



The relationship between digital competence and French learning outcomes in children

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RÉSUMÉ - ABSTRACT

La technologie dans l'éducation, y compris l'apprentissage des langues, est en plein essor. La compétence numérique est essentielle pour que les enseignants puissent intégrer efficacement la technologie et améliorer l'enseignement des langues. Elle permet d'accéder à des supports authentiques, à des exercices interactifs et à des possibilités de collaboration. Cependant, l'intégration de la technologie pose des défis aux enseignants. Cette recherche empirique vise à étudier la relation de la compétence numérique avec les résultats de l'apprentissage des langues dans le contexte de l'éducation intelligente (smart education) qui intègre des pratiques durables et des technologies numériques dans l'enseignement des langues. Dans ce but nous avons utilisé un questionnaire afin d'évaluer le niveau de la connaissance des enseignants et des enfants des outils numériques mais aussi de sa part dans le processus d'enseignement/apprentissage du français. 40 personnes (20 enseignants et 20 apprenants) constituaient notre cas d'étude. Tous les participants venaient de l'institut Ghotb Ravandi et ils avaient un niveau de langue A1-B1. Une analyse comparative a démontré l'effet significatif de cette compétence sur la performance des enfants.

Technology in education, including language learning, is booming. Digital competence is essential if teachers are to integrate technology effectively and improve language teaching. It provides access to authentic materials, interactive exercises and collaborative opportunities. However, integrating technology poses challenges for teachers. This empirical research aims to investigate the relationship of digital competence with language learning outcomes in the context of smart education, which integrates sustainable practices and digital technologies into language teaching. To this end, we used a questionnaire to assess the level of teachers' and children's knowledge of digital tools and their role in the French language teaching/learning process. 40 persons (20 teachers and 20 learners) made up our case study. All participants came from the Ghotb Ravandi institute and had a language level of A1-B1. A comparative analysis demonstrated the significant effect of this skill on children's performance.

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1. INTRODUCTION

In recent years, the use of technology in education has become increasingly commonplace, and language learning is no exception. The rapid growth of technology allows teachers to experiment with innovative methods with today's digital natives. According to the interaction hypothesis, a language can be developed when there is regular interaction between learners and other speakers, so as technology continues to evolve and transform our daily lives, the successful integration of technology into language learning is essential.

According to Howard et al (2021), digital competence encompasses the essential knowledge, skills and attitudes needed to use digital technologies responsibly and effectively. Digital competence could enhance teaching and learning in language classrooms by giving students access to real-world language material, interactive language exercises and the opportunity to interact and collaborate with native speakers and other students. Furthermore, integrating digital skills into language teaching can help educators provide a personalized, student-centered learning experience that meets the unique interests and needs of their students, as noted by Pöldoja et al. (2014). This study focuses on the importance of digital competence in language classrooms, given the critical role of classroom interaction in language learning and the desire to speak. The constant evolution of technological advances is a defining feature of the technological age. We'll now look at the two main axes that are crucial in this new technological era, and whose concordance may appear to be the necessary condition for success.

1.1. Digital competence

Digital competence refers to a set of skills, knowledge and practices that enable individuals to use new technologies effectively for a variety of purposes, including learning, work and leisure. Technology profoundly influences our communication processes, our everyday experiences and, as educators, our teaching resources and learning environments (Erskine et al., 2019). Areas of digital competence include information and data literacy, communication and collaboration, digital content creation, security and problem solving.

A fundamental technological competence is the ability to use and manipulate any technology or tool. When humans can use technology, it will be appropriate for the tasks it can accomplish. This means that if users' abilities and technological capabilities are compatible, they can use the technology to accomplish their tasks. Knowledge deepening refers to teachers' mastery of ICT-related tasks, such as critical thinking, problem solving, data analysis and so on. Another element of digital competence in the language classroom is the development of skills for deepening knowledge through digital means.

On the other hand, educators who use didactic teaching, also known as presentation skills, communicate with their students by providing detailed explanations, descriptions, lectures, asking questions, answering queries and establishing a relationship with them. Professional skills are another crucial component of digital competence and essential if teachers are to be successful in their work. In addition to courses, programs, conferences, seminars, events and workshops, educators acquire their knowledge and expertise through experimentation, observation, professional networks and personal experience.

Cerisier et al (2008) show that when it comes to using information technologies, we need to take into account different levels of competence. They distinguish three levels of digital skills:

- Instrumental skills at the operational level
- Transversal skills at the functional level
- Metacompetencies at the strategic level.

In the next section, we'll look at the role of teachers in this new order of things.

1.2. New role for teachers

While technology is part of young children's everyday experiences, teachers can sometimes miss opportunities to extend children's learning about technology. This may be due to teachers' knowledge and ability to implement technological experiments or share technological knowledge.

Research by Saxena et al (2020) showed that some teachers felt overwhelmed when designing plugged-in and unplugged technology experiences due to their lack of knowledge. Teachers involved

in technological knowledge and practice see their role primarily as facilitators of technological resources rather than facilitators of technological conceptual knowledge. Furthermore, if teachers were active in the technological learning process, children's technological skills outcomes would improve. When lived experiences are rich in opportunities for critical reflection and logical and intellectual growth, according to the learners' needs, technological conceptual knowledge makes more sense to the learner. In addition, when the teacher has a solid technological background, the quality of the proposed experiences and learning increases.

Teachers who have successfully integrated technology into their classrooms have reported participating in professional development that has helped them recognize how educational programs, criteria and technology fit together (Penuel, 2006). In order to provide an optimal French learning experience, teachers need to apply technology more effectively. The particularity of this research lies in the fact that we are interested in this topic in the context of teaching children. In the following section, we set out the main themes that we believe are essential to the development of teaching methods that take into account the psychology of children's learning.

1.3. Theoretical framework

Using a cognitive approach, this research aims to evaluate the effects of knowledge of digital tools on the outcome of learning French. Several studies have already shown the role of exposure to digital content on the cognitive development of users. One example is the study by Giacomo et al. (2017), which showed the effect of applying digital tools on the development of users' cognitive ability.

Another method of applying technology in the classroom can be inspired by Piaget's theories. From Piaget's perspective, to support child-centered learning, teachers need to pay attention to the resources they provide and how the environment is set up for children. Piaget believed that cognitive development was enhanced by the use of resources that are open and offer many possibilities so that learners in the sensorimotor stage can explore their sense of wonder, which will reinforce the exploration of children's schemas (Curtis et al., 2015; Mooney, 2013). Open resources that support technological practices can be heuristic resources where children explore how they can use these tools for a specific purpose. Heuristic resources, such as bowls, utensils, fabric or natural objects like shells and rocks, can have a specific purpose, but can also be manipulated according to users' goals (Curtis et al., 2015). Furthermore, if teachers are able to intentionally design spaces where technological objects are attractive and enticing, they reinforce the child's sense of belonging and the value of their play. In this way, the learner can explore technological possibilities in complete safety.

Mooney (2013) explains that Piaget believed that when children engage in hands-on learning, their understanding of concrete thoughts evolves into abstract understandings. For example, if a child sees a picture of a farm animal, the picture represents the extent of his or her knowledge of the subject, but if the child physically encounters the farm animal, his or her understanding of the subject becomes manifold. Furthermore, Halpenny and Pettersen (2013) explain that Piaget believed that children's learning was active and constantly evolving due to the environment in which they found themselves.

Similarly, Hargraves (2021) agrees with Piaget that knowledge is built up gradually over time through exposure to environmental factors. Therefore, the provision of real-world experiences will support children's knowledge construction more than simply hearing about or being instructed about the experience. This research aims to determine children's and students' attitudes towards the use of technology in learning French, focusing on the degree of children's autonomy and the role of teachers as providers of materials to awaken children's sense of wonder. Concepts that were dear to Piaget. And it's the effect of adherence to these principles that interests us.

2. METHOD

With regard to our research methodology, we opted for a comparative-analytical method. We used a questionnaire with 40 people (including 20 children learning French and 20 teachers of French to children). The 40 research participants came from a French language institute in Tehran (Ghotb Ravandi). After collecting the data, we used an analytic-descriptive method to analyze the data. Finally, we compared learners' statements with their performance in the classroom. For this purpose, we used

the grades obtained by the learners at the end of the term. Our two questionnaires were composed of 8 questions and focused on 3 main categories: personal information, information on the use of digital tools and information on the relationship between the integration of digital tools and the development of French. It should be pointed out that certain questions relating to the role of digital tools were repeated in both questionnaires in order to assess and compare their perceptions of digital tools. We should add that the questions were inspired by Piaget's main theories on children's learning, namely: giving children the opportunity for autonomy, the teacher's role as provider of original material, and regular contact with the learning environment. The questionnaires are appended at the end of the research.

3. RESULTS AND DISCUSSION

3.1. Data collection and results

Data collection shows that the majority of children participating in our research are at least ten years old. There are no children under the age of 5. On the other hand, most of the teachers of the children in our research are under thirty. In terms of level, the majority of children declared A2 as their level (15 people), against 5 people declaring other levels (3 A1 and 2 B2).

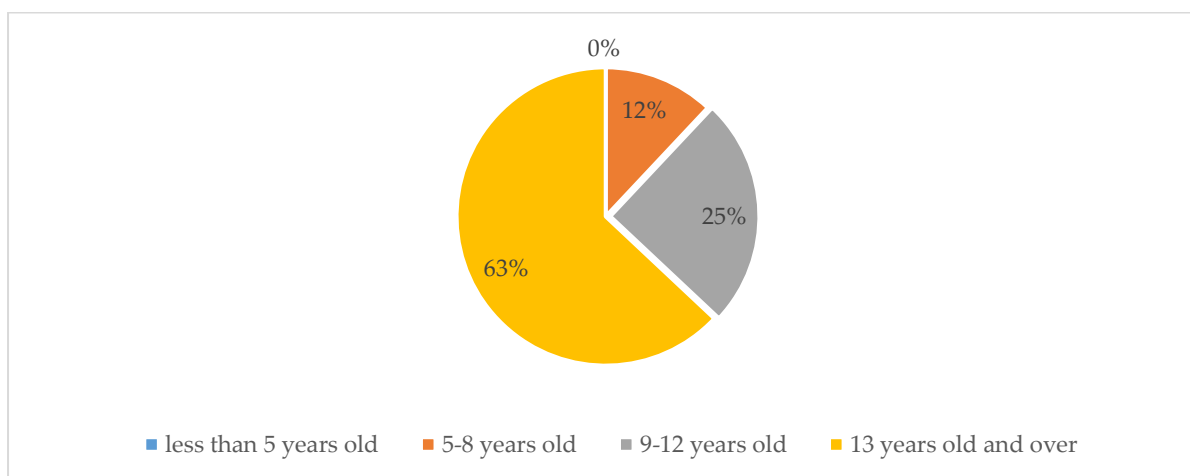


Image 1. Children's ages

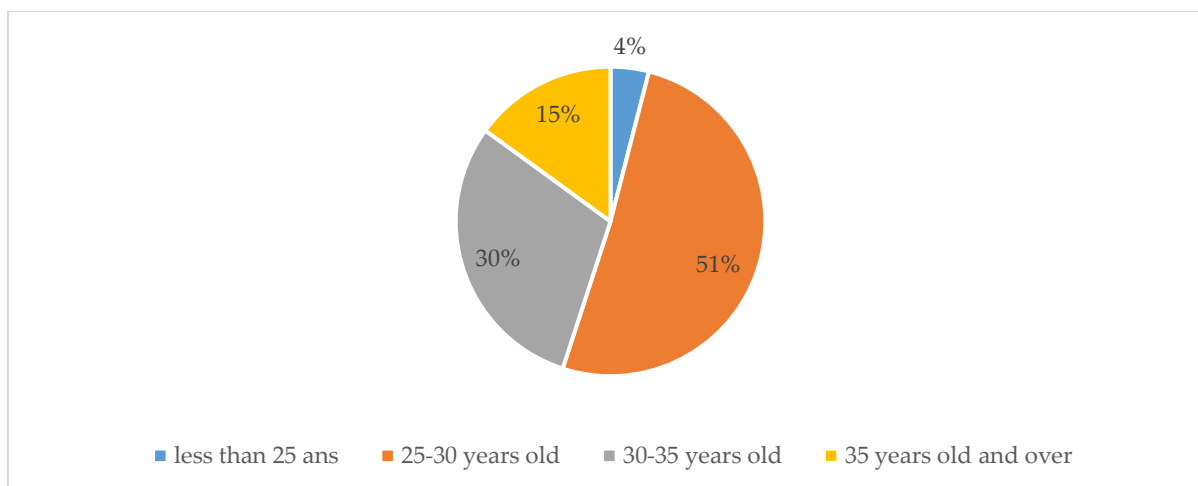


Image 2. Teachers' ages

Regarding the questions used with the children, our data collection shows that the vast majority of children are comfortable using digital tools. 80% of participants said yes, while 20% said no to the

question about being comfortable using digital tools. On the other hand, we asked the same question of the children's teachers, and obtained more or less the same result. 75% of teachers said they were comfortable using digital tools such as tablets, computers and smartphones.

Another question asked children about using digital applications or games to learn French. This figure shows the frequency of use.

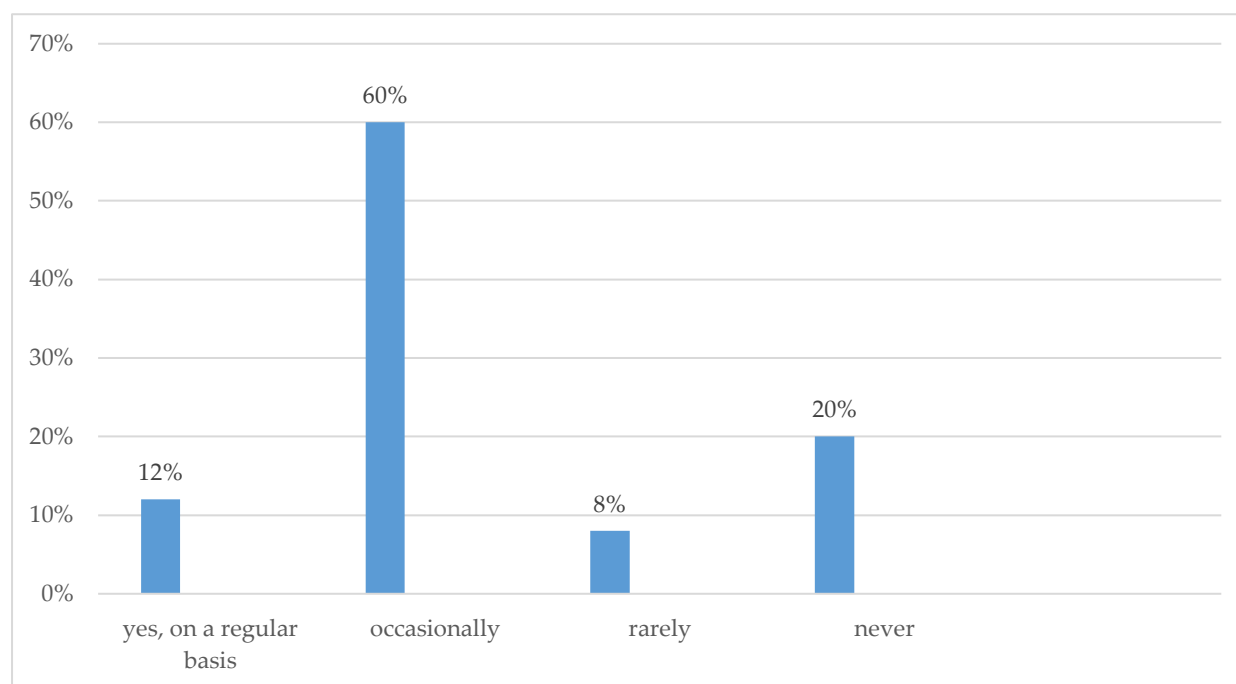
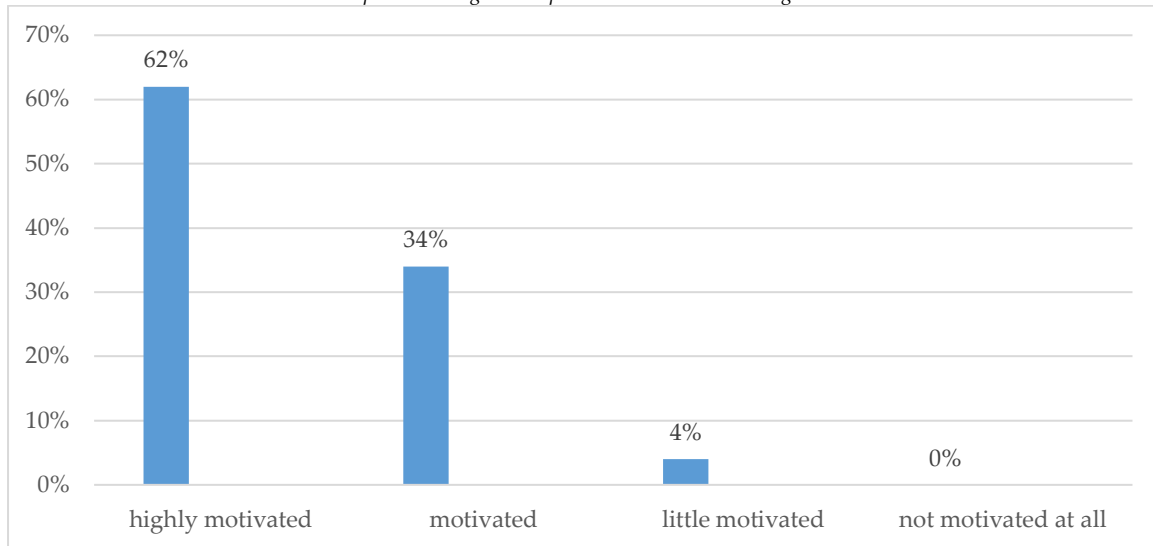


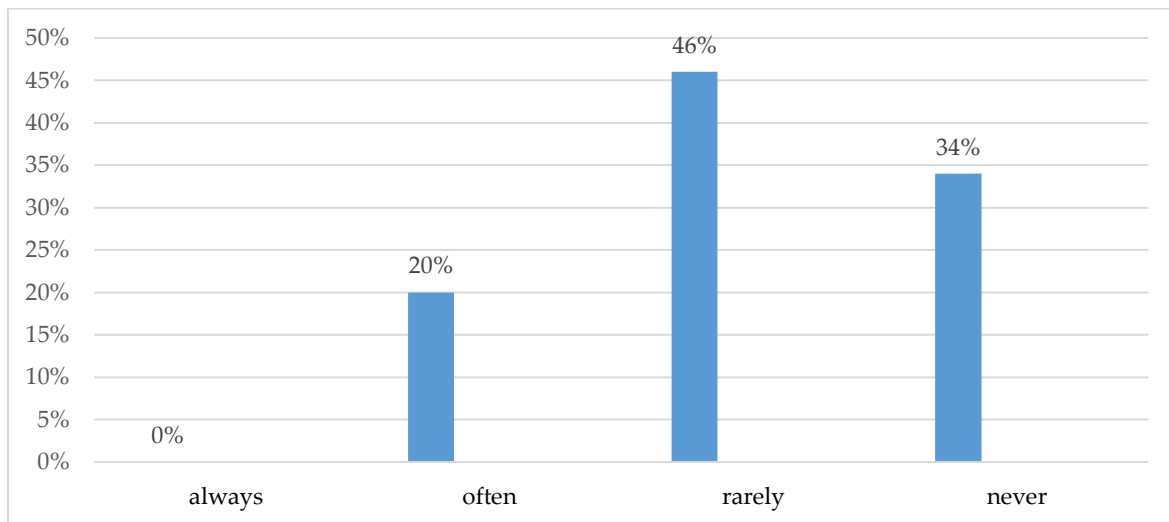
Image 3. Frequency of use of digital applications and games

The other question asked of teachers concerned the skills required to integrate digital tools into French lessons. This question reveals one of the major challenges in the application of digital tools. The question was: What digital skills should French teachers develop to effectively integrate technology into their teaching? In response to this question, almost half (49%) of the teachers chose digital instructional design skills. This indicates the need for effective design adapted to the integration of digital tools. The second issue chosen (21%) was educational technology evaluation skills. This choice justifies the importance of having a program dedicated to the evaluation of different possibilities that exist in the digital domain.

The next question asked of the children concerned the relationship between technology and motivation to learn French. As we have already mentioned in our theoretical framework, according to Piaget, the learner's sense of wonder can be explored through the use of resources that are open and offer many possibilities. The question was: How would you describe your motivation to learn French using technology?

**Image 4.** Motivation for using technology

We can see that children view technology positively and as a motivating tool. This positive attitude towards technology may lead to easy adaptation to the application of these tools by teachers, but as we have already specified in the theoretical framework, it remains to be seen whether teachers are familiar with the methods of arranging digital tools to create a space conducive to learning, and whether they pay attention to the resources they provide. To answer this criterion, teachers were asked the following question: How often do you evaluate the effectiveness of the resources you use?

**Image 5.** Resource assessment frequency

From the figure we can see that none of the teachers claim to evaluate the resources presented to the children constantly. Most say they rarely evaluate what they offer as a resource. Having gained an insight into how teachers handle digital content, we turned to teachers' perceptions of the use of technology in teaching French to children. The challenges seen by the teachers inform us about the possible gaps that exist within the FLE didactic program. The question was: What are the potential challenges associated with the use of technology in teaching French to children?

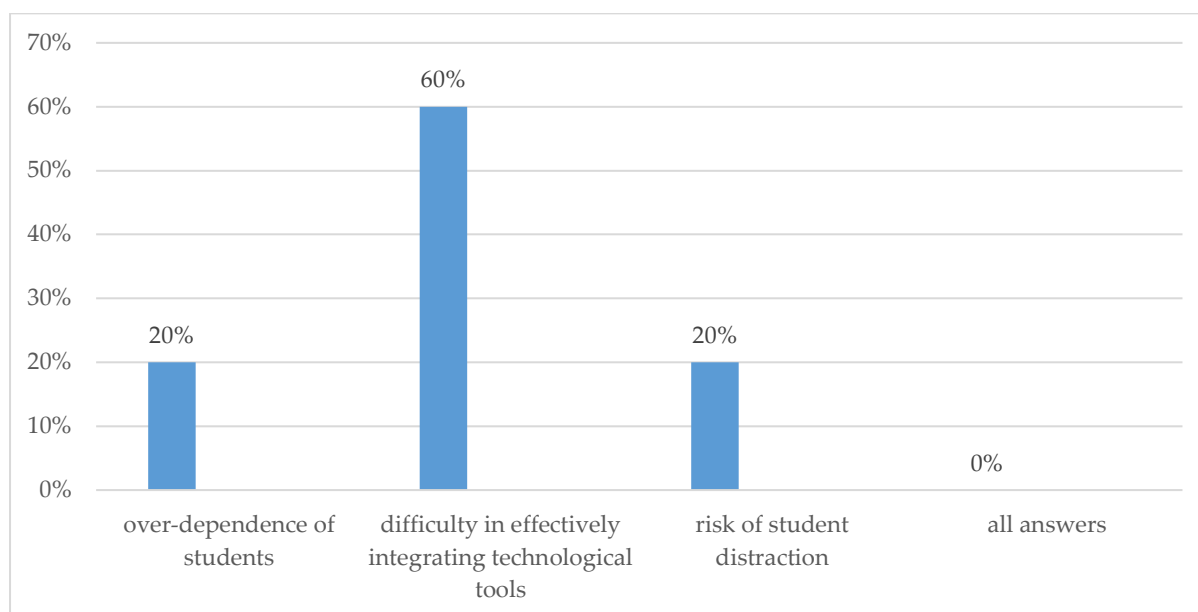


Image 6. The challenges of using technology

As we can conclude, the major concern regarding the use of technology in teaching French to children lies in the fact that there is a difficulty in effectively integrating technological tools. The element of novelty can be seen as one of the reasons affecting the ease of integration of these adapted tools into pedagogical activities. A feature representing a necessary need for today's teachers. The next two concerns about the use of technology relate to students' over-dependence on technological tools and the risk of student distraction.

On the other hand, we asked the children to make a self-assessment in French, considering the impact of technology use. This question helps us to estimate the effect of technology use on French language learning, and to assess users' impressions. It was also the first step towards the final phase of our research to assess the effect of using digital tools on children's French performance. The question was: Have you noticed an improvement in your French language skills since you started using technology to learn?

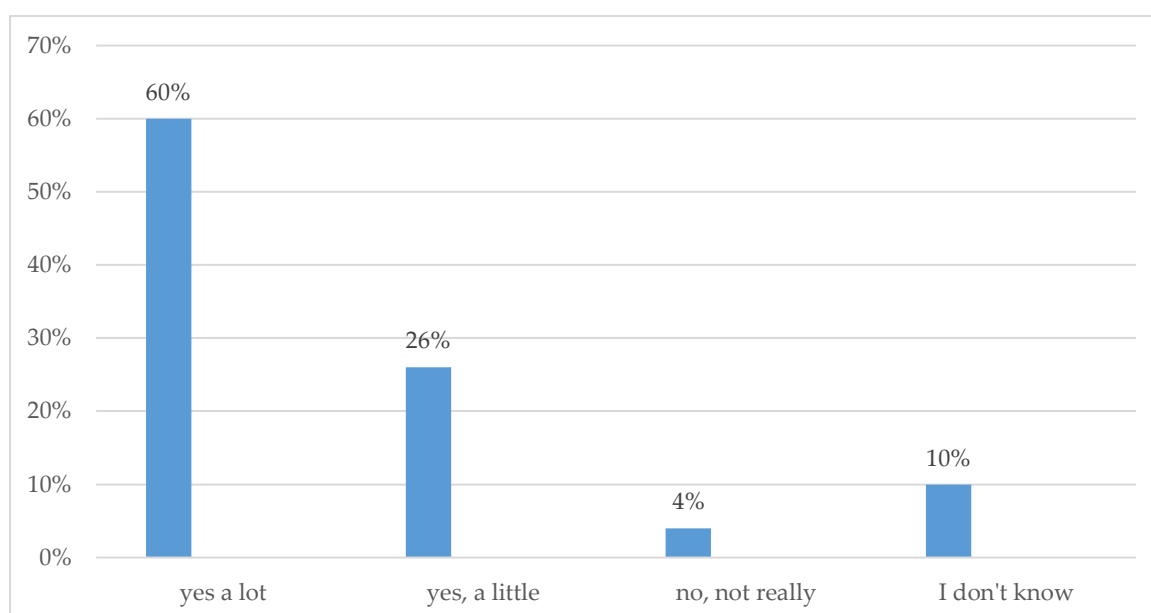


Image 7. Technology enhances language skills

The figure shows a clear positive evaluation of technology. Not content with this conclusion, in the final phase of our research we look at the children's final test scores, making a comparative analysis with the answers given to the questions.

The last two questions of both questionnaires assess the positive points of technology, and there is a final statement on the use of technology to teach children French. We asked teachers and children to list the advantages of using technology to learn French. Let's see what the children think about this in the following figure.

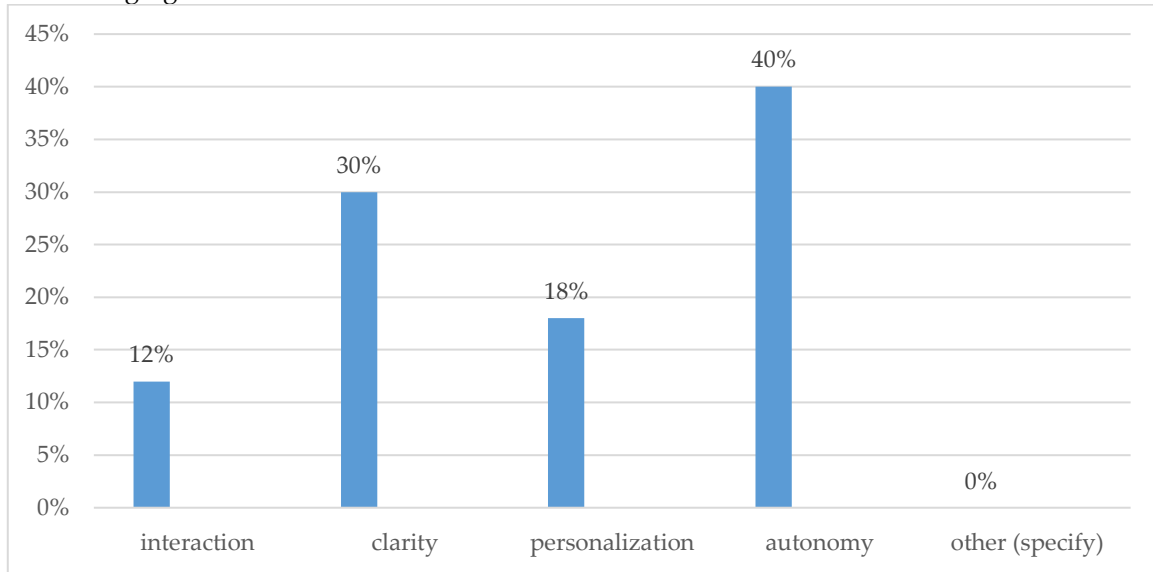


Image 8. Benefits of using technology according to children

The figure shows us that most children see autonomy as the major advantage of using technology. We can't deny the insignificant gap between the options, which can be seen as the wide variety of possibilities offered by technology. Teachers were asked the same question to arrive at a comparative analysis between the two perceptions.

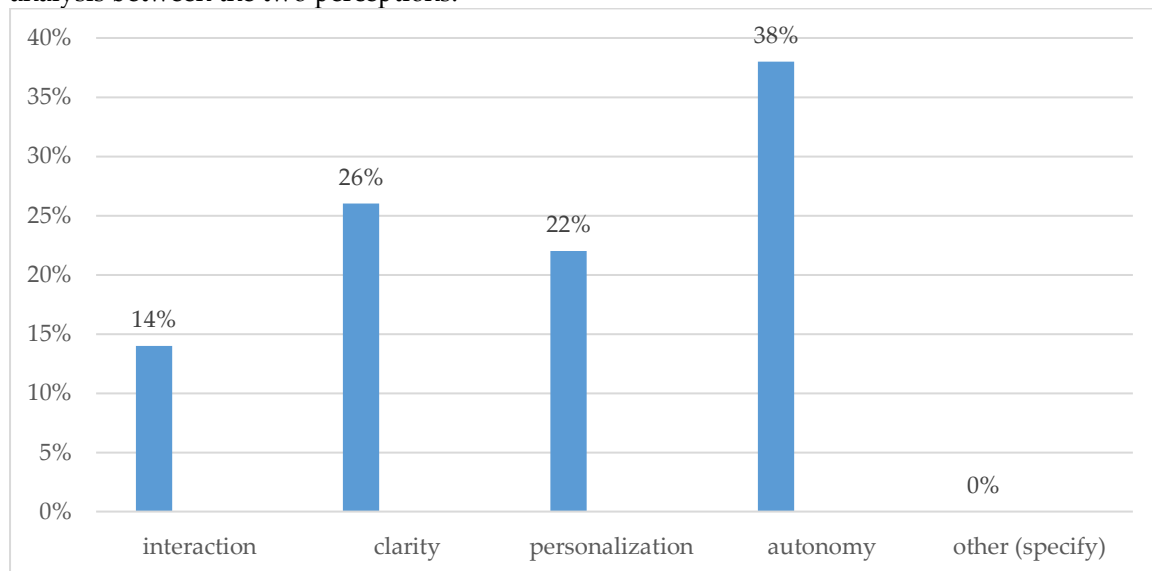


Image 9. Benefits of using technology according to teachers

According to teachers, autonomy is also the main benefit of technology. Here again, we see a small gap between responses. The difference lies in the fact that, for teachers, the personalization aspect is more in evidence. In addition, they see the clarity aspect as less present. But all in all, the difference in

response between the two groups is not significant, and we can conclude that both groups have the same impression of the benefits of using technology to learn French.

The last question in the questionnaire appears to be a final statement on the use of technology in teaching/learning French to children. The question asked was: Would you recommend using technology to teach children French? First, we analyze the children's answers.

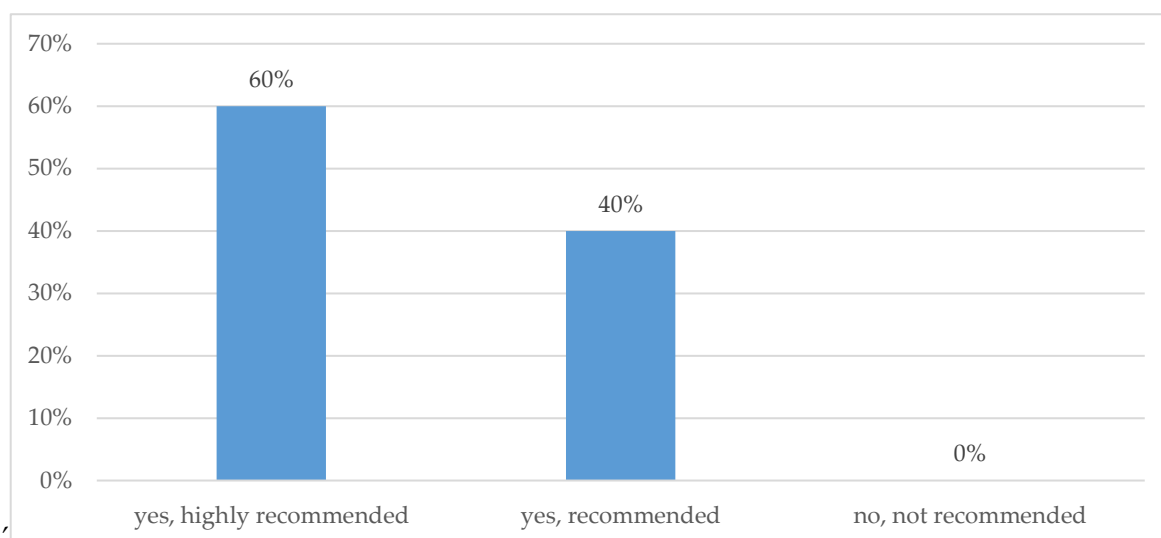


Image 10. Children's perception of using technology

As we can see, all the children recommend technology as a pedagogical tool for learning French, and 60% of them are strongly in favor of using technology in children's learning. Let's now look at the results of the same question asked of teachers.

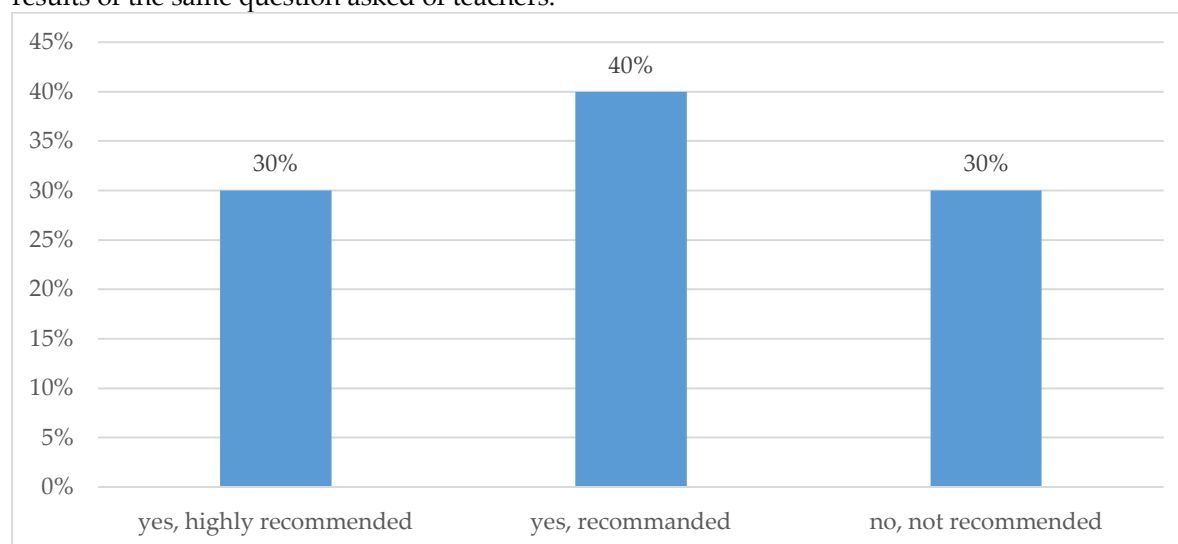


Image 11. Teachers' perception of using technology

As the figure shows, there is a significant difference in the perception of technology as a pedagogical tool for children. 30% of teachers do not recommend technology for teaching French to children, while all children do. But here again there is relative agreement on the usefulness of technology for children. Having obtained a schema of the image of technology among children and teachers, we move on to the final phase of our research, devoted to the relationship between digital competence and performance.

3.2. Discussions

As we have already mentioned, the main aim of this research was to find the link between digital competence and the performance of learners of French. Our corpus consisted of 20 children (aged 7-15) from a language institute in Tehran (Institut Ghotb Ravandi). Our criterion for performance was the last score they had obtained in the exam. We obtained the official scores from the institute and kept the anonymity of our research participants. In the following figure, we can see the last scores of 20 participants in our research. These are the grades of the main exam they had to pass before entering another level.

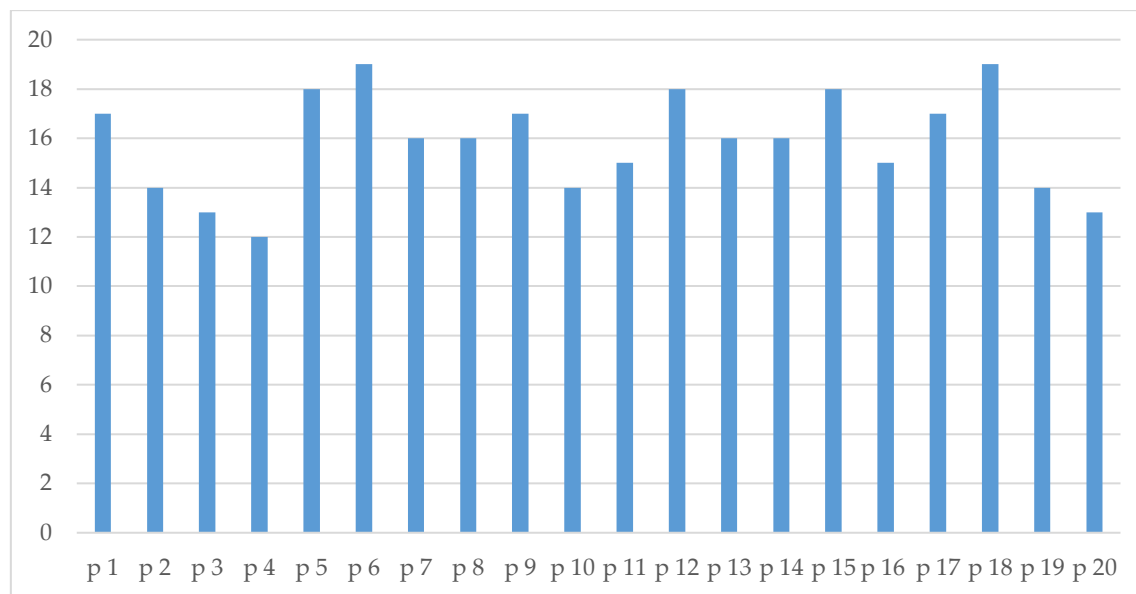


Image 12. Children's last exam scores

According to the data we received, the most frequent score is 16 (repeated 4 times). In addition, the best score obtained is 19 (repeated 2 times). The lowest score is 12, with only one repetition. It should be pointed out that all the participants chosen were from the same institute and used the same manual, but with different levels. We maintained the anonymity of the participants and carried out a comparative analysis between the children's scores and their answers to our questionnaire. We used the answers as the data to be studied in order to arrive at a diagnostic analysis. Diagnostic analysis is a branch of data analysis that focuses on examining historical data and identifying the root causes of various outcomes, events or trends (Wolniak & Grebski, 2023). More specifically, our research falls within the branch of correlative analysis, which is part of diagnostic analysis.

Studying the correlations of responses with scores gives us a picture of the place and role of technology in children's learning. The first point to make concerns children's relationship with technology. Analysis of the data shows that 80% of children are comfortable using technology or digital tools. Relating this to the scores shows us that among the children who were comfortable with technology, the lowest score starts at 15, and the two children with the highest score (19) also consider themselves to be competent in technology. This is a significant difference from the other children who scored lower, but given that a large proportion consider themselves comfortable with technology, this comparison cannot be valid.

The next point concerned the frequency with which children use digital applications and games. 28% of children said they never or rarely use digital applications or games. Among these children we have the lowest scores. Among those children who don't use digital applications and games very much, only one has a score above 16. On the other hand, among children who regularly use these tools, there are higher scores. Among the dominant group or children who apply these digital tools from time to time (60%), the range of scores is from 16 to 19. A remarkable difference that indicates a strong

correlation between the frequency of use of digital opportunities and the exam result we consider performance.

The other aspect of technology use concerns motivation. 96% of children say they are very motivated or motivated to use technology to learn French. Among this group there are different grades, and given that this is the vast majority, it's a normal fact. As there is no opportunity to study correlations, we've left this aspect of tool integration out of our research. But we point out that among the 4% of children who are not very motivated to use technology, there is no score above 16. Having given a correlative analysis of the children's statements and their scores, we turn to the analysis of the teachers' responses.

As we have already stated in our theoretical framework, the development of digital tools and attention to the resources provided to children are among the essential conditions for the successful integration of technology into French lessons. Analysis of the data collected from teachers reveals a lack of training in the effective integration of technology into the teaching of French to children. 60% of teachers stated that they were concerned with integrating technology to provide an effective experience for children.

Another finding was that 30% of teachers did not recommend the use of technology to children. On the other hand, all the children agreed that using technology can be a positive way of learning French. This discrepancy can have a negative impact on program design, as there are sometimes two different perceptions of the use of technology for children. According to our theoretical framework, the child's sense of wonder needs to be activated, and this is made possible by the use of open resources that offer many possibilities.

Another aspect of the use of technology is the question of frequency. According to Piaget, children's learning is active and constantly evolving as a result of the environment in which they find themselves. Regular contact with digital tools facilitates the application of these tools to exploit the possibilities offered in learning French. Data analysis has shown us that constant use of technology in French language learning can result in better results, at least in the case of exams. However, as we have already explained, some teachers' mistrust of digital tools can hinder the full integration of the possibilities offered.

The study sought to investigate the impact of digital competence in enhancing children's performance in learning of French as a Foreign Language. Based on the interviews, one could conclude that having digital competence improves learners' engagement in the teaching and learning of FFL as it boosts learners understanding of French content and this may result into good performance.

Additionally, a look at the data shows that teachers don't pay enough attention to the development of this skill and for them there is no evidence that strengthening this skill can impacts the act of teaching in a good way. In addition, teachers see the involvement of technology in teaching children as risky, and are wary of its usefulness.

4. CONCLUSION

Recent advances in technology are opening up new avenues for teaching French as well as any other foreign language. The question is how these tools relate to children's learning. The approach taken to these new possibilities can be decisive in terms of results. Our study has shown that children have a positive attitude towards digital tools, and that they also improve performance.

Digital literacy gives children access to a variety of online resources that can complement and deepen their learning of French, including learning videos, interactive exercises and online courses. In addition, digital tools make learning more fun and motivating for children, increasing their engagement and progress in learning French.

It's important to stress, however, that digital skills do not replace traditional French lessons. Human interaction, classroom discussions and traditional classroom activities remain essential for complete and balanced language learning.

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APPENDICES

Children's questionnaire

Name :

Level:

1. How old are you?

- A. Under 5
- B. 5-8 years old
- C. 9-12 years old
- D. 13 and over

2. Are you comfortable using digital devices such as tablets, computers or smartphones?

- A. Yes
- B. No

3. Do you use digital applications or games to learn French?
 - A. Yes, regularly
 - B. From time to time
 - C. Rarely
 - D. Never
4. How would you describe your motivation to learn French using technology?
 - A. Very motivated
 - B. Motivated
 - C. Not very motivated
 - D. Not at all motivated
5. Have you noticed an improvement in your French language skills since you started using technology to learn?
 - A. Yes, a lot
 - B. Yes, a little
 - C. No, not really
 - D. I don't know
6. In your opinion, what are the advantages of using technology to learn French?
 - A. Interactivity
 - B. Fun
 - C. Personalization
 - D. Autonomy
 - E. Other (please specify)
7. In your opinion, what are the disadvantages of using technology to learn French?
 - A. Over-reliance on technology
 - B. Lack of human interaction
 - C. Risk of distraction
 - D. Other (please specify)
8. Would you recommend the use of technology to teach children French?
 - A. Yes, strongly recommended
 - B. Yes, recommended
 - C. No, not recommended

Teacher questionnaire

1. How old are you?
 - A. under 25
 - B. 25-30 years old
 - C. 30-35 years old
 - D. 35 and over
2. Are you comfortable using digital devices such as tablets, computers or smartphones?
 - A. yes
 - B. no

3. What digital skills should French teachers develop to effectively integrate technology into their teaching?
- a) digital instructional design skills
 - b) virtual classroom management skills
 - c) educational technology assessment skills
 - d) all of the above
4. How often do you evaluate the effectiveness of the resources you use?
- a) always
 - b) often
 - c) rarely
 - d) never
5. What are the potential challenges of using technology to teach French to children?
- a) students' over-reliance on electronic devices
 - b) difficulty in effectively integrating technological tools into teaching activities
 - c) the risk of distracting students during lessons
 - d) all of the above
6. In your opinion, what are the advantages of using technology to learn French?
- A. interactivity
 - B. fun
 - C. personalization
 - D. autonomy
 - E. other (please specify)
7. In your opinion, what are the disadvantages of using technology to learn French?
- A. over-reliance on technology
 - B. lack of human interaction
 - C. risk of distraction
 - D. other (please specify)
8. Would you recommend the use of technology to teach children French?
- A. yes, strongly recommended
 - B. yes, recommended
 - C. no, not recommended