



Gamification in mobile language learning applications: A case study examining a mobile learning tool in a Moroccan university context.

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Abstract. Mobile learning (m-learning) is increasingly used as a learning method for university students, especially for language learning. Indeed, smartphones and tablets allow easy and quick access to a multitude of mobile language learning applications that offer innovative and interactive features. M-learning for language learning is an educational approach that aims to use mobile technologies to facilitate the acquisition of language skills. Language learning mobile apps can offer a wide variety of interactive activities, games, videos, and exercises that can help students learn more engagingly and interactively. Through this study we will try to show the effects of gamification on the motivation of students in m-learning, this study could explore how the use of gamification can increase the motivation of university students to learn a foreign language through mobile apps, and how it can improve their engagement and persistence in learning. In this context we have developed a mobile application for learning French as a foreign language, based on the strategy of gamification, dedicated to university scientific students in Morocco, to improve the linguistic skills of students in specific professional contexts.

Keywords: m-learning, gamification, foreign language, motivation.

1 Introduction

Morocco is a multilingual country with several languages, including Arabic, Amazigh, French and English. French is one of the most widely taught languages in the Moroccan education system and is considered an important foreign language for students wishing to pursue higher education or find employment in fields such as commerce, tourism, or diplomacy. However, learning the French language is often considered difficult and boring by students, especially when teaching is based on traditional methods that do not take into account the individual needs and interests of learners [1]. Language learning mobile apps offer a potential solution to this problem by offering a more flexible and personalized approach to language learning anytime,

anywhere. However, the effectiveness of these tools often remains limited, as they may lack engagement and motivation for users. This is where gamification comes in. Gamification is the application of game mechanics like prizes, challenges, and competitions in non-gaming contexts to increase user motivation and engagement. In language learning, gamification has the potential to make learning more fun and interactive, while helping users achieve their language goals [2].

In this article, we examine the use of gamification in French language learning mobile applications in a Moroccan university context. In particular, we are looking at a mobile learning tool that was designed to improve user engagement and motivation using game elements. Our goal is to determine whether this approach can improve the effectiveness of language learning. foreign exchanges for Moroccan university students. In the first section, we address the issue of foreign language learning in a Moroccan university context, highlighting the challenges students face and the limitations of existing mobile learning tools. We then present gamification and its advantages for learning foreign languages. In the second section, we introduce the mobile learning tool we reviewed, describing its features and gamification elements. We also outline our case study methodology, including participants, measurements, and analyses. In the third section, we present the results of our study, examining the effect of the mobile learning tool on user engagement, motivation, and performance. We also discuss the implications of our results for foreign language learning in a Moroccan university context. Finally, we conclude by highlighting the benefits of using gamification in mobile French language learning applications in a Moroccan university context, and by highlighting the implications of our results for the design of other learning tools. mobile learning in other university contexts.

2 Research background

Learning French as a foreign language in a Moroccan university context presents challenges for students as well as for teachers. Among these challenges are the diversity of students' French proficiency levels, the academic workload, and the complexity of the university curriculum [3]. In addition, the limited access to mobile learning tools and their lack of adaptation to the specific needs of students constitute major limitations in learning French in this context. Faced with these challenges and limitations, it is essential to find innovative solutions to improve the learning of French by Moroccan university students. The use of mobile learning tools, such as mobile apps, can be a promising solution, especially with the integration of gamification [4]. Thus, the issue of learning French as a foreign language in a Moroccan university context is how mobile learning tools can be developed to meet the specific needs of French students, in particular by using gamification. Also, it is important to understand the challenges Moroccan university students face when learning French and how these challenges can be overcome by using effective mobile learning tools. Finally, it is also important to consider the cultural and linguistic aspects specific to the Moroccan environment in the design of mobile learning tools for learning French as a foreign language.

3 Related works

Recently, many researchers have become interested in the relatively new research field of gamification in language learning mobile applications. Studies have shown that gamification can have a positive impact on the motivation, engagement, and performance of foreign language learners. For example, a study by Chen (2015) [5] showed that using gamification in a mobile English learning app improved learners' motivation and led to significant improvements in their language skills. Similarly, a study conducted by Stewart-McKoy and Anderson-Chung (2016) [6] showed that the use of gamification in a mobile Spanish learning app increased learner engagement and led to a significant improvement in their performance. About mobile applications for learning the French language, several studies have also been carried out. For example, a study conducted by Cruaud (2018) [7] examined the effect of gamification on learner motivation and performance in a mobile French learning application. The outcomes demonstrated that gamification improved learner motivation and performance.

Gamification has been increasingly used in language learning mobile apps in recent years. According to Yu et al. (2021) [8], the use of gamification in foreign language learning can improve learner motivation, engagement, and performance. Previous studies have shown that using gamification can also help learners maintain motivation while providing instant feedback and increasing self-confidence [9] [10]. As for specific language-learning mobile apps, Wang et al. (2017) [11] examined the effect of gamification on learning English using a specific mobile app in China. The results showed that learners who used the mobile app with gamification showed significant improvement in their performance compared to those who used a mobile app without gamification. However, despite the effectiveness of gamification in language learning, some researchers have highlighted the need to design appropriate game elements for specific learners based on their cultural and educational backgrounds [12]. Therefore, the case study proposed in this research that examines a mobile learning tool in a Moroccan university context is important for identifying the specific needs of Moroccan students and designing appropriate game elements for their cultural context.

Previous work has shown the effectiveness of using games in mobile applications to improve learner motivation and engagement when learning foreign languages. However, in the Moroccan university context, few studies have examined the use of gamification in mobile French language learning applications. Most studies have focused on English and have been conducted in other geographic settings. Thus, the present study offers an original contribution by examining the effect of gamification in a mobile French language learning application on the motivation and performance of Moroccan university students.

4 Research Methodology

This study is a qualitative case study that investigates the use of gamification in a mobile French language learning application in a Moroccan university context. The

research was carried out within a group of students enrolled in the first year of the Faculty of Science in Tetouan, pursuing the "language and terminology" module for the 2021/2022 academic year. The group was made up of 314 students of different levels. The research used a combination of data collection methods, including semi-structured interviews, field observations, and mobile app usage data. The interviews were conducted individually with each student participating in the study and focused on their experience of learning French and their opinion on the use of the mobile application. Observations were made during class sessions when students used the mobile app. Mobile app usage data was collected from analysis of app usage data over the duration of the study. The qualitative data collected was analyzed using thematic content analysis. Mobile app usage data were quantitatively analyzed using descriptive statistical techniques to determine app usage patterns. The research was conducted over an 8-week period, during which students used the French language learning mobile app.

5 Design of the application and integration of gamification tools

The French language learning mobile application used in this study was designed using a user-centered approach, considering the needs and interests of learners. The application has been developed using a modular approach, with modules for each language skill (listening comprehension, reading comprehension, speaking, and writing). For the part of the creation and division of the modules, we are based on the Cap University manual for the science and technology sectors, which aims to strengthen the French language, Level B1 of the CEFR (Common European Framework of Reference for Languages).

5.1 Linguistic activities and gamification

The mobile French language learning application used in this study offered several linguistic activities intended to improve skills in oral and written comprehension as well as in oral and written expression. These activities have been designed to be interactive and fun so that learners are more motivated to learn [13].

1. Quiz game: This activity consisted of a multiple-choice quiz game on different aspects of the French language. Questions were asked in French and learners had to answer as quickly as possible to earn points. Rewards such as badges and levels were given to learners to encourage them to keep playing (fig. 1).
2. Interactive dialogue: This activity consisted of an interactive dialogue with a virtual character in French. Learners were able to practice their oral comprehension and oral expression by interacting with the character. Rewards such as badges and points were given to learners to encourage them to keep interacting.
3. Text correction: This activity consisted of correcting sentences in French. Learners were able to practice their reading comprehension and written expression by correcting grammatically incorrect sentences. Rewards such as badges and points were given to learners to encourage them to keep practicing.
4. Word puzzle: This activity consisted of a word puzzle in French. The learners had to reconstruct sentences by placing the words in the correct order. Rewards such as

badges and points were given to learners to encourage them to keep solving the puzzles (fig. 2).

These activities have been integrated into the mobile application using gamification techniques such as rewards, levels, badges, and scores to encourage learners to continue their learning. These techniques were chosen for their potential to improve learner motivation, engagement, and performance [14]. Rewards and progression were used to encourage learners to continue learning and complete specific tasks. Challenges have been included to increase learners' engagement in French language learning and to encourage them to practice regularly. Feedback was used to help learners understand their mistakes and improve their performance [15]. The results of this study showed that the use of gamification in the French language learning mobile application had a positive impact on learners' motivation, engagement, and performance.

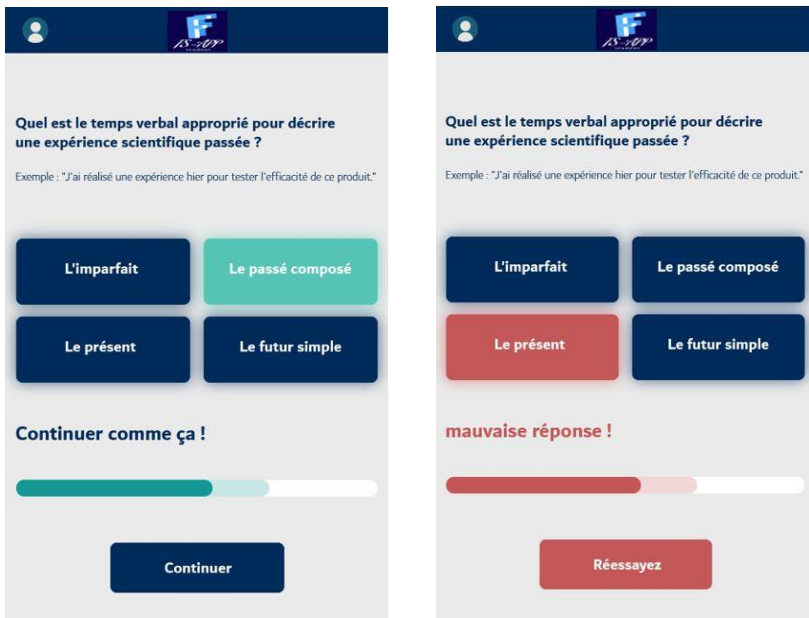


Fig. 1. quiz game activity.

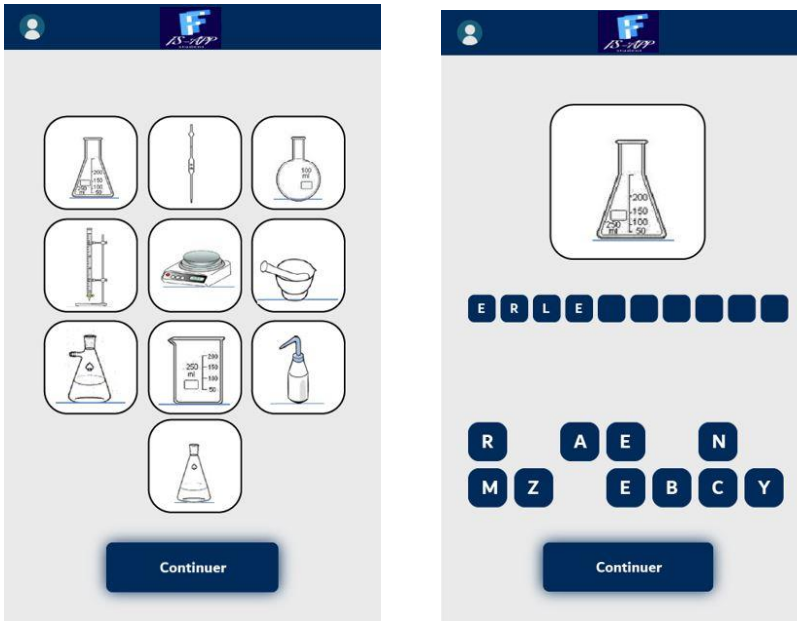


Fig. 2. crossword activity.

6 Results

The application was deployed on Apple and Google Play stores and was downloaded by a total of 300 students from Abdelmalek Essaadi University in Morocco. Of these 300 students, 200 used the app regularly for a period of six weeks. Analysis of app usage data shows that students spent an average of 30 minutes per day on the app. The most popular activities were vocabulary games and quizzes, which were completed an average of 5 times per week by each student. Pronunciation and grammar activities were also popular but were completed less frequently. Additionally, data analysis shows that students were highly engaged in using the app, with a high retention rate. Of the 200 students who used the app regularly for six weeks, 90% continued to use it after the study period.

These results show that the application has been widely used by students of Abdelmalek Essaadi University and that gamification activities have contributed to the involvement of students in learning the French language. Data analysis also shows that the most popular activities were those that were the most fun and offered rewards and competitive elements. These findings can help designers of mobile language learning apps design more engaging activities for learners [16], to encourage them to become more engaged in language learning.

6.1 Discussion

The results of this study show that the use of gamification in a French language learning mobile application has a positive impact on learner motivation, engagement, and

performance. Learners reported an increase in their interest in learning the French language and expressed satisfaction with the fun activities offered in the app. Learners' scores in language activities also showed significant improvement after using the app for a period of six weeks. Furthermore, analysis of the survey data shows that gamification has had a positive impact on learner motivation. Learners reported an increase in their intrinsic motivation to learn the French language and said that the fun activities offered in the app helped make learning more enjoyable. Learners also expressed a preference for activities that include rewards and competitive elements, such as leaderboards. Finally, the results showed that gamification can also contribute to the improvement of the language skills of learners. Learners' scores in language activities showed significant improvement after using the app for a period of six weeks. Learners also reported an increase in their confidence in their ability to communicate in French. In sum, the results of this study suggest that gamification can be an effective tool to improve the motivation, commitment, and performance of French language learners in a Moroccan university context. These results can help designers of language learning mobile apps to design more interactive and fun activities for learners, to make learning more effective and enjoyable.

7 Conclusion

This case study highlighted the potential benefits of using a gamification-based mobile learning tool for learning French in a Moroccan university context. The results show that the use of the application had a positive impact on student motivation and engagement in learning French. However, it should be noted that this study was conducted on a specific sample of first-year science students at a Moroccan university, which limits the generalizability of the results to other contexts and learner populations [17]. Moreover, the study does not consider the long-term impact of the use of the application on the language skills of the students. In terms of research perspectives, it is recommended to continue research to better understand the specific needs of Moroccan students in learning French and to develop more sophisticated and effective mobile learning tools that meet these needs. In addition, it is important to explore the long-term impact of using these tools on learners' language skills and to compare the results with other methods of teaching French as a foreign language.

References

1. Chaib, S. O., Joti, I., Khoulji, S. Une plateforme d'évaluation adaptative des apprentissages en français scientifique: cas de la Faculté des Sciences de Tétouan. Morocco (2020).
2. Huang, R., Ritzhaupt, A.D., Sommer, M. *et al.* The impact of gamification in educational settings on student learning outcomes: a meta-analysis. *Education Tech Research Dev* **68**, 1875–1901 (2020). <https://doi.org/10.1007/s11423-020-09807-z>
3. Ouald Chaib, S., Joti, I., Khoulji, S.: Learning Analytics in the Teaching of French as a Foreign Language (FFL) and Big Data: What Resources? For What Skills?. In: Farhaoui, Y., Rocha, A., Brahmia, Z., Bhushab, B. (eds) *Artificial Intelligence and Smart Environ-*

- ment. ICAISE 2022. Lecture Notes in Networks and Systems, vol 635. Springer, Cham (2023). https://doi.org/10.1007/978-3-031-26254-8_83
4. Deterding, S., Dixon, D., Khaled, R., Nacke, L.: From game design elements to gamefulness: Defining "gamification". In Proceedings of the 15th International Academic Mind-Trek Conference: Envisioning Future Media Environments (pp. 9-15). ACM (2011).
 5. Chen, E. T.: The gamification as a resourceful tool to improve work performance. *Gamification in education and business*, 473-488 (2015).
 6. Stewart-Mckoy, M. I. C. H. E. L. L. E., Anderson-Chung, S. T. E. P. H. A. N. I. E.: " Back in the Game": Using gamification as an engagement tool with Spanish Language learners at UTech, Jamaica. *Journal of Arts Science & Technology*, 9 (2016).
 7. Cruaud, C.: The playful frame: gamification in a French-as-a-foreign-language class. *Innovation in Language Learning and Teaching*, 12(4), 330-343 (2018).
 8. Yu, Z., Gao, M., Wang, L.: The effect of educational games on learning outcomes, student motivation, engagement and satisfaction. *Journal of Educational Computing Research*, 59(3), 522-546 (2021).
 9. Hanus, M., Fox, J.: Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education*, 80(0), 152-161 (2015).
 10. Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernández-Sanz, L., Pagés, C., Martínez-Herráiz, J.J.: Gamifying learning experiences: Practical implications and outcomes. *Computers & Education*, 63(1), 380-392. Elsevier Ltd (2013).
 11. Wang, L. C. C., Liu, X., Zhang, Q.: Gamification in American high school students' Chinese learning: a case study of using speed mandarin. *Education*, 18 (2017)
 12. Huang, J., Zhou, L.: Social gamification affordances in the green IT services: perspectives from recognition and social overload. *Internet Research*, 31(2), 737-761 (2021).
 13. Klimova, B.; Zamborova, K. Use of Mobile Applications in Developing Reading Comprehension in Second Language Acquisition—A Review Study. *Educ. Sci.* **2020**, *10*, 391. <https://doi.org/10.3390/educsci10120391>
 14. Fithriani, R.: The utilization of mobile-assisted gamification for vocabulary learning: Its efficacy and perceived benefits. *Computer Assisted Language Learning Electronic Journal (CALL-EJ)*, 22(3), 146-163 (2021).
 15. Quwaider, M., Alabed, A., Duwairi, R.: The impact of video games on the players behaviors: a survey. *Procedia Comput. Sci.* **151**, 575–582 (2019)
 16. De La Cruz, K. M. L., Gebera, O. W. T., & Copaja, S. J. N. (2021). Application of Gamification in Higher Education in the Teaching of English as a Foreign Language. *Smart Innovation, Systems and Technologies*, 323–341. https://doi.org/10.1007/978-981-16-5063-5_27
 17. Shortt, M., Tilak, S., Kuznetcova, I., Martens, B., Akinkuolie, B.: Gamification in mobile-assisted language learning: A systematic review of Duolingo literature from public release of 2012 to early 2020. *Computer Assisted Language Learning*, 1-38 (2021).

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