

Retraction

Retracted: Artificial Intelligence and Edge Computing Technology Promote the Design and Optimization of Flipped Classroom Teaching Models for Higher Vocational, Ideological, and Political Courses

Mobile Information Systems

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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- [1] L. Zhang, P. Wei, Y. Zhang, and N. Wang, "Artificial Intelligence and Edge Computing Technology Promote the Design and Optimization of Flipped Classroom Teaching Models for Higher Vocational, Ideological, and Political Courses," *Mobile Information Systems*, vol. 2022, Article ID 5385386, 10 pages, 2022.

Research Article

Artificial Intelligence and Edge Computing Technology Promote the Design and Optimization of Flipped Classroom Teaching Models for Higher Vocational, Ideological, and Political Courses

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Technology has made life simpler for every human being, irrespective of educational qualifications and sector of work. The education sector in the current modern era is revolutionized by technology. Teaching and understanding theoretical subjects like ideological and pedagogical education (IaPE) has become simple with technologies like artificial intelligence (AI), edge computing (EC), and flipped classrooms. These are unique technologies in the education sector to make classroom learning more manageable by creating concepts in digitization and visualization with audiovisual technologies. In recent research, many authors have proposed models for IaPE through ideological and pedagogical teaching (IaPT) for different courses in vocational colleges and universities. Some researchers have designed a hybrid model with IaPT and analyzed the results as an extension to this teaching method. This research work introduced AI and EC technologies to the flipped classroom to promote higher vocational education in colleges and universities for IaPE. With digitization and visualization in course material preparation, AI aids in an interactive classroom study. On the other hand, EC aids in the easy storage and accessing of the resources prepared through AI. The analysis work is performed on the dataset from the unique client identifier (UCI) repository by proposing a novel optimization algorithm for flipped classrooms.

1. Introduction

Flipped classroom (FC) is a pedagogical learning strategy in which the student and teacher interaction has increased drastically—. In this learning method, learning through activities, applying the concepts to real-world applications, and many more are followed in the educational system. From these advantages, it can be observed that the traditional classroom is reformed or restructured by flipped classrooms. The reformation in classroom teaching is accomplished by a tremendous change in the role of a teacher, introducing various teaching modes, such as independent learning, active participation of the students, the teacher giving activities to the students have increased. The approach of the flipped classroom has the following advantages: an increase in problem-solving activities, keeps the student engaged or busy, helps mediocre students to excel in the

subjects, individual students gain attention from the teacher in learning the subject, an increase in student and teacher interaction, interaction among students, and many more. Another significant advantage of this flipped classroom is that it supports both online and offline classes, whereas there is an offline mode for the traditional classroom. As the flipped classroom combines both online and offline modes, cutting-edge technologies are utilized. The most frequently used technology for enhancing the teaching environment is artificial intelligence (AI) with edge computing (EC). The role of AI in a flipped classroom is to regularize or routine the classroom teaching schedule that will aid in the faster learning capability of the students with increased efficiency in teaching. Edge computing (EC) is a powerful technology needed in FC to concentrate on storing and accessing the resource materials anytime and anywhere, i.e., the prepared contents for the classes, activities, results of the activities,

schedule of the classes, and much more. This edge computing technology, along with artificial intelligence, will overcome the difficulties in flipped classrooms. In this modern era of technology, the digitization and visualization of basic needs have multiplied rapidly. Digitization and visualization have begun to permeate the education sector, assisting students in better understanding the subject. Digitization and visualization as tools have made content updating and maintenance simpler, along with task automation. Also, as an extension, if any student cannot attend the class for any reason, he/she can learn the concepts individually as the subject concepts are readily available online and offline. However, while FC has significant advantages, it also faces some drawbacks. One such drawback might be introducing the FC model for higher vocational, ideological, and political courses. If the subject is loaded with theoretical concepts, then the teachers may face difficulties preparing the subject materials and providing activities for the students. Hence, the subject has to be reformed so that everyone benefits from it. In the flipped classroom (FC) model of education, the students will be able to get some knowledge about the specific session of the course. It is challenging for the students and teachers when they are working with wireless internetworking. When the course is carried on in online mode, every individual is dependent on the internet and electric power stability. If either is not functioning well, then the student or the teacher will not be able to continue the course at its scheduled duration. However, in this FC model, the students may be provided with access privileges to the prerecorded or postrecorded video of the session, which will aid in the course continuity for them.

2. Related Works

Rapid development and advancement in the field of information technology have made classroom teaching easier. The authors of [1] in this research have quoted that flipped classroom means the flipping of knowledge transfer and its internationalization, which is achieved by the teaching structure and the processes involved in teaching. These authors have proposed a novel recurrent neural network model for music classification with a channel attention mechanism and improved classification accuracy. The offline teaching of ideological and political courses (IaPC) will make the students less enthusiastic because of its theoretical contents. Hence, in [2], the authors have suggested making microlectures for the subject by preparing empirical surveys and questionnaires and preparing a single topic for single lecturing. These microlectures must also be easier to understand and support access through different possible devices and modes. In [3], the authors have assessed and evaluated the students' performance and effective teaching through flipped classrooms. The authors of [4] suggest that the ideological and political teaching (IaPT) of theory subjects can be explored using new technologies to popularize the vocational subjects and develop them with ease. The authors of [5] propose the deep learning model for teaching quality analysis (DLM-TQA) that implements a feedback

mechanism for teaching and the availability of knowledge resources. The results from the authors provide that the teaching mechanism and the learning rate have improved for the political education subject. If a traditional teaching model is replaced by IaPT, then artificial intelligence and machine learning models can enhance the efficiency of the practical learning of any given subject [6]. The authors of [7] combined the ideological and political education (IaPE) with other courses, such as property management and regulations, and suggested introducing vocational colleges. Furthermore, in [8], the authors have combined the concepts of operations research with IaPE for additional studies. In [9], it is concluded that when the flipped classroom is implemented for English subjects in colleges and universities, it has improved the quality of English teaching. The students have better self-learning capabilities. In [10], the authors concluded that the new technology had provided challenges, opportunities, and new dimensions to the education sector. This new technology is researched for the military theory course and discusses the results [11]. For performing IaPE and IaPT, managing the resources becomes mandatory. Hence, the concept of ideological management is discussed in the paper [12]. IaPE is a theoretical subject, and therefore, it will be difficult for the students to understand through classroom studies. Hence, the authors in [13] have advised framing microcourses, comprising one topic per lecture. These microcourses will aid in understanding the subject quickly, and the teachers have to focus on the availability of the courses at any time. In [14], a current information-retrieval system is required for providing an attractive audiovisual tutorial in online classes. This method is treated as new media, and recent research suggests a practical approach for teaching and learning. In [14], the authors have suggested utilizing audiovisual teaching mechanisms for teaching-learning to improve the easy understanding of the subjects through IaPE. The authors of [15] insisted on developing flipped classrooms as it will increase independent learning among the students and quality teaching. As an extension, the authors of [16] have explained the concepts by taking physical education as an example. Social media plays a significant role in flipped classrooms as the students can clearly understand the subjects quickly [17]. Among various social media, Facebook and YouTube are preferred by the students for learning. Experimental teaching will aid in the improvement of IaPT [18], and the authors in this research work explored the concept by integrating the teaching methods according to the student's characteristics. The authors of [19, 20] discussed the gap and requirement in the development of English subjects in higher vocational colleges through the flipped classroom. Through IaPE, the authors of [21] suggest implementing classes on high moral values for the students to become moral, artistic, and intellectual. Whenever a new course and methodology is introduced in the colleges and universities, the organization may face specific issues earlier. The problems in IaPT theoretical subjects were addressed and discussed in [22, 23], and [24]. The authors of [25] have introduced flipped classroom technology to

provide business English learning (BEL). BEL is performed on the students with questionnaires and interviews along with online resources.

3. Proposed Work

Step 1. Procedure for initialization

The optimization algorithm is used to select a certain quantity of audience to understand with knowledge base at probability $s = (s_1, s_2, \dots, s_n)$ sampling (along with the classification level of every knowledge point), in which s needs to stand for flipped classroom important variables and is represented in (1).

$$s = \sqrt{s_1^2 + s_2^2 + \dots + s_n^2}. \quad (1)$$

Allocate a knowledge position from the reading room at random to each to learn the representative. However, assigning a knowledge position to multimodal teaching investigators at the same time is difficult to permit.

Step 2. Substitute k in the process of learning (for every learning representative) with the following:

- (a) Artificial intelligence learning: two or more different knowledge elements are randomly picked and termed as $s=(s_1, s_2)$. From various levels of knowledge, the identified knowledge observations are utilized for learning by the investigators and this learning will help them to understand the audience, and an improved knowledge about the location helps the audience to identify the hiring process and understand the basic concepts about selection. This substitute process is represented in the following equation:

$$k = \left[\frac{s_1}{s}, \frac{s_2}{s} \right]. \quad (2)$$

- (b) Participant observation learning: an identified knowledge observation is compared with the investigators to help the audience understand. The excellent position is determined from the centralized location, and the deprived position is also set as an

$$\cos(\theta) = \cos(\beta - \alpha) = \cos \beta \cos \alpha + \sin \beta \sin \alpha = \frac{s_1 p_1}{s p} + \frac{s_2 p_2}{s p} = \frac{s_1 p_1 + s_2 p_2}{s p}. \quad (5)$$

Step 6. From $s.p$, teaching design is used to determine the current level of flipped classroom teaching methods by implementing through Equation (6). The purpose $(s_1 p_1 + s_2 p_2 / s p)$ is to educate participants in a structured and simpler way to integrate educated predefined values and behavior that are appropriate for specific automatic thoughts.

$$s.p = s p \frac{s_1 p_1 + s_2 p_2}{s p} = s_1 p_1 + s_2 p_2. \quad (6)$$

opinion of comparison. The individual learns the attribute search concept, transition to a new knowledge s opinion, and saves the new knowledge s point within the database. $\cos(\theta) = (s_1/s)$ and $\cos(\alpha) = (s_2/s)$.

Step 3. From Equation (3), it can be observed that removing k knowledge points from the reading room for the lowest possible level can improve the level of concentration of student's teaching.

$$k = (\cos(\theta), \cos(\alpha)). \quad (3)$$

Step 4. Data from the online survey aid in the analysis of the impact of design, integrate, and scoring system in the flipped classroom teaching method on students' individualized learning capacity. This learning capacity is identified by utilizing the course materials for preparing the analysis. It has the benefits of improving the objectivity such as measurement of efficiency of learning with the parameter $s p$ analyzed, among other things. It also is a common technique for monitoring independent learning ability. Rather than particular learning actions as in Equation (4). The value of can be calculated as.

$$s.p = s p \cos(\theta). \quad (4)$$

It also is a common technique for monitoring independent learning ability rather than particular learning actions as in Equation (4). The value of can be calculated as follows.

The value of can be calculated as $\theta = \beta - \alpha$. $S.P = IISII IPIICOS(\ominus)$.

Step 5. The IPE learning with the centralized $\cos(\theta)$ collection of a flipped classroom teaching method represented as $\cos(\beta - \alpha)$ would be an educational framework which integrates the recognition of the irrational evolution of $\sin \beta \sin \alpha$ with the modern economy. This integration would increase the importance of ongoing learning and is demonstrated in the following equation:

Equation (6) specifies that the current level of teaching design in flipped classroom works similar way of integrating student with the education system.

Step 7. In the educator's perspective and also that the participants of the education process $\sum_{i=1}^n s_i p_i$ is much more than just the education system and is given in the following equation:

$$s.p = \sum_{i=1}^n s_i p_i. \quad (7)$$

Step 8. In (8), it is given that learners can enhance their skills by $|S(s)|$, such as promotion, appreciation, comprehension, and encouragement.

$$|S(s)| = \sum_i \text{obj}|p(S(s))|. \quad (8)$$

Step 9. Equation (9) presents the social and philosophical education framework that is unable to contribute to the necessary contents in the higher education of IPE courses through Flipped Classroom.

$$R_p(s) = \begin{bmatrix} \varphi_s(s_1 R_1(s)) \\ \dots \\ \varphi_s(s_n R_n(s)) \end{bmatrix}. \quad (9)$$

(9) denotes the level of growth of the flipped classroom teaching in various courses in social media.

Step 10. Flipped classroom teaching should be the center of the socialist ideology and optimization methodology. Also, it should be with the objective of escaping from the shackles of organizations and undertakings. Also, establishing a reasonable paradigm is a primary goal of intellectual and political education.

To label $s = (s_1, s_2)$ and $k = (a, -1)$, we acquire the following:

$$R(s_i) = R_p(s) = -p \ln(\text{obj}(-s) + \text{obj}(-t)) = \begin{cases} +1, & \text{if } k.s + t \geq 0, \\ = 1, & \text{if } k.s + t < 0, \end{cases} \quad (10)$$

Equation (10) represents the objective that is undertaken for the courses to establish a reasonable paradigm and is also the primary goal of IPE.

This research work uses artificial intelligence as an information visualization technique and uses instruments for teaching evaluation under the supervision of behavioral framework theory. Research in the proposed system will gather course materials in the relevant course by analyzing the participants (or group) to participate in different interactions through a questionnaire system. This system can reveal an association between the attributes by the analysis framework and perform the visual processing of the gathered data to analyze and evaluate a learners' learning and thinking processes. The AI framework of learners is investigated by coupling with the ability and cognitive level for analysis, personalized, and visual assessment and feedback are provided. The evaluation method based on the epistemic network theory is built. AI incorporates specific components, such as learners' behavioral framework, psychological functions, learning, and behavioral network, to produce evidence, data analysis, etc. These components seem to be a consensual collaboration between processes comprised of linked edge devices based on the method with fundamental teaching and learning strategies. The objective is to promote the evolution of the driver's license level of reasoning and AI framework and bring out learning experience through students' learning evaluation. Figure 1 shows the stream graph of the assessment method of the AI method.

In the outline, the actions can gather information related to schooling and practical exercises of information. It can be regular or practice of preparation and can be extraordinarily intended. For instance, peer assessment has different ways to expose the exercises, such as addresses, conversation, collaboration, assessment tests, and submitting the work. Students utilize their explicit intellectual structures for

thinking and tackling issues. As indicated by various fields, the intelligent system is decayed into various intellectual variables. Next to these exercises, mirroring the intellectual elements in the instructing exercises is recording the information, examination, and assessment. These recordings will aid the students in updating themselves with the advanced level of reasoning. Also, intelligent design is looked for the mix of intellectual organization examination and measurable investigation. The dynamic course of students' information, ability advancement level, thinking mode, and intellectual development are estimated by examination and exploration. It is found that understudies in flipped classroom halls have a decent beginning for learning inspiration, and a large portion of their independent learning practices occur to get information.

Nonetheless, the trouble of learning undertakings and the insight of subject worth, alternates, and do not have a sensible measure will make it hard for the students to keep up with their underlying learning inspiration. Hence, this stage draws illustrations from the overall functional connections of oneself coordinated learning model dependent on the issue. Some issues include course development, course creation, material preparation, assurance, self-coordinated learning, community learning, impact assessment, and connections. It centers around the provocation maintenance of preschool' learning influence and gives alternates with specific learning direction through applicable authoritative methodology mediation. The preparation of understudies is understood in an autonomous process of arranging capacity in flipped classroom, and it explicitly arranges the essential capacity of the classroom.

In Table 1, the flipped classroom strategy analysis used an identity questionnaire that is comparatively simple to design, implement, and score the system in analyzing the significant effect of flipped classroom teaching method on students' individualized learning ability. It also has the

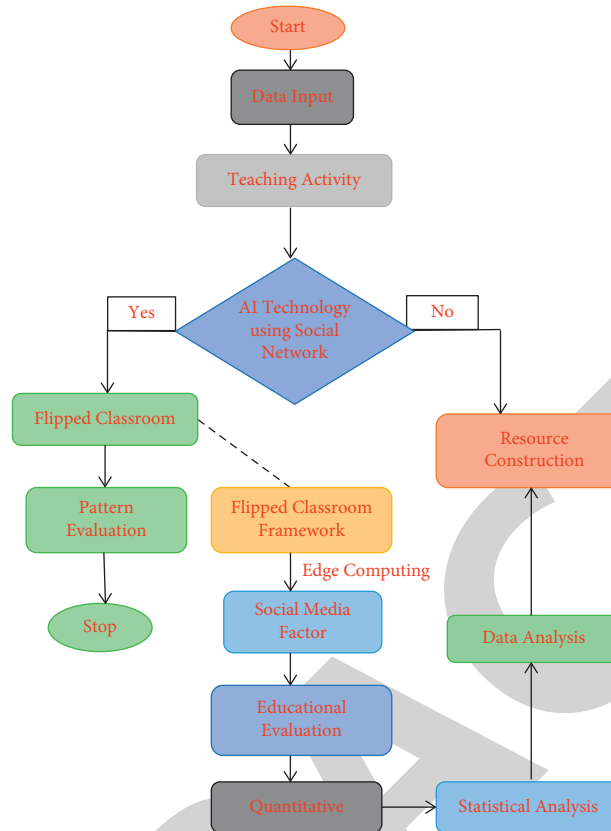


FIGURE 1: Overall architecture of flipped classroom teaching evaluation.

benefits of objective reporting, high efficiency, low price, and quantitative results obtained, among other things. These benefits can be processed using an optimization algorithm for assessing automated learning ability. Rather than specific learning actions, a graded topic upon how to improve the learning ability under different situations is given in Table 1.

The idea of independent learning capacity, four places of worry for working on flipped homeroom understudies' independent learning capacity in flipped study hall not really set in stone, which are learning inspiration, learning arranging capacity, learning climate usage, and learning reflection capacity. To arrangement system for structure investigation technique for educating, to Jackie Gerstein's "experience to partake in an idea to investigate the importance to develop a presentation application" flip class ring was a procedure dependent on four-stage model set up, consolidating focuses class thought and the connected information on independent picking up showing mode, just as the current issues thus dependent on the examination on the current circumstance in the study hall, the particular develop the procedure model of advance understudies' independent learning capacity, furthermore, association methodologies of each connection, as displayed in Figure 2.

The unpleasant examination and exploration on the state of affairs found that preschool in flipped study hall has a decent beginning learning inspiration, and the majority of their independent learning practices happen to get information. In any case, impacted by the trouble of learning errands and the cognizance of subject worth, understudies do not have a sensible gauge of themselves. Furthermore,

they have a low ability to be self-aware adequacy, which makes it hard for them to keep up with their underlying learning inspiration. This stage draws illustrations from the overall functional connections of oneself coordinated learning model dependent on the issue of which means development, including setting creation, issue assurance, self-coordinated learning, cooperative learning, impact assessment, and different connections. Furthermore, it centers on the stimulation, supports learning inspiration, and gives preschools specific learning technique direction through an appropriate hierarchical system.

In Table 2, we can observe that the educational framework for the year 2010 to 2020 schedule is established with the help of the social network-based optimization of the flipped classroom and learning method to analyze the support of the current requirements of the environment.

In Figure 3, we can observe the optimization algorithm with flipped classrooms being analyzed to determine the overall flipped classroom teaching process based on social media. The flipped classroom teaching activities begin with the joint identification of complicated issues by students and teachers. Communication between teachers and students is decided to be carried out. Ultimately, the combined description of performance analysis of teaching and learning in a flipped classroom is performed with social media support. Initially, teachers and students focus on the issue and work together to organize all the knowledge.

To analyze the optimization algorithm in the context of social media and flipped classroom teaching method by

TABLE 1: Investigation on flipped classroom learning ability.

Flipped classroom learning ability	Secondary dimension	Explanation
Motivation of learning	Consciousness through action	Without an external influence, active learning can come in the form of learning first or learning as much.
Strategies of learning	Learning materials	Methodically classify, organize, and summarize learning materials based on the relationship between experience and knowledge to rationalize their structure.
Self-inspiration	Organizational strategy	Arrange time for studying in accordance with the study content. Supervise specific educational activities to ensure that no deviation from of the learning objectives occurs.
Question and answer	It is time to get organized.	Determine if the learning outcome meets the educational objective and progresses.
Self-regulating	The process of learning	Capable of obtaining, evaluating, identifying network information resources, and using the media result of structures and platforms, consciously and effectively.
Learning of environment	Self-assessment	Without external influence, active learning can come in the form of learning first or learning as much.

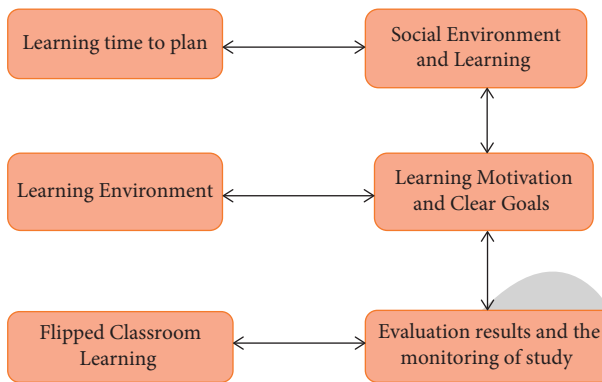


FIGURE 2: Learning ability in flipped classroom with social network.

relating to the framework of self-education and incorporating the concept of effective teaching design is discussed in Table 3. Flipping the classroom provides an excellent practical supposition with social media and within the time required for research practice, confirm or not confirm, does not have to concern categories.

In Figure 4, we can see that the optimization algorithm of a flipped classroom teaching method of such a social cognitive network outperforms the algorithm in terms of searching capabilities. In such a flipped classroom, the overall grade and variance of the students' online pedagogical knowledge base were 3.68 and 1.04, respectively. It suggests that flipped classroom participants' overall level of digital citizenship reading skills is well above the ordinary levels, with such a high range of online participation in education.

In Table 4, the classifier's performance measurement of a flipped classroom using the optimization algorithm for a flipped classroom teaching process using social media has a greater search ability than the optimization algorithm. The overall averages and variance of students' online humanity at large in the flipped classroom have been 3.88 and 1.07, respectively. The above suggests that the flipped classroom students' overall level of data naturalization education is well above the ordinary level, with such a high implementation of technology naturalization education.

TABLE 2: Result learning ability in flipped classroom with social network.

Year	Inverted classroom	Flipped classroom	Flipped learning	Total
2010	0	0	0	0
2011	0	0	0	0
2012	2	3	0	5
2013	1	10	3	14
2014	3	30	2	35
2015	7	68	14	89
2016	5	103	23	131
2017	6	142	44	192
2018	2	127	51	180
2019	8	137	59	190
2020	9	143	65	210

In Figure 5, the classroom learning teaching assistants are completely aware of every student, giving importance to two or more objects released with educational materials and setting aside sufficient learning time for learners to study the significance of individual development. Flipping the classroom provides the social media with excellent practical supposition social media with "Not Confirm" rates the highest value. and, within the time required for research practice, confirm or not confirm, does not have to be a concern.

Flipped classroom is an educational learning strategy that has dramatically increased student-teacher communication. In this optimization learning method, learning is through social media activities, by applying concepts to real-world AI applications, and many other things. From these benefits, it is clear that flipped classrooms reform or restructure the traditional classroom. The reformation of classroom teaching is accomplished by a significant change in the role of a teacher, the introduction of various teaching modes, independent learning, active participation of students in the teacher's activities, and an increase in the number of activities. The resource development investigation of Table 5 social media with "Not Confirm" rates the highest value. 70.3% of the respondents want to "confirm" or "not confirm," an average of 20.12% and 87.76%, respectively. In the "compline" item questionnaire, the participants

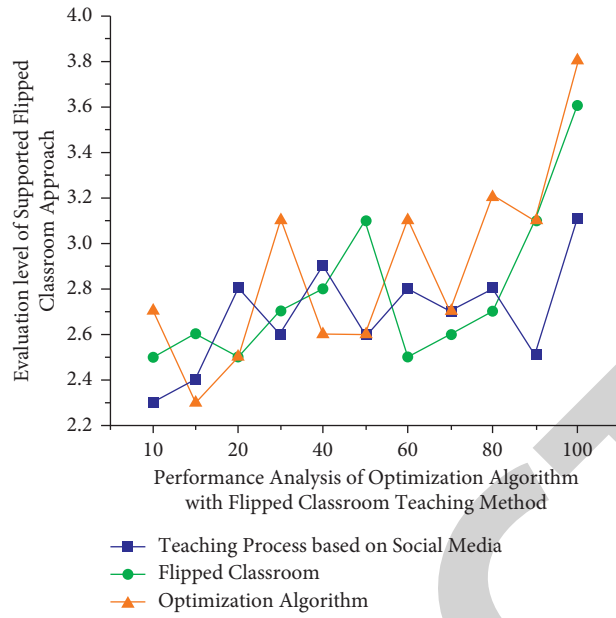


FIGURE 3: Performance analysis of the optimization algorithm with the flipped classroom teaching method.

TABLE 3: Result analysis of the optimization algorithm with the flipped classroom teaching method.

Optimization algorithm with the flipped classroom teaching method			
No. of students	Optimization algorithm	Flipped classroom	Social media
10	27.89	23.45	22.78
20	23.34	25.65	23.12
30	32.34	31.43	28.12
40	25.92	27.89	27.67
50	27.45	26.32	25.98
60	35.23	31.56	28.56
70	29.78	27.21	26.34
80	35.34	32.62	28.90
90	31.78	31.97	26.28
100	38.94	36.86	32.65

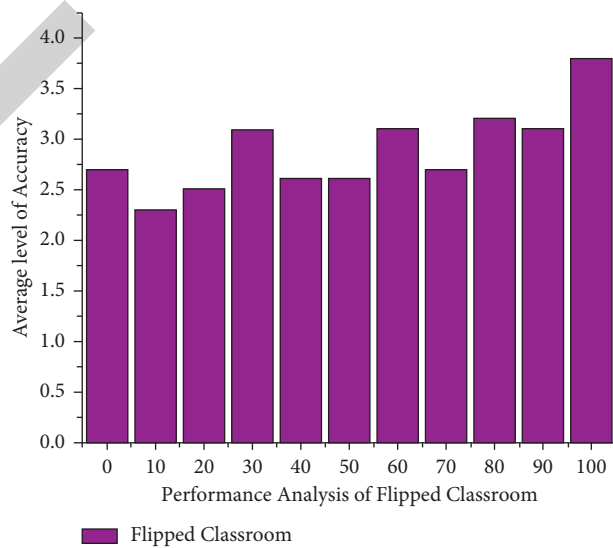


FIGURE 4: Performance analysis of the flipped classroom.

TABLE 4: Result analysis of the flipped classroom.

Optimization algorithm with the flipped classroom teaching method	
Number of students	Flipped classroom
10	2.45
20	2.65
30	3.43
40	2.89
50	2.32
60	3.56
70	2.21
80	3.62
90	3.97
100	3.86

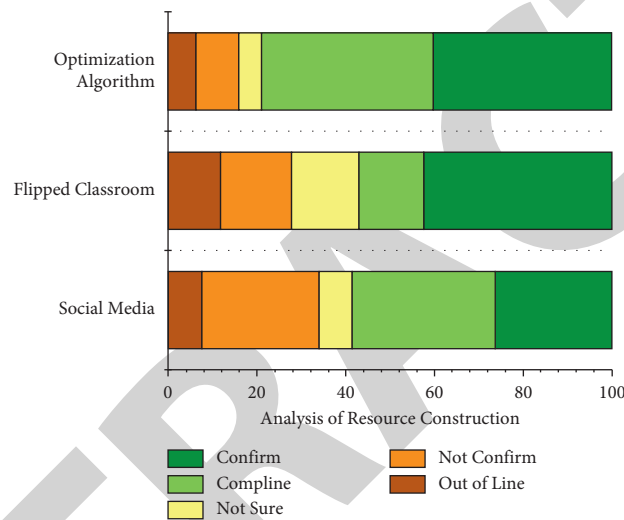


FIGURE 5: Performance analysis of resource construction using the optimization algorithm with flipped classroom methods.

TABLE 5: Result analysis of resource construction using the optimization algorithm with flipped classroom methods.

	Optimization algorithm with flipped classroom methods		
	Optimization algorithm	Flipped classroom	Social media
Confirm	15.23	26.2	20.4
Compline	23.43	35.12	70.45
Not sure	12.1	34.12	20.12
Not confirm	93.67	32.34	85.76
Out of line	97.4	93.9	70.3

TABLE 6: Comparison result in the flipped classroom.

Algorithm	Training (%)	Testing (%)	Accuracy (%)
Optimization algorithm	97.34	96.46	98.75
Existing method a priori algorithm	91.89	94.56	95.63

of flipped classroom wanted to “confirm” or “not confirm” by only 26.2% and 32.34%, with the averages of 93.9% and 70.3%, respectively, especially on comparison with “resource report in a timely manner,” as the overall mean is really large.

The outcome of the class materials is digitized and visualized using artificial intelligence technology, and the

systems that support the availability and accessibility of the prepared material are maintained using edge computing technology with or without internet support. It has been discovered that combining these two technologies with flipped learning results in increased efficiency in the higher vocational ideological and pedagogical teaching-learning process. The existing method is to provide the flipped

classroom IPE training (91.89%) and testing for the overall accuracy (95.63%). In our proposed method to provide flipped classroom training (97.34%) and testing for the overall accuracy of 96.46%, getting the result is more accurate than the existing system (Table 6).

4. Conclusions

In this digital era, life has become simpler with easy-to-visualize effects. This approach in the education sector has given a new dimension to the teaching-learning process with the flipped classroom strategy. Because of the increased number of new courses in colleges and universities for vocational-related subjects, ideological and pedagogical teaching-learning has become vital to understand the student's ability in the course material preparation. In this research work, the digitization and visualization of the course materials are achieved through artificial intelligence technology, and the systems that support the availability and accessibility of the prepared material are maintained through edge computing technology, with or without the support of the internet. It is observed that the combination of these two technologies with flipped learning has resulted in improved efficiency in the higher vocational ideological and pedagogical teaching-learning process.

Data Availability

The datasets used to support the results of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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