“The impact of LMS platforms on the development of smart education

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Abstract
The education system has been revolutionized by the application of Learning Management Systems (LMS), which have transformed traditional teaching methods. LMSs are critical in education, providing the tools for cooperation and communication needed to foster student-teacher interactions and transfer learning materials in virtual classrooms. Learning management platforms serve as the basic infrastructure for implementing Smart Education. Smart Education is not just about using technology but also about transforming learning and teaching approaches. The results of this study offer empirical insights into the experiences and perceptions of students at the Faculty of Business, "Aleksandër Moisiu" University, regarding the impact of LMS on learning processes. Using a structured questionnaire, this research examines how LMS platforms contribute to key dimensions of Smart Education, such as interaction, motivation, flexibility, and the development of students' digital skills.

Keywords: Student-Teacher Interaction, Virtual Classrooms, Digital Skills Development, Questionnaire.

1. Introduction
Traditional training and education methodologies, in which instructors explain the subject in the classroom and students complete exercises at home, are being replaced by new learning approaches [1]. All seek to promote interactive environments that foster the development of knowledge and ideas through a more collaborative, active approach than traditional teaching [2].

The COVID-19 pandemic compelled institutions to adopt online teaching to support the education system, and digital technologies were used as the primary means of preserving education. During the pandemic, online learning was the only possible solution. Later, as an alternative, the possibility emerged for students, teachers, and other groups to engage in informal learning activities in special spaces, such as educational centers, thematic museums, or international learning centers [3].

The digital transformation of education has become one of the most important directions of university reform in the last decade. A crucial element in the digital transformation of education is the availability of educational resources [4]. By integrating digital technology into the broader educational framework, policymakers can create a more cohesive and effective education system that prepares students for the demands of the digital age [2]. With the help of digitalization tools, the socioeconomic significance and effectiveness of

students' knowledge increases, and the educational process becomes more transparent, efficient, and effective [5]. Research on LMS platforms in higher education began in the late 90s and has steadily grown throughout the new century [6]. The education system is being transformed through the adoption of LMS technologies, enabling a comprehensive overview of learning processes and the performance of teachers and students, as well as the functioning of the administration and academic structures as a whole. Recent advancements in information and communication technologies have transformed instructional contexts into innovative learning environments [7]. In Demir's study [1], smart education is defined as "the effective and coherent use of information and communication technologies to achieve a learning outcome using an appropriate pedagogical approach". The goal of smart education is to foster a workforce that masters 21st-century knowledge and skills to meet society's needs and challenges [8]. One of the most common practices in these environments is the use of learning management systems (LMS), in which learners and instructors use a software platform to support and manage instructional activities aligned with predefined objectives [7].

LMSs have gained importance in recent years, particularly in universities, as a means to enhance educational outcomes and support online learning. However, they are underutilized in universities, despite being standard components of higher education [9]. In universities, learning management systems are essential in organizing course materials, encouraging student engagement, and streamlining administrative processes, supporting an intelligent learning environment. Educators can better provide curriculum, encourage student communication, and evaluate student achievement in a centralized digital environment provided by LMS [10].

2. Literature Review

A systematic study by Maluleke & Maake (2025) [11] analyzed the impact of LMS platform use in African higher education and identified the positive effects that LMSs have on teaching methodologies, linking studies and learning analysis.

Asrida, Amanda, & Ul Fadilah (2024) [12] analyzed the effectiveness and limitations of using LMS in English teaching and learning in the Indonesian context, concluding that LMS has significant potential to enhance learning quality by improving accessibility, flexibility, and student-teacher interaction. However, effectiveness is affected by users' technological skills and institutional support.

According to [13] Simelane-Mnisi (2023), academics agree that activities in LMS promote student interaction and engagement, creating active learning environments. In Aljad's (2023) study, it was found that educational institutions at various levels worldwide use LMSs as popular tools for effective e-learning management. Moodle is one of the most popular systems, followed by Blackboard and Google Classroom (GC). GC is widely used in Central and Eastern Europe. According to [7] Tinmaz and Lee (2020), age and gender variables did not make as significant a difference in LMS design as culture and school-year variables, indicating that the use of LMS platforms and student preferences vary across countries. The only difference observed was that male students tended to favor efficiency

when using the LMS. Male students valued downloading multiple files more than female students.

Urbanek et. al. (2022) [15] analyzed whether teachers' and students' digital communication skills improved after the COVID-19 pandemic, comparing three universities in Poland, the Czech Republic, and Slovakia. The results showed a significant increase in students' satisfaction with digital communication after the pandemic, especially in Poland. However, the changes were not uniform across countries, suggesting that national and institutional factors influence the improvement in digital communication.

The study by [16] Jeladze & Pata (2018) suggests that schools should create smart, digitally lean, sustainable, and resilient learning ecosystems through stakeholder activities, digital sensing, sharing of good practices, and feedback for change management.

Regarding an Albanian study [17] they conclude that the more informed students are about interactive teaching methods, the better they understand their use and relevance, thereby increasing their willingness to attend classes. Their findings show that lecture design, the application of interactive techniques, self-perception of effort, and students' ability to identify with the subject significantly influence class attendance, regardless of academic year or study workload. Other studies reported that communication with lecturers and classmates on the current platform is acceptable, and they requested improvements such as discussion forums, more interactive tools, and more frequent communication with academic staff. These concerns are in line with findings from Hamzallari [18], who, in a study conducted during online teaching at two public universities in Albania, reported that students reported "low levels of interaction with lecturers and peers", which was accompanied by a feeling of isolation in the virtual environment. An interesting finding from a study in Kosovo [19] shows that the tendency to continue online studies can differ by students' profiles: in a comparison between groups, English language students were significantly more willing to continue online learning than psychology students. This implies that motivation and preferences for learning through an LMS may depend on the nature of the study program and the students' learning style.

3. Methodology

- ***Population and Sampling***

We will use a structured survey approach to collect information from a specific demographic group. The participants in this study will be students of the Faculty of Business (UAMD). They will represent a wide range of demographic characteristics and study programs within the faculty, enabling a comprehensive understanding of their attitudes and perceptions regarding the research topic. Descriptive statistics were used to examine the impact of LMS utilization on smart education at the Faculty of Business, "Aleksandër Moisiu" University, Albania. The sample size consists of 210 students. To ensure that everyone can easily participate, we will collect data through an online survey platform. 60.6% of the candidates were students in the bachelor's program, and 39.4% were from the master's program. 7.7% were in the first year of a bachelor's, 7.7% in the second year, and 45.4% in the third year. As shown, 22.2% of the candidates were freshmen from master's programs, and 2nd-grade students comprised 16.9% of the sample (see appendix).

- ***Objective of the Study***

The purpose of our questionnaire is to determine how LMS platforms (e.g., Moodle, Google Classroom) incorporate the key elements of smart education. The objective of this study is to evaluate students' perceptions of digital learning platforms at UAMD, focusing on their usability, effectiveness, and contributions to teaching and learning. The study aims to identify strengths, challenges, and opportunities to improve the institution's digital infrastructure and advance Smart Education.

- ***Overview of the Questionnaire***

Using the platform is related to smart education because active use of LMS is a prerequisite for the development of intelligent learning environments. They serve as the basic infrastructure for the practical realization of smart education [10] by measuring the frequency and purpose of use.

A smart learning environment encompasses interaction and learning experience, measuring digital communication with lecturers and students, interactions between students, and the overall learning experience through the LMS. Student satisfaction with digital communication with teachers varies across countries [15]. In the smart education framework, motivation is an indicator of digital engagement and the effectiveness of data-driven learning. One of the most significant factors influencing students' academic achievement is their active participation in distance learning [20]. Some studies have also confirmed a lack of motivation to work in online classes, which, in turn, has led to higher dropout rates [15]. The core components of the smart education ecosystem are support and infrastructure, which enable the LMS to function effectively.

4. Results

Regarding Figure 1, the evaluation of traditional classroom teaching methods, the results show strong approval: 67.3% of students selected scale 4 (32.7%) and scale 5 (34.6%), indicating that most respondents consider traditional in-class teaching highly effective.

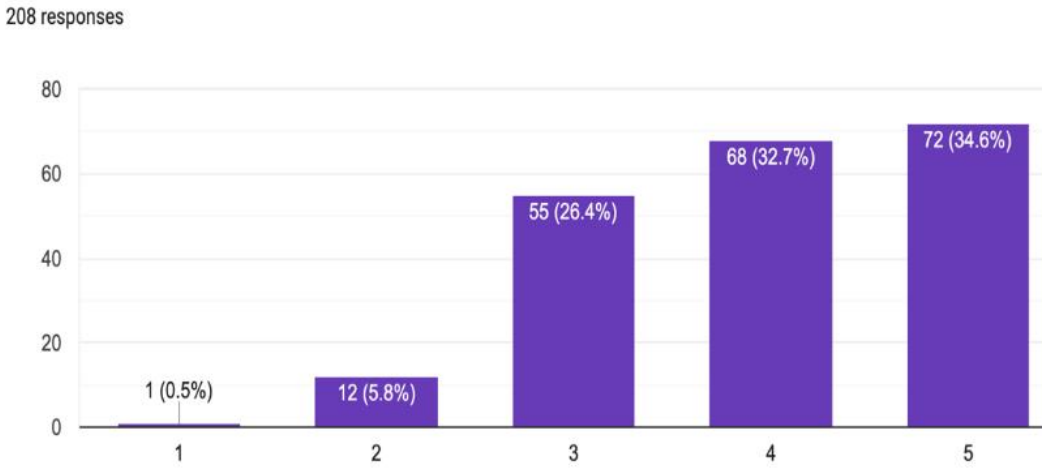


Fig. 1. How do you evaluate the traditional classroom teaching method
Source: Own calculations.

Regarding Figure 2, which of the following platforms does he use regularly? 95.7% of respondents from the Business Faculty use Classroom Google, and very few use Moodle (1.9%), since we don't have an official platform.

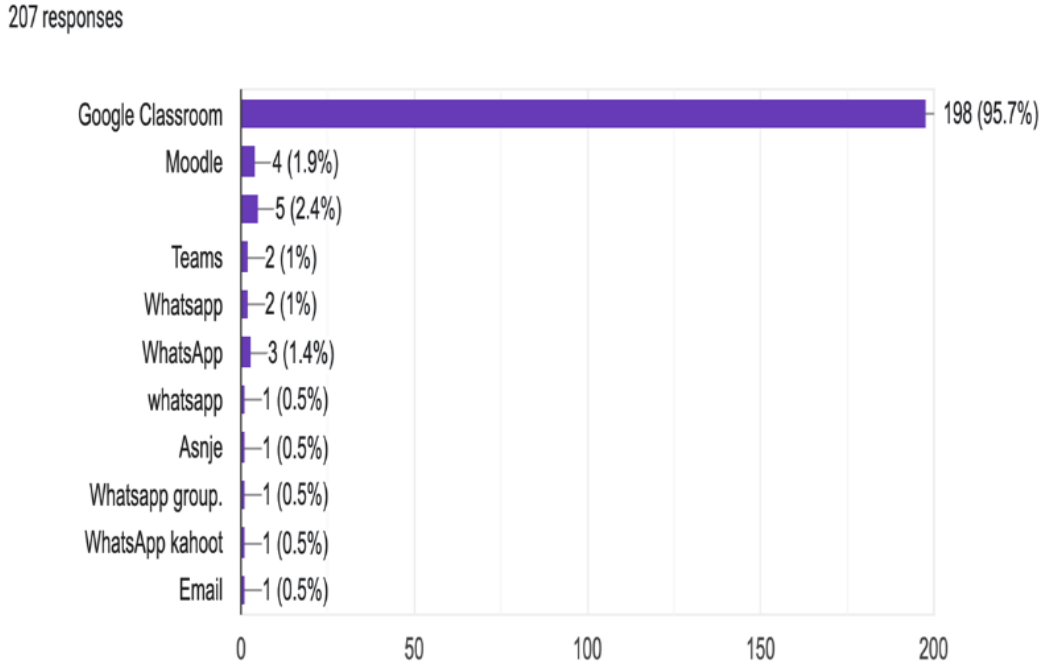


Fig. 2. Which of the following platforms do you use for your courses?
Source: Own calculations.

Regarding Figure 3, how often do they use the platform for each course? The students reflect a generally positive use, with the majority of responses concentrated in the mid-to-

high range. The most frequent response was scale 3 (32.7%), indicating moderate use of it in their courses. Additionally, 29.8% selected scale 4 and 21.6% selected scale 5, indicating they lean toward greater use. On the lower end, 4.3% selected scale 1, and 11.5% selected scale 2, representing a small group of students who do not use the platform regularly.

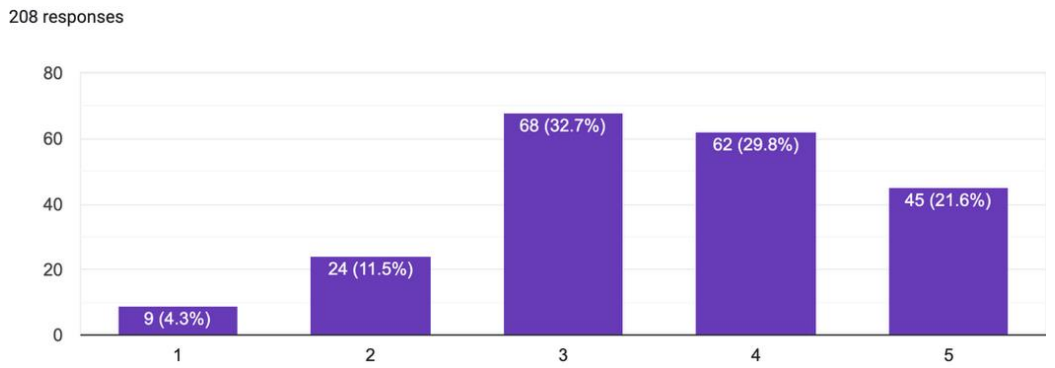


Fig. 3. Do you use the platform regularly for every course?
Source: Own calculations

Regarding the second section, students evaluated several statements using the same 1–5 scale. Overall, the results show generally positive perceptions of the digital platforms used at the Faculty of Business/ UAMD. Most respondents agreed that the platforms are easy to use and allow them to locate learning materials effectively, with a high concentration of responses at scale 4 (29.5%), referring to the first block. Students also indicated that the platforms help them organize assignments and deadlines, as reflected in 28.5% selecting scale 4 (block two). Regarding how the platform enables better task and deadline organization, 28.5% of students selected scale 4 (agree) on the platform's importance (see block 3).

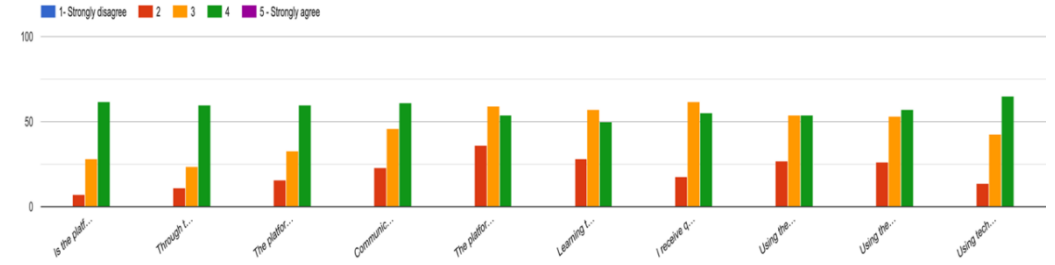


Fig. 4. If you use a platform, please provide your evaluation.
Source: Own calculations

Communication with lecturers was assessed as effective, with 21.9% selecting scale 3 and 29% selecting scale 4, indicating that while digital communication is functioning (see block 4). Collaboration tools (block 5) received positive but less strong evaluations, with 28% selecting scale 3, suggesting that although these tools are functional, they are not yet fully integrated into students' learning practices. Interactivity and engagement followed a similar pattern, with 27% selecting scale 3, revealing that digital learning feels engaging for some students but not fully included (block 6). Feedback processes were viewed as moderately

strong: 29.5% selected scale 3, while 26.1% selected scale 4, indicating that students generally receive timely feedback and more precise grading explanations (see block 7). Motivation and perceived academic improvement also centered around scales 3 and 4 (25.7%), showing that while platforms support learning, they are not the main drivers of motivation for all students (see block 8). The highest agreement was observed for the item on digital skill development, with 30.9% selecting scale 4 or 5, highlighting the significant role of technology in strengthening students' digital competencies, as shown in block 9.

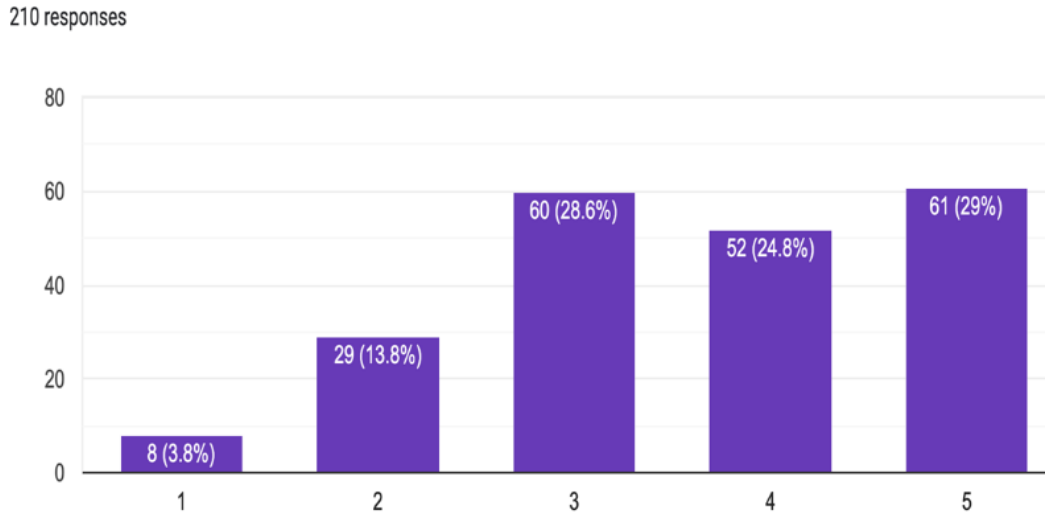


Fig. 5. The university provides sufficient technical support for the use of the platforms.
Source: Own calculations

Regarding Figure 5, if the university provides sufficient technical support, they respond that the university provides technical support for the platform, with moderate backing at 28.6% and high support at 29% on a 5-point scale.

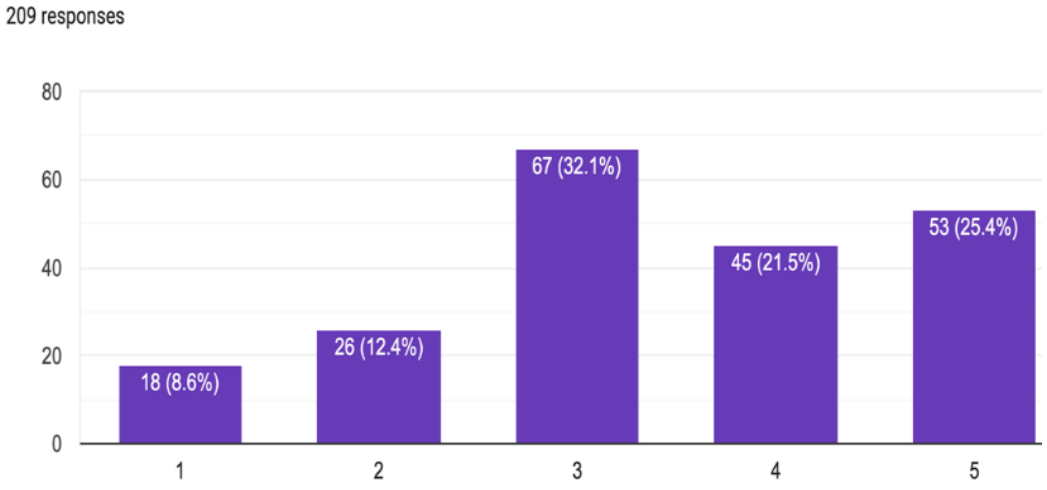


Fig. 6. The infrastructure (internet, laboratories, equipment) is suitable for digital learning.
Source: Own calculations

Figure 6 illustrates students' evaluations of UAMD's infrastructure (internet, laboratories, and equipment) for digital learning, and the results show a mixed but generally positive perception. A significant proportion of students selected scale 3 (32.1%), indicating moderate satisfaction with the existing infrastructure. Additionally, 46.9% of respondents chose the higher agreement levels (scale 4: 21.5% and scale 5: 25.4%), suggesting that nearly half of the students believe the infrastructure is suitable for digital learning. However, a smaller portion expressed dissatisfaction, with 8.6% selecting scale 1 and 12.4% selecting scale 2, suggesting ongoing issues likely related to unstable internet, outdated equipment, or limited lab functionality.

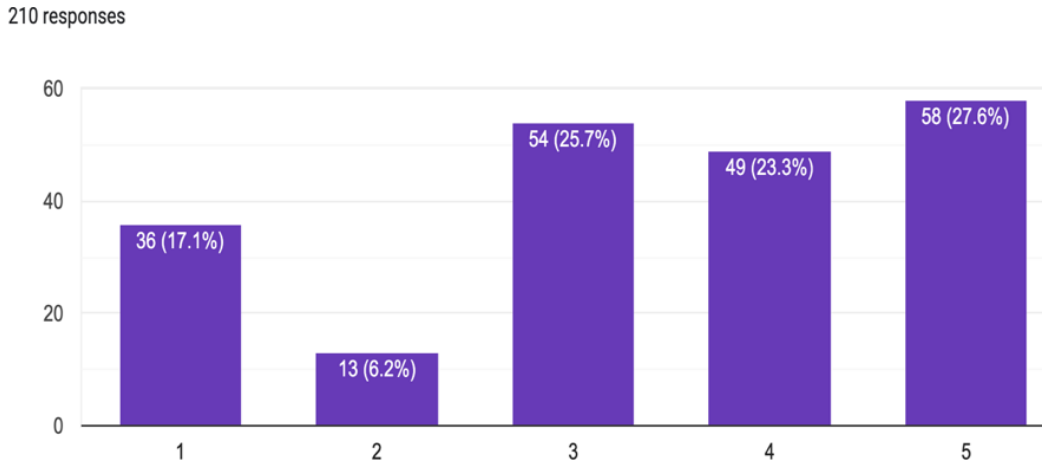


Fig. 7. Do you think the University should move toward "Smart Education" through the use of these platforms?
Source: Own calculations

Figure 7 shows students' perceptions of whether the University should move toward "Smart Education" through digital platforms. The responses indicate a generally positive attitude toward adopting Smart Education. A combined 51% of students selected the highest levels of agreement (scale 4: 23.3% and scale 5: 27.6%), showing strong support for expanding digital tools and smart-learning approaches at UAMD. Another 25.7% chose scale 3, suggesting neutral or moderate agreement. Nevertheless, some students expressed disagreement: 17.1% selected scale 1, and 6.2% selected scale 2.

Regarding the question, "What would you like to see improved in the use of these platforms at UAMD?", it is open-ended. Most students expressed a need for practical improvements in UAMD's digital platforms, particularly regarding internet quality, technical stability, and infrastructure. The most frequent concerns included slow or unstable Wi-Fi across campus, outdated or non-functional laboratory computers, and delays in uploading or accessing materials. Students also requested a faster, more stable platform with clearer organization of lectures, deadlines, and notifications, as well as improved technical support. Another recurring theme was the desire for a unified digital system used consistently by all lecturers, preferably a single platform (e.g., Google Classroom) that integrates lectures, grades, announcements, and exam information. Students also asked for more interactive digital tools, better communication with lecturers, and features such as digital calendars, forums, and online exercises. Despite some respondents reporting that no changes were needed, the majority emphasized the need for improved infrastructure and a more coherent, user-friendly digital learning environment.

5. Discussion

Traditional educational models, in which instructors explain the subject in class and students complete exercises at home, are increasingly being replaced by more interactive and student-centered approaches [1]. These new models, grouped under the umbrella of Smart Education, seek to promote learning environments that are more collaborative and active than conventional teaching [2]. The results of this study show that, although students at the Faculty of Business, UAMD, still express strong appreciation for traditional classroom teaching, they also recognize the value of LMS as part of this broader digital transformation.

The COVID-19 pandemic accelerated this shift, forcing universities to adopt online teaching as the primary means of preserving educational continuity. Digital technologies, and specifically LMS platforms, became the core infrastructure through which learning was organised. Later, as the pandemic receded, alternative models such as blended learning and informal learning spaces (educational centres, thematic museums, international learning centres) emerged as complements to purely online teaching [3]. In this context, our findings confirm that LMS platforms are now perceived by students as an essential component of the learning experience at UAMD, particularly for accessing materials, organizing coursework, and supporting Smart Education elements such as flexibility and digital skills.

5.1 The Role of LMS in Smart Education

Smart Education is the practical and coherent use of information and communication technologies to achieve learning outcomes through appropriate pedagogical approaches [1]. Its goal is to prepare a workforce equipped with 21st-century knowledge and skills to address societal needs and challenges [8]. LMS platforms are among the most widely used tools in these environments, providing a digital space where learners and instructors manage instructional activities aligned with predefined objectives [7].

Our results show that students generally perceive the LMS as easy to use and helpful in finding learning materials and organizing assignments and deadlines. This aligns with international evidence that LMSs enhance educational outcomes, support online learning, and provide a backbone for intelligent learning environments [10], [6]. At the same time, the literature notes that LMSs remain underutilized in many universities despite being standard components of higher education [9]. The moderate ratings in our data for dimensions such as interaction, motivation, and collaboration suggest that the LMS at UAMD is primarily used as a repository and assignment tool rather than a fully exploited smart learning ecosystem.

5.2 Interaction and Digital Communication

A central component of Smart Education is interaction among students, lecturers, and among students themselves. The questionnaire results indicate that communication through the LMS is perceived as only moderately effective.

Students expressed a clear desire for more dynamic features: discussion forums, interactive activities, and more frequent communication with academic staff. This is consistent with regional evidence. Studies from Albanian universities during the pandemic reported low levels of interaction with lecturers and peers, often accompanied by a sense of isolation in the virtual environment [18]. Other work in African and international contexts also highlights that LMS-based activities can promote interaction and engagement, create more active learning environments when properly designed [13]. Research comparing universities in Poland, the Czech Republic, and Slovakia found that students' satisfaction with digital communication improved after the pandemic, but the extent of improvement varied across countries, indicating that national and institutional factors condition how communication tools are used [15]. Considering these findings, our results suggest that UAMD has made progress in integrating LMS-based communication but still has significant room to strengthen interactive features and pedagogical practices that foster dialogue rather than one-way content delivery.

5.3 Motivation and Engagement

Motivation emerged as a critical dimension in our study. Although students acknowledge the usefulness of LMS platforms, many do not perceive them as a strong driver of motivation or academic improvement. Ratings on items related to motivation and performance were generally moderate. This aligns with international and regional studies that report challenges with motivation in online learning, particularly when courses rely heavily on asynchronous materials and limited interaction [15]. A study from Kosovo [12] shows that willingness to continue online studies varies by program profile: English language students were more willing to remain online than psychology students [19]. This suggests that motivation and preferences for LMS-based learning depend on disciplinary culture and learning styles. Translated to the LMS environment, this implies that platforms like Moodle or Google Classroom can more strongly motivate learners when lecturers deliberately integrate interactive techniques as quizzes, collaborative tasks, and problem-solving activities rather than using the LMS merely for file sharing.

5.4 Flexibility, Convenience, and Learning Experience

One of the most substantial advantages reported by students in this study is the flexibility offered by LMS platforms. Students appreciate being able to access lectures and materials at any time and from any location, which reduces commuting time and allows them to combine studies with work or other responsibilities. This corresponds with broader findings that online and blended learning increase accessibility and allow students to learn at their own pace [3], [12]. However, flexibility also introduces challenges in time management and self-regulation. For this reason, a possible student demand may be for clearer course organization, integrated calendars, automatic reminders, and better-structured content, which is highly consistent with the literature on smart learning environments and data-driven engagement [20], [15]. Properly designed LMS courses should combine flexibility with structured guidance to prevent disorganization and disengagement.

5.5 Digital Skills, Infrastructure

A positive outcome of intensified LMS use is the development of digital skills. Our respondents report that using the LMS has helped them improve their computer skills and ability to navigate online resources.

This mirrors international findings that digitalization tools increase the effectiveness and transparency of education and enhance students' technological competencies [5], [15]. At the same time, studies warn that differences in technological skills and digital readiness can limit the effectiveness of LMS platforms, especially when institutional support is weak [12]. The results from UAMD underline this dual reality. On the one hand, students recognize the LMS as supportive for their digital competence; on the other hand, they consistently report infrastructure problems: unstable internet, outdated or non-functional laboratory equipment, and technical delays. Similar issues are documented in regional research, where unequal access to devices and connectivity has been identified as a key barrier to effective e-learning. In addition, although LMS platforms are essential for organizing course materials, encouraging engagement, and streamlining administrative processes [10], several studies note that universities often underuse their advanced

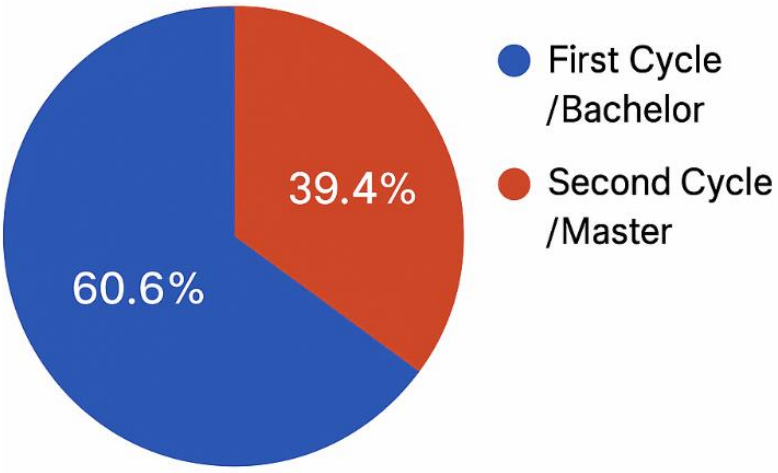
capabilities [9], [14]. The same pattern appears in our study: the LMS is widely present but still not fully exploited for analytics, adaptive learning, or advanced interaction.

5.6 Implications for Smart Education at UAMD

Taken together, the findings of this study are consistent with international and regional evidence on the digital transformation of higher education. The adoption of LMS technologies has clearly contributed to more flexible, resource-rich, and digitally oriented learning at the Faculty of Business, UAMD. This reinforces the broader view that digital transformation and the availability of educational resources are central directions of university reform [4], [6]. At the same time, the underutilization of LMS functionality, persistent infrastructural constraints, and mixed results in terms of interaction and motivation indicate that UAMD is still in a transitional phase towards a mature Smart Education ecosystem. In line with the work of [16] Jeladze & Pata (2018), who argue for smart, digitally lean, sustainable, and resilient learning ecosystems, the results suggest that UAMD should move beyond simple platform adoption toward a more holistic approach. This would include: a unified institutional LMS strategy; systematic staff and student training; investment in connectivity and equipment; and a pedagogical redesign that integrates interactive methods, collaborative tools, and data-informed feedback. By incorporating these elements, policymakers and university leaders can create a more cohesive and effective education system that leverages digital tools and genuinely prepares students for the demands and complexities of the digital age.

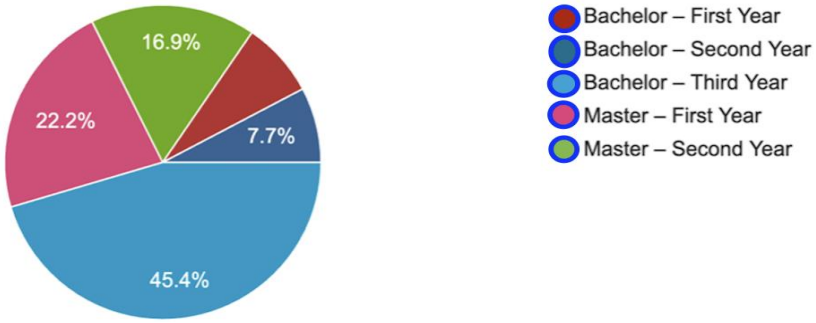
Appendixes

A.1. Results from the questionnaire, from which study programs bachelor's and master's were from and the year of study to which they belong.



2. Year of study

207 responses



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