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Virtual Reality-assisted User Interface with Hypertext system for Innovative and Entrepreneurship Education

Weimin Zhang[1]

[1]School of Innovation and Entrepreneurship, Jiangsu Vocational Institute of Commerce, Nanjing, 211168, China

Corresponding author: Weimin Zhang, zhangweiminei@163.com, weiminzhang.1981@yahoo.com

Abstract. Mobile devices can make it easier for people to communicate and navigate information networks every time. Researching students' adoption of mobile learning is a crucial concern about broad technology possibilities. Courses of entrepreneurship are essential elements in the curriculum in the graduate program. Virtual reality-based user interfaces with hypertext systems (VR-UIHS) for collections of digital documents may be developed using a general technique presented in this study. Hence, this paper, Intelligent Mobile Assisted Entrepreneurship Learning System (IM-ELS), has been proposed to optimize the entrepreneurship education learning scheme and enhance students' structure of entrepreneurship expertise. Artificial intelligence has been used to track students' actions to enhance sustainable enterprise courses. The proposed method for maximizing the entrepreneurial education curriculum system is to improve student entrepreneurship structure and positively advance sustainable entrepreneurship education. Assumptions concerning meaningful learning in higher education and learning through hypertext are laid forth in this paper. In representing the Hypertext system graphically on information retrieval and structural modeling approaches. Associative networks are used to visualize the most important connections in the system. The user interface provides a consistent spatial paradigm that allows users to explore and browse the digital library's 3D virtual environment. The results show a strong learning outcome of 97.8%, enhanced interface usability of 95.7 %, estimation ratio of 98.4 %, the response of 96.1 %, an error rate of 17.6 %, a data transfer rate of 95.5 %, a performance rate of 91.8 %, and student happiness of 94.2 % all have a substantial impact on the implementation of mobile learning (m-learning) programs.

Keywords: Artificial Intelligence, Augmented Reality, Curriculum Development, Entrepreneurship Education, Interaction, M-Learning, Hypertext System, Virtual Reality.

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1 OUTLINE OF ENTREPRENEURSHIP EDUCATION

Entrepreneurship education has been described as collecting formalized teaching, informing, training, and educating all involved in socio-economic development through an enterprise awareness promotion project about small companies' growth [18]. Entrepreneurship education offers vital life skills such as a creative approach to solving problems, real-world problems, and collaborating with a team [16]. Entrepreneurship education is important since it has the potential to raise the standard of living and produce money for the general public, rather than only for the entrepreneur's linked businesses. [19]. Enterprise helps drive change with innovation in which new and enhanced goods allow for the development of new markets [4]. Entrepreneurship training has emerged as a challenging subject for young students. A fundamental entrepreneurship program should be introduced as a compulsory subject in the regular curriculum to make students aware of the potential advantages of becoming an enterprise [6],[33].

Consequently, intellectuals have often urged young minds to start their own business. People never understand all these life functions that describe a person's personality [23]. By fostering creativity, innovation, and cooperation, Entrepreneurship Education makes the students more able to face the external world. In addition to degrees and graduate degrees, the students have the necessary experience to begin their market journey with a strong basis [27],[32].

Every day, when jobs are limited due to various factors, such as advances in technology and population growth, a business choice can be a significant career choice for the present generation [9]. Entrepreneurship frequently provides countless job prospects, which contribute to economic growth. Students are direct objects in teaching procedures; their input is one of the main factors in assessing teaching and training [24]. Accordingly, student satisfaction can be a critical teaching or training quality indicator. Higher education quality insurance work has shifted from supply to demand-oriented, particularly in massive education [1]. Entrepreneurship Education plays a chief role in teaching quality assurance. Therefore, building entrepreneurship education from a student satisfaction point of view is required. The solution and identification of problems are two different matters [13]. Students, through years of practice, should improve their problem-solving skills. The curriculum development must select and organize the learning experiences accordingly [10]. It helps choose research topics and other activities to achieve objectives and instructional objectives [2]. The main aim of curriculum development is to strengthen the district's educational opportunities and educational and practical activities to expand student participation and enhance student performance [22].

Mobile technology's rapid growth shows the revolution in the wireless world and its importance in many areas, including education [3]. Adopting this technology in training improves network infrastructure, high bandwidth internet, and wireless connectivity [21]. M-learning provides the teaching opportunity to teach anywhere, and it provides students with ultimate accessibility and versatility [28]. Learners should use their mobile devices to access entrepreneurship education courses and never have to attend classes during business hours [17],[8]. This teaching and learning approach is intriguing. It allows learners to access learning materials, including external work time, anywhere and at all times, and in different formats, such as audio, visual, or text mode, by learners' preferences [30],[26]. On the other hand, the recent acceptance of m-learning in education warrants further research to identify possible acceptance factors. Custom learning for mobile students focuses on each student's needs and desires to learn their mobile learning way [11].[29].

The increasing use of the World-Wide Web has highlighted cost-effective means for accessing information in enormous distributed hypermedia environments such as digital libraries, electronic publishing, and subject-specific knowledge repositories (WWW). Consumers have difficulty navigating through a large collection of documents and hyperlinks since they have no idea how these materials are related. A vast amount of data must be accessible to users easily and efficiently. This research examines an entrepreneurship education with mobile technology to assess students' attitude in accepting mobile methods and the quality of mobile services to enhance their learning and teaching strategies in higher education institutions for academic and social reasons. Institutions use AI to provide more tailored learning environments and enhance training through analytics, innovative tools, and automated work. Using artificial intelligence approaches in conjunction with a learning management system that provides mobile learning services for students and instructors at any time and from any place, this work contributes to the advancement of M-learning at the graduate level. Student attentiveness, flexibility in accessing learning materials and m-services, and development of student's abilities in utilizing mobile e-learning technologies incorporated into teaching are all seen positively. An overall strategy for creating a unified hypertext user interface is outlined in this research. The matrix factorization model and wayfinding networks are presented for the first time in this portion of the generalized similarity analysis (GSA). Second through the compendium's virtual reality interface design. These user interfaces will enable people to travel through a complicated network of digital documents easily. To round up our investigation papers that fit into some of the system's most common structural patterns. Finally, the implications of this method for building digital library user interfaces.

The main contribution of this paper

- i) Designing the IM-ELS has been proposed to improve the student curriculum development based on mobile learning through easily mobile access
- ii) Analyze students' behavior in m- learning using AI to improve student performance
- iii) In the case of digital publications, spiders or crawling, often known as Internet traversal and retrieval agents, are usually employed to locate and retrieve them.
- iv) Constructing content resemblance methods that rely on hypertext connection and user behavior.
- v) Scaling Pathfinder networks, identifying important inter-document links, and creating spatial configurations.
- vi) The numerical values have been performed, and the proposed method IM-ELS to achieve high accessibility, enhance student performance, predict student behavior and learning outcomes compared with other methods.

The paper structures remain as follows: section 1 Introduction of mobile learning-based entrepreneurship education, section 2 explores the literature survey. Section 3 IM-ELS has been proposed to reduce the student difficulty to enhance learning outcomes. Section 4 represents the result and discussion section. The last part of the paper, section 5, concludes the paper.

2 LITERATURE SURVEY

[5] Suggested successful entrepreneurial models for entrepreneurship education. Entrepreneurial learning based on an effective business model should facilitate education for sustainable development in higher education institutions. Exposure to effective business models in entrepreneurial education programs may be notable for stimulating student trust in starting a business and strengthening entrepreneurship. However, our results stress the importance of various programs to business and non-entrepreneurship students if educators want to increase education productivity to create entrepreneurial qualifications.

[31] Introduced the online education model based on machine learning and data analysis. The events of 2020 have shown us that society is still fragile and is exposed to events that change its paradigms quickly. Briefly, the way culture performs every activity has changed. This involves learning, which has made bets on using ICTs for students to achieve. This purpose may be explained in a new standard that seeks reliable educational models. Some chores are completed online, and technologies enable virtual assistants to aid students in their educational endeavors.

[20] Initialized the linear regression and psychological factor analysis for entrepreneurship education. The entrepreneurship group of college students was chosen to examine start-ups'

entrepreneurial performance to enhance the entrepreneurial results and create an organic combination of entrepreneurial training and performance. The findings have a psychologically-based reference value to research entrepreneurial training and to enhance business performance.

[14] Deliberated the teaching framework (TF) based on content analysis to focus on sustainability education. Sustainability education research has failed to incorporate business skills with other vital skills like complex problem solving and interdisciplinarity. They introduce a teaching framework that combines subject modeling with the content analysis of chosen articles based on a bibliometric process. These findings add to the literature on sustainable education by incorporating business skills growth in the interdisciplinary programs.

The machine learning approach (MLA) impacts entrepreneurship orientation on project performance expressed by [25]. Recent project management research has demonstrated the critical role of individuals' business orientation in project performance. This research uses predictive analysis to propose a machine learning approach to forecast individual project performance based on several factors, entrepreneurship orientation, and individual entrepreneurial attitudes. This study adds to the relationship between enterprise skills and project achievement. It offers insights into business management and project management studies of emerging data science and machine learning tools.

Kernel extreme learning machine (KELM) and gaussian barebone (GB) strategy with harris hawk's optimizer (HHO) for predicting the entrepreneurial intention of students were explored by [34]. This research suggests an innovative, efficient model that predicts entrepreneurial intentions that can serve as a basis for developing a talent training program and guiding student entrepreneurship. The prediction model is based mainly on the KELM, optimized with the HHO. The test results demonstrate that, by four criteria, better classification and stability can be achieved with the proposed GBHHO-KELM. They are, thus, supposed to be an effective prediction method for the GBHHO-KELM model.

Fuzzy Bayesian Intelligent Tutoring System (FB-ITS) improves students' academic performance, as [12] described. This theoretical thesis uses furtive, logic-based artificial intelligence approaches and the Bayesian network approach to help students adaptively build an intelligent tutoring system in the fuzzy Bayesian intelligent learning environment tutoring system (FB-ITS). The findings showed that FB-ITS students required less time than those using the conventional e-learning system about the time it took to carry out the post-test. The results indicate that the current method has led to the final examination speed and academic performance.

Dual-Scaffolding Framework for an investigation on the collective flow state of students and the behavioral patterns of teaching and learning process [15]. Learners' flow and acceptance were shown to have a favorable association. The students' behavioral patterns also revealed that interpersonal and cognitive scaffolds were beneficial to their problem-solving process. Further study revealed that high collective flow groups were more reflective and analytical than low collective flow companies in game-based learning, but low collective flow companies were not.

AR-based mobile touring system on university students' learning effectiveness and interest [7], [33]. The experimental findings reveal that the AR-based mobile touring system greatly increased the students' memorizing dimension of learning accomplishment compared to a traditional mobile touring system. The results of these experiments suggest that augmented reality technology has the potential to enhance learning outcomes and increase student motivation in outdoor settings. AR-based mobile touring system in realistic learning activities, AR virtual objects be built correctly to improve content recall performance and learning interest.

Based on the survey, there are some issues in the existing method for sustainable entrepreneurship education. Hence in this paper, overcoming these issues based on IM-ELS proposed to reduce the uncertainty of the education results outcome and provide students behavior analysis to create a relationship between teacher and student interaction.

3 PROPOSED INTELLIGENT MOBILE ASSISTED ENTREPRENEURSHIP LEARNING SYSTEM (IM-ELS)

Mobile technology developments have changed how learning is transmitted, received, and assessed. The emerging link between technology and education has made digital teaching and learning tools more necessary. The demand for entrepreneurial education throughout the world is increasing. This cannot be related to the alarming unemployment rate, which has required the inclusion in the college curriculum of entrepreneurial studies to develop skills and job creation. Hence, IM-ELS minimizes the uncertainty of education results by providing student behavior analysis and establishing a link between instructor and student interaction. The proposal studied e-learning relationship indicators to construct the students' profiles and took counter-measures in this research. The idea established a framework for filtering and analyzing education and student learning data. Using a similarity calculation and a Jaccard coefficient algorithm, the student profile learning behavior length.

It is important to consider additional student characteristics when designing or implementing scientific learning activities in schools using Interactive VR. It is important to consider VR qualities like control immediacy while creating Interactive VR settings. Even though the intelligent virtual robot may give rapid feedback for students' learning, it is still unclear if this kind of IVR design, which contains feedback features, is as successful as many other online systems or classroom circumstances. For this reason, future research should examine the pedagogical and technical design of the Interactive VR feedback features to promote scientific learning. To examine how these student groups work in interactive virtual reality settings and equip students to utilize shared Head Mounted Display (HMD) time efficiently.

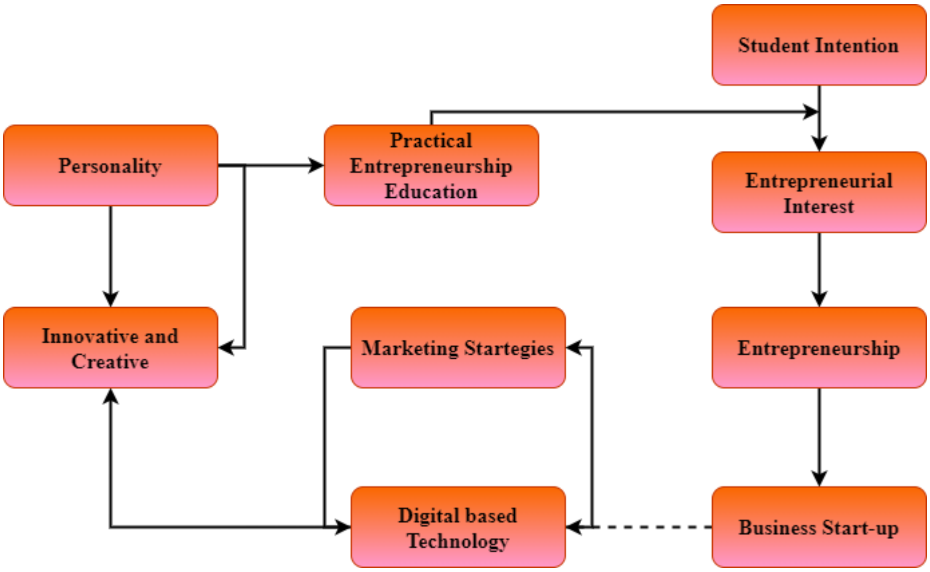


Figure 1: Student Entrepreneurship Education Intention.

Figure 1 shows the basic diagram of student entrepreneurship education intention. Education for entrepreneurship must be based on action. This is done to develop creativity by creating new companies and industries. The fact that capable personnel is limited becomes an obstacle in a company’s future as a student potential. Universities should address this need by improving graduates' motivation and skills to become creative and entrepreneurial activities in companies or enterprises. Traditionally, entrepreneurial education is centered on individual instruction not many programs are oriented to entrepreneurship. Strategies that use creative business management include market analysis and planning, price-setting, investment strategies, leadership, human resources capabilities, and know-how to establish multiple management dimensions. Entrepreneurial education must be included in management and other areas, thus encouraging new start-ups to emerge. Students need to examine all forms of barriers and solutions to overcome them. Different skills include leadership competencies, communication and product development skills, and communication and information technology inventions. Developing entrepreneurship learning can be carried out by prioritizing strategies for improvement in four main respects: 1) inclusion of material content; 2) leadership skills and behaviors; 3) mentality; and 4) personality education. Business intentions can be cultivated by educating in entrepreneurship to create interest in entrepreneurship. Different elements and dimensions can be achieved in practice. 2) Creativity and innovation may be developed to shape students' nature who can formulate management strategies sufficiently good for improving their entrepreneurship. Digital technology helps to develop industry start-ups that reflect the times and requirements of today's digital era. Four sets of tasks include good business development through the implementation of digital technology: 1) the applied engineering business ideas; 2) a new understanding of entrepreneurship issues using digital technology; 3) personal development based on creative and innovative actions; 4) a collective effort. Entrepreneurial learning can be done through e-commerce, such as digital technology in entrepreneurial practices. Students can be taught various forms of new media and predict consumers' tastes, the environment, and the needs of thousands of generations, and, of course, create good quality products quickly at low cost. With a range of product innovations such as goods or environmentally-friendly products. Thus, students indulge in practical training where independent entrepreneurial intentions can potentially form quality human resources.

Figure 2 deliberates the proposed IM-ELS. Three main models for each adaptive mobile training system include the student, adaptation, and domain models. The immediate outside environment of the system defines the context of the system and its environmental dependence. The context model illustrates the system's external boundaries where all application navigation includes the user interface portion and connections to other modules. Users should watch previous messages posted on the platform by other members and comment on other feedback. It provides trends in entrepreneurship and education. Returning users can log in easily when new users are allowed to register on the registration module. On the website, people can register on the registration page. The following must be given to the new users: name, institute, department, telephone number, username, and password. The data transmits to the database when these details are provided. All fields must be registered successfully, and failure to supply anything causes an error. Users can utilize the accessibility of the login module. This happens if the user has logged into the platform successfully. To successfully log in, a user must enter a username and password. Any variance in username or password would be mistaken, as this does not match the values available in the database. This may help them evaluate their art's acceptance and attract patronage. Lecturers should request students to upload their jobs to this module. These uploads include lessons, videos, and photos that demonstrate practical skills in entrepreneurship. The admin should handle users, access pending posts, agree on a post, receive user feedback, go to the homepage, log out and answer user feedback.

The student models this part using the student characteristics to chart user types, knowledge, and behavior. This model is the principal part of the IM-ELS mission. It hierarchically reflects all learning materials contained in the study content index. This model describes the classification for individual subjects with classes, assessments, and references. It adapts the learner model data to produce the appropriate learning materials with courses from the domain model because it is the principal model for any system for adaptation. An adaptive model shows data that can develop throughout the modeling process with changing contexts. These models predict real-world scenarios where factors that influence the marketability of goods and services determine sustainability changes. This makes it possible to obtain background values using smartphone sensors to predict the learner’s current position, physical activity and detect noise.

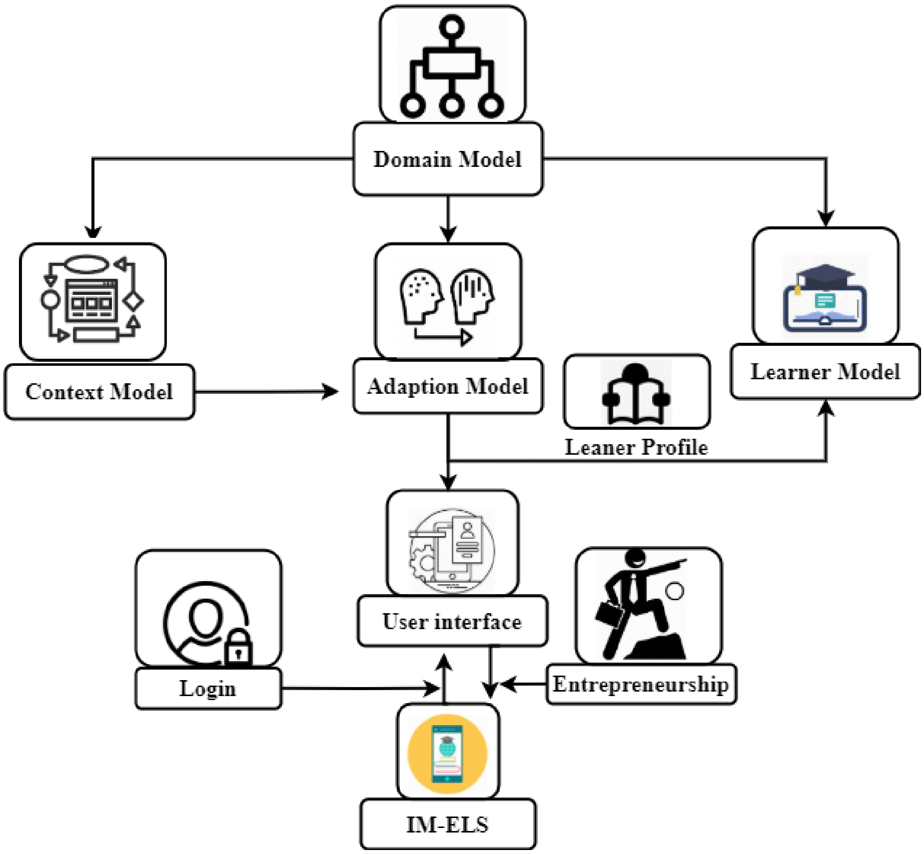


Figure 2: Proposed IM-ELS.

The contextualization model aims for every mobile application or service may differentiate. More user-focused applications enhance existing features, provide users with information conveniently to their current contexts, increase users' interaction and involvement. Many dynamic 3D images in this virtual environment are linked to their information elements. VR controllers allowed students to move around the virtual environment and interact with the 3D picture at their discretion and convenience. Through the knowledge pieces, including introductions, encyclopedia material, exterior aspects, habits and life cycles of the 3D picture, they could learn more about the person. In this paper, there are three methods i) Predicting student entrepreneurship activity, ii) Student Behavior analysis iii) student engagement and student satisfaction.

Figure 3 signifies the Virtual Reality-based User Interfaces with Hypertext system for College Students. Generalized Similarity Analysis (GSA) is a methodology for identifying structural patterns from an interactive multimedia information space. Interrelationships between hypertext fundamentals, such as hypertext linkage, content similarity, and browsing behavior, are routinely included in the overall architecture. The Hypertext Compendium was subjected to a GSA in this investigation. Many computational models make up the architecture of the GSA framework. Each of these computer models creates a virtual network of links based on a different characteristic of the input data. Some or all of the component models may be combined to create a virtual link structure. The architecture may be expanded to incorporate more inter-document links based on citation and co-citation counts.

The vector-space paradigm is commonly utilized in information retrieval. Each document in this paradigm is derived as follows terms. The weighting of words in a text indicates how important they are in delivering their message. The distance between the two related vectors is used to measure the distance between two papers.

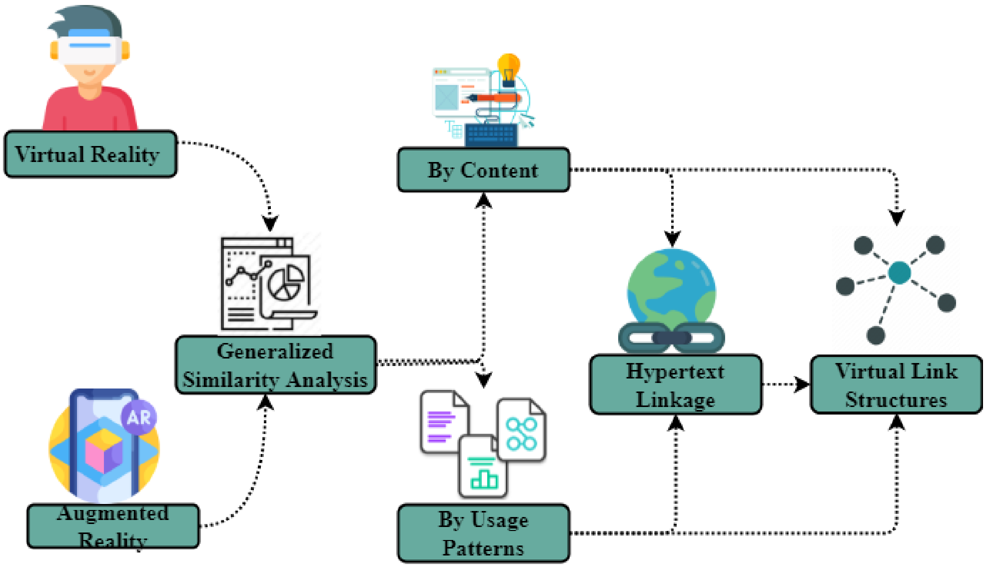


Figure 3: Virtual Reality based User Interfaces with Hypertext system for College Students.

The vector space paradigm is used to build semantic information hypertext networks automatically. In this work, create term vectors using the well-known which consists of maximum - likelihood times inverse document frequency. A vector of terms represents each document. The magnitude of the word in document vector is defined by

$$Z_{jl} = \frac{se_{jl} \times \log\left(\frac{M}{m_l}\right)}{\sqrt{\sum_{i=1}^{s}(se_{ji})^2 \times \log\left(\frac{M}{m_i}\right)}} \tag{1}$$

As shown in equation (1) vector space paradigm has been proposed. Where se_{jl} is the number of instances of the phrase in , is the number of documents in the corpus (including the size of an Internet site), and m_l is the number of records including the term . Based on the related vectors , the textual similarity is calculated as follows:

$$\text{similarity}_{ji}^{content} = \sum_{l=1}^{S} Z_{jl} \times Z_{il} \tag{2}$$

As described in equation (2) similarity has been detected. The virtual and augmented reality models were updated in the Hypursuit system. The Hypursuit system is focused on producing hierarchical classifications of documents is to produce a network representation of the structure of digital documents. The virtual and augmented reality models were used, although content similarities were calculated between articles linked by hyperlinks. Content similarities are analyzed throughout our research's complete collection of papers to identify under-represented patterns. The spatial arrangement in GSA is determined by a spatial configuration, which transforms commonalities from the domain into a spatial arrangement to or in the same way as multidimensional scaling does (MDS). Pathfinder networks are created from conspicuous connections using the triangle inequality criterion, which eliminates incorrect links, while MDS solutions are produced using MM to measurements of pair-wise relationships. This approach, known as force-directed graph sketching, is used to design the network topology of the Pathfinder network.

In information visualization, force-directed graph drawing is increasingly popular since it's easy and uncomplicated. As the name implies, weighted links link the nodes in a spring-energy model. The weights' spring energy pushes these nodes into their desired positions. The graph starts to emerge as the amount of spring energy in the system declines. Resolving spring models often requires a computational cost of. There is an increasing need for more efficient approaches as the number of nodes in the network expands Divide-and-conquer is an approach in which a huge information space is divided into smaller clusters using basic classification algorithms until computationally costly techniques can be used successfully in the remaining information space after the first division.

3.1 Predicting Student Entrepreneurship Activity

Figure 4 demonstrates the analysis of the student behavior. Data on student motivation are used in this research to measure facial responses and to sit during learning. Students' motivation can be considered subjective evidence and must be seen by corresponding sources. The study identified generic profile data for students, such as personality and academic results. Furthermore, student performance data are still required to develop a student model profile. This paper took ideas from several research papers that addressed posture response and task behavior to extract information on student learning motivation. The next stage is building models according to the individual student profile after separating the data processor.

Figure 5 explores the time analysis for student behavior prediction. Under the proposed application architecture, the time analysis enables simulation development to identify the capability to match the classroom's actual learning obstacles. The expense of building a physical system in real-time is significant. In sensor devices, for example, simulation development is chosen as the best alternative. The outcomes of simulated situations have been reviewed to determine if the offered methodologies can extract students' qualities and give personal learning methods.

Students who do not usually talk and choose not to participate in the learning process do not generate a healthy atmosphere for good learning. Effective teaching is difficult, even with a more usual approach to teaching. Thus, the system keeps track of student engagement and dynamic conduct every 5 minutes with our proposed framework. The system can draw up a teaching decision-making plan for each student’s learner status using the decision-taking model and each student's attributes data.

Students' simulated behavior is moved to the id3 category, which builds and refreshes a decision-making tree that shows their relationship with their learning viewpoints. This model generates the decision tree and the system uses the data every 5 minutes, and the decision tree is eventually updated. The learning profiles of pupils get increasingly detailed as the decision tree builds up excessive knowledge. The accuracy of the student learning profile improves thanks to the decision tree, which was built using prior data to anticipate fresh data. When results with high precision are achieved automatically, the whole data set is not used.

Multiple transformations in the data show that the variables are commonly distributed by log transformation. Thus, a model reminiscent of the production function Cobb-Douglass may be suitable. It suggests the following model equation one research how a change in entrepreneurship activity (with GEI as a proxy) explains the variance per capita GDP in equation (1):

$$\text{Quality of life Index}_{js} = e^{\beta_0} \text{gei}_{js}^{\beta_1} e^{\delta_{js}} \tag{3}$$

As shown in equation (3), entrepreneurship activity has been explored. The β_0, β_1 coefficients of regression j country indexes, s indexes over time in years, and δ_{js} means random mistake term with mean null and constant variance.

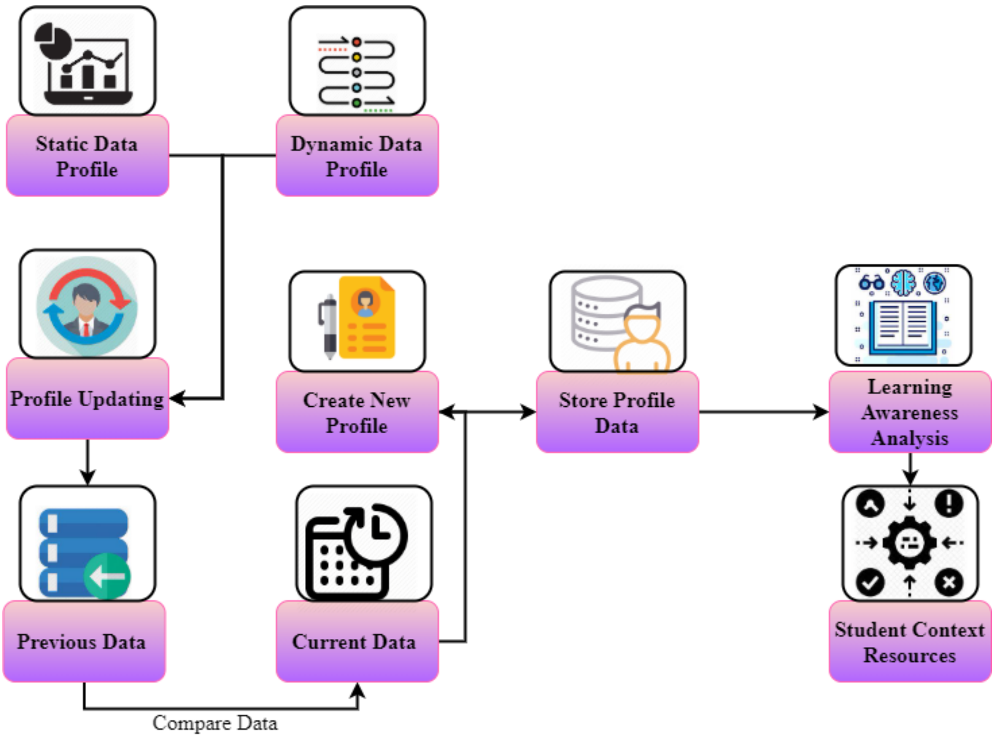


Figure 4: Analysis of the Student Behavior.

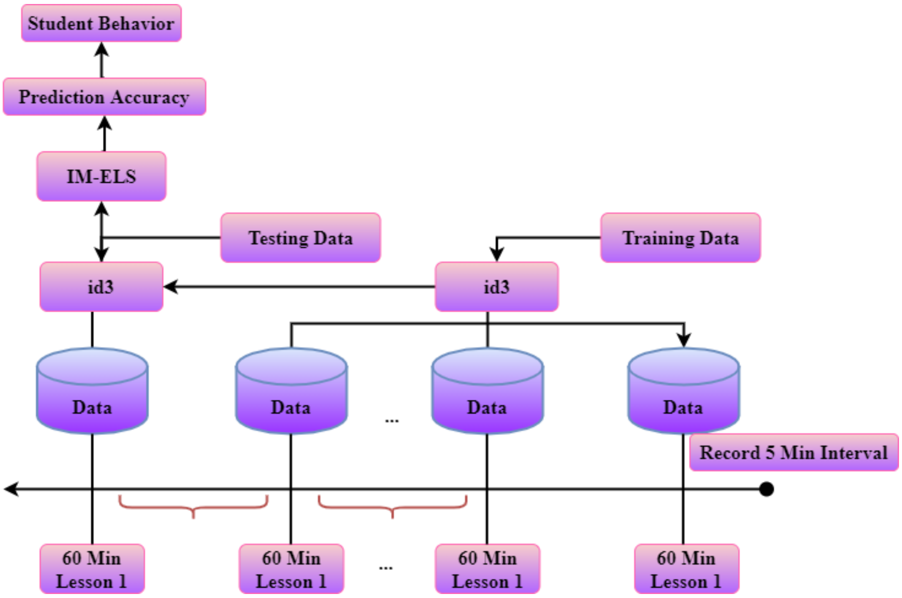


Figure 5: Time Analysis for Student Behavior Prediction.

3.2 Student Behavior Analysis

The student profile explained multi-dimensional and multi-faceted learning traits. It encompasses analyses and considerations, such as students' behavior, data collection, data purification, and student profiles creation and interpretation.

The basic thesis on the user profile is that the students in the classroom or on the e-learning platform are the primary target audience. Suppose the student is set in equation (4):

$$\mathbb{v} = \{(\mathbb{v}_j^i | \mathbb{v}_1^i, \mathbb{v}_2^i, \dots \mathbb{v}_{\mathbb{N}}^i)\} \tag{4}$$

As described in equation (4) student set has been expressed. Where $\mathbb{v}_j^i$ shows the classified students by age; j refers to a certain person; i indicates the age of the students in the class (the above-mentioned is generally omitted for convenience $\mathbb{v}_j$).

Start concentrating on digitalizing the characteristics of pupils based on their online learning activity. The operation of internet learning is the core of learning behavior. Students, for example, click on a course, browse the website, play the video and download the respective course pieces. The download and click are the two learned behavior functions. The comportment set in the profile of the student is set in equation (5):

$$\mathbb{B} = \{(\mathbb{b}_j | \mathbb{b}_1, \mathbb{b}_2, \dots \mathbb{b}_{\mathbb{N}})\} \tag{5}$$

As explored in equation (5), student behavior has been found. $\mathbb{b}_j$ shows various behavioral variants and encompasses 12 learning behaviors, such as learning purpose, text learning, and online practice. Since online learning is the era, online learning quality reflects learning as an essential parameter for evaluating. The timeframe is described as follows in the student profile in equation (4):

$$\mathbb{P} = \{(\mathbb{P}_j | \mathbb{P}_1, \mathbb{P}_2, \dots \mathbb{P}_{\mathbb{N}})\} \tag{6}$$

As obtained in equation (6), a timeframe has been performed. Where $\mathbb{P}_j$ Specifies various durations; divided into 1 to 10m, 10 to 20 m, 20 to 30m, 30 to 40m, 40 to 50m, 50 to 60m, etc. Under these principles, $\mathbb{v}_j . \mathbb{b}_j .$ refer to the student's behavior.

Data cleaning takes the original data into account, eliminates redundant data, preserves data helpful to analyze and organizes the information in a standard format. Data cleaning enhances data analysis accuracy and makes data mining more reliable due to abnormal values interference.

Collection of data source pre-treatment attributes induction is the most critical method. Suppose the $\{\mathbb{G}_1, \mathbb{G}_2, \dots, \mathbb{G}_{\mathbb{N}}\}$ original field, in which GNG is the original field data dimension. Set vector A to mean the desired property for $\{\mathbb{G}_1, \mathbb{G}_2, \dots, \mathbb{G}_{\mathbb{N}}\}$and $\mathbb{A}$. The attribute induction procedure is characterised as a signature, and the data is cleaned by the property status of preprocessing data in meant to receive the anticipated properties in equation (7):

$$\{\mathbb{A}_1, \mathbb{A}_2, \dots \mathbb{A}_{\mathbb{N}_{\mathbb{A}}}\} = \text{signature}\{\mathbb{G}_1, \mathbb{G}_2, \dots, \mathbb{G}_{\mathbb{N}}\} \tag{7}$$

As calculated in equation (7), set vector and data preprocessing have been deliberated. The student profile explained multi-dimensional and multi-faceted learning traits. It encompasses analyses and considerations, such as students' behavior, data collection, data purification, and student profiles creation and interpretation.

Compared to the online behavioral and learner length characteristics, comparative class properties and the classroom discrepancies, similarities in the student's behavior are calculated using Jaccard similarity coefficient algorithms.

The similarity between the behavioral properties of different items of students is non-numerical; the proposed use of computed similarity coefficient Jaccard for resemblance is in equation (8):

$$\mathbb{U}_{iK} = \text{jaccard}(\mathbb{V}_j . \mathbb{B}_k . \mathbb{V}_i . \mathbb{B}_k) = \left| \frac{\mathbb{V}_j . \mathbb{B}_k \cap \mathbb{V}_i . \mathbb{B}_k}{\mathbb{V}_j . \mathbb{B}_k \cup \mathbb{V}_i . \mathbb{B}_k} \right| \tag{8}$$

As found in equation (8) Jaccard coefficient has been discussed. Where $\mathbb{V}_j . \mathbb{B}_k$ and $\mathbb{V}_i . \mathbb{B}_k$ depict the course of events $\mathbb{B}_k$ of students j and $\mathbb{V}_j$, suppose the student $\mathbb{V}_i$ belongs to $\mathbb{B}_k$; the proposed compare $\mathbb{V}_j$to $\mathbb{V}_i$. If $\mathbb{V}_j$ and $\mathbb{V}_i$ similarity variance is too high; it is added to $\mathbb{B}_k$ as a new class. The similarity between users is defined in equation (9):

$$\mathbb{U}_{ij} = \text{similarity}\left(\mathbb{V}_j.\mathbb{V}_i\right) = \frac{1}{\mathbb{M}}\sum_{k=1}^{\mathbb{M}} \mathbb{U}_{ijk} \tag{9}$$

As discussed in equation (9), user similarity has been evaluated. $\text{similarity}\left(\mathbb{V}_j.\mathbb{V}_i\right)$indicates the similarity between students $\mathbb{V}_j$ and $\mathbb{V}_i$; M indicates the student set characteristics relating to conduct $\mathbb{V}$; $\mathbb{U}_{ijk}$ shows the similarity between two different properties$k$ between students $\mathbb{V}_i$ and $\mathbb{V}_j$ and $i \neq j$.

Define each course having j learner and every learner having N representative assessments

$$\mathbb{C} = \{\mathbb{C}_1, \ldots, \mathbb{C}_{\mathbb{N}}\} \in \mathbb{U}^{jXN}$$

$$\mathbb{O} = \mathbb{f}(\mathbb{C})\mathbb{R}^{jXN}, \mathbb{R} \in \{0,1\} \tag{10}$$

As explored in equation (10) course certificate has been defined where $\mathbb{C}_{\mathbb{N}}$ expresses an entrepreneur course; $\mathbb{O}$ =0 means it is unlike to get a certificate, and $\mathbb{O}$ p=1 denotes the might got a certificate and $\mathbb{f}(\mathbb{C})$ is a function of prediction.

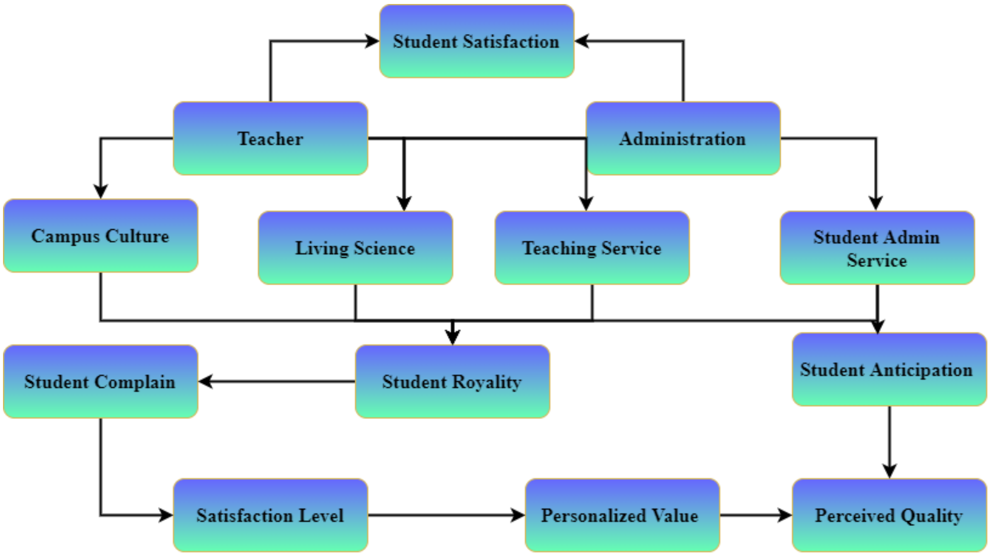


Figure 6: Student Satisfaction- Organic Model.

4 STUDENT ENGAGEMENT AND STUDENT SATISFACTION

Figure 6 expressed the student satisfaction detection model (organic model). This hierarchy discusses the various levels of factors resulting in student satisfaction. A model encompassing perceived value, expectations, quality, student loyalty, student contentment, criticisms, and many other values must be built to quantify student satisfaction levels accurately. The above six factors constitute an organic model: each of the six preceding elements contributes to student satisfaction. The three general aspects that improve student satisfaction include the classroom environment, college facilities, and course structure. Each building component is summarized by a weighted average, whereas surveys and statistics provide observation factors. The perceived quality indicator summarizes the total experience of education and service, whereas student satisfaction assesses the difference between the expected and perceived quality of education. This relationship is demonstrated in figure 5 for student satisfaction. There are three organizations within the education community: administrative entities, teachers, and students.

Administrative organizations include managers and teaching services; students study under instructors' guidelines. The administrative entity refers to the management group or the delivery of services for training, comprising managers and administrators. In the second level, the satisfaction of students for administration and service and their satisfaction with the living service are totally in line with an assessment of administrative bodies and other indicators, including the level of satisfaction of students for their education services, their level of satisfaction with the culture of the campus, their complaint and loyalty and general satisfaction. The administrative entity consists of service workers and university or college administrators. The logistics managers who offer cooking, lodging, and other services to the students are part of the service group. The other group of university administrators is in charge of allocating instructional resources, formulating a university development plan, managing the day-to-day operations, and deciding on strategic goals, techniques, and measurements for the culture of talented people. This group has significant consequences for professor satisfaction in this regard. It is possible to construct the university's administrative entity from the following four elements. The first is to build a series of rational, efficient, scientific concepts on the conceptual level, transform the primary role of higher education and nurturing talent to a student-oriented consciousness, and guide entire university work. The second is to devise a policy on student development and achievement at the political level. These policies encourage teachers to focus on teaching and diversifying approaches to educating students. It is based on the obligation design that the teacher entity has built. The first is a group with a particular social role in teaching expertise and educating individuals, making it an essential teacher's social responsibility. The second part of teachers' professional roles consists of providing skills, cultivating individuals, and cultural development. The third is that the teachers must enhance their quality, research new telecommunications methods, increase teaching effectiveness, and provide detailed guidance. The student entity is a university research group.

The evaluation system indicators of student satisfaction reflect students' views on the quality and value of universities' educational services and their comparison with their demands. All the measurement indicators of a satisfactory student-level indicate students' perception of universities' educational services quality and value and their comparative findings. The central issue in building a student entity should be as per the student's initiativeness to successfully implement. Talent training can be accomplished through teaching, learning, and practicing, and these elements are intimately linked. It isn't easy to achieve successful teaching without efficient learning.

The question in this paper is to lower the drop-out rate by recognizing that students with insufficient commitment in the first phase of an appraisal are dependent on the relative time of students and their actions when evaluating the courses in equation (11)

$$\mathbb{P} = \{\mathbb{X}_j, \mathbb{Y}_j\}_{j=1}^{\mathbb{M}} \tag{11}$$

As shown in equation (11) course set has been expressed. The above equation, $\mathbb{P}$, is the course set in the research, and $\mathbb{X}_j$ is a $\mathbb{M}$ in-dimensional input vector containing the inputs. These characteristics include the number of clicks on mobile operations before the first-course evaluation is finished. $\mathbb{M}$ represents the number of students in the first evaluation; $\mathbb{Y}_j$is a target class vector that chooses the $\mathbb{X}_j$ and $\mathbb{Y}_j$ [1, 0] input classes in equation (12):

$$\mathbb{Y} = \mathbb{f}(\mathbb{V}) \tag{12}$$

As evaluated in equation (12), input classes have been expressed. Allow $\mathbb{L}$ to be a classification. Each $\mathbb{L}$ classification has been trained on the $\mathbb{P}$ functions. $\mathbb{P}$ training set for each classification $\mathbb{L}$ is a dyad $\{\mathbb{X}_j, \mathbb{Y}_j\}$ in which $\mathbb{X}_j$ marks the record of the characteristics and $\mathbb{Y}_j$ is the class of characteristic $\mathbb{X}_j$.

The most committed students gained higher scores and improved exam results. The highest education level variable is omitted because it had a statistically significant low $\mathbb{O}$ value. It describes commitment as follows in equation (13)

$$\mathbb{W} = \mathbb{O}\{\text{exce}, \text{que}, \text{act}\}, \tag{13}$$

$$\mathbb{Q}_{\gamma\,\{exce,que,act\}} = \begin{cases} 1 & \mathbb{W} = exce \vee (quality \wedge action) \rightarrow high\ engagement \\ 0 & otherwise \rightarrow Low\ engagement \end{cases}$$

The analysis of the student engagement has been obtained in equation (13). Where $\mathbb{Q}_j$ represents the engagement level of student valuation and $\mathbb{Q}_j\,\{0,1\}$ "OR" is denoted by the operator $\vee(.)$ an "AND" operator is denoted by $\wedge(.)$.

Different methods such as questionnaires, external testing, and physiological measures may be used; additionally, students may disrupt, and these methods can not be scaled. In addition, according to previous studies, measuring students' commitment by total clicking does not ensure that the students are very active. It measured the commitment of the pupils based on excellent (Exce), Qualified (Qua), and action (Act) during courses. Results show that highly engaged students reach high values for evaluations (excellent) and pass (qualified) final examinations (active)

The first measure is accuracy, which is the correct percentage of pupils with low levels of commitment in equation (14):

$$Accuracy = \frac{True\ positive + True\ Negative}{True\ positive + True\ Negative + False\ Positive + False\ Negative} \tag{14}$$

As calculated in equation (14), accuracy has been formulated. Next, calculates a recall which shows the portion that the classifier correctly recognizes as having a low level of engagement of all the students in the dataset. A high-recall ML model is thought to be acceptable in equation (15):

$$Recall = \frac{True\ positive}{True\ positive + False\ Negative} \tag{15}$$

As determined in equation (15), the recall has been performed. IM-ELS has been proposed to reduce the uncertainty levels in student satisfaction to achieve learning outcomes, user accessibility, prediction, response, error rate, data transmission rate, efficiency.

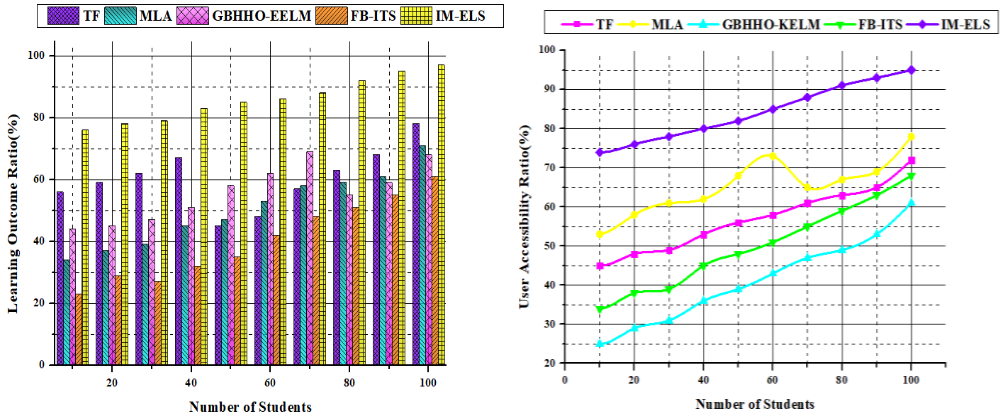
5 RESULTS AND DISCUSSION

Simulations explore hands-on learning opportunities. It is an effective tool for teaching material and the thinking and reasoning abilities required to solve issues in the real world. Students' mental representations of complicated circumstances, and their problem-solving techniques, can be developed through simulations. User interfaces based on virtual reality with hypertext systems hold great promise for helping people meet their cognitive demands. Therefore, this study develops the simulation model and evaluates the proposed IM-ELS, which is aimed to reduce the uncertainty levels in student satisfaction based on these parameters learning outcome, user accessibility, prediction, response, error rate, data transmission rate, efficiency.

According to the academic success test results, comparable research has revealed that Interactive VR has a beneficial influence on learning outcomes. In this research, the advantages of Interactive VR were shown to be attributed to three distinct causes. As a first step, the experimental group's superior performance may be due to the beneficial aspects of virtual reality. This is in line with earlier research that found that more effective interactions and communication in Interactive VR will improve learning outcomes. Computer conferencing facilities are more suited to connecting ideas, interpretations, and issue integration, whereas face-to-face encounters facilitate creative problem investigation and idea production. As a result, the combination of in-person group activities with VR-enabled interactive settings might provide an engaging learning environment. In addition, the visual explanations of scientific information and the intelligent robot's quick reply in the virtual setting may help students strengthen their conceptual understanding of science.

5.1 Learning Outcome Ratio and User Accessibility Ratio (%)

Practical implications for M-learning Students with the entertainment-education program, tending to influence their satisfaction with their studies results, have various incentives for researching entrepreneurship. With teams in a business course, students with low and high intrinsic motivation seem to be generating more positive results. In conclusion, the findings show the need for more flexibility in the design of courses. This paper adds to understanding the theoretical implications of student motivation and team performance for entrepreneurship learning outcomes. It makes an original contribution to differentiate between an extrinsic and intrinsic motivation for entrepreneurship research and underlines the impact of team-based learning of the resources. It shows the possibility of examining enterprise education's influence, especially if its immediate goal is to create a new enterprise. Figure 7 a) and 7 b) shows the Learning Outcome Ratio and User Accessibility Ratio (%)



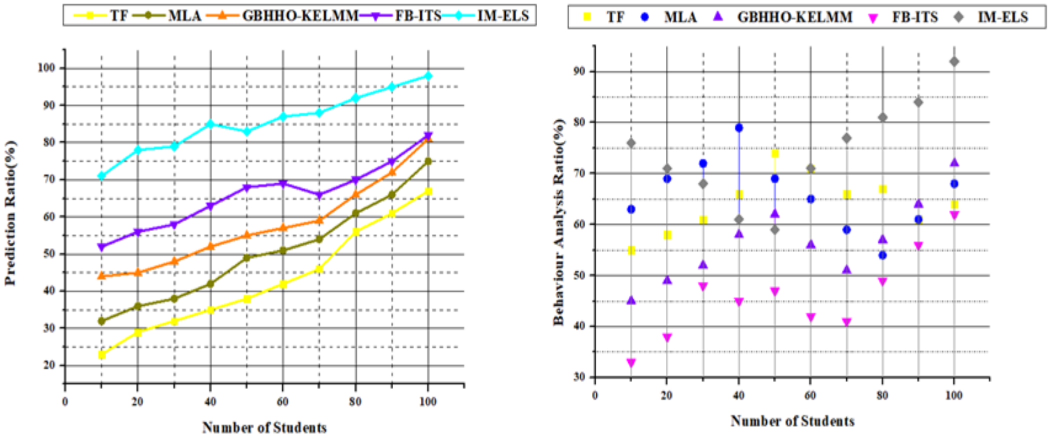
(a) (b)

Figure 7 (a) and (b): Learning Outcome Ratio and User Accessibility Ratio (%).

In this research, a study is conducted on mobile technology to determine students' attitudes in accepting mobile technology and assess mobile services quality for academic and social reasons to increase teaching and learning performance in higher education groups. Individual components in big spaces should be discernible and the spatial structure of representations should be understood as a meaningful context and prominent interactions between components should be recognized. Because the results of this research combine the M-learning technique with a learning management system that allows students and instructors to access mobile educational services from any location at any time, the findings of this study contribute to the advancement of M-learning at the university level. The study has seen some critical findings for integrating mobile technology into education, including positive student perception, ease student concentration, flexible access for learning materials to m-learning, and enhancing student skills in mobile entertainment-education technology.

5.2 Prediction Ratio and Behavior Analysis Ratio (%)

Identifying at-risk or potentially excellent students is increasingly important to higher education institutions to meet students' requirements and create effective learning strategies. User interface design for virtual reality is still in the early phases. Virtual worlds on the Internet will become more interactive if VRML 2.0 is widely used. The early prediction may indicate students' performance during their years of training, which helps to adapt a suitable learning strategy for poor or good students. Mobile application to predict the achievement of students before beginning college education. An intelligent data system that predicts the participation of students through logged student data analysis. The effort student makes to learn procedures for the content of a particular course is student engagement. Figure 8 a) and 8 b) shows the Prediction Ratio and Behavior Analysis Ratio (%).



(a) (b)

Figure 8 (a) and (b): Prediction Ratio and b) Behavior Analysis Ratio (%).

A predictive model can help professors lead students to complete a course successfully and can be used to identify tasks and materials that are most relevant for the course evaluation. These models often allow teachers, through virtual learning environments, to involve students in various activities and encourage students to take part in entrepreneurship. It offers an intelligent model guide to guide the entrepreneurship platform and students by developing entrepreneurship tools and learner behavior. Studying the user profile allows the entrepreneurship platform to address comprehensively and direct student learning conduct, develop a customized learning environment and encourage entrepreneurship optimization.

5.3 Response Ratio (%)

M-Learning is important to remember that technological application in educational settings has to be based on the dominant theories and methods used as technology usage in education for mobile learning. It is done when a conditional correlation between a specific stimulus and a detailed response has been formed according to behavioralism. Mobile learning and behavioral applications are confined to their principal concept of stimulation and reactions. The learning content and the stimuli are given to students through mobile learning, while the attachments, the brief tests and the response are the answers to the students. Figure 9 shows the Response Ratio (%).

5.4 Error Rate (%)

The student's low error rate in the success prognosis is a fascinating topic. It can help teachers deter students from leaving before the final exams and identify students who need additional help. This research aims to foresee students' problems in a future digital design course. The IM-ELS makes it impossible for students to solve digital modelling exercises while recording input data at different stages. According to the average time, the total number of tasks, mean idle periods, the average number of critical hits, and the corresponding total operation, each exercise input variable is the outcome variables in each session's student ratings. The stats of the initial session and the following session algorithms are checked. Thus, teachers hope to report better student success during the subsequent sitting. Figure 10 shows the Error Rate (%).

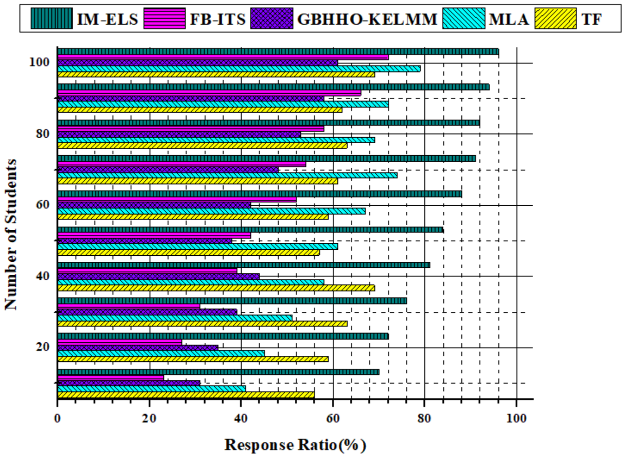


Figure 9: Response Ratio (%).

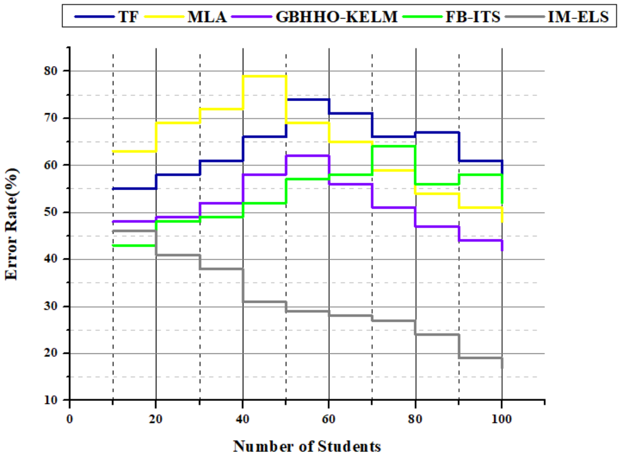


Figure 10: Error Rate (%).

5.5 Satisfaction Ratio (%)

Mobile learning technology services have provided higher education institutions with a new platform to strengthen learning. Mobile learning offers versatility and all-embracing for learners. Students remain academically uncharted in their happiness and use factors at private and public colleges. In this research, the constructivism learning theory is employed to study students' satisfaction and the variables that predict ML use between students from public and private universities. User satisfaction refers to the emotions of affection encountered by a system interaction, a subjective set of interactive experiences with successful components. The satisfaction of students constantly measures successful ML implementation. Figure 11 shows the Satisfaction Ratio (%).

5.6 Efficiency Ratio (%)

The M-learning platform can help students submit their job, generate ideas and present them. Students may share pictures and videos to show their innovative process on the input and sponsoring platform and teach other students how to make or perform a specific product.

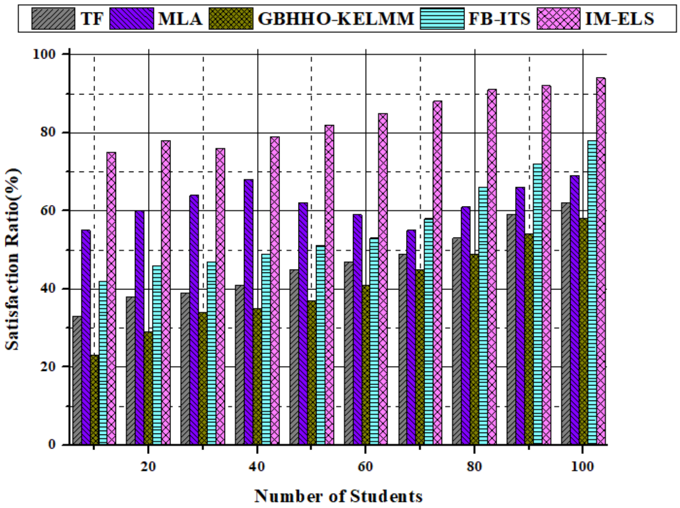


Figure 11: Satisfaction Ratio (%).

This platform offers students the chance to take over their learning and enhance students' entrepreneurial spirit through active, experimental and investigation-based learning. The mobile platform offers an environment for motivating the learning of entrepreneurship courses for effective teaching. Learning processes are highly efficient as a performance-centered way of delivering engineering students with timely and pertinent information. Educational systems that focus on performance should help students master skills in employment. This paper explains M-learning as a performance support system for higher education and training. M-Learning solutions incorporate mobile appliances into learning to accomplish a task by providing information, advice, and experiences when and where students need them. Table 1 shows the efficiency ratio (%).

5.7 Data Transmission Ratio (%)

This paper is intended to analyze the correlation between learners' online behavioral characteristics and their course levels and attempt to develop an efficient prediction model based on limited information. In preparation for the learner to communicate with the operating platform, data on online behavior, primarily recorded and saved through the learning platform and other real-time tools, is created. The classification of many data on learning behavior is important for data collection. Click on a learner course, browse a website, play the video and download the training program. The acts of clicking and downloading are the two activities associated with learning behavior. Data related to students' AI traits are preprocessed for learning behavior, ultimately analyzing the student profile. It helps to interpret the learning behavior of students through the e-Learning platforms. Table 2 shows the Data transmission Ratio (%).

The proposed IM-ELS has been proposed to reduce the uncertainty levels in student satisfaction to achieve high learning outcomes, enhance user accessibility, prediction, response, less error rate, improve data transmission rate, efficiency when compared to Teaching Framework (TF), Machine Learning Approach (MLA), Gaussian Barebone (GB) strategy with Harris Hawk's Optimizer (HHO) and Kernel Extreme Learning Machine (KELM) model, Fuzzy Bayesian Intelligent Tutoring System (FB-ITS) methods.

Number of Students	*Efficiency Ratio (%)*				
	TF	*MLA*	*GBHHO-KELMM*	*FB-ITS*	*IM-ELS*
10	46.1	50.3	45.1	53.4	71.4
20	47.2	53.5	46.3	54.6	74.7
30	48.4	56.6	48.4	57.8	76.3
40	51.6	58.8	44.5	56.6	77.7
50	53.7	60.9	45.6	58.7	81.9
60	54.8	62.1	47.8	61.5	83.1
70	55.9	61.4	51.7	63.4	85.2
80	60.0	65.2	53.9	65.7	88.5
90	58.2	68.3	52.1	67.8	90.6
100	57.4	65.4	58.4	72.3	91.8

Table 1: Efficiency Ratio (%).

Number of Students	*Data transmission Ratio (%)*				
	TF	*MLA*	*GBHHO-KELMM*	*FB-ITS*	*IM-ELS*
10	47.2	50.4	52.5	50.1	75.2
20	48.4	53.6	55.6	53.3	77.8
30	49.5	56.8	58.0	55.6	79.5
40	52.7	58.5	56.7	54.5	81.5
50	54.8	60.7	57.4	57.9	83.3
60	55.9	62.2	59.8	62.3	85.1
70	59.4	61.3	63.6	64.5	87.2
80	60.6	65.6	66.9	66.6	89.4
90	63.8	68.8	67.3	68.8	94.2
100	66.2	69.2	73.4	74.2	95.5

Table 2: Data transmission Ratio (%).

6 END NOTES

The way learning is transmitted, received, and evaluated has changed mobile technology developments. The web page between technology and education has increased the need for digital education and learning. There is an excessive demand worldwide for entrepreneurial training. This cannot be connected with the alarming unemployment rate, which means that entrepreneurial studies must be incorporated into the college curriculum to develop skills and create jobs. As a result, IM-ELS advises that entrepreneurship education performance and learning outcomes be improved in this study. In this work, the suggested IM-ELS has examined the entrepreneurial education connection predictor's student profile and implemented counter-measures to enhance it. With the help of students' attitudes and the length of learning behaviors, a model was developed to clean and digest educational data. The model produced a student profile using the Jaccard coefficient approach. The results show a strong learning outcome of 97.8%, enhanced interface usability of 95.7 %, estimation ratio of 98.4 %, the response of 96.1 %, an error rate of 17.6 %, a data transfer rate of 95.5 %, a performance rate of 91.8 %, and student happiness of 94.2 % all have a substantial impact on the implementation of mobile learning (M-learning) program.

Weimin Zhang, https://orcid.org/0000-0002-0741-8536

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