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Blended Learning in Moulay Ismail University: An Innovative Path to Promote the Mixed Learning of the LC Module

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Abstract

The aim of this article is to design, test, and evaluate a hybrid teaching system tailored to the Languages and Communication (LC) module within universities with selective admissions. This Blended Learning approach is intended to serve as an additional learning resource. The platform is heavily influenced by recent educational reforms, drawing on interactive paradigms that align with contemporary pedagogical and instructional strategies in the digital age. Situated within an action-research-intervention framework, this article presents and evaluates the initial version of the developed system. Through a newly conducted experiment, we identified key success factors, gathered insights, and analyzed the challenges related to the pedagogical, methodological, and technological aspects of the experience. This descriptive and analytical research uses action-research methods. This technique uses repeated questioning in an iterative framework to identify problems, prepare solutions, and experiment. Changing questions and goals during this cycle ensures ongoing refining and progress. The following study aims to target only the Faculty of Sciences and Techniques in Errachidia, particularly the students of MIP and BCG students parcours in a two-stage survey. The anonymous questionnaire assessed their views on Blended Learning for language and communication modules and examines their use, efficacy, and performance of blended learning tools and social networks and their motives for personalising learning. This paper evaluates the first and second learning framework versions to identify successes, gather student viewpoints, and analyse educational, methodological, and technological problems in order to provide possible technopedagogical scenarios to boost Blended Learning methods in Morocco.

Keywords: action-research, Blended Learning, experimentation, evaluation, insights, contributions, limitations.

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1. Introduction

In the current educational landscape, the capacity of universities is increasingly failing to meet societal demands. Beyond the challenges posed by massification and shifting national and international dynamics, issues such as faculty retirements, a decline in administrative and technical staff, and inadequate infrastructure have unveiled profound structural, organizational, and pedagogical dysfunctions. Additionally, the linguistic disconnect between secondary and higher education, along with insufficient disciplinary grounding among recent graduates, has resulted in inadequate preparation for the labor market. The urgent need to harness new technologies to address these challenges has become a central topic of discourse. The revolution in information and communication technologies (ICT) and the advancement of the digital society necessitate a novel approach to these issues. To improve the quality of education, the integration of innovative pedagogies in higher education is essential. Given the lack of dedicated platforms for blended or distance learning, the new higher education reform, Pacte ESRI 2030, underscores the importance of implementing hybrid systems to foster personalized language instruction.

The pedagogical framework of regulated scientific and technical universities, which operate under a modular system, requires students to undertake six modules per semester, including the Languages and Communication (LC) modules embedded in the core curriculum. Within this ambitious program, students face significant linguistic and communicative challenges in French, both spoken and written. This language barrier is a critical obstacle that severely hampers their academic progression (Vaughan, 2007).

To mitigate these challenges, a hybrid teaching system has been conceptualized and implemented. This educational platform serves as a supplementary learning resource, specifically designed to support students by adapting to their individual learning paces, needs, and availability. It addresses the difficulties they encounter (Mozelius and Hettiarachchi, 2017). This system embodies a Blended Learning approach, offering access to courses, guided exercises, and self-assessment through online tests and other evaluation methods. Through this platform, students gain access to digital resources, interactive courses, supportive materials, and exercises aimed at language consolidation. It also includes instruction in communication and presentation techniques, additional pedagogical content, sample exams with solutions, and navigation tutorials. The overarching goal of this system is to provide comprehensive solutions to students' queries through an interactive bimodal approach.

Following the articulation of the research project's objectives, we will present the Blended Learning approach in both its initial and revised iterations and analyze this digital learning support within the context of scientific and technical higher education. This analysis will be guided by the methodologies and criteria established (Mellot et al., 2020) to evaluate the platform, which is based on interactive models and approaches, such as the flipped classroom model.

The primary objective is to develop a pedagogical scenario framework. This process begins with the creation of essential digital resources and the remote viewing of recorded lectures, systematically organized by modules into playlists. It includes the preparation of synthesis reports and the execution of practical activities within the classroom. During the evaluation phase, we will identify the successes and challenges encountered. Finally, we will discuss the impact factors and limitations of this initiative, which will be the focal point of subsequent action-research efforts (Lebrun and Deschryver, 2014).

2. The First Version of Blended Learning

This project is embedded within an action-research-resolution framework that functions through continuous cycles of planning, action, observation, reflection, and replanning. It specifically targets students within the core curriculum of the Faculty of Science and Technology of Errachidia at Moulay Ismail University. The primary objective is to establish a hybrid teaching system for the Languages and Communication (LC) module. As articulated by Marcel Lebrun, a system constitutes a coherent ensemble of resources, strategies, methods, and actors that interact within a specific context to achieve a defined goal. Blended Learning, as defined by Kiran Lata Dangwal (2017), is an innovative concept that merges the benefits of traditional classroom instruction with ICT-supported learning, encompassing both offline and online modalities.

The web platform developed through this project aims to seamlessly integrate learning experiences both in the classroom and online (Avazmatova, 2020). This approach holds the potential to become a dominant pedagogical model in the future (Garrison and Kanuka, 2004). The system is designed to alleviate the demands of in-person training, while simultaneously supporting students and guiding them towards self-regulated learning. Both the initial and revised versions of this platform were conceived, tested, and evaluated with active participation from faculty and students. The updated version, which is integrated with social media, draws

significantly from recent educational reforms and is informed by Constructivist and Socio-Constructivist paradigms, along with innovative interactive approaches.

The initial version of the Blended Learning system was developed as part of a final-year internship in Information Systems and Software Engineering (SIGL). The project's goal was to create and implement a dynamic website for the Language, Communication, and Entrepreneurship department at FST-E. This platform was designed to facilitate the teaching and learning of French, English, communication techniques, and additional modules in management and entrepreneurship for students across various disciplines at the institution.

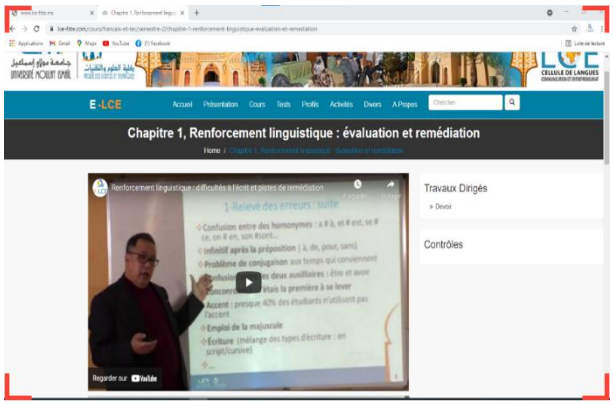
The system is intended for use by both faculty and students within regulated universities nationwide. The Competice tool outlines five scenarios: enhanced face-to-face, reduced face-to-face, existing or non-existent face-to-face, and minimized face-to-face interaction. The minimized face-to-face scenario was selected for the development of our platform. The training content in this scenario combines both in-person and distance learning. The instructor plays a critical role in providing explanations, guidance, simplification, evaluation, and motivation. In this configuration, the learner is positioned at the center of the implemented system, becoming highly active and engaged in the learning process.

3. Material Presentation and Advantages of the Blended Learning Platform in Higher Education

The Blended Learning platform has been meticulously developed and launched online for experimental use. It has undergone a comprehensive evaluation across various dimensions, with active student participation to better understand its strengths and identify areas for improvement. As previously noted, the evaluation of e-learning courses is essential for measuring their effectiveness and facilitating ongoing enhancements to deliver a memorable and impactful learning experience (Nou, 2022).

The platform offers a range of advantages, although post-implementation, certain limitations have surfaced that warrant attention to optimize its performance. One of the key strengths of the platform lies in its design, which adheres to a graphical layout that aligns with the brand colors specified in the usage charter of UMI. This alignment ensures consistency and visual coherence. The platform provides students with access to courses in French and communication, English, and modules in entrepreneurship and soft skills, all of which have been outlined and approved by the relevant authorities. These courses are structured as

educational *learning units* or *granules*, which can be combined to create a cohesive learning pathway. This granularization strategy involves breaking down content into the smallest independent units possible, allowing for flexible combination and recombination to suit various learning needs (Amal, Cherkaoui, and Mammass, 2012). In addition to a diverse array of digital resources, the platform supports the creation of a mailing list that includes students from various programs and disciplines. This feature enables professors to maintain continuous communication with students, ensuring the broad dissemination of information and facilitating the tracking of graduates throughout their careers, extending beyond their time at the institution. Understanding the significance of social interactions in learning and recognizing that the target audience comprises digital natives who are highly connected, the platform has been integrated with social networks and provides direct access to the *YouTube* page (lce-fste) as indicated in figures 1. This page hosts video sequences related to the courses, practical work, micro-sessions, and other departmental activities, as well as scientific and socio-cultural extracurricular programs of the institution. Furthermore, the platform has been designed with ergonomic considerations to ensure that users can navigate it with ease.



French *English*

Figure 1. *English and French Blended Learning Courses on the platform*

Ergonomics, defined as the body of scientific knowledge related to humans needed to design tools, machines, and systems that can be used with maximum comfort, safety, and efficiency (Brangier, 2019), plays a crucial role in enhancing the user experience. Users can freely access collected content and data sources, and they can interact through a *comments* section available after each course. This feedback mechanism fosters engagement between students and professors, allowing for the clarification of questions and deeper exploration of topics discussed. Users of the platform are categorized as administrators, users, or teachers, each with specific access and interaction capabilities. Additionally, the platform is optimized for

compatibility with mobile devices, such as smartphones and tablets, enabling students to download content for offline access as needed. It also facilitates further research by providing links to related curricula and international online applications at the footer, enhancing the overall utility and connectivity of the platform.

4. Platform Management and Student Satisfaction

The Blended Learning platform's installation, configuration, and management are straightforward, allowing the administrator to efficiently organize data sources, develop content, and manage files in various formats such as Word documents, PowerPoint presentations, PDFs, and videos. This simplicity extends to the platform's users, who can access the required content with ease, regardless of their technical expertise. The platform's flexibility in deployment was reflected in student feedback during the 2019/2020 academic year. Students expressed satisfaction with the platform, appreciating its capacity to support autonomous learning and guide them towards self-regulation. It also serves as a valuable resource for refreshing acquired knowledge or catching up on missed content.

5. Challenges Observed with the Platform

Despite its functional deployment, the platform presents several challenges that hinder its effectiveness. Primarily, it adheres to a lecture-based, directive teaching model that contrasts with the socio-constructivist paradigm outlined in the theoretical framework. This paradigm advocates for active and interactive approaches that encourage the co-construction of knowledge. However, the platform currently facilitates unidirectional information delivery, lacking the reciprocal interaction necessary for effective regulatory feedback.

Moreover, the platform does not provide students with opportunities to complete exercises or take online tests. While a comments section exists, the absence of an interactive forum or synchronous chat limits direct communication with professors, thereby restricting the potential for engaging discussions and activities. Additionally, the platform fails to offer online placement tests that would enable students to assess their proficiency in French according to the Common European Framework of Reference for Languages (CEFR) (CECRL 2022).

Another significant drawback is the cumbersome process required to modify educational units containing files (PPT, DOC, PDF, or videos). Any changes necessitate re-uploading and reordering all files according to the program's progression, leading to inefficiencies in maintaining the platform's content. Additionally, the lack of automated applications hinders the

platform's ability to evaluate its performance in terms of user visits, interactions, and cybersecurity.

The platform also struggles with file management, as it does not support the insertion of multiple downloadable files per chapter, limiting the availability of practical exercises and tests. The absence of essential educational units and audiovisual materials further exacerbates this issue, necessitating the digitization and diversification of materials to ensure comprehensive access to content.

Furthermore, the platform lacks links to similar pedagogical and didactic sites that could provide users with additional resources or complementary information. The inability to download content from static sections, such as the Presentation page, poses a challenge for users needing to make updates or corrections. This limitation requires repeated revisits to the source to update and revise the content.

The platform's footer requires a redesign to enhance its attractiveness, and the inactive *Search* function needs activation. Adding sections such as *Articles/Documentation/Forum* to the page header could also improve the platform's functionality. Additionally, the site's font type, size, and style should be reviewed to improve its visual appeal, particularly concerning the difficulty in displaying article titles on the scrolling homepage.

Concerns about the platform's scalability must also be addressed, particularly in terms of accommodating increased data storage and a growing number of users. Revisiting the platform's foundational architecture may be necessary to resolve these issues. Furthermore, the platform lacks tools for administrators to identify, monitor, and audit content usage, conduct impact analyses, and diagnose performance-related issues. Addressing these limitations will be crucial for enhancing the platform's overall effectiveness and user experience.

In fact, improving a blended learning platform as indicated in figure 2 needs a relentless, daily endeavor that demands constant resilience, vigilance and adaptation. Content must be continuously updated to stay relevant, while the platform itself requires ongoing technical maintenance to integrate new features and ensure security. Student feedback fuels regular adjustments to enhance the learning experience, and efforts to boost interaction and engagement are crucial in maintaining an active learning environment. Monitoring the platform's performance and integrating emerging technologies are ongoing challenges, making the refinement of blended learning an ever-evolving process. Each day brings new opportunities to

refine and elevate the platform, ensuring it meets the dynamic needs of both students and educators (Vaughan, 2007) to meet students' appreciation as shown in table 1.

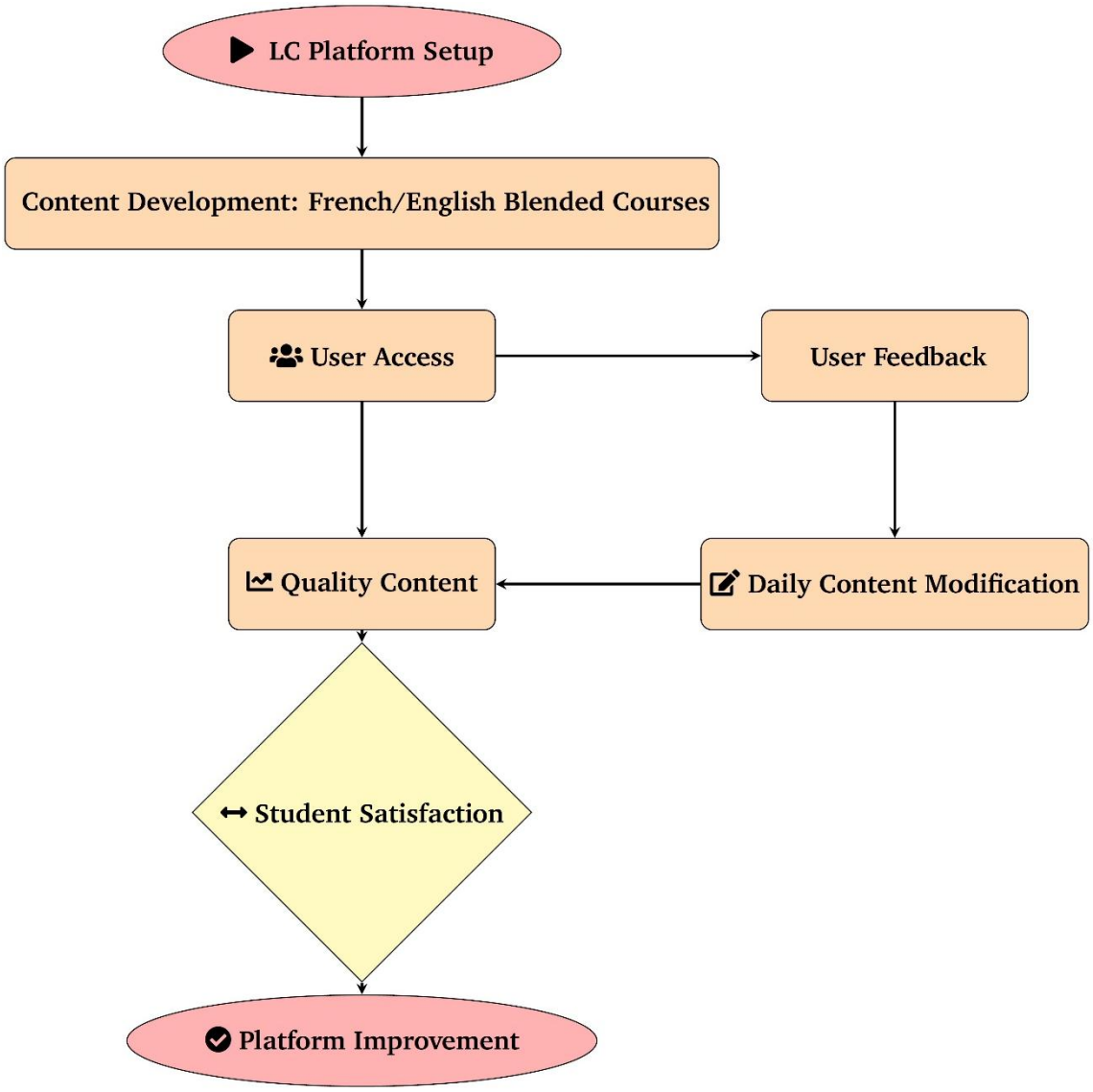


Figure 2. *Our Blended Learning Platform Process and Daily Challenges*

Table 1. *Appreciation of the Web Platform*

Response Category	Number of Respondents (n)	Percentage (%)
Beaucoup (A lot)	372	66.1%
Un peu (A little)	172	30.6%
Mal (Badly)	19	3.4%
Total	**563**	**100.00%**

6. Research Methodology

The study tries to gauge our efforts to create a hybrid language acquisition model for Moulay Ismail University inside the Faculty of Sciences and Techniques in Errachidia. In addition to in-person lectures by Professors Mohammed Nou and Azelmad Said in the university auditorium, a specialised platform offers online courses and YouTube lectures. This blended learning strategy combines presential and digital teaching techniques to improve student engagement and learning to the LC module. Our survey targeted only the Maths, Informatics, Physics (MIP) and Biology, Chemistry, and Geology (BCG) students. Both disciplines in the faculty include students from Morocco and all the neighbouring cities, added to other African countries students. All of the students must take the three-core language and communication programs during the two semesters, due to the importance of LC in their parkour. Henceforward, both parkours are our sampling population in the study. The collected data is saved through online Google Forms, in which We measured 375 replies. A questionnaire is used to analyse student impressions of the blended learning system deployed in August 2020. This survey targeted 4,155 program students. The platform will be improved based on feedback to provide a high-quality learning experience in-person and online with all essential material. A rigorous statistical technique is utilised to provide a beneficial statistical feedback for interpretation.

7. Student Perspectives on the Initial Version of the Blended Learning Platform

Our survey, encompassing 563 students, provided valuable insights into the reception of the initial Blended Learning platform. A significant 66.1% of respondents highly valued the platform, appreciating its role as a supplementary learning resource. In contrast, 30.6% expressed moderate interest, while 3.4% rated it poorly, though the reasons for dissatisfaction—whether technical issues or content-related concerns—were not specified. Despite these mixed reviews, students generally felt positive about having an additional tool to refresh their knowledge or catch up on missed content. This feedback highlighted the need for ongoing reconstruction and maintenance of the platform. In response, we collaborated with specialized researchers to develop a new, improved version of the platform, aiming to better align pedagogy with technology and enhance the learning experience.

8. Advancements and Enhancements in the Blended Learning Platform

Building on the evaluation of the initial version and incorporating stakeholder feedback, the Blended Learning platform was significantly refined. The second version, developed as part of a Final Year Project in Software Engineering at FST-E, represents a major step forward. This updated platform (figure 3) exemplifies the principles of blended learning by merging in-person and online instruction, thus offering a robust and flexible educational tool. It provides students with access to extensive resources, including course materials, practical work, and activities across various subjects such as foreign languages, French, and English. This initiative is aligned with the new reform's focus on hybrid learning tools and the enhancement of foreign language and soft skills education. The revised platform not only addresses the challenges identified in the initial version but also facilitates a new learning posture, enabling students to engage more effectively with modern teaching methods through interactive links and networks. As a result, this enhanced portal aims to enrich the university's distance learning experience, providing a more organized and efficient web space for student interaction and knowledge acquisition (Drechsler, 2017).

Figure 3. *LC Module description*

9. Architecture of the Blended Learning Platform

The second iteration of the Blended Learning platform retains the familiar graphic design of its predecessor while integrating updates to enhance functionality. The platform's main menu includes key sections: Home, Presentations, Modules, Media, Tests, Forum, Activities, and Documentation. The Home section features updates on various activities, online services, and

educational resources, while the footer provides links to frequently visited official sites and contact details for ongoing communication with professors and program coordinators.

The homepage connects users to social media platforms like Facebook, YouTube, and Instagram, fostering community engagement. The *Presentations* section introduces FSTE, detailing its technical specifications, administrative structure, and course offerings in French and English. It also provides an overview of the Language and Communication Cell and a portfolio showcasing institutional facilities and activities.

Grounded in socio-constructivism, connectivism, and active pedagogical approaches, the platform promotes synchronous and asynchronous interactions. The *Modules* section facilitates learning through various language modules (French and English) and soft skills courses mandated by recent reforms. This section includes detailed course descriptions, organized content, and interactive elements such as downloadable PDFs, PPTs, and automated guided exercises.

The *Control* module allows students to take online tests and submit assignments, with results managed and reviewed by administrators. The *Media* section supports synchronous discussions via chat and videoconferencing, while the *Activities* section highlights socio-cultural and sports events organized by students. Additionally, the platform includes a toolkit for language placement tests aligned with the Common European Framework of Reference for Languages (CEFR). This toolkit features exercises in text, audio, and image formats, enabling students to self-assess and practice before formal exams. The platform aims to provide a comprehensive, interactive learning environment that supports both academic and personal development through its design, as highlighted in figure 4. The Blended Learning Platform LC boasts a sophisticated and multi-layered architecture designed to enhance the educational experience. It includes a variety of sections such as Home, Presentations, Modules, Media, Tests, Forum, Activities, and Documentation. Each section serves a specific function, from providing course content and multimedia resources to facilitating online assessments and fostering student interactions. The platform's dedicated Blended Learning Platform: French/English Courses section offers tools for self-assessment and practice, aligned with the CEFR. This rich architecture ensures a comprehensive, flexible, and engaging learning environment for students to improve their language competencies as indicated in figure 5.

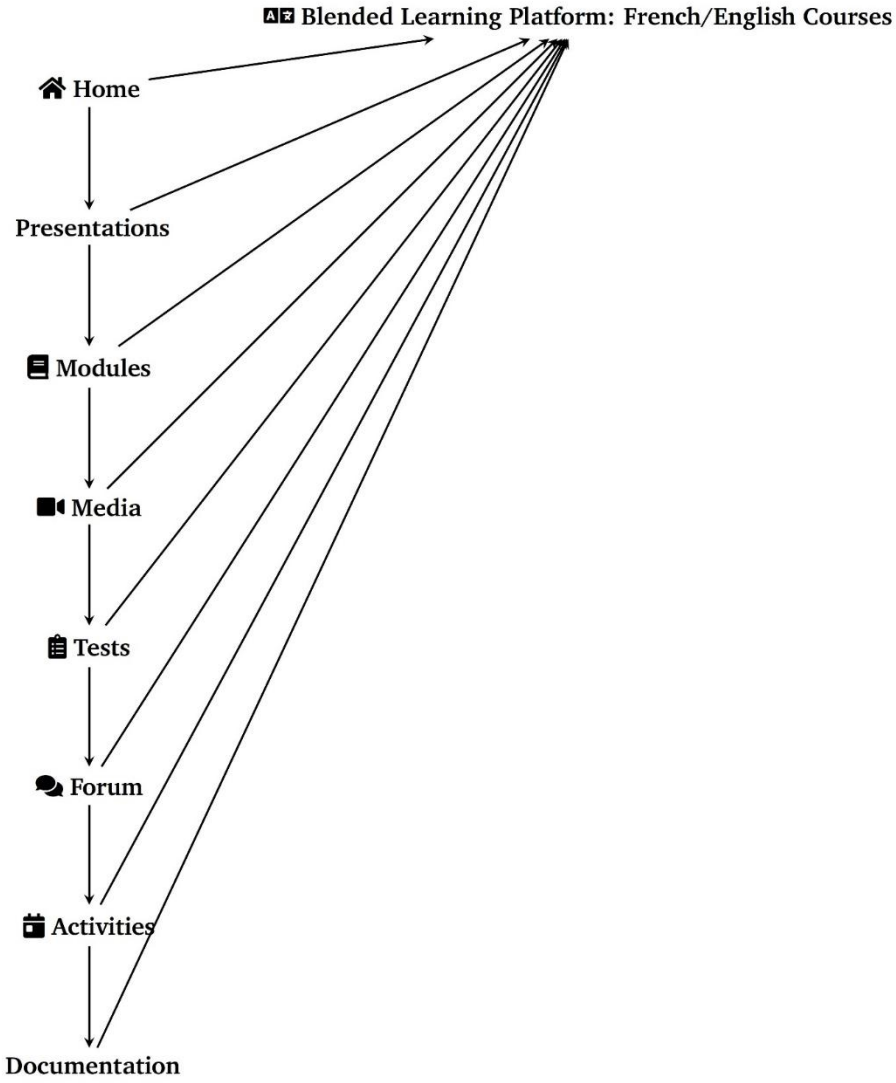


Figure 4. *Architecture of the Blended Learning Platform*

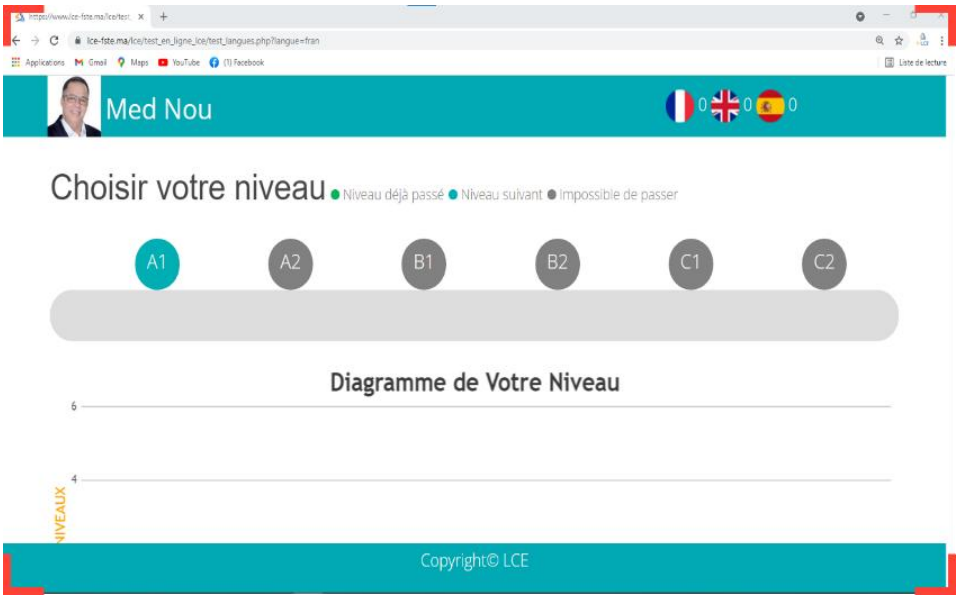


Figure 5. *Tests and CEFR Level Diagram in French and Englis*

10. Visitors' Experience and Documentation Access

Visitors to the Blended Learning Platform encounter an interactive forum designed to foster engagement and discussion on various topics. This forum provides a space for users to share information and participate actively. The *Documentation* section offers access to essential templates for administrative documents and professional writing tools, including request letters, cover letters, CVs, and versatile glossaries. To access these resources, users must register and authenticate themselves with a password. The platform also features a *Netiquette* communication protocol that outlines the code of conduct and usage rules, ensuring ethical and respectful interaction. This protocol supports a positive and effective communication environment by requiring users to accept its terms upon registration.

11. Experimentation and Evaluation

To evaluate user perceptions of the Blended Learning Platform, a survey was conducted among students who have been using the system since its launch in August 2020. With a user base of 1,879, the survey targeted 375 students from the Faculty of Science and Technology, specifically those in MIP and BCG programs across various semesters. The survey responses are instrumental in guiding future improvements to enhance both in-person and remote learning experiences. The survey results, depicted in Table 2, show a gender distribution of respondents closely mirroring the overall user base, with 45.9% male and 54.1% female. Figure 6 provides a visual representation of this distribution.

Table 2. *Distribution of Students by Gender, Program, and Study Level*

Gender	Program / Course	Study Level	Headcount	Percentage	Percentage by Gender
Female	BCG	Semester 1	9	2.40%	53.87%
		Semester 3	66	17.60%	
		Semester 5	23	6.13%	
	MIP	Semester 1	24	6.40%	
		Semester 3	63	16.80%	
		Semester 5	17	4.53%	
Male	BCG	Semester 1	2	0.53%	46.13%
		Semester 3	20	5.33%	
		Semester 5	21	5.60%	
	MIP	Semester 1	47	12.53%	
		Semester 3	57	15.20%	
		Semester 5	26	6.93%	
Total			**375**	**100%**	

Table 3 indicates that 61.6% of respondents discovered the platform during the introductory session organized by LCE professors. Additionally, 21.06% learned about it through word-of-mouth, and 16.3% found it via other websites. Most respondents visit the platform infrequently, mainly accessing it through social media links. Feedback reveals that 78% of users find the site content clear and understandable. Navigation is reported as easy by nearly 50% of respondents, while 35% occasionally face difficulties. The platform's design and configuration are similarly evaluated. The total number of site visits is 17,048, and the associated YouTube channel, launched in June 2019, has 1,740 subscribers and 53,930 views as of November 15, 2021.

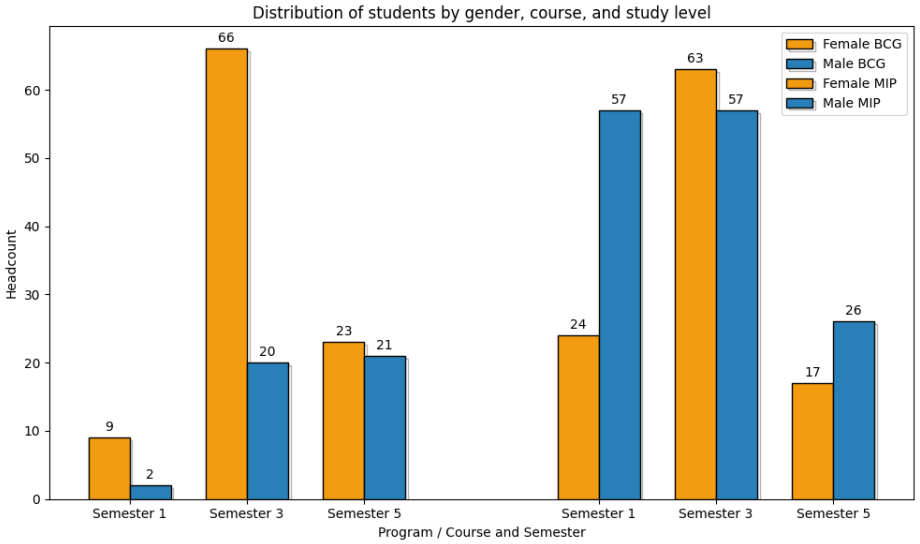


Figure 6. *Evaluation of participants according to gender, program, and study level.*

Table 3. *How Participants Discovered the LC Website by Gender and Program*

Program	Program / Course	Study Level	Headcount
	Female		
BCG	Word of Mouth	23	6.13%
BCG	Link from Another Site	18	4.80%
BCG	Introductory Session at FSTE	57	15.20%
MIP	Word of Mouth	24	6.40%
MIP	Link from Another Site	18	4.80%
MIP	Introductory Session at FSTE	62	16.53%
	Male		
BCG	Word of Mouth	8	2.13%
BCG	Link from Another Site	11	2.93%
BCG	Introductory Session at FSTE	24	6.40%
MIP	In-person communication	26	6.93%
MIP	Link from Another Site	16	4.27%
MIP	Introductory Session at FSTE	88	23.47%
Total		**375**	**100%**

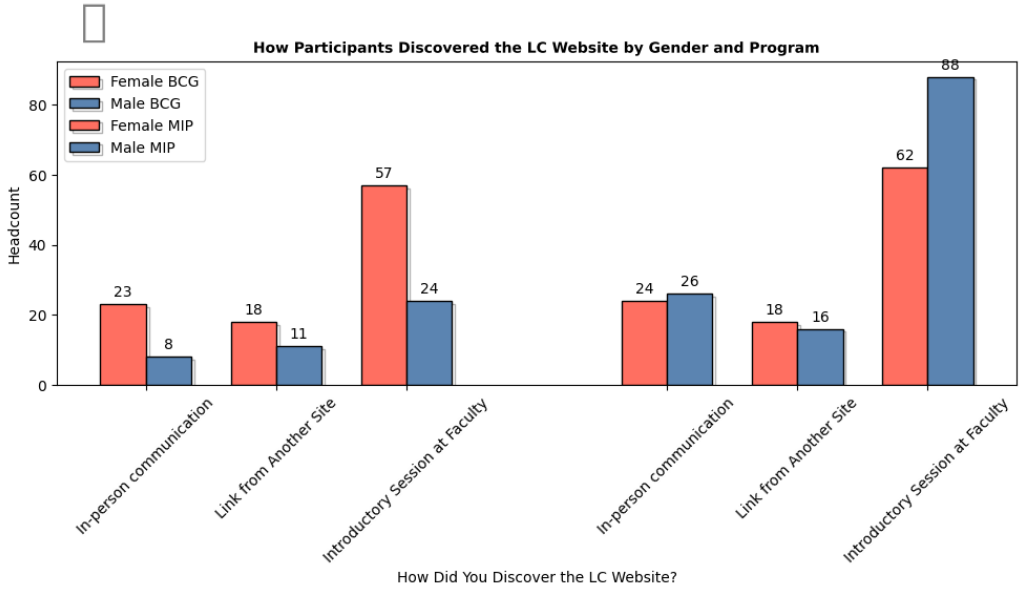


Figure 7. *Platform communication*

12. Respondents' Perceptions of the Platform

Student feedback on the Blended Learning Platform has been overwhelmingly positive. Many students appreciate the platform's role in facilitating learning, especially during the pandemic, and value its detailed and organized course materials. The platform is seen as a valuable support tool, particularly for those struggling with traditional learning methods. However, some students express a preference for in-person classes, citing the benefits of direct interaction, practical activities, and discussions. While the platform aids in exam preparation and offers flexible access to virtual classes, some students experience feelings of isolation with online-only learning. Technical issues are occasionally encountered but are addressed by the site administrator.

13. Results and Observations

The recent data on the Blended Learning Platform underscores its growing impact and effectiveness. The platform has seen a substantial increase in user engagement, with total visits reaching 39,850. Concurrently, the number of registered users has surged to 3,736, and the YouTube channel now boasts 4,100 subscribers. These statistics highlight a significant evolution in the platform's reach and influence, as illustrated by the accompanying charts and graphs.

The YouTube channel has been particularly successful in engaging the target audience. As of September 15, 2023, it has accumulated 180,000 views and averaged 200 hours of viewing per

day. This robust engagement underscores the channel's role in delivering valuable content to students and educators. The channel's growth is evident, with the number of videos expanding to 115, organized into playlists, reflecting the ongoing effort to enrich digital resources for the educational community.

The surge in viewership, from 65,500 views in 2021 to 180,000 in 2023, highlights a transformative shift towards digital platforms in education. This increase not only demonstrates the growing reliance on online resources but also signals the efficacy of the YouTube channel in enhancing blended learning experiences. The data reveals a notable uptick in views between 2022 and 2023, suggesting that improvements in content, visibility, or audience engagement have contributed to this upward trend.

Furthermore, the data on how participants discovered the Learning Center (LC) website accentuates the significance of digital communication in education. While traditional face-to-face interactions remain crucial, digital platforms such as YouTube have become essential in reaching and engaging students. The majority of students, particularly those in the Male MIP group, were introduced to the LC website through faculty-led introductory sessions. Others found the site through in-person communication or external links, emphasizing the blend of traditional and digital methods in contemporary education.

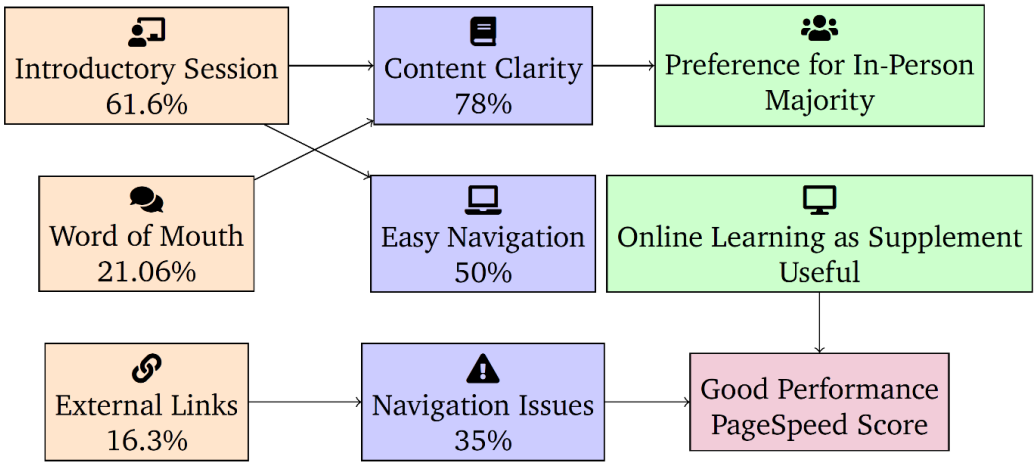


Figure 8. *Summary*

In summary, the increasing viewership of the YouTube channel and the expanding user base of the Blended Learning Platform highlight the vital role of digital resources in modern education. The strategic integration of these tools enhances the accessibility and effectiveness of educational content, bridging the gap between in-person and online learning. As higher education institutions continue to refine their blended learning strategies, leveraging platforms

like YouTube will be crucial in broadening the reach and impact of educational resources, catering to diverse learning preferences, and ultimately improving educational outcomes.

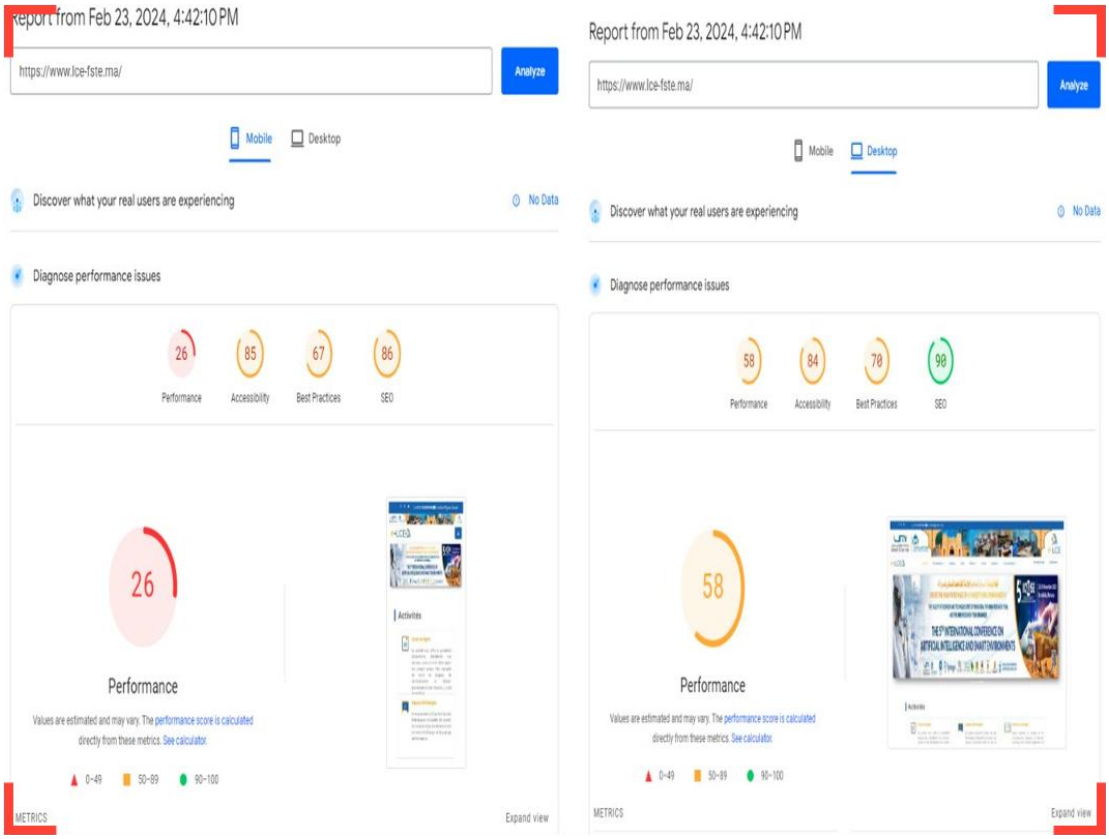


Figure 9. *The Platform Performance*

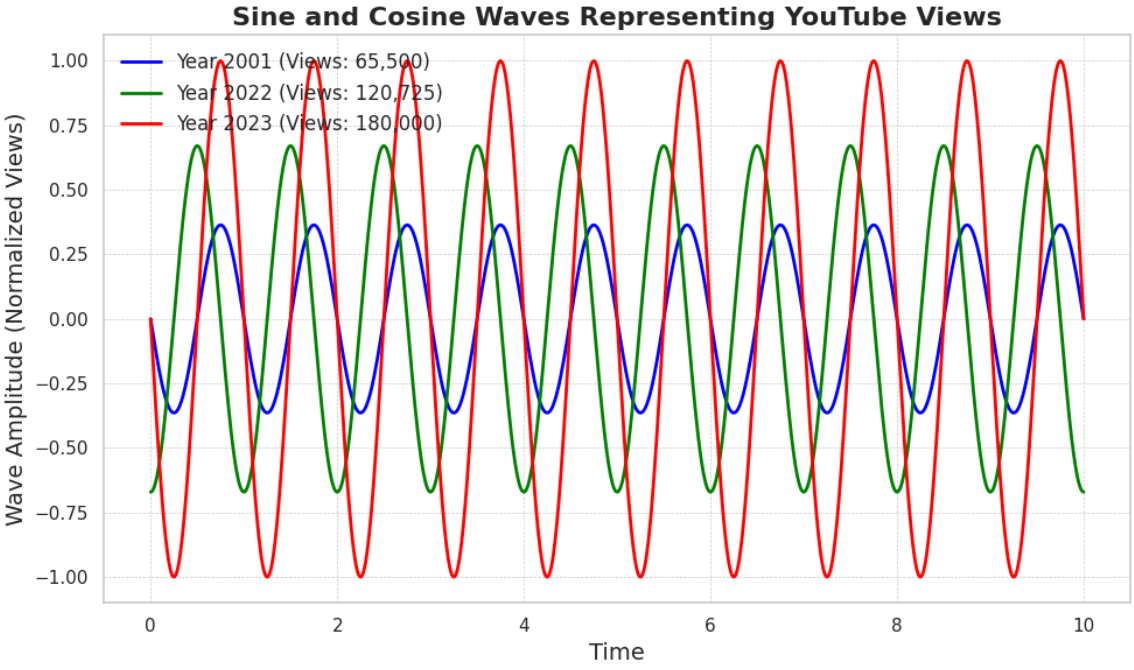


Figure 10. *French courses evolution*

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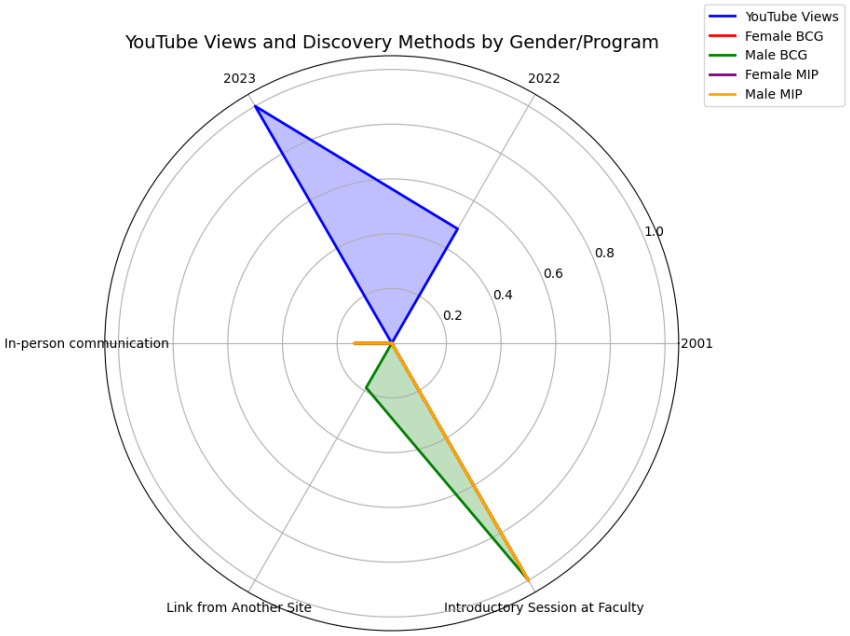

Figure 11. *YouTube views and discovery methods by gender/program*

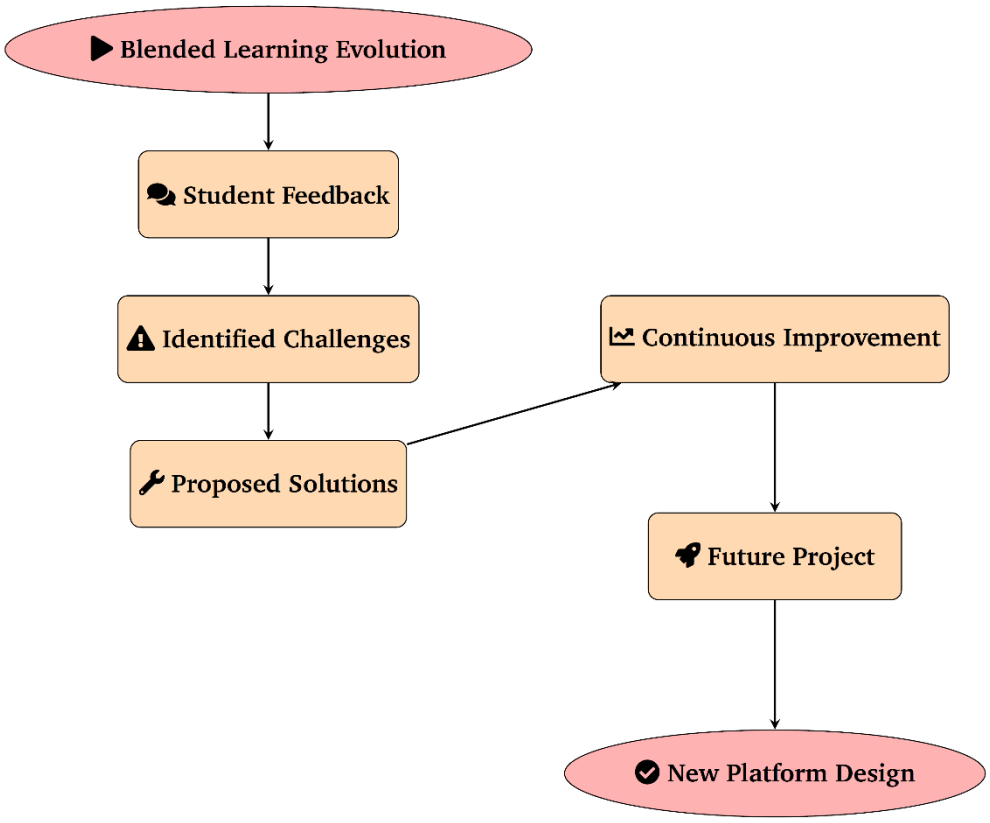

Figure 12. *Taxonomy for a Blended Learning Evolution*

14. Analysis of Platform Growth from 2021 to 2024

The platform's visitor statistics from 2021 to 2024 in figure 13 shows a constant boost in engagement and highlights the impact of the blended learning system changes. With just 1,900

visitors in 2021, the platform was likely in its infancy, with little adoption of the hybrid learning model still being developed. Due to key advancements such integrating presential lectures and internet resources like YouTube lectures, visits increased to 31,673 by 2022. These improvements greatly increased access and flexibility, accommodating more learning styles.

With 39,850 visitors in 2023, the platform's usefulness and hybrid learning models' performance in supporting student autonomy and self-directed learning increased. Accessing information in-person and online likely improved engagement and learning. The portal received 44,770 visits by May 2024, proving the blended learning improvements' worth. This consistent growth shows that students are increasingly using this approach for personalised and dynamic learning.

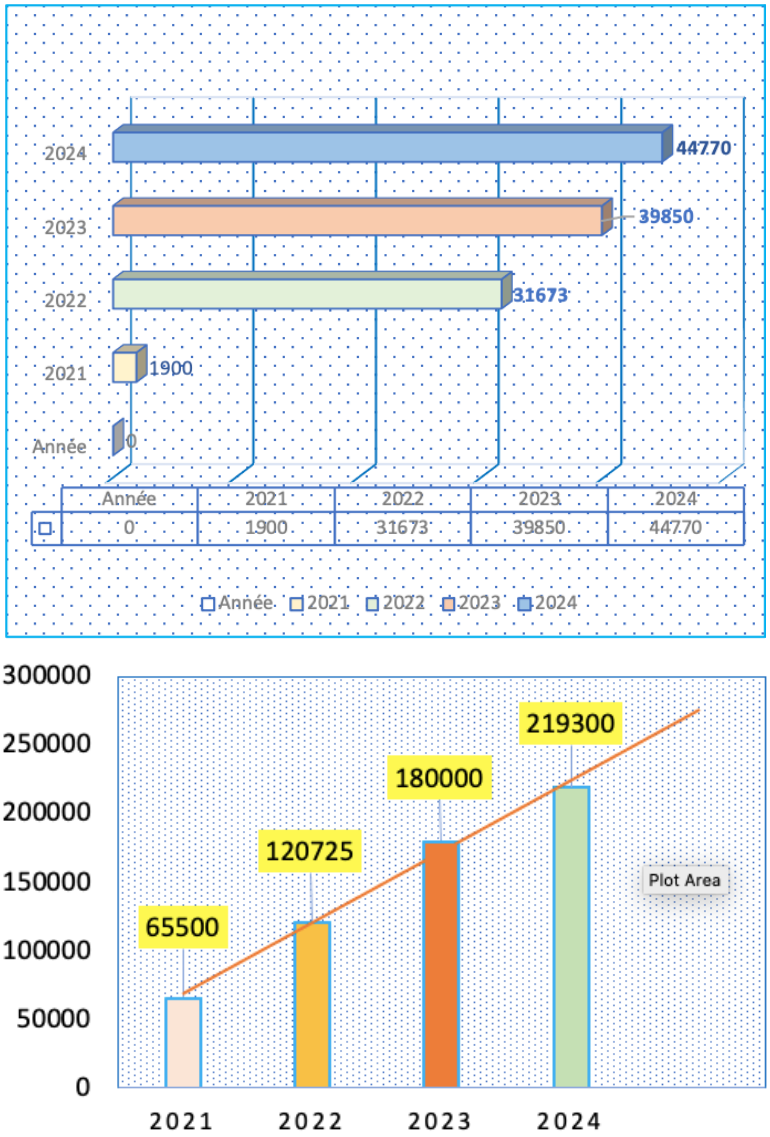

Figure 13. *Number of visits*

Changes to the blended learning system have improved accessibility and education quality, making it successful. Digital resource improvements and presential support have kept the platform fresh and successful in meeting the different demands of students locally and abroad.

Furthermore, the growth in platform visitors, as well as the increase in registered users and YouTube subscribers (4,026 and 4,744 respectively by May 2024) for the French courses, suggests that the platform's reach is expanding across different mediums. The year-on-year growth shows that the platform has been able to maintain and likely improve the quality of its offerings, leading to a consistent increase in engagement.

15.Recommendations

To advance educational taxonomy in Moroccan universities, a strategic investment in several key areas is essential. Universities should allocate dedicated funds for high-quality content creation, including purchasing recording equipment, acquiring software, and hiring technical support. Enhancing educational resources through multimedia development, translation, and professional expertise is also crucial. Strengthening infrastructure by investing in Learning Management Systems, technical support, and cybersecurity will ensure reliable and secure digital environments. Additionally, funding training programs for faculty and supporting ongoing professional development will keep educators updated on best practices. Investing in research and innovation, including grants for new teaching methods and pilot programs, will foster continuous improvement. This comprehensive approach not only alleviates financial burdens on faculty but also enriches the learning experience, ultimately supporting academic excellence and student success.

16. Conclusion

In this article, we have explored the evolution of Blended Learning related to the teaching and learning of LC modules through its initial and subsequent versions. These iterations, which have been tested and evaluated, have highlighted both successful elements and areas needing improvement. Engaging the target audience in this evaluation process has proven essential, as their feedback provides valuable insights for refining and enhancing the E-Learning experience.

To address the challenges identified, several solutions are proposed: fostering self-directed learning (Moisan, 2010) to align with individual learning paces, addressing student needs, and optimizing the use of human and material resources. Given that language, methodological, and communicative skills are crucial in scientific and technical training, the development of virtual

classes and online resources is indispensable. Online learning provides a flexible and accessible means to support students, overcome spatial and temporal constraints, and facilitate engagement with scientific content through accessible courses, assignments, video materials, and remote assessments.

Feedback from students responding to evaluation questionnaires indicates general satisfaction with the platform's provision of necessary materials. However, continuous efforts are needed to enhance the platform's technical and pedagogical performance. To ensure ongoing improvement of E-Learning services, it is crucial to incorporate feedback from students, educators, and other stakeholders. Effective evaluation should focus on the following aspects:

- Setting E-Learning objectives that align with adopted pedagogical paradigms and models, and developing a balanced scenario that integrates virtual classes with in-person sessions, involving technical actors, and meeting the needs and expectations of system users.
- Presenting courses and assignments in engaging and memorable formats, and creating a supportive space that captures the target audience's attention.
- Providing all program chapters with striking visuals, adhering to the principle that a picture is worth a thousand words, and developing more attractive materials for online publication.
- Expanding the range of exercises and materials by CEFR level to enable students to self-assess through placement tests in both oral and written forms.
- Designing relevant learning experiences based on learners' age groups and interests, ensuring availability, and encouraging participation in evaluations through the forum section. Additionally, addressing technical or pedagogical issues proactively (Nou, 2022).

Despite the positive aspects of this educational support, technical anomalies persist, affecting the system's performance and necessitating a complete redesign. In the framework of action research, we have decided to design a new project, inspired by various experiences, and involving all stakeholders—sponsors, students, teachers, tutors, administrators, IT specialists, graphic designers, and logisticians. This collaborative effort aims to develop a new platform using recent technologies and efficient software, incorporating agile functionalities within the framework of a final study project in collaboration with the computer engineering program.

Through specialized consultations and expert input, we aim to create an advanced and responsive learning environment that meets contemporary educational needs.

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