Pedagogical Integration of ICT and Interactive Videos: Their Effects on the Learning of Struggling Students in High School

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Abstract

The phenomenon of struggling students in Morocco is considered today as one of the problems that affects the profitability of education, which is the basis of any sustainable human development. Moreover, this phenomenon has negative implications for economic performance in the country. On the other hand, several efforts have been made to improve the quality of teaching and learning by promoting the use of ICT; however, their integration into pedagogical practices has remained slow. In this context, the objective of this research is to identify the importance of the pedagogical inclusion of ICT in the Core Curriculum of secondary education and to evaluate its impact on the learning and performance of struggling students. The study also seeks to identify the advantages that ICT can bring to the development of the various skills of these students. To answer our research question, « How can the use of ICT promote or improve the learning of struggling students in one high school class? », we used a quantitative methodological approach, based on the distribution of questionnaires in the class, for a representative sample of 100 struggling students. The results show that most of these students reported that « learning by using ICT is very motivating » and expressed a preference for "lessons presented using a projector". Moreover, many students indicated that the use of ICT in the classroom is "useful and effective' for their learning, and they found that « the computer is an essential tool for overcoming school difficulties ». Additionally, the respondents reported they feel that using ICT in the classroom brings « an improvement in grades ». Consequently, ICT is an important element that motivates struggling students to learn. It is also a pedagogical tool used to allow these students to undertake their learning to improve their academic results and obtain good results.

Keywords: Education, GENIE, ICT, learning difficulties, struggling students.

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1. Introduction

Morocco's educational landscape, like many across the globe, grapples with the persistent challenge of ensuring all students acquire fundamental competencies. International assessments have, at times, painted a concerning picture. For instance, in 2011, Morocco's participation in the Progress in Reading Literacy Study (PIRLS) and Trends in Mathematics and Science Study (TIMSS) revealed alarming results, with Grade 4 primary students ranking last in PIRLS and second to last in TIMSS. While Grade 8 students showed a slight improvement, outperforming a few countries in mathematics and science (Stitou & AMAQUEN Association, 2013), a significant concern remains: students in the general secondary track often lack the foundational knowledge and skills outlined in the national curriculum (CSEFRS, 2016). This is particularly evident in core areas such as languages and mathematics, where research consistently highlights substantial learning gaps. These difficulties are frequently linked to deficits in cognitive functions like reasoning, memory, comprehension, planning, and decision-making, leading to a cumulative effect of academic delays.

Indeed, the gravity of this situation has been underscored by prominent figures. Mr. Chakib Benmoussa, for example, highlighted that approximately 70% of students face challenges in reading, writing, and mathematics (Senoussi, 2021). This stark reality necessitates a concerted effort from all stakeholders within the education system to elevate educational quality and overcome these pervasive issues. Furthermore, the problem is compounded by a concerning school dropout rate among young people aged 12 to 14, reaching 28% (Senoussi, 2021), which underscores the urgency of effective interventions.

Considering these challenges, Morocco has embarked on profound educational reforms, implementing ambitious measures designed to enhance the quality of its education system. These initiatives include the National Charter of Education and Training (1999-2009), the Emergency Program (2009-2012), the Strategic Vision for Reform (2015-2030), and the current Roadmap (2022-2026), alongside the broader national strategy, Digital Morocco 2030. A key component of these reforms, particularly since the early 2000s, has been the strategic integration of digital technology into teaching and learning. The rationale behind this integration is compelling: digital tools possess the potential to revitalize teaching practices by offering learners novel ways to access knowledge and engage with content (Karsenti, 2001).

A notable example of this commitment is the GENIE program, launched in 2005, which aimed to equip all schools; from elementary to high school; with multimedia rooms connected to the internet. This ambitious endeavor sought to foster a digital age learning environment, stimulating and catalyzing pedagogical innovations (El Madhi & El Madhi, 2017). The program's core objective was to improve learning quality by disseminating IT tools and promoting their diverse uses within Moroccan schools, thereby enhancing access to digital resources for teachers, administrative staff,

and students alike. The 2009 emergency plan further invigorated the GENIE program, accelerating the pace of educational reform.

Moreover, the Higher Council for Education, Training and Scientific Research, in its Strategic Vision 2015-2030, strongly advocated for the progressive and effective integration of digital media into teaching practices and school textbooks (CSEFRS, 2015:43). This vision is actively being realized through updated school programs, enriched educational resources, and the cultivation of a culture of digital innovation within the educational sphere. Complementing this, the Digital Morocco 2030 strategy aligns with the CSEFRS recommendations by prioritizing the digitalization of education, notably through the integration of digital skills from primary school onwards.

More recently, the Pioneer Schools project, a cornerstone of the 2022-2026 roadmap, directly addresses the imperative to improve basic learning outcomes and support students facing difficulties. This project adopts a multidimensional methodology to cater to the specific needs of each student, establishing quality conditions in public educational institutions through a systemic approach that focuses on three fundamental components: the student, the teacher, and the establishment (MENPS, 2022).

Despite these extensive efforts to support struggling students, they continue to encounter frequent obstacles in their academic journeys. Therefore, this study seeks to explore the transformative potential of information and communication technologies in enhancing their learning and improving their academic outcomes. ICTs are now unequivocally a priority in education, with educators increasingly recognizing their capacity to enrich learning experiences, foster creativity, and significantly motivate students. As Karsenti (2001) aptly states, ICTs have become indispensable tools for both teaching and learning. Consequently, our research aims to identify the importance of pedagogically integrating ICT in high school settings and to evaluate its specific effect on the learning and performance of struggling students within a particular high school class. Furthermore, we intend to explore the advantages that ICT can bring to the development of various skills in these students. Thus, this study seeks to address the following research questions:

- What is the impact of classroom ICT use on the motivation of struggling students in general education?
- How do ICTs influence the learning environment for students facing academic difficulties?
- In what ways does the use of ICT affect struggling students' comprehension and classroom participation?

2. Problematic

Learning difficulties represent a significant challenge within educational systems globally, impacting students' academic trajectories and overall well-being. Historically, the perception of these difficulties has evolved from mere segregation to an intrinsic component of the learning process itself (Estace, 2013; Zakhartchouc, 2007). These challenges often manifest as struggles in reading, writing, arithmetic, and comprehension, which can disrupt a student's concentration and hinder the acquisition of new knowledge. Consequently, such obstacles profoundly affect academic success and can lead to diminished self-esteem, feelings of inferiority, and increased anxiety among students (Hall, Rouse and Bolen, 1993; Huntington and Bender, 1993; Geisthardt and Munsch, 1996). This situation not only impacts the students but also generates a sense of powerlessness for teachers and heightened anxiety for parents, ultimately having broader societal implications (Lhotellier, 2013).

Traditional teaching methods, often characterized by a one-way transmission of knowledge, can exacerbate these difficulties. When teachers primarily act as knowledge dispensers, students with learning challenges may struggle to engage, concentrate, and assimilate information. This passive learning environment can lead to a cumulative effect of academic setbacks, potentially resulting in disengagement and school dropout. The teacher's attitude and expectations also play a crucial role, as they can significantly influence student behavior and learning outcomes (Potvin, 1993; Rousseau and Potvin, 1991).

In response to these persistent challenges, Information and Communication Technologies (ICT) have emerged as a promising avenue for pedagogical innovation. Many educators and policymakers advocate for the integration of ICT in classrooms, recognizing their potential to transform learning into a more engaging and effective process (Zaklani, 2019). Recent research consistently highlights the importance of effective ICT integration to create interactive learning environments and enhance student success (Msafiri Mgambi, 2024). ICT encompasses a range of digital tools, including software, hardware, multimedia resources, and virtual learning environments, all designed to facilitate exchanges and interactions within the educational setting (Baron, 1996). The effective integration of ICT involves a thoughtful insertion of these tools throughout the teaching sequence, with clearly defined pedagogical objectives and a coherent workflow (Bourguignon, 1994; Mangenot, 2000).

Numerous studies and reports, including those from UNESCO (2023), underscore the transformative power of ICT in education. Their integration into pedagogical systems is increasingly viewed as a necessity for modern teaching and learning, capable of fostering greater student motivation compared to traditional methods (Grégoire et al., 1996; Lapierre and Gingras, 2001; Ouellet et al., 2001). By addressing diverse learning needs, ICT can promote the acquisition of knowledge and skills, thereby enhancing student interest and engagement. Educational

technologies have been shown to significantly impact student success and promote more equitable learning experiences, particularly for struggling learners in secondary education (Every Learner Everywhere, 2023; Stanford Report, 2024). However, the effectiveness of these digital tools is not solely dependent on their availability or choice; it critically relies on the teacher's ability to strategically integrate them with the curriculum and learning objectives (Jefferson and Edwards, 2000).

Given this context, a pertinent question arises: Does the use of ICT in the classroom primarily serve to diversify teaching methods, or does it contribute to a more fundamental overhaul of pedagogical practices, particularly in improving the academic performance of struggling high school students? This leads to our central research problematic: How can the pedagogical integration of ICT and interactive videos specifically impact the learning outcomes and engagement of struggling high school students in Morocco?

To answer this question, we put forward two hypotheses:

- The first would be: the pedagogical integration of ICT in high school could create a good working climate in which struggling students would feel motivated, while they could more easily enter learning, give the best academic performance and increase their chances of success.
- The second is that: the use of ICT in classroom teaching practices would have no impact on the learning of struggling students.

3. Materials and Methods

To address our research questions and to either confirm or refute our initial hypotheses regarding the pedagogical integration of ICT and interactive videos and their effects on the learning of struggling students in high school, our study primarily adopted a positivist paradigm. This approach seeks to understand social reality and uncover objective truths through empirical tools. It provided a robust framework for investigating the impact of Information and Communication Technology in Education (ICTE) on the learning outcomes of students facing academic difficulties in a high school setting.

3.1. Study Context and Participants

Our research focused on struggling students enrolled in the first year of high school at Almansour Eddahbi Qualifying High School in Ain Aouda, under the Provincial Directorate of Skhirat-Témara, during the 2024–2025 school year. This specific context allowed for a focused examination of the challenges and opportunities within a real-world educational environment.

3.1.1. Target Population

The target population for this study comprised 300 struggling students across various core curriculum streams: vocational (60 students), literary (117 students), and scientific (120 students). Given the diverse characteristics within this population, a sampling technique was essential to ensure representativeness while respecting the attributes of the broader reference population.

3.1.2. Sample Selection

Our final sample consisted of 100 students, carefully selected using a stratified probability sampling method. This approach allowed us to include 20 students from the vocational stream, 39 from the literary stream, and 40 from the scientific stream. This distribution was deliberately chosen to encompass the different branches of the core curriculum and various age groups, thereby providing a comprehensive understanding of the issues addressed in our questionnaire and enabling a more robust verification of our research hypotheses and objectives.

It is important to note that our sample specifically included students with academic results consistently below average, predominantly categorized as having 'average' or 'weak' academic profiles. These students shared common characteristics related to learning difficulties. Their selection was based on several criteria, including their academic performance in previous years, results from diagnostic tests, observed classroom interaction and participation, and the completion rates of their homework assignments. These criteria helped ensure that our study focused on the intended population of struggling learners.

3.2. Data Collection Instrument: The Questionnaire

The primary method for data collection in our study was the distribution of a questionnaire. This technique was chosen for its effectiveness in gathering data through observation and analysis of responses to structured questions. Its ease of distribution allowed students to respond at their own pace, minimizing potential biases linked to individual personalities. Furthermore, questionnaires provide the flexibility to explore a wide range of application fields and diverse phenomena, including sensitive or private behaviors.

3.2.1. Measurement Scales

Recognizing that the questionnaire was primarily administered to students experiencing academic difficulties, particular attention was paid to ensuring the clarity and accessibility of all questions. Key concepts were explicitly defined to avoid ambiguity. The questionnaire predominantly utilized qualitative items, incorporating both single-response and multiple-response questions. These items were structured as closed-ended questions, employing formats such as 'yes/no' and three-

point Likert scales. These scales were designed to assess students' perceptions of their digital competence, their engagement with ICT, and their level of agreement with the statements presented.

3.2.2. Questionnaire Validation

Prior to the main data collection, a pre-validation study was conducted with 37 students (10 vocational, 12 literary, and 15 scientific) to ensure the instrument's clarity and comprehensibility. This pilot phase successfully confirmed that all items and response modalities were easily understood, allowing for necessary revisions to be made before the full-scale data collection commenced.

3.3. Investigation Process

Our investigation process was structured to facilitate an immersive and interactive learning experience for the participants, followed by systematic data collection.

3.3.1. Learning Environment Enrichment

As a foundational step, we enriched the learning environment by developing interactive digital content using the Powtoon tool. These resources, crafted as animated videos and dynamic presentations, were designed to offer learners a more engaging and personalized approach to the subject matter. The aim was to transform potentially abstract concepts into more accessible and enjoyable learning experiences.

3.3.2. Course Presentation and Digital Training

All study participants received comprehensive digital training within a fully equipped computer room. This training was meticulously structured into several separate two-hour sessions, with each stream (vocational, literary, scientific) having its dedicated sessions. During these sessions, students had the opportunity to familiarize themselves with essential IT tools, such as computers and video projectors. This hands-on experience enabled them to effectively follow the interactive courses created, which were further supplemented by assessments at the end of each session to gauge immediate comprehension and engagement.

Figure 1. *Overview of digital content*

3.3.3. Data Collection

Following the digital training and interactive course sessions, students participated in the data collection phase by completing a paper questionnaire. This method was chosen for its straightforwardness and efficiency, ensuring a high response rate and facilitating the collection of valuable insights directly from the students. The paper format also allowed for a consistent and controlled data collection environment across all participants.

Results

The questionnaire covers learners' use of digital content and interaction, as well as their perceptions of the impact of this environment on their understanding, performance, and other aspects.

Personal information

Identity

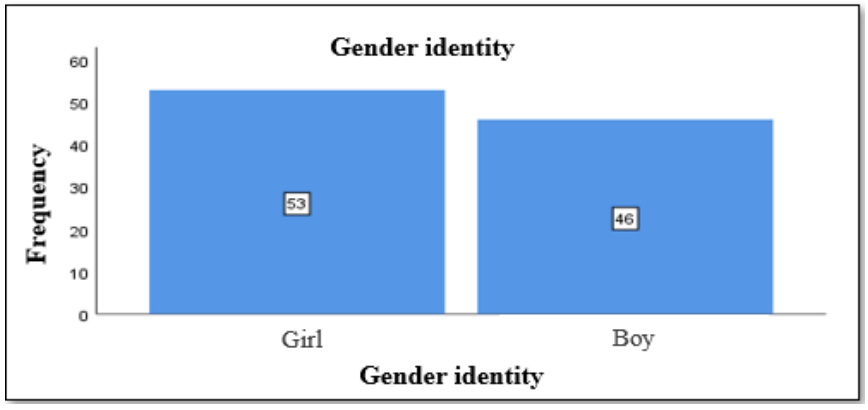

Figure 2. *Gender identity*

A total of 99 struggling students responded to our questionnaire, including 53.5% girls and 46.5% boys. This distribution indicates a relatively balanced gender representation, with a slight predominance of girls. This slight difference may be explained by the higher proportion of female students enrolled in all core curriculum tracks.

Age

The statistical description of the intermediate variable age revealed the following result:

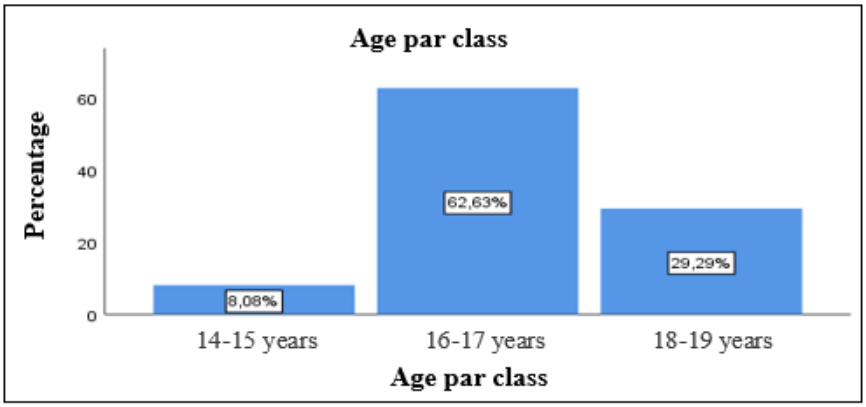

Figure 3. *Age ranges*

In terms of age, 62.6% of respondents were between 16 and 17 years old, 29.3% were between 18 and 19, and just over 8% were between 14 and 15.
This distribution reflects a diversity of age groups within the study sample and highlights a notable age gap among students. This gap may be explained by the repetition of school years by some pupils.

branches

The following table presents the distribution of the study sample by modality (class), shown in both percentages and absolute values.

Table 1. *numbers and percentages of the study sample by class*

Class	Frequency	Percentage
Scientific Core	40	40,4%
Literary Core	39	39,4%
Professional Services Core	20	20,2%
Total	99	100,0%

Our sample is diversified, as it is made up of students from different fields of study. This diversity can only be useful in identifying trends in struggling students according to their field of study

Personal use of ICT

Internet connection

The following bar chart illustrates the number and percentage of participants in the study sample who have an Internet connection.

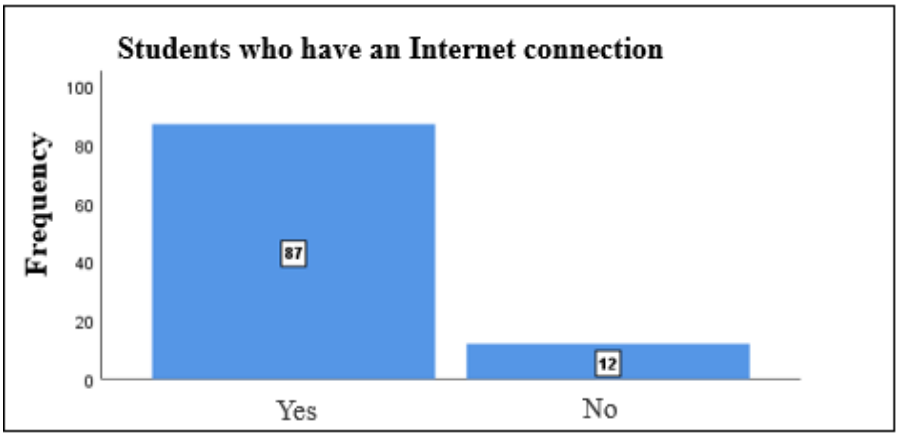

Figure 4. *Internet connection*

Regarding internet access, the majority of struggling students reported having a connection at home, while a smaller proportion did not. This information provides insight into their level of exposure to digital tools and their familiarity with using the Internet and computers.

Computer use:

The following pie chart illustrates the distribution of the study sample based on computer use, presented in both absolute numbers and percentages:
According to the graph:

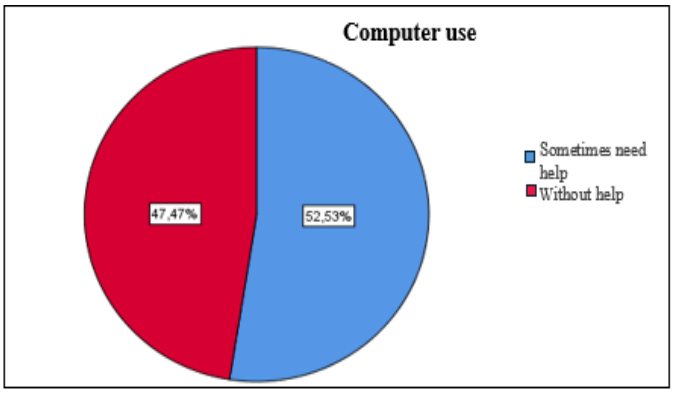

Figure 5. *Computer use*

- No student reported needing complete assistance when using a computer.
- 52.5% of students indicated that they occasionally needed help.
- 47.5% stated they could use the computer independently.

These results suggest that nearly all respondents are able to use a computer, or at least believe they can, and therefore have a basic mastery of its core functions. This can be attributed to regular use of computers during computing sessions and for various purposes outside the classroom, as explored in the following questions.

This led us to the following research question:

Does computer use among struggling students vary by academic track?

To explore the significance of the relationship between these two variables, we formulated the following two hypotheses:

H_0: there is no relationship between stream and computer use.

H_1: there is a relationship between channel and computer use.

To infer a relationship between the two variables concerned, we used the chi-square test:

Table 2. *Chi-square tests for the student class variable and the student computer use variable.*

	Value	ddl	Asymptotic significance (two-sided)
Pearson chi-square	3,096[a]	2	,213
Likelihood ratio	3,122	2	,210
Linear by linear association	3,002	1	,083
N of valid observations	99		

p = 0.2; i.e. p >0.05. So, the p value is above the significance level, we accept the null hypothesis and conclude that there is no significant association between the variables student class and computer use.

Digital skills:

The following table shows the number and percentage of the study sample according to their digital skills:

Table 3. *Representation of respondents according to digital skills*

	Frequency	Percentage
Fairly average	10	10,1%
Average	55	55,6%
Excellent	34	34,3%
Total	99	100,0%

We observed that more than 50% of struggling students who use digital tools reported having an average level of digital skills, while 34.3% considered their skills to be excellent. This suggests that the majority of these students have a good command of basic digital competencies and are aware of the relevance of ICT, not only in everyday life but also in the educational context.

Use of ICT in the classroom

The following table presents the number and percentage of participants in the study sample based on their use of ICT in the classroom:

Table 4: *Numbers and percentages of the study sample by use of ICT in the classroom*

		N	PERCENTAGE OBSERVATIONS
Use of ICT in the classroom	Useful	86	86,9%
	Adapted to your needs	52	52,5%
	satisfactory.	40	40,2%
	Develop your learning autonomy	33	33,5%
	Efficient for your learning	90	90,9%
Total		301	304,0%

The results indicate a generally positive perception of ICT use among struggling students. Nearly 90% stated that using ICT in the classroom was both useful and effective for their learning. Additionally, 56.6% reported that it enhanced their learning autonomy, while 52.5% felt that it was well adapted to their needs. Overall satisfaction was expressed by 40% of the students.

These findings contradict our second hypothesis, which stated that *"**the use of ICT in classroom teaching practices in high school would have no impact on the learning of struggling students.**"*

Learning using ICT

This section presents the results concerning learning outcomes associated with the use of ICT:

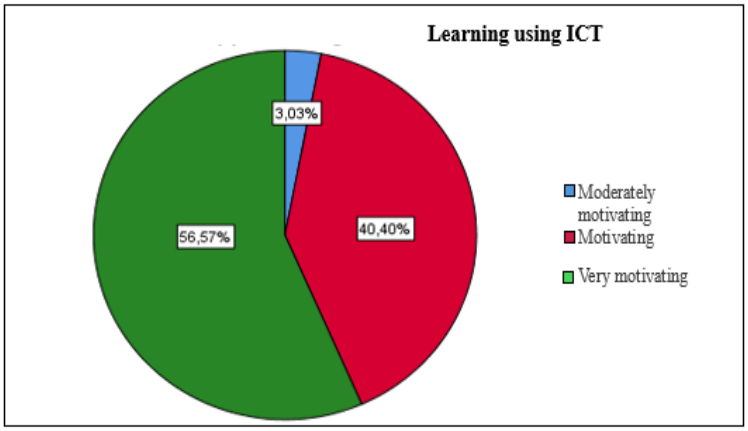

Figure 6. *Learning using ICT*

The data collected show that 56 students, representing 56.5% of respondents, found learning with ICT to be very motivating, while 40.4% described it as motivating, and 3.03% considered it moderately motivating. Notably, no student reported that learning through ICT was unmotivating.

These results indicate that most struggling students are satisfied with ICT-based learning, which highlights the importance of integrating ICT into various school subjects to support student engagement and motivation.

Agreement levels on the use of presentations, simulations, and interactive exercises

To illustrate the levels of agreement regarding the use of presentations, simulations, and interactive exercises, we considered the following indicators:

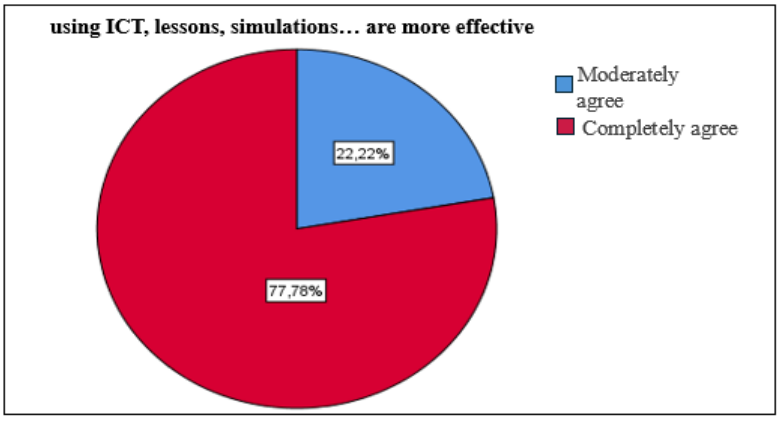

Figure 7. *Course, presentations, simulations*

Based on the graph above, not a single respondent disagreed, with 77.7% fully agreeing that these interactive courses, simulations, and exercises are superior, while 22.2% expressed moderate agreement.
This indicates that most struggling students are satisfied with the courses, simulations, and exercises delivered through ICT.

Lessons presented on board/video projector:

To show the degree of agreement levels on the use of presentations, simulations, and interactive exercises, we considered the following indicators:

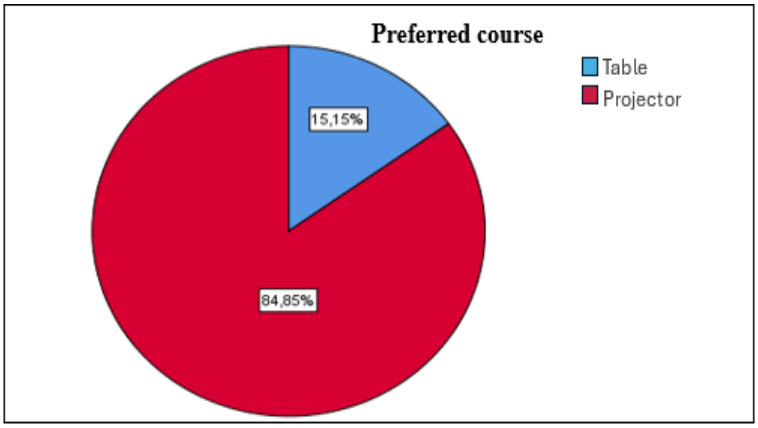

Figure 8. *Preferred course*

The graph shows that the majority of struggling students support the use of courses presented via the projector. However, a relatively small proportion of the surveyed students (15.15%) downplay the usefulness of this tool, expressing a preference for courses delivered on the blackboard.

The influence of ICT on the learning of the struggle students:

Table 5. *Respondents' perceptions of the influence of ICT on their learning process*

		PERCENTAGE	PERCENTAGE OBSERVATIONS
Influence of ICTs on learning	Makes you eager to discover new knowledge	12,9%	56,6%
	Sparks curiosity to explore different ways of thinking and studying	6,2%	27,3%
	Encourages research	8,5%	37,4%
	Increases interest in learning activities	8,8%	38,4%
	Stimulates the desire to learn	18,7%	81,8%
	Motivates academic progress	20,7%	90,9%
	Develop intellectual skills	4,1%	18,2%
	Facilitate learning.	20,0%	87,9%
Total		100,0%	438,4%

When asked " What is the impact of ICTs on the learning outcomes of struggling students?", the results were as follows:

- Almost all students (90.9%) aim to progress in their studies by using ICTs.
- For 87.9% of students, ICTs make learning easier.
- Nearly 82% of respondents are motivated by the desire to learn.
- Over half of the students (56.6%) want to learn more thanks to ICTs.
- ICTs make activities more engaging for 38.4% of students.
- Nearly 38% of students use ICTs to conduct research and learn better as a result.
- For 27.3% of students, ICTs open new doors for learning.
- 18.2% of students feel that ICTs promote intellectual development.

Therefore, struggling students recognize the value of ICT and its positive impact on their learning process.

ICT and grade improvement:

The graph below shows the number and percentage of respondents by their level of agreement or disagreement concerning grade improvement:

Regarding academic performance:

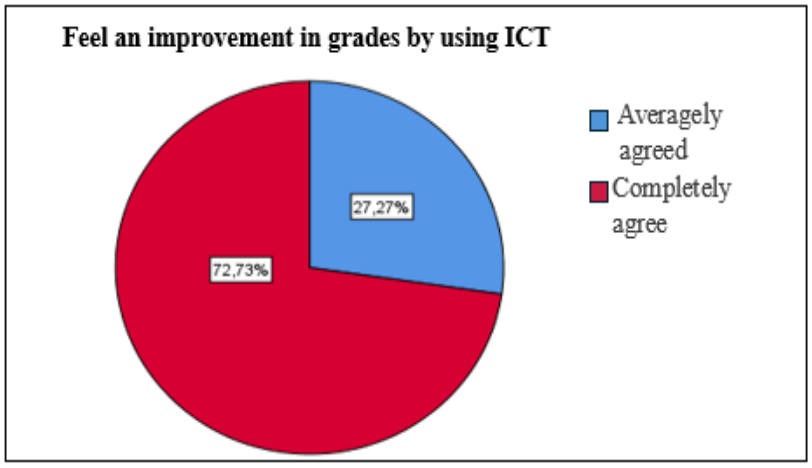

Figure 9. *ICT and grade improvement*

- 72.7% of respondents fully agreed that they achieve better grades when ICT is used in the classroom.
- 27.2% moderately agreed.
- No student expressed disagreement.

These results support our hypothesis that the pedagogical integration of ICT in high school can foster a positive learning environment in which struggling students feel more motivated, engage more easily in learning, perform better, and ultimately improve their chances of success.

Computers as a learning tool in the classroom in the future:

The table presents the number and percentage of respondents based on their opinions about the computer as a future learning tool:

Table 6. *Distribution of respondents according to their opinion of the computer as a learning tool*

		N	PERCENTAGE OBSERVATIONS
The computer as a learning tool	It is a tool that lets me work at my own speed	84	84,8%
	An essential tool to overcome my academic difficulties.	82	82,8%
	A tool that helps me work easily with my peers	54	54,5%

The use of computers as a learning tool aligns well with the needs of struggling students. Indeed, 84.4% of them affirmed that the computer is "a tool that lets me work at my own pace, "while 82.8% described it as" an essential tool to overcome my academic difficulties," and 54.5% viewed it as" a tool that facilitates collaboration with my peers." These findings suggest that struggling students recognize the potential of computers to support and enhance their learning experience.

Satisfaction with digital tools in the GENIE classroom

The graph below illustrates students' levels of satisfaction with the digital tools used in the GENIE classroom:

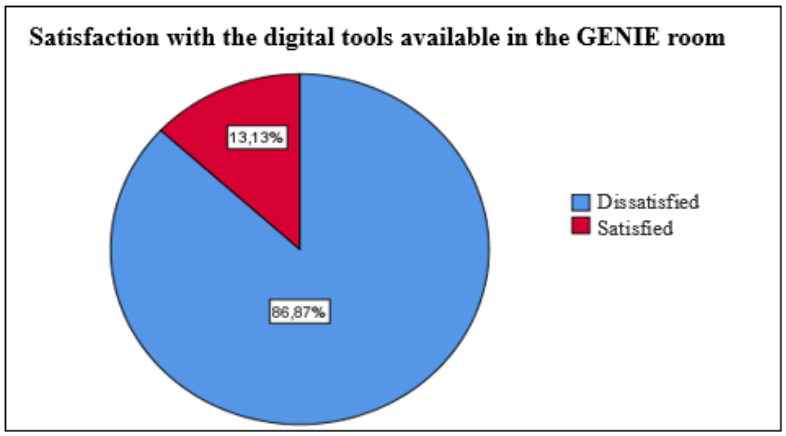

Figure 10 *.Satisfaction with digital tools*

A substantial majority of students (approximately 86%) expressed dissatisfaction with the limited number of digital tools available in the GENIE classroom. In stark contrast, only just over 13% reported being satisfied, and notably, not a single student was very satisfied. Consequently, these findings clearly underscore the necessity of enhancing the availability of digital resources to more effectively support struggling students

Discussion

Our study aimed to identify the significance of pedagogically integrating Information and Communication Technologies (ICT) within the common core curriculum of high school education. Furthermore, we sought to evaluate its effect on the learning and performance of struggling students, while also exploring the potential benefits ICT can offer in developing various skills among these learners. To achieve this objective, we employed a questionnaire as our primary research instrument, administered to students facing academic difficulties across the three core streams at Almansour Eddahbi Lycée. Our investigation specifically focused on several key areas: the integration, use, and perceived value of ICT within the school environment; its contribution to

the learning process of struggling students; and the impact of classroom ICT use on students' sense of self-efficacy.

Following the meticulous collection of data via the questionnaire, we proceeded with comprehensive statistical analyses. These analyses served a dual purpose: first, to thoroughly describe our sample, providing a clear demographic and academic profile of the participants; and second, to rigorously test our formulated hypotheses. Our initial descriptive analysis of the sample and its variables revealed a diverse student body. Specifically, our cohort of struggling students comprised 53% girls and 46.5% boys. Their age range varied from 14 to 19 years, with over 62% falling between 16 and 17 years, 29.3% between 18 and 19 years, and less than 9% between 14 and 15 years. Regarding academic streams, approximately 40.1% of students belonged to the scientific common core, 39.4% to the literary common core, and 20.2% to the professional services common core. This multi-skilled sample, encompassing students from various streams, proved invaluable for identifying trends in struggling students' learning experiences based on their specialization.

Crucially, this study unequivocally confirms the positive impact of ICT integration on the learning and performance of struggling students within the common core curriculum. The collected data vividly illustrates this point: a significant majority, 56.5% of students (56 out of 100), reported that learning with ICT was highly motivating, while an additional 40.4% found it motivating. These findings resonate strongly with previous research on the positive influence of ICT on student learning. Indeed, studies by Brown-Chidsey and Boscardin (2001), Karsenti et al. (2005), and Loiselle et al. (2012) consistently demonstrate that integrating ICT into the classroom fosters ideal learning conditions and empowers teachers to actively involve their students in the learning process.

Furthermore, a descriptive analysis of indicators related to grade improvement revealed compelling insights: almost all struggling students perceived an enhancement in their grades using ICT in class. This suggests that digital tools, whether visual or audiovisual—such as explanatory videos, simulations, or concepts, facilitate students' comprehension and sustain their attention, thereby enabling teachers to achieve their instructional objectives more effectively. In line with this, Tardif (1998) cogently argues that new technologies facilitate more "meaningful" learning and enhance students' problem-solving capacities and the use of metacognitive strategies. Similarly, the use of ICT as a pedagogical support tool has been shown to boost motivation, encourage struggling students to engage in their learning, complete homework, and exhibit greater attentiveness in learning tasks (Depover et al., 2007), ultimately leading to improved academic outcomes.

Our research further illuminated the profound impact of ICT on student autonomy and digital literacy. Over 60% of the students reported that ICT use in the classroom fostered their learning

autonomy, while a remarkable 78% claimed to have developed a strong command of digital tools thanks to ICT integration. Moreover, 85% of students expressed that ICT allowed them to learn at their own pace, and over 90% of respondents reported increased motivation for learning. These findings align with the observations of Jamet and Lieury (2000), who emphasize that ICT significantly enhances student motivation and promotes active learning.

In summary, our research yielded three main findings:

- Limited ICT integration: Despite concerted efforts, the integration of ICT in high schools remains limited in several institutions. Furthermore, the existing computer equipment in dedicated ICT rooms often falls short of meeting the specific needs of students with learning difficulties, suggesting that current efforts to generalize ICT in education are insufficient.

- Enhanced student engagement and motivation: A significant majority of struggling students confirmed that ICT profoundly altered their interest in learning, fostering a heightened sense of engagement. Consequently, they are acutely aware of the importance of ICT in the classroom and expressed a strong desire for its expanded integration across all school subjects.

- Improved self-efficacy and learning environment: Most struggling students demonstrated familiarity with various IT tools and reported a high sense of self-efficacy stemming from ICT use in the classroom. Their preference for lessons presented via video projectors indicates satisfaction with this mode of delivery, which they perceive as providing a conducive learning environment. This positive perception, in turn, reflects favorably on their learning capabilities and academic results.

While this research offers considerable insight into a critical area of educational inquiry, it is important to acknowledge its methodological limitations. Firstly, focusing solely on struggling students within the common core curriculum at a single high school in a provincial authority significantly restricts the sample's representativeness. This limitation inherently impacts the generalizability of our findings on a broader student population. Although our sample size was statistically significant for our specific context, extrapolations to the entire educational system should be made with caution.

Secondly, the unique context of the study, specifically, the school's location in a rural center and the inadequacy of available digital resources to meet the needs of all qualifying secondary school students may have influenced the obtained results. These contextual factors could introduce biases that limit the transferability of our findings to more technologically advanced or urban educational settings. Additionally, the survey period, spanning six months, is relatively short and may not have been sufficient to observe the long-term effects of sustained ICT integration on student learning

and development. Finally, the inherent complexity of measuring ICT effectiveness in a single session, coupled with the diverse definitions and approaches to pedagogical ICT integration (e.g., project-based learning, peer teaching), makes it challenging to generalize our results to other pedagogical contexts.

In conclusion, the integration of ICT in the classroom should not be viewed as an optional or superficial activity. Instead, it is a necessary and powerful tool for enhancing learning, particularly for struggling students. A proactive and sustained motivation among teaching staff to effectively utilize ICT in their pedagogical practices is paramount to supporting these students, fostering their success, and ultimately mitigating academic failure. The findings of this study underscore the urgent need for continued investment in digital infrastructure, teacher training, and the development of tailored ICT-based pedagogical strategies to create truly inclusive and effective learning environments for all students.

Conclusion

In this study, we meticulously highlighted the pedagogical integration of Information and Communication Technologies (ICT) within the common core curriculum of high school education, examining its profound impact on the learning experiences of struggling students. Our field research, conducted with a sample of one hundred such students, provided invaluable insights into the benefits that ICT can bring to the development of various essential skills. While acknowledging that our sample size was not exceptionally large, the rich and detailed responses from our participants furnished a substantial body of evidence, enabling us to illuminate the analyses presented throughout this article.

Through our investigation into the impact of ICT, we consistently found that the strategic use of these technologies in the classroom significantly streamlines the educational process for students facing academic difficulties. More profoundly, it instills in them a renewed desire to learn, to progress in their studies, and to actively discover new knowledge. Beyond mere facilitation, the integration of ICT in the classroom yields a multitude of benefits, including a discernible positive impact on the learning outcomes and attitudes of these students. It fosters a heightened sense of commitment to their learning journey and underscores the tangible utility of ICT within the classroom context.

Indeed, the empirical evidence suggests that ICT empowers students to achieve a deeper understanding of their lessons, which, in turn, positively reflects on their academic grades and overall results. Our participants consistently reported feeling motivated and capable when undertaking their homework with ICT support, and they expressed a sense of encouragement and competence when actively utilizing these technologies. These compelling results not only confirm our initial hypothesis but also directly address our central research question concerning the

pedagogical integration of ICT in secondary education and its specific impact on the learning of struggling students within the common core curriculum.

Building upon these findings, our work has led us to formulate several practical proposals aimed at optimizing the use of ICT in the classroom, thereby fostering a more conducive learning environment for students with learning difficulties. These proposals include:

- Enhanced Equipment Provision: We strongly recommend that educational institutions prioritize equipping every classroom with essential IT tools, such as computers, video projectors, and interactive whiteboards (IWBs), to ensure ubiquitous access to digital resources.

- Curricular Integration of ICT: It is crucial to seamlessly integrate ICT into official curricula and student textbooks. This can be achieved by designing and proposing activities that actively encourage the use of interactive digital resources, making ICT an intrinsic part of the learning process rather than an optional add-on.

- Professional Development for Educators: We propose systematic programming of pedagogical days and continuous in-service training activities specifically tailored for teachers. Such initiatives would empower educators with the necessary skills and confidence to effectively leverage ICT in their pedagogical practices.

In conclusion, while this study provides clear answers to our initial inquiries, its results simultaneously open new and exciting avenues for future research. It strongly suggests the need for deeper investigations into the role of ICT as a significant motivating factor in the learning experiences of struggling students within the classroom context. Moreover, ICT holds immense potential as a valuable tool within active pedagogies, capable of activating students' existing knowledge, fostering new skills, and enhancing interpersonal competencies. This, in turn, can facilitate more profound learning and the construction of new knowledge, ultimately enabling these students to engage more readily with their studies, improve their academic performance, and achieve greater success.

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APPENDIX QUESTIONNAIRE

Questionnaire about Pedagogical Integration of ICT and Interactive Videos: Their Effects on the Learning of Struggling Students in High School.

Introduction

This questionnaire is intended for struggling students in the first year of high school. It is part of a training project within which we are conducting educational research on the topic: ***Pedagogical Integration of ICT and Interactive Videos: Their Effects on the Learning of Struggling Students in High School*.**

The responses collected will be used to help improve the integration of ICT into teachers' classroom practices.

We kindly ask you to answer all the questions.Thank you very much for your cooperation.

Introduction

Ce questionnaire est destiné aux élèves en difficultés du Tronc commun, il s'intègre dans le cadre d'un projet de fin de formation, dans lequel nous menons une recherche pédagogique concernant L'intégration des TIC en secondaire qualifiant et son impact sur les apprentissages des élèves en difficultés.

Il sera exploité afin d'améliorer l'usage des TIC dans les pratiques pédagogiques des enseignants en classe.

Veuillez répondre à toutes les questions. Merci beaucoup de votre collaboration

You are:

□ Girl □ Boy

Your age:

□ Between 14 and 15 □ Between 16and 17 □ Between 18 and 19

Your current class:

□ Scientific Core
□ Literary Core
□ Vocational Core

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2. Personal use of ICT

Do you use a computer?

□ Without help □ Sometimes need help □ Need full assistance

How would you rate your digital skills?

□ Fairly average □ Average □ Excellent

Do you have an internet connection at home?

□ Yes □ No

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3. Use of ICT in the Classroom

The use of ICT in class is: *(Multiple answers possible)*
□ Useful
□ Adapted to your needs
□ Satisfactory
□ Develop your learning autonomy
□ Efficient for your learning

In your opinion, learning with ICT is:
□ Not motivating □ Moderately motivating □ Motivating □ Very motivating

When using ICT in class, do you feel that course presentations, simulations, and exercises are improved?
□ Strongly disagree □ Moderately agree □ Completely agree

Which format do you prefer for class presentations?
□ Blackboard □ Video projector

How does using ICT influence your learning? *(Multiple answers possible)*

- □ Makes you eager to discover new knowledge
- □ Sparks curiosity to explore different ways of thinking and studying
- □ Encourages research
- □ Increases interest in learning activities
- □ Stimulates the desire to learn
- □ Motivates academic progress
- □ Develops intellectual skills
- □ Facilitates learning

By using ICT in class, do you feel that your grades have improved?
□ Completely disagree □ Averagely agree □ Completely agree

How do you perceive the future of computers as learning tools in the classroom? *(Multiple answers possible)*
□ It is a tool that lets me work at my own speed
□ An essential tool to overcome my academic difficulties.
□ A tool that helps me work easily with my peers.

Are you satisfied with the quality of digital tools available in the GENIE classroom?
□ Dissatisfied □ Satisfied □ Very satisfied