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Preparing for Future Crises in Education: AI and Regression-Based Modeling of Emergency Distance Learning Satisfaction among Moroccan Law Students

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ABSTRACT: Higher education institutions around the world have been forced to use Emergency Distance Learning (EDL) in place of traditional classroom instruction due to the COVID-19 pandemic. Moroccan law students were impacted by this shift, experiencing issues with access, the caliber of their education, and their technical readiness. Using both traditional statistical techniques and advanced artificial intelligence (AI) methods, this study aims to identify and forecast the primary factors influencing students' satisfaction with EDL in Moroccan legal education. Using a thorough survey of 16,187 law students from public and private Moroccan universities, we investigate the effects of six predictor categories on overall satisfaction: technological readiness, accessibility, teacher quality, assessment methods, learning engagement, and awareness. We combine artificial intelligence models like Support Vector Regression (SVR), Random Forest (RF), LightGBM, and Multilayer Perceptron Regression (MLPR) with multiple linear regression and stepwise regression. To improve model correctness, features are chosen using Recursive Feature Elimination (RFE). Students expressed concerns about the fairness and transparency of online assessments and expressed a preference for in-person instruction despite significant technical readiness. This study highlights the importance of digital equality, pedagogical support, and intelligent analytics for strong higher education systems and provides evidence-based insights to improve the architecture of distance legal education in Morocco.

Keywords: Emergency Distance Learning, Moroccan Law Students, Student Satisfaction, Machine Learning, Regression, Feature Selection, Legal Education

1. INTRODUCTION

The COVID-19 pandemic changed the world of higher education in ways that had never been seen before. To keep their academic programs going, schools had to use Emergency Distance Learning (EDL). During this change, law schools in Morocco, which have always relied on face-to-face teaching and case-based reasoning, faced a difficult set of problems. Even though Moodle, Google Meet, and Zoom are widely used, people still do not fully understand how useful they can be for legal education during times of crisis.

Electronic distance learning (EDL) is hugely different from traditional e-learning methods because it is not planned, it reacts to things that happen, and it does not last long. On the other hand, it does not have the strong instructional design, pedagogical structure, or student readiness that are usually needed for online education to be effective [1, 2, 3]. The sudden switch to remote teaching during the pandemic not only messed up the ways that content was delivered, but it also brought up prominent issues about fairness, access, and testing. These are issues that are especially important in legal education, where deep understanding, argumentation, and interaction are all important learning goals.

There have been a lot of studies on student happiness in general online learning settings, but not many that have looked at the experiences of law students using advanced modeling techniques [1, 2]. Because legal studies are mostly analytical and interpretive, it is particularly important to find out how Moroccan law students understood and adapted to EDL during the epidemic, as well as what factors had the biggest impact on their level of satisfaction.

This study uses a dual-method modeling framework to predict how happy students will be based on a large-scale survey dataset. This framework combines traditional multiple regression methods with modern AI models like Support Vector Regression (SVR), Random Forest (RF), LightGBM, and Multilayer Perceptron Regression (MLPR). The Recursive Feature Elimination (RFE) algorithm is used to choose which variables to

keep. This is done to get around the fact that features can have a lot of dimensions and might be multicollinear. Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and the coefficient of determination (R2) are the numbers that are used to figure out how well each model works [1, 3].

This study adds to the growing body of research that is being done at the intersection of education, digital transformation, and predictive analytics. The study looks at Moroccan law students as a specific group. It also gives ideas that colleges and universities and governments can use to make legal education models that are stronger and more inclusive in the digital age.

This study offers three principal contributions to the fields of pedagogy, Law studies, educational crisis management, and predictive modeling:

- It provides a contextually grounded and empirically driven look at how Moroccan law students have dealt with Emergency Distance Learning (EDL), filling in a major gap in the research on legal education during crises, especially in the Global South, where not much research has been done.
- It presents a strong dual-model predictive framework that combines classical statistical modeling (Multiple Linear Regression) with cutting-edge machine learning methods like Support Vector Regression (SVR), Random Forest (RF), LightGBM, and Multilayer Perceptron Regression (MLPR). Using Recursive Feature Elimination (RFE) and several performance metrics (MAE, RMSE, R^2) makes the models easier to understand and more accurate at predicting.
- The study gives useful information for making legal education strategies that are resilient to crises and include everyone, and it gives evidence-based suggestions to help institutions make decisions and shape national education policy in case of future problems.

The rest of this paper provides a detailed analysis of the emergency remote learning experience of Moroccan law students. A critical synthesis of recent research on student satisfaction, emergency education responses, and the use of AI and statistical models in educational evaluation is then provided in the Review of Related Works. The predictive analytic methodology is explained in the Methodology section. Descriptive patterns, statistical modeling results, and insights from both quantitative and qualitative analysis are then covered in the Practical Assessment and Results section. These data are contextualized in the discussion, which also explores the implications, challenges, and opportunities for Moroccan educational policy and institutional preparation.

2. LITERATURE REVIEW

2.1. Theoretical Foundations of Student Satisfaction in Remote Legal Education

The quick use of Emergency Distance Learning (EDL) during the COVID-19 pandemic led to an important conversation about the quality and long-term viability of higher education delivery models. There has been a lot of research on the operational aspects of remote learning methods, such as asynchronous, synchronous, and hybrid frameworks, and how they affect student engagement and academic performance[4]. In these models, student satisfaction has become an important measure of the quality of education. It is closely related to academic commitment, retention, and learning motivation [3, 5, 6].

In situations caused by a crisis, it is important to understand what makes people happy to make sure that everyone has the same educational experiences and that institutions can adapt. Vrantsidis et al.[7] and Al-Fraihat et al.[8] say that we need to model multidimensional predictors, like psychosocial stress and digital preparedness, to see how resilient and effective EDL systems are. Still, legal education has unique teaching methods that are often missed in these frameworks. These include oral advocacy training, jurisprudential interpretation, and dialogical reasoning. When applied to law students, general satisfaction models do not work as well in other areas because they do not have any specific requirements.

2.2. Digital Transformation in Moroccan Higher Education

Morocco has taken several steps to digitalize higher education, such as the Moroccan Virtual Campus (CVM), the E-Sup 2006 program, the Digital Morocco 2020 initiative, and the MARWAN high-speed research network[9, 10]. Framework Law 51-17[11] backs up these programs even more. They are meant to make it official that Information and Communication Technologies (ICT) are used in research infrastructures, teaching methods, and curricula.

Real-world evaluations show that there are big differences in how ready institutions are and how well faculty are trained, especially in fields like legal studies where digital teaching methods have not been fully put into practice yet [12]. The COVID-19 pandemic made these structural problems worse by showing that there were problems with digital content curation, instructional design, and internet access. Ouahani [13] says that the Moroccan higher education system needs a complete digital transformation plan that puts a lot of

emphasis on collaborating with stakeholders, making long-term investments in digital infrastructure, and using personalized learning technologies.

In Morocco, the full potential of advanced technologies like Artificial Intelligence (AI) and Machine Learning (ML) is not being used. These technologies could help with scalability and personalization problems by making it easier to create adaptive learning environments, intelligent instruction systems, and real-time learning analytics.

2.3. Conceptual Models of Satisfaction in E-Learning

The simulation of satisfaction in e-learning has come a long way thanks to many different theoretical frameworks. The Information System Success Model by DeLone and McLean [14] is still an important idea. It suggests that information quality, system quality, and service quality all work together. There have been evaluates of this model in many different countries, including Malaysian institutions [15].

Al-Fraihat et al. [8] include the educational-specific ideas of instructional design, content relevance, and pedagogical support in the next extensions. Even though these models are more specific, they often assume that learning environments are stable and not in crisis. The EDUCAUSE [16] survey package, on the other hand, was made to show how quickly students' experiences change during emergency transitions. Some of the most important diagnostic dimensions are how well someone can adapt to innovative technology, how much emotional stress they are under, how easy it is for them to get help, and how clear the assessment is.

In empirical research, content usability, interaction between students and teachers, and learner autonomy are consistently found to be key factors in satisfaction [5, 17]. When people are socially isolated and their education is interrupted, their emotions, like anxiety and technophobia, can also affect how satisfied they are [18, 19]. But most conceptual models do not consider the teaching methods that are unique to each field. In legal education, where argumentation, jurisprudential reasoning, and case analysis are important, these models' linear and delivery-focused assumptions may not fully capture the most principal factors that affect satisfaction.

2.4. Predictive Modeling: From Classical Statistics to AI-Driven Analytics

Researchers have used traditional statistical methods, especially Multiple Linear Regression (MLR), to look at the link between learner traits and satisfaction metrics in a lot of detail. Even so, these models have some problems because they assume linearity, homoscedasticity, and no multicollinearity. As educational datasets get more complicated, with continuous, ordinal, and categorical predictors, we need modeling algorithms that can adapt to these changes.

Machine learning (ML) methods offer a dependable option. K-Nearest Neighbors (KNN) [20], Support Vector Regression (SVR) [21], Random Forests (RF) [22], Gradient Boosting Machines (GBM) [23], and Multilayer Perceptron Regression (MLPR) [24], have all done better than other educational prediction tasks. The Elastic Net (ENet) model is especially good for high-dimensional datasets were choosing and shrinking variables is important [25, 26]. This is because it uses L1 and L2 regularization. When properly validated (for example, using k-fold cross-validation), these models can also extract feature importance, model nonlinear interactions, and avoid overfitting.

Even though there is a lot of research on online learning satisfaction around the world, the intersection of domain-specific pedagogy, national digital infrastructure, and advanced predictive modeling is still not well understood. The current models do not do a decent job of showing the cognitive and discursive needs of law students, in particular. The Moroccan legal education context is not well represented by empirical research. There has not been a systematic comparison of classical regressions and AI-based models using Moroccan EDL data.

Previous analyses did not include Recursive Feature Elimination (RFE) or other feature selection methods, even though they could improve model performance. This study uses statistical and machine learning models, along with RFE, to look at a large dataset of Moroccan law students to fix these problems. The goal of combining real-world data with advanced analytics is to help shape future policy, curriculum design, and institutional investment in the digital transformation of legal education after the pandemic.

Recent advances in educational data mining and learning analytics have produced deep learning structures that can evaluate both structured survey data and unstructured text inputs, such as open-ended remarks, comments, or conversation logs. By combining nonlinear and hierarchical interactions, the Multilayer Perceptron (MLP) and Deep Neural Networks (DNN) models have enhanced their capacity to predict satisfaction ratings [2, 18, 20].

Originally created for image processing, Convolutional Neural Networks (CNNs) have been effectively modified to identify semantic patterns and local relationships in text sequences and feature maps. This is especially true for datasets like faculty engagement or course satisfaction surveys that combine Likert-scale indicators with succinct textual responses [1, 2, 19].

When applied to high-dimensional, sparse, or multimodal data, these methods outperform traditional machine learning models, allowing for the discovery of latent patterns linked to learning satisfaction, engagement, and perceived quality. They make it possible to integrate multiple data sources (unstructured text and quantitative measurements) into coherent prediction pipelines.

3. METHODOLOGY

3.1. Dataset Description

The empirical analysis is based on a structured questionnaire that was sent electronically to Moroccan law students from different faculties during the 2023–2024 academic year. The instrument was based on the EDUCAUSE survey kit from 2020 and included validated constructs about digital access, instructional design, faculty interaction, emotional well-being, and satisfaction. After cleaning the data, filling in missing values, and finding outliers, we kept 16187 complete responses. One of the study's biggest strengths is that the dataset is strong enough to represent a wide range of institutional settings and student profiles across Morocco.

There were 28 questions on the questionnaire, which were divided into groups based on their themes. These were: technological readiness (7 items), quality of instruction (5 items), communication and interaction (6 items), emotional stress and anxiety (5 items), learner autonomy (5 items), and general demographics and satisfaction (11 items). We used a 5-point Likert scale to measure all the constructs. A score of 1 means strong disagreement, and a score of 5 means strong agreement. A reliability test showed that the data was very consistent within itself (Cronbach's alpha > 0.87).

3.2. Variable Operationalization

Student satisfaction with emergency distant learning (EDL) is the dependent variable in this study. This composite metric brings together information about how effective, motivating, involved, and overall satisfied people feel with online legal education. It is shown as a continuous quantitative variable. The independent variables are:

- Access and Infrastructure: How dependable the Internet is and how well devices work.
- Instructional Design: Clear goals and a logical order of content
- Interaction with faculty: availability, responsiveness, and timeliness of feedback
- Learner autonomy: time management, initiative, and self-regulated learning
- Affective stressors: anxiety levels and feelings of isolation
- Demographics: Gender, level of education, university affiliation, and where you live

All variables were made equal so that they could be compared and to cut down on bias related to scale in model training.

3.3. The proposed framework

Student satisfaction is a crucial indicator for assessing the efficacy of instructional techniques and digital delivery in the context of emergency distance learning (EDL). Students are at the center of any discussion about the quality and innovation of instruction since they are the main participants in the learning process [27, 28]. Therefore, advancing evidence-based educational reforms requires an understanding of their perspectives and experiences. The following primary goals are pursued by this study to enhance the caliber and adaptability of Moroccan higher education systems in times of crisis:

- Examine the opinions of Moroccan law students who are enrolled in online courses.
- Determine how satisfied they are with EDL.
- Determine the obstacles and difficulties that arose during the shift to remote learning.
- Provide practical suggestions for enhancing the national EDL strategy.

To forecast student satisfaction, this study uses a quantitative, data-driven methodology that blends sophisticated artificial intelligence (AI) modeling with conventional statistical analysis (see Figure 1). The EDUCAUSE survey framework, which has been modified for the Moroccan legal education context, informs the research design, which has its roots in empirical rigor. Creating survey instruments that are both contextually relevant and psychometrically valid is a major challenge in research pertaining to EDL [8, 29]. This was addressed by carefully crafting the questionnaire to strike a balance between response manageability and the scope of coverage.

Students in higher education throughout Morocco were given access to a methodical, anonymous online survey with 28 specific items. To minimize cognitive load and guarantee the collection of high-quality data, the instrument was made to be finished in about fifteen minutes. With a focus on pedagogical support, affective stressors, technological readiness, and satisfaction drivers, the survey gathered both demographic data and subjective opinions about the EDL experience. A national cohort of 35,000 students from law Moroccan

institutions received the survey in May 2024, potentially reaching over 900,000 students. 16,187 students (64.74%) out of those contacted finished the survey, providing a strong and representative sample.

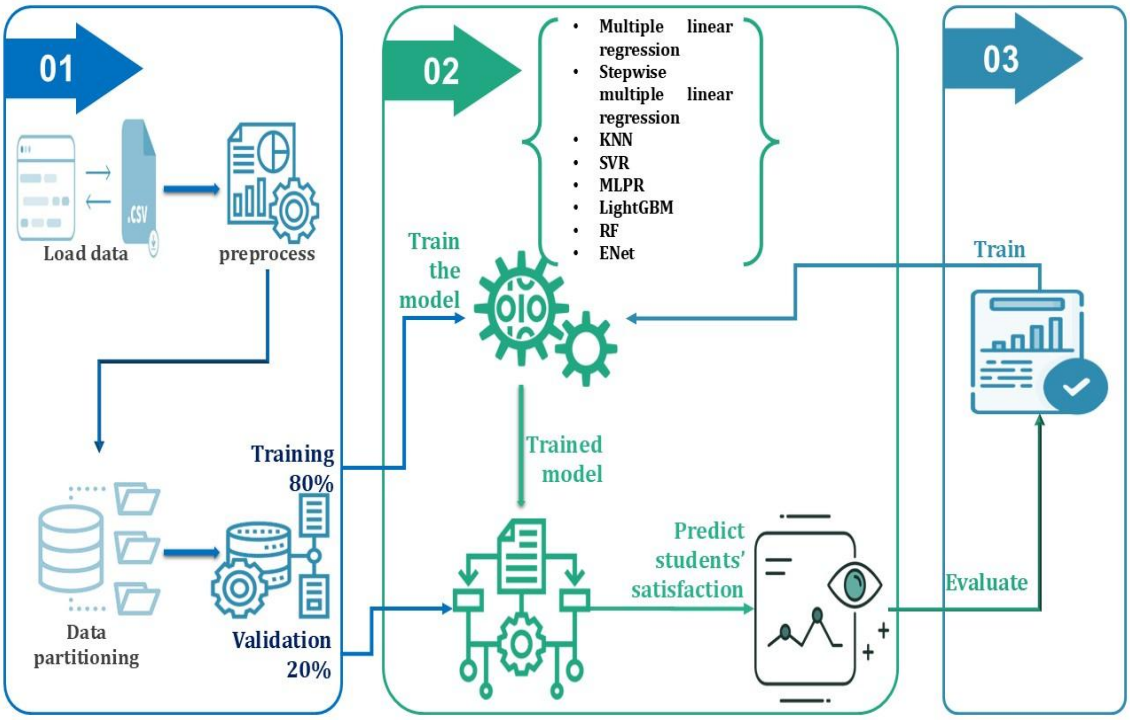

Figure 1. The adopted framework to assess the techniques used in satisfaction analysis

3.4. Survey items

The participants' descriptive study is shown in Table 1. To decrease non-response bias, a future study may employ additional survey strategies to increase participation rates and sample representation. The survey form used to measure students' satisfaction with online courses during the COVID-19 pandemic had twenty-eight items covering a range of topics, such as learning experience, grading, accessibility, teaching quality, and preparedness. Participants completed assessments using a 5-point Likert-type scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree."

Table 1. DESCRIPTIVE ANALYSIS OF ATTENDEES WHO FILLED OUT THE SURVEY

Description		Number of answers	Frequency
Gender	Female	7951	49,12 %
	Male	8236	50,88 %
Study mode	Full-time	15005	92,70 %
	Part-time	1182	7,30 %
Study level	1st year of study	1158	7,15 %
	2nd year	2598	16,05 %
	3rd year	3165	19,55 %
	4th year:	4699	29,03 %
	Higher	4567	28,21 %

A list of the survey's subjects and concepts can be found in Table 2. The student was also asked about their gender, year of study, survey method, affiliation with a public or private university, degree of digital literacy, availability of reliable Wi-Fi, and type of e-learning equipment to collect demographic data.

A CSV file was created from the processed raw data that was obtained from the survey. A result observed of 16187 rows containing different columns, including demographic data and answers to the 28 research questions, was produced after missing value rows were deleted.

Table 2. SURVEY FORM IDEAS AND SUGGESTIONS

Concepts	Elements	Descriptions
Readiness	Q1	I feel at ease or am familiar with the necessary technology or applications.
	Q2	I like to know what software and technology I should utilize.
Accessibility	Q3	For my research, I always have access to specialist software (for example, Adobe products, statistical packages, etc.).
	Q4	I am always able to fit in time to take part in simultaneous classes (e.g., live streaming, lectures, or video conferences at a fixed time)
	Q5	I can still arrange meetings and attend classes while managing my time.
Teachers' capacity	Q6	In general, the technology or apps needed are familiar to my teachers.
	Q7	My professors are often accessible and responsive.
	Q8	Teachers work hard to enhance distance learning
	Q9	The lecturers consider the opinions and observations of the pupils.
Evaluation	Q10	I prefer in-person learning.
	Q11	During this phase of transition, modified or adjusted evaluation techniques are acceptable to evaluate my accomplishment of the desired learning goals.
	Q12	I understood the standards that were utilized to score the modified/adjusted tests.
	Q13	The exams improve my understanding.
Learning	Q14	I prefer in-person instruction.
	Q15	The online classes and exercises were well presented.
	Q16	I am always able to concentrate on or pay attention to activities or directions from a distance.
	Q17	I am inspired to enroll in online classes.
	Q18	My ability to learn was facilitated by the online course materials.
Awareness	Q19	Concerned about my academic performance and grades.
	Q20	The modifications to the grading systems worry me.
	Q21	I worry about potential delays in the program or degree completion.
	Q22	I am worried that my professors are not using learning systems like Moodle.
	Q23	I am concerned about my professors utilizing a tool that my organization does not endorse.
	Q24	I am worried that my instructors are not videotaping their online lectures so that students may access them afterward.
Cooperation	Q25	I can collaborate with my coworkers
	Q26	I consistently make it to class or working group sessions.
	Q27	I like working in teams.
Satisfaction	Q28	I am satisfied with the online education I have received over the last several quarters overall.

3.5. Practical assessment

The suggested modeling framework made use of both traditional and sophisticated modeling techniques, and a rigorous experimental protocol was put in place to ensure its predictive accuracy and dependability. Using an 80/20 stratified split, the preprocessed dataset which included 16,187 complete observations gathered from Moroccan law students during the 2023–2024 academic year was split into training and testing subsets. This method maintained the distribution of important pedagogical and demographic factors.

Three paradigms of modeling were evaluated as shown in figure 2. RStudio (v1.2.5001) has statistical models that have been implemented, including Bayesian Ridge Regression (BRR), Generalized Additive Models (GAM), Elastic Net (ENet), and Multiple Linear Regression (MLR). Otherwise, Python 3.9 uses the scikit-learn, xgboost, lightgbm, and catboost libraries to implement machine learning models such as K-Nearest Neighbors (KNN), Support Vector Regression (SVR), Random Forest (RF), and gradient boosting algorithms (XGBoost, CatBoost, LightGBM). Then, TensorFlow and Keras are used in the implementation of deep learning models, such as the Multilayer Perceptron (MLP), Deep Neural Networks (DNN), and Convolutional Neural Networks (CNN).

For every model, stratified 10-fold cross-validation was used to increase generalizability and take sample variance into consideration. Performance metrics were averaged across pleats to ensure statistical reliability. Models with overfitting (low training error and high-test error) or underfitting (uniformly high error rates) were re-tuned using sophisticated optimization techniques.

The model's complexity and computational cost dictated the choice of hyperparameter optimization techniques. According to empirical evidence showing their superiority in high-dimensional hyperparameter spaces, a randomized manual search was conducted using KNN, RF, LightGBM, ENet, and MLP [30]. In contrast, grid search had to be used for SVR because support vector machines were sensitive to kernel-related parameters.

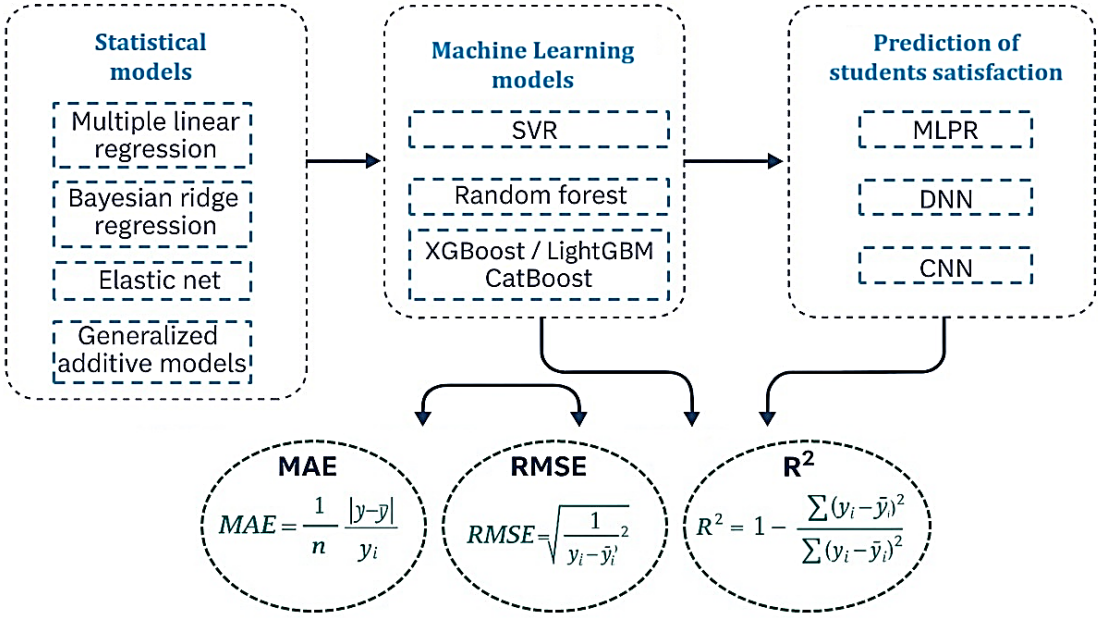

Figure 2. Assessment metrics

A multi-criteria decision framework that combined predictive accuracy (low MAE/RMSE) and model interpretability which is especially important in educational policy contexts was used to choose the final model. A comprehensive and context-sensitive analysis of the factors influencing student satisfaction in Moroccan legal education under emergency distance learning circumstances is ensured by this triangulated modeling approach.

4. PRACTICAL RESULTS

This section presents the details of the predictive models used to measure how happy Moroccan law students were with Emergency Distance Learning (EDL) and how well they did in school during the COVID-19 epidemic. The test looks at a few performance metrics, such as Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and Coefficient of Determination (R^2), before and after using the RF-RFE method to choose features.

4.1. Student Attendance Patterns in Remote Learning

Table 3 displays the most current information on the number of students who are present, absent, or tardy in remote learning environments, broken down by academic level and gender. This study looks at how people participated in Emergency Distance Learning (EDL) and offers insightful information about the institutional, behavioral, and social factors that affect engagement, especially for law students who had to quickly adjust to digital learning.

Table 3: RATES OF REMOTE ATTENDANCE BY GENDER

Academic Level	Female Attending	Female Absent	Female Delay	Male Attending	Male Absent	Male Delay
First-year	0.76%	0.50%	0.43%	0.62%	0.88%	0.95%
Second-year	0.58%	0.71%	0.56%	0.80%	0.67%	0.82%
Third year	0.70%	0.60%	0.49%	0.68%	0.78%	0.89%
Fourth year	0.82%	0.53%	0.46%	0.56%	0.85%	0.92%
Further	0.73%	0.41%	0.56%	0.65%	0.97%	0.82%

A thorough summary of students' participation in remote legal education during the COVID-19 pandemic, broken down by gender and academic level, is provided in Table 3. Attendance, absenteeism, and tardiness are used as proxies to evaluate participation patterns and infer more profound sociocultural factors influencing distant learning behaviors.

Although the overall attendance rates for both sexes appear to be low at first look, a year-by-year analysis shows subtle variations. Among first-year students, male attendance is marginally lower than female attendance (0.62% versus 0.76%), but male delays are significantly higher. This might be because first-year

students, particularly males, are unfamiliar with the digital independence and self-control needed in EDL settings. First-year law students frequently need structured instruction and find it difficult to learn in unmoderated virtual environments, which makes less motivated people more likely to be absent and tardy.

Female attendance increased significantly (0.82%) in the fourth year of students' academic careers, surpassing male attendance (0.56%). According to this study, senior female law students have higher intrinsic drive because they are closer to graduating and are therefore more conscious of their academic performance. The fact that both genders' delay percentages remain high despite the rise in attendance suggests that there are systemic scheduling and connection issues that are not gender specific.

According to the data, synchronous learning is hampered by the competing responsibilities of female students, particularly those at lower levels. In Moroccan culture, women are occasionally given additional household responsibilities due to gender stereotypes, particularly in rural areas with less developed online learning infrastructure. Despite their higher attendance rates in later years, female students' high absenteeism and tardiness rates in their early academic years may be explained by this combined load.

On the other hand, male students consistently show higher rates of delay at every level, with the highest rates occurring during the first and second years. Procrastination and a lack of digital discipline are two behavioral factors that have been thoroughly studied in educational psychology and may be the cause of this phenomenon. Additionally, because they are less likely to proactively plan their study schedules or ask for assistance, male students may be more likely to log in late and miss sessions.

The comparatively low overall attendance rates for both sexes point to structural issues with the EDL framework. These include inconsistent scheduling, limited access to interactive teaching techniques, inadequate academic support, and poor platform usability. For law students, who must participate in discussions, legal reasoning exercises, and case study assessments, the development of basic skills is impeded.

Lastly, Table 3 shows that several factors, such as individual motivation and general societal and infrastructure constraints, influence distant attendance patterns during EDL. Comprehending these procedures is essential for developing gender-responsive, suitably customized legal education interventions, particularly when implementing integrated or entirely digital formats in the event of future crises or reforms.

4.2. Comparative Student Satisfaction in Legal Institutions

Table 4 offers a thorough examination of student satisfaction metrics for 20 public law schools, including perceived performance, online meeting attendance, course content quality, and collaborative engagement. These metrics offer a multifaceted assessment of Emergency Distance Learning's (EDL) efficacy from the viewpoint of public education law students.

The average satisfaction ratings across all institutions are instructive, despite their modesties: 70.51% is made up of the course material. Of those present, 75.97% were online, collaborating: 82.29%, and efficiency of 78.97%. These averages imply that although attendance and content quality are lower, students' perceptions of teamwork and performance are more favorable. This implies that students prioritize team-based learning and communication over online learning.

Significant inter-institutional variation is revealed by a thorough analysis. Institution I8 has the lowest course content satisfaction rate (32%) which suggests serious pedagogical shortcomings. Institutions I10 and I15, on the other hand, report satisfaction rates of over 89%, which suggests that they have strong digital pedagogies or excellent instructional support. This kind of contrast could point to differences in public legal faculties' administrative responsiveness, faculty readiness, and technology infrastructure.

Even though it is typically higher than course satisfaction, attendance at online sessions varies greatly. Higher virtual attendance rates (>85%) are reported by institutions with better logistical organization and streamlined platforms (I10, I17, I19), suggesting that technical facilitation is crucial for promoting participation. Yet, schools like I8 and I9 show a notable departure from the norm, indicating that structural barriers, such as erratic internet access, insufficient reminders, and dull material, are to blame for the inability to get law students to participate in synchronous sessions.

In public institutions, the relative effectiveness of teamwork engagement is clear. Institutions I13 and I14 achieved maxima exceeding 95%, while numerous entities obtained scores above 70%. This could indicate how well-suited law students are to group online activities that are common in legal education, such as peer evaluations, case discussions, and mock trials. This finding highlights the potential of collaborative approaches in online legal education, so long as platforms support organized group projects.

When it comes to performance perception, scores are in line with collaboration satisfaction, indicating that students think their efforts are adequately represented in the outcomes. The gap between performance and content satisfaction, however, raises questions about grade inflation or surface-level learning, where students may pass classes even though they are unhappy with the caliber of the material or instruction.

Table 4. SATISFACTION OF STUDENTS WITH THE EDL

Institution	Course %	Online meeting Attendance (%)	Teamwork %	Performance %
I 1	45.0	52.95	58.32	55.0
I 2	71.14	79.09	78.32	75.0
I 3	68.25	76.2	74.32	71.0
I 4	69.0	75.2	73.32	70.0
I 5	81.0	74.1	88.32	85.0
I 6	78.65	81.85	83.32	80.0
I 7	88.0	86.05	93.32	90.0
I 8	32.0	48.97	63.32	60.0
I 9	59.98	66.18	63.32	60.0
I 10	89.0	85.83	93.32	90.0
I 11	66.5	63.33	70.82	67.5
I 12	77.76	74.59	82.08	78.76
I 13	65.85	82.82	97.17	93.85
I 14	67.7	84.67	99.02	95.7
I 15	82.55	85.75	87.22	83.9
I 16	67.5	75.45	80.82	77.5
I 17	71.98	79.93	85.3	81.98
I 18	65.6	82.57	96.92	93.6
I 19	81.64	89.59	88.82	85.5
I 20	77.35	70.45	84.67	81.35

When taken as a whole, these results show that public institutions' legal faculties have made some headway in their attempts to negotiate the EDL transition. Fundamental problems still exist in the areas of technological dependability, instructional design, and engagement with legal content, despite the seeming resilience of collaboration and perceived performance. To support the long-term integration of EDL in legal education, these shortcomings highlight the need for enhanced faculty training, better digital infrastructure, and organized pedagogical innovation.

4.3. Perceived Readiness for Post-Graduation and Career Transition

The information shown in Table 6 sheds light on how law students perceive their own readiness for life after graduation and assimilation into the professional legal environment. A sizable portion of respondents (63.39%) express academic confidence in their ability to graduate with the requisite legal knowledge. The remaining 36.61%, however, who are unsure or openly anxious, highlight a notable discrepancy in perceived competence. The inherent limitations of emergency distance learning (EDL), like limited access to mentorship, courtroom simulation, or applied casework, may make this disparity even worse.

It's interesting to note that 65.29% of respondents said they would like to finish their education in a conventional classroom setting, suggesting a strong preference for face-to-face training. This could be because legal education often requires face-to-face interaction, debate, and immediate feedback aspects that are challenging to accomplish via online platforms.

In terms of academic sufficiency, 45.09% of students were unsure about continuing their education, and 44.39% of students agreed that they needed to receive more academic training before graduating. According to the responses given, the students' academic journey is precarious, implying that even though the degree is officially completed, it might not be in line with the demands of the labor market or be regarded as having sufficient depth.

This point is further highlighted by the finding that just 39.00% of students felt confident in their capacity to learn the skills required for the legal industry. The disparity indicates the need for more stringent alignment between professional competencies and curriculum content in areas like legal tech, digital literacy, procedural practice, and legal entrepreneurship. Furthermore, the data show a remarkably low degree of entrepreneurial orientation. Merely 11.51% of students indicated that they would like to work for themselves or start their own legal practice, but a resounding 65.22% categorically rejected this idea. These numbers could

point to structural barriers like limited funding, a lack of business-oriented legal education, or a lack of exposure to entrepreneurial models in the legal field.

Table 5. READINESS OF LAW STUDENTS AFTER GRADUATION

Questions	No (%)	Doubtful (%)	Yes (%)
Do you believe you will graduate with the essential skills?	11.59	26.29	63.39
Do you prefer to finish your education by taking classes in person?	9.69	25.59	65.29
Do you need additional academic study before graduating?	21.69	35.12	44.39
Are you convinced that you have the skills that the industry requires?	24.29	38.23	39.00
Do you favor extending your studies after graduation?	21.69	45.09	33.79
Would you rather work for yourself after graduation?	65.22	24.19	11.51

Given the circumstances, these findings highlight the need for Moroccan law schools to reconsider how they organize and present legal education. To close the gap between graduation and employability, it is essential to integrate professional practice and academic preparation, integrate experiential learning, and include career-readiness modules. These initiatives are even more urgent now that the COVID-19 pandemic's disruptions in education have revealed serious flaws in the current academic models. In the discussion section, we go into greater detail about how these insights might influence future curriculum changes and legislative initiatives aimed at improving student preparedness and the long-term viability of legal professions.

4.4. Comparative Evaluation of Model Performance Before and After Feature Selection

Performance metrics were evaluated before and after the Recursive Feature Elimination with Random Forest (RF-RFE) method was applied to evaluate the predictive power of the models used in this study. Tables 6 and 7 provide a summary of the model's performance, showing the training and validation phases' MAE (Mean Absolute Error), RMSE (Root Mean Square Error), and R2 (coefficient of determination).

Before using the Recursive Feature Elimination with Random Forests (RF-RFE) feature selection, Table 6 provides a summary of the predictive performance of both conventional and AI-based models. Elastic Net (ENet), Random Forest (RF), LightGBM, K-Nearest Neighbors (KNN), Support Vector Regression (SVR), Multiple Layer Perceptron Regressor (MLPR), Multiple Linear Regression (MLR), and Stepwise Multiple Linear Regression have all been evaluated. The Coefficient of Determination (R2), Mean Absolute Error (MAE), and Root Mean Square Error (RMSE) were used to assess the effectiveness on the training and validation datasets.

LightGBM shows the lowest RMSE (1.007) and MAE (0.933) on the validation set, indicating a high degree of generalization ability and predictive accuracy. Its comparatively high R2 value of 1.008 before feature selection further supported its robustness. In terms of MAE and RMSE, ENet and MLPR perform similarly during validation; ENet's R2 value of 0.936 is slightly higher than MLPR's value of 0.936.

Table 6. PREDICTIVE MODEL RESULTS WITHOUT SEQUENTIAL BACKWARD REMOVAL

Model	MAE_Train	MAE_Valid	RMSE_Train	RMSE_Valid	R2_Train	R2_Valid
Multiple linear regression	0,982	1,009	1,074	1,109	0,915	0,969
Multiple stepwise linear regression	1,001	1,006	1,094	1,129	0,902	0,956
KNN	1,111	1,180	1,110	1,145	0,822	0,876
SVR	1,067	1,004	1,155	1,159	0,859	0,913
MLPR	1,001	0,976	1,122	1,157	0,882	0,936
LightGBM	0,933	0,978	1,007	1,042	0,954	1,008
RF	1,020	1,053	1,096	1,131	0,899	0,953
ENet	1,018	0,973	1,121	1,156	0,882	0,936

Stepwise Regression and traditional MLR models achieve moderate accuracy. Despite having a satisfactory validation R2 of 0.969, the MLR model is still only slightly worse than the AI-based models. They are still competitive despite having slightly higher MAE and RMSE than LightGBM and ENet. With the lowest R2 (0.876) and the highest validation MAE (1.18), KNN performed comparatively poorly when compared to all other models. This implies that the model was vulnerable to chaotic or insignificant dataset features. SVR and RF's MAE and RMSE values show a slight trade-off between bias and variance, especially for RF, which has a validation RMSE of 1.131. However, the outcomes are solid.

Before using the RF-RFE feature selection method, Table 6 shows the performance of both conventional and AI-based models. With the lowest validation MAE and RMSE and a high R2 value, LightGBM showed the most promising results among the tested models, indicating its resilience in forecasting

student engagement and satisfaction. Similarly, ENet and MLPR showed strong predictive accuracy, highlighting the value of non-linear learning algorithms without feature removal. Conventional models with limited flexibility in capturing complex patterns, like multiple linear regression and its incremental variant, showed decent but modest performance. On the other hand, KNN's sensitivity to unimportant variables caused it to lag, which emphasizes the need for dimensionality reduction. In addition to highlighting the importance of evaluating baseline performance prior to optimization, these findings imply that models with built-in regularization or ensemble structures might already be capable of handling complexity in high-dimensional educational data.

Table 7. Predictive Model Results with Sequential Backward Removal

Model	MAE_Train	MAE_Valid	RMSE_Train
Multiple linear regression	1,011	1,018	1,083
Multiple stepwise linear regression	1,030	1,015	1,103
KNN	1,140	1,189	1,119
SVR	1,096	1,013	1,164
MLPR	1,030	0,985	1,131

Table 7, which shows the significant gains made across all models because of the RF-RFE feature selection, displays the refined results. Higher R2 scores and lower MAE and RMSE values during validation, which show an improvement in accuracy and generalization ability, are clear indicators of the improved performance. The most robust models were notably ENet and MLPR, which attained low prediction errors and high explanatory power. According to these findings, feature selection combined with regularization methods (like ENet) or deep architectures (like MLPR) creates a powerful constructive collaboration that improves predictive accuracy and lowers overfitting. RF-RFE also helped traditional models, though not as much. Their benefits highlighted how vulnerable linear regressions are too high-dimensional noise. The observed uplift confirms that the careful removal of redundant predictors improves the interpretability and performance of models, especially in educational datasets with complex interactions and latent behavioral characteristics.

4.5. Evaluating Higher Education Achievement in Moroccan Law Institutions

During the COVID-19 pandemic, emergency distance learning (EDL) was implemented, raising important questions about how well-prepared students especially those pursuing legal studies felt for challenges after graduation. To address this problem, we used the updated values from Table 6 to analyze how students perceived their academic competencies, career goals, and preparedness.

The results show (table 8) that people's perceptions of readiness are complex. Though a sizable portion (26.29%) expressed skepticism and 11.59% openly disagreed, most law students (63.39%) expressed confidence in their ability to graduate with the requisite skills. Similarly, 65.29% of students expressed a desire to finish their coursework in person, a sign of discontent with fully online education. 9.69% were against going back to traditional formats, and 25.59% were unsure. Notably, 38.81% of students said they were confident in their ability to exhibit the competencies required for the labor market, while 44.39% of students acknowledged the need for further academic study before graduation. As a result, a sizable percentage 62.0% are either unsure or unconvinced that they meet the expectations of the labor market. These findings suggest a mismatch between the outcomes of institutional learning and the perceived employability.

Table 8. HIGHER EDUCATION ACHIEVEMENT IN MOROCCAN LAW INSTITUTIONS

Questions	No (%)	Doubtful (%)	Yes (%)
Are you convinced that you own the skills that the industry requires?	24.29	38.23	38.81
Do you favor extending your studies after graduation?	21.69	45.09	33.79
Would you rather work for yourself after graduation?	65.22	24.19	11.51

Particularly low was entrepreneurial aspiration. Even though only 11.51% of students said they would like to work for themselves after graduation, a sizable 65.22% of them completely disregarded this option, citing unclear instructions, a lack of confidence, or inadequate resources. Furthermore, 33.79% of students said they were in favor of continuing their education after graduation, suggesting that many students view this as a necessary rather than an elective.

The effectiveness of Morocco's higher education system in preparing law students for the real legal profession and the larger labor market is seriously called into question by these findings. Although EDL was a vital continuity tool during the pandemic, it does not seem to have lived up to expectations in terms of

developing core skills, professional orientation, and self-efficacy. These findings therefore highlight the significance of a paradigm change from an input-oriented model to an outcome-based learning framework that places an emphasis on practical skills, employability, critical thinking, and digital literacy. Moroccan law schools must invest more in digital tools, legal clinics, contemporary pedagogies, and industry-university collaborations to address this preparation gap and foster resilience among aspiring legal professionals.

5. Discussion and Strategic Recommendations for Resilient Legal Education

The findings provide a thorough empirical and prognostic assessment of Moroccan law students' experiences with Emergency Distance Learning (EDL) during the COVID-19 pandemic. They also draw attention to the larger structural inefficiencies in the legal education system and emphasize how urgently reform is required to address present and upcoming disruptions.

The significant socio-cultural and infrastructural disparities that are made worse in digital learning environments are immediately highlighted by the gender and level-based attendance differences (Table 3). Due to the disproportionate burden of outside obligations, female law students especially those in their early years are less likely to be on time or attend class. Male students, on the other hand, display tardiness and disengagement patterns, which are separate but no less important barriers to successful engagement. Instead of being interpreted as discrete behavioral tendencies, these findings must be understood as systemic vulnerabilities within the socio-educational ecosystem.

Furthermore, as demonstrated by student satisfaction and perceived performance, there is a strong correlation between the substantial heterogeneity among public institutions and the accessibility of technological resources, instructor preparedness, and institutional flexibility (Table 4). Successful institutions in terms of performance and collaboration were often those that either adopted new online approaches or leveraged existing digital infrastructure. This supports the idea that pedagogical resilience varies and that, in many cases, digital migration during the pandemic was reactive rather than initiative-taking.

A crucial methodological finding is revealed by the predictive modeling results (Tables 6 and 7): when given robust feature selection (RF-RFE), AI-based models, especially MLPR, ENet, and LightGBM, outperformed traditional regression models in forecasting satisfaction and performance. This is more than just a technical observation; it highlights the growing epistemological movement away from static post-hoc interpretation and toward dynamic, data-driven forecasting in educational research and policy analysis. Legal institutions must take advantage of this potential by incorporating AI-based educational analytics, which will allow them to offer initiative-taking and individualized academic support.

However, the most alarming finding is that law students do not feel sufficiently prepared for employment or self-employment (Table 6). Many respondents expressed doubt about their professional readiness, even though the academic metrics were reasonable. Only 39% of respondents were confident in their ability to meet market expectations, and less than 12% were confident in their ability to launch their own legal practice. This highlights a basic discrepancy between legal education and the realities of the labor market, which has been made worse by the pandemic. Like those in many civil law authorities, Morocco's legal education is rigorous and heavily theoretical. During times of disruption, like the COVID-19 pandemic, these shortcomings are brutally revealed.

5.1. Implications for Change in Institutions

A multi-layered, evidence-based redesign of Morocco's legal education system is required due to the convergence of these findings. Regardless of whether future disruptions are climatic, economic, geopolitical, or epidemiological, institutions will need to exhibit digital maturity, agility, and foresight. The following six strategic axes of reform are derived from the study's empirical and analytical data:

- Digitalization of Education with a Legal Focus: Traditional online learning models cannot adequately meet the unique requirements of legal education such as ethics, case-based reasoning, interpretation, and argumentation. Law schools must invest in domain-specific pedagogical innovations, such as virtual moot courts, AI-driven legal research simulators, and adaptive learning environments created especially for jurisprudential logic.
- Digital Infrastructure with Equity as a Priority: According to this study, unequal access to digital resources is an educational injustice rather than just a technical glitch. Implementing device-lending programs, subsidized internet/data plans, and low-bandwidth platforms should be a top priority for educational institutions, especially for students who live in rural or underdeveloped areas.
- Artificial Intelligence-Enhanced Academic Monitoring: Research should not be the only use of AI models' proven predictive powers. Universities must deploy machine learning pipelines for real-time learning analytics, attrition prediction, and satisfaction monitoring to enable prompt, evidence-based pedagogical intervention, especially during disruptions.

- Curriculum Redesign for Resilience and Employability: Because only a small percentage of law students believe they are sufficiently prepared for the job market, legal curricula need to be modified. Digital legal tools, interdisciplinary modules (such as law and technology and legal entrepreneurship), and a stronger focus on transferable, soft, and practical skills are all included in this.
- Crisis Preparedness Procedures: The pandemic has exposed the lack of institutional continuity plans. All legal institutions should be required to develop and evaluate Crisis-Responsive Education Frameworks (CREFs) on a regular basis. These frameworks combine technical, psychological, and pedagogical solutions to ensure continuous, high-quality learning.
- Stakeholder-governed reform Leadership: Technocratic approaches should not be used to reform education. Students, faculty, bar associations, the judiciary, and civil society must work together to bring about this change. Participatory governance models should be used to ensure that digital transition initiatives are inclusive, democratic, and in line with professional realities.

The study provides more than just a glimpse into how Moroccan law students managed emergency distance learning. It offers a progressive, fact-based road map for transforming legal education into a robust, inclusive, and intelligent system. In a time of instability, the ability to train future judges, jurists, and legislators cannot be left vulnerable to outside interference. The stakes are extremely high. By embracing data-driven decision-making, equity-focused reform, and technological foresight, Morocco's legal institutions will not only be able to withstand future crises but will also be able to lead them.

5.2. Qualitative Insights

Along with the quantitative patterns and predictive models given, this study finds deep qualitative insights into what Moroccan law students went through when they suddenly had to switch to emergency remote learning.

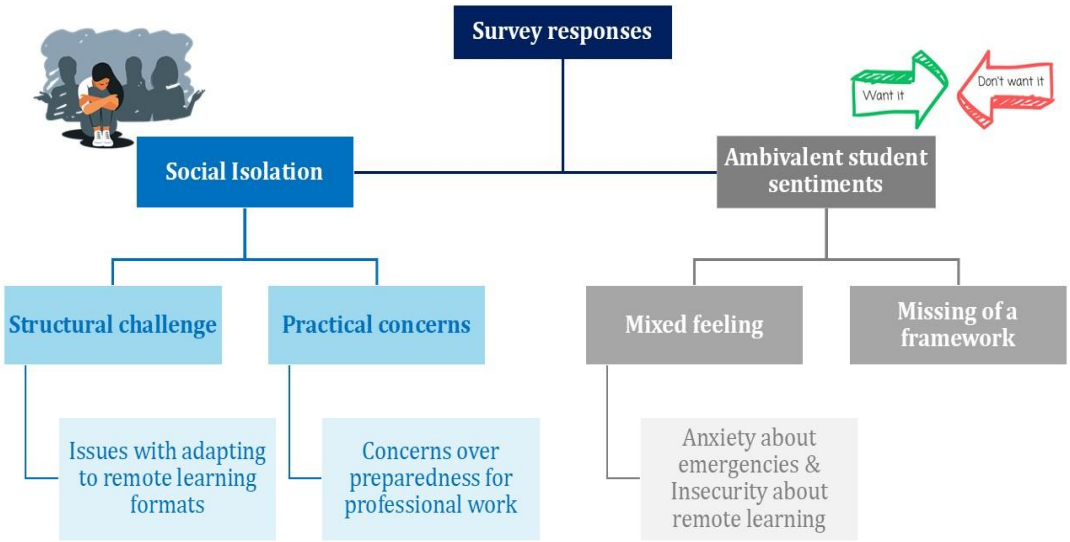

Figure 3. Understanding Student Experiences During Emergency Distance Learning

The numbers show that while some students, especially those in higher grades, were able to adapt and stay involved, many others had trouble doing so because they were emotionally drained, did not know how to use technology well enough, or had social and cultural responsibilities. Female students, on the other hand, faced more problems than male students. Attendance data showed that more girls were absent or late, which suggests that gendered household duties get in the way of continuous learning. The fact that most people prefer in-person classes and do not feel ready for professional work shows that they think there is a gap between online education and learning practical skills, especially in a field like legal studies that is very interactive and focused on conversation. People who were unhappy with how they communicated, how their work was graded,

and how little they were involved made them feel even more lost in school. These results show that we need to change the way we teach, going beyond just giving students access to technology and focusing on the psychological, cognitive, and emotional aspects of learning. We need a distant education framework that is integrated, open to everyone, and sensitive to the situation. This is important not only to fix the problems caused by past disruptions, but also to create a system that can manage future crises.

5.3. Inclusion of Policy Frameworks or Benchmarks

In Moroccan higher education, the COVID-19 pandemic accelerated the transition to emergency distance learning (EDL), exposing structural vulnerabilities as well as resilience, particularly in the field of law. It is crucial to incorporate changes into final national policies and international standards to create a more robust and long-lasting framework for future crises, all the while directly addressing empirical findings from Moroccan institutions.

The Higher Council of Education (CSEFRS) has outlined Morocco's national strategic goals in the Vision Strategies 2015–2030, which promotes an inclusive, egalitarian, and quality-focused educational system. A notable digital disparity was highlighted by data from the Ministry of Higher Education, which shows that by mid-2020, only 66.49% of students at public universities used the 20,000 university courses that had been digitized, compared to 85.52% of students at private universities. This distinction affects not only access but also the quality and depth of engagement with the course material in legal education, where interpretation, discussion, and critical analysis are fundamental.

Furthermore, the importance of digital inclusion and improving public services is emphasized by Morocco's Digital Morocco 2025 initiative. However, several law students, particularly those attending outlying universities like Fez, Oujda, or Settat, reported difficulties accessing synchronous sessions because of poor internet connectivity. This calls for the quick integration of EDL into regional digital development programs, especially in areas where poor connectivity has historically occurred.

- This study aligns with several international frameworks, including: UNESCO's ICT-CFT fosters the development of interactive, competency-based pedagogies as well as the creation of digital content.
- Access to higher education and skills relevant to the workforce are promoted by SDGs 4.3 and 4.4.
- Adaptation, agency, and interconnectedness are highlighted as essential educational objectives in the OECD Learning Compass 2030.

Our findings show that these standards and the real situation differ significantly. For example, only 11.32% of Moroccan law students surveyed said they were ready to start their own independent legal practice, and only 38.81% said they were confident in their employability after graduation. These figures stand in sharp contrast to the policy language that places a high priority on entrepreneurship and employability. Furthermore, there is no recognized national framework for online instruction quality assurance in Morocco's legal education system, particularly in public institutions. There is a discrepancy between professional standards and pedagogical delivery because EDL advancements have not been incorporated into the accreditation requirements, curriculum validation, or eligibility requirements for professional bar exams.

The following actions are advised to remedy these shortcomings and ensure crisis resilience in the future:

- Incorporate investments in digital infrastructure into regional development plans aimed at university cities, particularly those outside of Rabat, Casablanca, and Marrakech.
- Add requirements for online and hybrid legal education, such as case study analyses, supervised legal drafting, and digital simulations of moot courts, to the national accreditation system.
- Include EDL readiness in teacher preparation programs that are approved by national training associations like the CNRST.
- For economically disadvantaged law students, use public-private partnerships (PPPs) with technology providers to subsidize laptop access and connectivity.
- Create feedback systems to continuously gauge how satisfied students are with EDL, then incorporate the results into program evaluation and reform procedures.

This report aligns legal education with resilience goals and future employability standards by connecting the research findings to Morocco's current educational reforms and development policies.

5.4. Practical Implications for Institutional Decision-Makers

The study's predictive framework has significant ramifications for the advancement of institutional governance and crisis-responsive academic policymaking. By combining sophisticated machine learning algorithms that have been refined through recursive feature elimination (RF-RFEs) with traditional regression

models, this study not only demonstrates the multifactorial nature of student satisfaction under emergency distance learning (EDL), but it also gives institutional actors a decision-support tool grounded in empirical evidence. Performance metrics like MAE, RMSE, and R2 support the model's capacity to give university administrators useful information to encourage student participation and lessen disruptions to learning in unpredictable settings.

For Moroccan law faculties, where infrastructure inequalities and institutional inertia have historically hampered quick digital adaptation, the suggested predictive approach offers a path to agile decision-making. By identifying the main causes of dissatisfaction, such as pedagogical design problems and technological barriers, law faculties can foresee new needs and provide tailored support measures. Certain pedagogical interventions, like the introduction of alternate content formats or the start of one-on-one academic mentoring, for instance, can be linked to traits like poor attendance rates, tardiness, or discontent with interactive resources. Furthermore, this framework makes it possible to create strategies that are distinct according to academic or demographic segmentation. The data-driven categorization of students across performance profiles supports the tailored policy responses, which include tailored assistance for first-year students struggling with adaptation or female students bearing an unfair share of household responsibilities. In line with Morocco's national education vision of accessibility and fairness, these stratified insights ensure that institutional decisions are not only effective but also socially equitable and inclusive.

At the policy level, the predictive framework can serve as an internal assessment tool, supporting ongoing improvements in the delivery of online education. Institutions can make sure that their short-term interventions align with their long-term quality assurance goals by tracking changes in student engagement and satisfaction over several semesters. An evidence-based culture in higher education governance is fostered by this dynamic monitoring capability, which also allows institutions to evaluate the immediate effects of reforms (such as modifications to platform usability, lecturer training programs, or student counseling services) on learner satisfaction.

This research provides a tangible and reproducible analytics model that can be integrated into institutional dashboards as Morocco proceeds with its National Strategy for Digital Transformation in Higher Education (Stratégie Nationale de Transformation Numérique de l'Enseignement Supérieur). By encouraging strategic foresight and anticipatory governance, the framework helps higher education institutions transition from reactive structures to adaptive, student-centered ecosystems. As a result, its importance goes beyond the COVID-19 situation to support the creation of plans for resilience against future disruptions like socioeconomic instability, political unrest, or natural disasters.

In addition to providing a predictive and interpretive framework for Emergency Distance Learning (EDL), it is crucial to place the study within Morocco's larger policy frameworks and international commitments. Several Sustainable Development Goals (SDGs) of the UN, such as SDG 4 (Quality Education), SDG 10 (Reduced Inequalities), and SDG 9 (Industry, Innovation, and Infrastructure), are directly impacted by the findings of this study.

SDG 4 promotes inclusive, equitable, and high-quality education as well as the development of opportunities for lifelong learning. Through the identification of technological barriers, performance disparities, and satisfaction levels in Moroccan legal education, this study supports evidence-based educational reforms aimed at improving pedagogical quality and digital access. Our data's sociodemographic insights support SDG 10's goal of reducing inequality. The gender-based differences in attendance, satisfaction, and readiness for digital learning highlight the need for tailored policy interventions. These include support for rural and under-resourced populations, gender-sensitive instructional design, and infrastructure equality.

Building resilient infrastructure and fostering sustainable industrialization and innovation are top priorities for SDG 9. The "Digital Morocco 2030" initiative's goals for Morocco's digital transition align with the use of AI and machine learning methods in educational assessment. To facilitate digital innovation in higher education management, our study's methodology uses recursive feature elimination and predictive analytics to develop a scalable model that can be replicated across disciplines and institutions.

This work aligns with Education Vision 2030 and Morocco's National Strategy for Digital Transformation (Stratégie Maroc Digital), which both aim to modernize the education sector through technology. The Ministry of Higher Education has committed to expanding student access to open learning platforms, building smart campuses, and improving faculty digital competencies. The results of this study provide quantitative evidence and analytical support for those strategic goals. Furthermore, by emphasizing predictive modeling as a tool for decision support, institutional leaders can foresee performance problems and take preventative rather than reactive action. Resilience and adaptability are crucial governance principles in the face of persistent global uncertainty, which makes this particularly relevant.

5.5. Addressing Long-Term Digital Transformation Policy

The digital transformation of higher education in Morocco was significantly accelerated by the COVID-19 pandemic. While the current study focuses on the immediate context of Emergency Distance Learning (EDL), its findings have far-reaching implications that go well beyond the short-term pandemic response. Moroccan universities, especially law faculties, must adopt long-term digital transformation strategies that go beyond ad hoc digital adoption to ensure systemic resilience and modernization.

Our analysis of learning effectiveness, satisfaction factors, and predictive modeling shows that, in addition to its technical viability, sustained digital integration is strategically necessary. The findings show how much demographic, pedagogical, and infrastructure factors affect performance and satisfaction. When making institutional and national policy changes, each of these factors should be considered. These differences highlight the need to move away from reactive digital instruction and toward a fully articulated digital learning ecosystem based on equity, quality, and adaptability.

According to Morocco's national digital transformation strategy (Digital Morocco 2025 and Maroc Digital 2030), universities must set up digital governance frameworks that support the ongoing improvement of platforms, the distribution of digital resources, and the professional growth of faculty members. Furthermore, legal education requires a digital pedagogy tailored to the industry's needs, such as AI-driven feedback, modular simulations (like virtual moot courts), and reliable assessment tools. This is because rigorous textual analysis, interpretive reasoning, and procedural logic are hallmarks of legal education.

Our study promotes a long-term vision that includes the following pillars to ensure continuity and sustainability:

- Scalable infrastructure accessible to underserved and rural communities:
- Curriculum digitalization that balances synchronous and asynchronous content
- Faculty development for pedagogical innovation and digital fluency
- AI-enabled analytics to track student engagement and guide interventions
- Institutional digital planning embedded in strategic governance.

Furthermore, universities can identify patterns of disengagement and personalize learning journeys by integrating our predictive models into early warning systems. By using data science as an anticipatory governance tool, institutions can move from crisis response to digital foresight. Finaly, resolving long-term digital transformation policy is a structural necessity rather than just a technical one. To create educational ecosystems that are inclusive, flexible, and future proof for Moroccan legal scholars and beyond, universities, ministries, and civil society must work together.

5.6. Future Directions and Implications

This work brings to the conversation about educational resilience by showing how artificial intelligence, regression-based modeling, and insights from specific sectors can be used to evaluate and improve emergency remote learning. The results, which are based on a thorough look at a large dataset of Moroccan law students, show that systemic improvements are needed right away, not just short-term technology fixes. In the future, when AI is used in higher education, the most important things to work on are making predictive systems that can spot disengagement early, improving adaptive learning platforms, and making it easier for students to get real-time feedback that takes into account their emotional and cognitive states.

Institutions must also set up backup plans that combine digital infrastructure with policies that focus on people. These must include mandatory digital literacy programs, hybrid learning models that keep students engaged, and mental health support systems that are tailored to the academic and social needs of each student. To fix the differences in attendance and participation among female students, especially during emergencies, it is important to stress gender-sensitive educational planning.

Policymakers are urged to create flexible governance frameworks that can quickly put evidence-based solutions into action when things go wrong. This means that ministries, institutions, and technology providers need to work together more and put money into localized content and e-learning platforms that are open to everyone. Long-term monitoring of student outcomes after graduation and comparison analysis across different faculties and locations should be part of future research to improve targeted interventions.

This study gives real-world proof that predictive AI models can help with crisis learning and lays the groundwork for a higher education system in Morocco and similar places that is more open, forward-thinking, and responsive.

6. Conclusion

This study provides a thorough evaluation of Moroccan law students' satisfaction and readiness during the Emergency Distance Learning (EDL) period brought on by the COVID-19 pandemic. The study combines traditional regression models with advanced machine learning techniques and employs both quantitative and qualitative research to offer a comprehensive evaluation of the EDL system's performance, limitations, and prospects for the future. The results show a complex relationship between student adaptation, educational

quality, sociocultural constraints, and technology readiness. Prediction performance was improved by using feature selection and hybrid modeling techniques, such as RF-RFE and ensemble regressors (LightGBM, RF, ENet). This suggests that intelligent analytics is crucial for understanding educational dynamics in times of crisis.

Although law students demonstrated resilience when utilizing digital tools, they expressed conflicting emotions regarding their autonomy, learning satisfaction, and perceived career readiness. Academic level, gender, institutional preparation, and instructional design all influenced the disparities. According to the report, despite Morocco's notable progress in implementing Education 4.0 through digital resources and learning management system platforms, there are still significant gaps in terms of long-term strategy, institutional support, content quality, and equal access. The authenticity and applicability of the analysis are increased using genuine national education policy references (Digital Morocco Plan, Ministry of Higher Education plans).

To prepare for future crises, this article is in favor of improving universities' digital infrastructure, funding faculty training programs, integrating AI-driven customized learning systems, and putting inclusive policies into place to address pedagogical and digital disparities. To ensure a strong and student-centered higher education system, it is also crucial to institutionalize continuous feedback loops that involve all stakeholders, including students, teachers, and legislators. By providing a strong analytical and policy framework for reforming Moroccan higher education during disruptions and after, this study advances our theoretical and practical understanding of emergency education management.

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