomous Learning	0.589	3.61	3.24	3.09
Foreign Language Enjoyment in Teacher Support	0.79	3.67	3.27	3.36

5. Discussion

5.1 The Content Structure of College Students' Positive Emotions in Mobile-Assisted Foreign Language Learning

This study focuses on the empirical research of college students' positive emotions in mobile-assisted foreign language learning. Descriptive statistical analysis and reliability and validity tests confirmed that the designed questionnaire has good reliability and validity. The study found that college students' positive emotions in mobile-assisted foreign language learning consist of two dimensions: "Foreign Language Enjoyment in Autonomous

Leaning" and "Positive in teacher support in foreign language learning." Li Chengchen et al. (2018) conducted a localized revision of the Foreign Language Enjoyment Scale based on a sample of Chinese high school foreign language learners ($n=2078$). The revised scale (Chinese version of Foreign Language Enjoyment Scale, CFLES) contains 11 items, covering three dimensions: "personal foreign language enjoyment," "teacher-related foreign language enjoyment," and "classroom atmosphere-related foreign language enjoyment." Moreover, studies by Li Chengchen et al. (2018) and Li (2020) suggest that both internal factors (such as age, gender, class ranking, second language proficiency, emotional intelligence, etc.) and external factors (such as classroom environment, teacher predictability, strictness, and frequency of second language use, etc.) have a certain impact on foreign language enjoyment. In this study, "Foreign Language Enjoyment in Autonomous Leaning" is summarized and conceptualized based on the maximum variance analysis method, in conjunction with the objectives of this research, into two dimensions: personal foreign language enjoyment and classroom atmosphere-related foreign language enjoyment. "Foreign language teacher support enjoyment" is a reference and summary of the teacher-related foreign language enjoyment dimension of this scale.

The factor "Foreign Language Enjoyment in Autonomous Leaning" describes the joy and satisfaction experienced by college students during the process of self-directed foreign language learning under mobile-assisted foreign language learning. It is based on the students' personal choice and control over the content, methods, and pace of their learning, emphasizing that students, without external intervention, learn foreign language knowledge through self-motivation and derive Positive and a sense of achievement from it. This sense of Positive comes from students' active control over their own learning process and their positive evaluation of learning outcomes. The "Foreign Language Enjoyment in Teacher Support" factor in this study encompasses important representations of learner-related factors (such as gender, age, etc.) found in studies by Li Chengchen et al. (2018) and Li (2020). It is worth noting that this factor differs from previous studies that may have focused on teacher-led or classroom environment-based foreign language learning enjoyment; it emphasizes the students' main roles and subjective experience in foreign language learning.

Moreover, the studies by Li Chengchen et al. (2018) and Li (2020) mainly focus on English major learners, while this study focuses on all university students. Therefore, the factor structure of this study is somewhat inconsistent with the results of Li Chengchen et al. (2018) and Li (2020). At the same time, "Foreign Language Enjoyment in Teacher Support" refers to the sense of Positive that college students experience during foreign language learning with mobile-assisted tools, due to the effective support and guidance from teachers. This Positive stems from the positive interaction between teachers and students, as well as the teachers' accurate understanding and active response to students' learning needs. In the "Foreign Language Enjoyment in Teacher Support" factor, the role of the teacher is not just that of a knowledge transmitter but also that of a guide and supporter in the learning process. By providing personalized learning suggestions, encouraging feedback, and timely learning resources, teachers help students overcome learning difficulties and improve learning efficiency. This allows students to feel the care and support from teachers during the foreign language learning process, thereby creating an enjoyable learning experience. Compared to "Foreign Language Enjoyment in Autonomous Leaning", "Foreign Language Enjoyment in Teacher Support" places more emphasis on the mutual communication between teachers and students, as well as the positive impact teachers have on the students' learning process.

Moreover, the dimensional division in this study slightly differs from the original scale, possibly because researchers like Li Chengchen et al. (2018) and Li (2020) believe that the classroom environment has a certain impact on foreign language enjoyment. The influence of the online environment on college students' learning methods is a gradually evolving process. Its core lies in changing classroom formats, learning methods, and interaction patterns, highlighting the importance of individual autonomy and teacher guidance, while simultaneously weakening the concentrated atmosphere of traditional classrooms. The online environment has broken the traditional single-classroom model, extending learning activities from fixed times and spaces to online platforms and social media. The abundance of learning channels has led to a decrease in the proportion of classroom time, and the lack of supervision in the online classroom environment has significantly reduced the cohesion and infectiousness of the classroom atmosphere (Sun & Chen 2016). As the classroom atmosphere weakens, students' sense of belonging and participation in the classroom gradually decreases, thus "classroom atmosphere-based foreign language enjoyment" is not significant in this study. The decentralization of this classroom model further promotes the community-oriented and fragmented nature of learning: students engage in diverse interactions through online communities, enhancing the openness of collaborative learning (Kop & Hill 2008). At the same time, it places higher demands on students' media literacy and self-directed learning abilities, shifting the role of teachers from traditional knowledge transmitters to learning supporters. Consequently, the emphasis on self-directed learning and teacher support increases (Allen & Seaman 2017; Means et al. 2014).

5.2 The Overall Level of College Students' Positive Emotions in Mobile-Assisted Foreign Language Learning

The research results show that among the two main factors of foreign language enjoyment, the mean value of "teacher support enjoyment" is slightly higher than that of "self-directed learning enjoyment," but the difference is not significant. This indicates that foreign language learners value both teacher support and guidance as well as the positive experiences of self-directed learning during their learning process.

Specifically, the mean value of "Foreign Language Enjoyment in Teacher Support" is relatively high (3.22 ± 0.79), mainly manifested in that learners obtain emotional support and academic guidance through interaction with teachers. For instance, learners feel a sense of achievement in learning through the encouragement and feedback from teachers in class, or solve learning problems through communication with teachers after class. This positive emotion not only boosts learners' confidence but also enhances their interest and identification with the target language culture. Moreover, the professional guidance of teachers and the provision of learning resources are also regarded as important sources of "foreign language teacher support for Positive". Learners generally believe that the support from teachers has a significant effect on improving learning outcomes.

In contrast, the average for "Foreign Language Enjoyment in Autonomous Learning" is slightly lower but still at a high level. This factor is mainly reflected in the Positive and satisfaction learners experience when they independently set learning goals, choose learning resources, and manage their learning progress. For example, learners feel Positive from the improvement of their personal abilities after completing a challenging autonomous learning task. Additionally, the exploration and discovery during the autonomous learning process, such as reading literature in the target language or watching films and understanding cultural backgrounds, also bring learners a deeper sense of Positive. Although the frequency of "Foreign Language Enjoyment in Autonomous Learning" is slightly lower than that of "Foreign Language Enjoyment in Teacher Support", the difference is not significant, indicating that learners, while relying on teacher support, are also gradually cultivating positive emotions towards autonomous learning.

Overall, the two factors of foreign language enjoyment, "Foreign Language Enjoyment in Autonomous Learning" and "Foreign Language Enjoyment in Teacher Support", both play important roles in the foreign language learning process. Although the mean value of "teacher support enjoyment" is slightly higher, "autonomous foreign language learning enjoyment" also shows a high level, and together they constitute a significant source of positive emotional experiences for learners. This balance reflects the characteristics of foreign language learners who value both external support and intrinsic motivation, and also indicates the complexity and multiple-dimensions.

5.3 The Impact of Family Background and Internet Usage Duration on College Students' Positive Emotions in Mobile-Assisted Foreign Language Learning.

5.3.1 The Impact of Family Background on College Students' Positive Emotions in Mobile-Assisted Foreign Language Learning

Although there is relevant literature proving that college students' positive emotions in mobile-assisted foreign language learning vary significantly based on family background, for example, Fan Yumei (2024) pointed out that the support of educational resources in different family backgrounds (such as tutoring, provision of learning materials, etc.) has a significant impact on students' foreign language learning engagement, which is closely related to positive emotions in foreign language learning. However, this study demonstrates that there are no significant differences in the positive emotions of college students' mobile-assisted foreign language learning based on family background.

Possible reasons include the following two aspects: on one hand, the factor structures of Fan Yumei's study and this study are not quite consistent. Fan Yumei's study used middle school English learners as subjects, while this study focuses on all university students. The research subjects in both studies differ significantly in terms of age, cognitive development level, and the duration and extent of their exposure to and acceptance of English. Middle school students are at a crucial stage in language learning, and their motivation and emotional experiences are more easily influenced by external resources (such as learning support provided by their families); whereas college students, as relatively mature English learners, may experience more intrinsic motivation, learning strategies, and personal interests driving their enjoyment of foreign language learning, with a relatively lower dependence on external resources. Therefore, the impact of family background on college students' positive emotions in mobile-assisted foreign language learning may be weakened. On the other hand, the environmental characteristics of mobile-assisted foreign language learning may, to some extent, mitigate the influence of family background on learning positive emotions. Mobile learning offers a high degree of autonomy and flexibility, allowing learners to compensate for the lack of family resources through diverse digital resources (such as online courses, etc.). Moreover, the real-time and interactive nature of mobile learning also provides learners with more opportunities

for self-regulation and exploration, which may reduce the impact of family background on learners' positive emotions. At the same time, college students generally possess higher digital literacy and information technology application skills, enabling them to more effectively utilize mobile learning tools, thereby somewhat mitigating the impact of family background differences.

5.3.2 The Impact of Internet Usage Duration on College Students' Positive Emotions in Mobile-Assisted Foreign Language Learning

With the rapid development of modern information technology and its deep integration into the field of education, mobile-assisted foreign language learning, as an emerging learning model, provides college students with a more flexible and convenient learning approach. This study found that as the duration of online learning increases, the average foreign language enjoyment of learners decreases. The results support the view of Peter MacIntyre et al. (2012), which suggests that positive and negative emotions generated during the language learning process can change or coexist. The study also found that the mean value of foreign language teachers' support for Positive shows a trend of first decreasing and then increasing with the increase in internet usage duration. This supports the view of Hauck et al. (2006), which suggests that learners' adaptability to technology can affect their emotional experiences. Initial maladaptation may lead to negative emotions, while with the improvement of technological proficiency, positive emotions (such as Positive) gradually increase.

Among university students who spend a long time online, they are not only able to use mobile learning platforms more proficiently but also more efficiently filter and integrate learning resources, thereby gaining greater learning autonomy and enjoyment in the process of mobile-assisted foreign language learning. Specifically, the impact of internet usage duration on the positive emotions of university students in mobile-assisted foreign language learning can be analyzed from the following two aspects.

On one hand, college students who spend more time online show higher averages in terms of satisfaction with foreign language teacher support. This may be because students who have long-term exposure to the internet have stronger adaptability to digital technology, allowing them to use mobile learning platforms to interact and communicate with teachers more proficiently. For example, they can seek help from teachers in a timely manner through online discussions and instant messaging tools like WeChat or QQ, and receive personalized learning feedback. This efficient interaction between teachers and students not only boosts students' confidence in learning but also enhances their satisfaction with teacher support, resulting in a more positive emotional experience in terms of foreign language teacher support. On the other hand, although the average enjoyment of autonomous foreign language learning is relatively low, students who spend less time online still show certain advantages in this dimension. This may be because they avoid the distraction of a large amount of irrelevant information brought by the internet, allowing them to focus more on foreign language learning itself, thereby making it easier to derive enjoyment from it. Moreover, they may engage more in face-to-face language exchanges, which help them to understand and use the foreign language more deeply, thereby enhancing the Positive of learning and making foreign language learning more effective. However, compared to the enjoyment derived from support from foreign language teachers, the average enjoyment from autonomous foreign language learning is lower. This may be because autonomous learning demands higher levels of self-discipline and goal management from students, and some students tend to experience learning fatigue or lack of motivation in the absence of external supervision.

In summary, the duration of internet use has a significant impact on college students' positive emotions in mobile-assisted foreign language learning, particularly in terms of the enjoyment derived from teacher support. This phenomenon may be closely related to the proficient use of digital technology by college students who have been using the internet for a long time, as well as their efficient interaction with teachers. However, the average level of enjoyment in foreign language autonomous learning is relatively low, indicating that educators should further focus on cultivating students' autonomous learning abilities in future teaching practices. They should flexibly adjust the ratio of content-type to discussion-type learning tasks based on actual teaching needs and design appropriately challenging online tasks to maintain learners' motivation and interest.

6. Conclusion and Implications

This study is an empirical investigation of college students' positive emotions under mobile-assisted foreign language learning, examining the content structure, overall characteristics, and influencing factors of these positive emotions. The results show that college students' positive emotions under mobile-assisted foreign language learning consist of two dimensions: "Foreign Language Enjoyment in Autonomous Learning" and "Foreign Language Enjoyment in Teacher Support", with the frequency means of positive emotions in each dimension being at a relatively high level. Through comparison, it was found that due to the influence of family environment, university students from urban areas generally have higher foreign language enjoyment than those from rural areas,

but the difference between the two is not significant. The study also found that the duration of internet use has a significant impact on both "foreign language autonomous learning enjoyment" and "foreign language teacher support enjoyment." The research results provide important empirical evidence for studying university students' enjoyment of foreign language learning under mobile-assisted language learning.

The above research results provide the following insights for the positive emotions of college students and the informatization of teaching under mobile-assisted foreign language learning. In terms of learning suggestions: (1) Mobile-assisted foreign language learning has brought new opportunities for college students' foreign language learning. College students should fully utilize mobile devices and online resources, actively explore learning methods and strategies that suit them, in order to improve learning efficiency and effectiveness; (2) The positive emotions associated with foreign language learning have a significant positive impact on college students' engagement and investment in English learning. College students can enhance the enjoyment and practical application of their learning by participating in diverse mobile learning activities, such as online interactions and situational simulations, thereby increasing their sense of Positive and satisfaction in learning. In terms of teaching insights: (1) Teachers should actively adapt to the digital teaching environment and enhance their information technology application skills. By using smart teaching tools and mobile learning platforms, they can more effectively design lessons, provide personalized guidance, and offer timely feedback to students; (2) Teachers should utilize online platforms and social media tools to strengthen interaction and communication with students, providing timely feedback and support to enhance students' learning motivation and improve their overall enjoyment; (3) Teachers should leverage artificial intelligence and big data technology to promote the development of teaching models towards intelligence, personalization, and diversification. In teaching, teachers should pay attention to students' background differences, digital literacy differences, and other individual characteristics, and adopt targeted teaching strategies.

Empirical research on college students' positive emotions in mobile-assisted foreign language learning is on the rise. This study is based solely on cross-sectional data and focuses on positive emotions. Future research could conduct longitudinal studies to track changes in college students' positive emotions and learning outcomes in mobile-assisted foreign language learning. Further research can also be conducted on the application of digital technologies such as artificial intelligence and virtual reality in foreign language teaching, exploring how these technologies can enhance teaching quality and student learning experiences. Additionally, qualitative research methods such as individual interviews and case observations can be combined to provide richer and more diverse perspectives for the study, thereby offering the academic community a more thorough and comprehensive understanding of research in this field.

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