



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL
OF CURRENT RESEARCH

International Journal of Current Research
Vol. 15, Issue, 05, pp.24676-24681, May, 2023
DOI: <https://doi.org/10.24941/ijcr.45448.05.2023>

RESEARCH ARTICLE

SMART CLASSROOM IMPLEMENTATION AND STUDENTS' ACADEMIC MOTIVATION: BASIS FOR IMPROVED CLASSROOM PEDAGOGY

*Zheng, Jie and Gatbonton, Ryan Ray

Adamson University, Philippines

ARTICLE INFO

Article History:

Received 05th February, 2023
Received in revised form
14th March, 2023
Accepted 25th April, 2023
Published online 30th May, 2023

Key words:

Smart Classroom, Academic Motivation.

*Corresponding Author:
Zheng, Jie

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Citation: Zheng, Jie and Gatbonton, Ryan Ray. 2023. "Smart Classroom Implementation and Students' Academic Motivation: Basis for Improved Classroom Pedagogy". *International Journal of Current Research*, 15, (05), 24676-24681

ABSTRACT

The rapid development and integration of technology into teaching has prompted many innovations in the learning milieu, and one of which is the use of the smart classroom method. This correlational research assessed the perception of 198 college students on the implementation of smart classroom and their academic motivation. The survey tools used were Smart Classroom Evaluation Questionnaire (SCEQ) and Academic Motivation Scale (AMS), and the results there is full implementation of smart classroom in terms of presentation ($\bar{x} = 3.75$), environment ($\bar{x} = 3.73$), enhancement ($\bar{x} = 3.68$), and management ($\bar{x} = 3.61$). There is a moderate implementation on resources ($\bar{x} = 3.08$) as perceived by the students. Academic motivation was perceived to be high in extrinsic motivation – identified ($\bar{x} = 5.09$), intrinsic motivation to know ($\bar{x} = 5.03$), extrinsic motivation to – external regulation ($\bar{x} = 5.01$), and moderate motivation in areas of intrinsic motivation to experience stimulation ($\bar{x} = 4.97$), extrinsic motivation – introjected ($\bar{x} = 4.92$), intrinsic motivation towards accomplishment ($\bar{x} = 4.91$), and amotivation ($\bar{x} = 3.32$). Correlating the data in terms of the smart classroom implementation yielded a non significant, negligible, negative correlation ($r = -0.02$, $p = 0.78$). Based the findings of the study, it can be concluded that smart classroom implementation has to be implemented extensively to help improve academic motivation. Digital learning was developed to address the discrepancies that were uncovered in this research.

INTRODUCTION

The introduction of "Internet plus education" has promoted the application of information technology in the field of education. The rapid development of big data, Internet of things, cloud computing, virtual reality, and artificial intelligence has promoted the transformation from traditional learning environment to intelligent learning environment. The smart classroom has promoted a new round of classroom reform with its information-based, digital, and intelligent teaching environment. More and more educational experts and academic researchers have studied the practice and application of smart classrooms in the field of education. This study aimed to uncover the relationship between the smart classroom and students' learning motivation.

Background of the Study: Teachers need to comply with the trends of the times, improve the application ability of information technology, use information technology resources to promote teaching, and encourage students to make rational use of information technology resources to promote their own learning. However, at this stage, the advantages of information technology in promoting teachers' teaching and students' learning have not been brought fully into light as most classrooms still use the traditional teaching modes, with major problems in the following aspects:

Single teaching form: In class, teachers usually teach according to traditional thinking. The way of learning, the way of interaction, and the way of consolidation practice are all single. Hence, reviewing for exams can be taxing, and loss of interest is more common.

Neglect to cultivate students' learning initiative and learning ability: Learning is a process in which individuals actively explore knowledge and acquire skills. Traditional school education advocates that "teachers teach and students learn"—that is, teachers lead the whole process and students learn according to the established progress. In this setup, the students are busy receiving a large amount of knowledge transmitted by teachers but lack time to think independently, integrate knowledge, and deal with homework.

Neglect to teach students according to their aptitude: In the traditional classroom, teachers teach according to relatively fixed teaching content, while the students have no relationship with cognitive speed and even lose the ability to master the knowledge in class. Students who master slowly are left behind because the teacher is in a hurry. They try their best to make up after class, but often to little effect. This results in negative or resistant learning emotions. To improve students' learning effect, it is imperative to improve both the teachers' teaching and the students' learning. In this regard, it should be noted that learning motivation is an important factor affecting learning.

Therefore, stimulating students' learning motivation and meeting students' learning interests and needs can promote students' learning and teachers' teaching as well. It must also be pointed out that students of different levels have different levels of learning motivation. Most students have an average foundation and learning motivation, while some experience failure in learning for many years to the point of giving up learning entirely. Only a small number of students have good foundation and strong learning motivation. The level of students' learning motivation is unstable and vulnerable to internal and external factors. External factors, such as the novelty and interest of teachers' teaching methods, the familiarity of learning content, the difficulty of learning tasks, reward or punishment measures, and learning atmosphere, directly affect students' motivation level. Internal factors such as students' learning foundation, learning expectation, learning interest, learning emotion and classroom preparation also directly affect their motivation level. Without clear learning objectives, learning autonomy is generally low. Most teachers do not follow clear learning objectives and the students' steps. As a result, learning enthusiasm is not high and there is a lack of the habit of active and autonomous learning.

Statement of the Problem

This research explores smart classroom implementation and students' learning motivation. The research aims to answer the following questions:

What is the profile of the students in terms of:

- Age
- Sex
- Year level

What is the extent of smart classroom implementation in terms of?

- Resources
- Environment
- Enhancement
- Management
- Presentation

What is the level of academic motivation of the students in terms of?

- Intrinsic motivation to know
- Intrinsic motivation towards accomplishment
- Intrinsic motivation to experience stimulation
- Extrinsic motivation – identified
- Extrinsic motivation – introjected
- Extrinsic motivation – external regulation
- Amotivation

Is there a significant relationship between smart classroom implementation and academic motivation of the students?

What improvement suggestions can be made in light of the results?

Significance of the Study: The results of this study will be of great significance to the following groups in the education sector:

Guidance Counselors: This study will enable guidance counselors to employ improvement strategies that can supplement the teaching capacities of teachers and aid students to have better learning experience.

Students: Identifying learning styles related to smart classroom learning will help students adapt to the new normal of education. This adaptation will enable them to choose appropriate learning methods and help them cope with smart classroom learning forms.

Teachers: Teachers will benefit from this study by knowing and implementing the preferred learning style in the smart classroom relative to academic motivation. This will help educators better understand students' learning needs, especially in this new environment.

Parents: Through this research, parents can know the importance of smart classroom for children's learning, so as to provide children with possible electronic learning equipment in family education to meet the needs of the smart classroom.

School leaders: Principals and education directors will be able to use the results of this study to identify effective strategies to enable their teachers to have the necessary skills and abilities to play a role in the smart classroom learning environment.

Future researchers: The conclusions of this study will lay the foundation for future research. Future researchers can conduct more in-depth research on smart classroom and learning motivation through the conclusions of this study.

Theoretical Framework: This study uses the ARCS theoretical model, which is an instructional design model incorporating four aspects: attention, relevance, confidence and satisfaction. This model focuses on how to mobilize students' learning motivation through teaching design. It represents four main types of motivation strategies. Designing teaching around these four aspects can stimulate students' motivation in classroom learning.

Attention motivation: Model refers to teachers attracting and maintaining their students' attention through teaching design (perceptual arousal, stimulating inquiry).

Relevance motivation: Model means that teaching should be linked with students' knowledge background, personal needs, and life experience.

Confidence motivation: Model means enhancing students' learning confidence and maintaining their desire for success through expected success, challenge situation, and attribution style.

Satisfaction motivation: Model means to let students feel the value and joy of learning and to allow them get satisfaction in learning, which can be attained via natural results, positive results, and fairness.

Research Hypothesis

This researched hypothesized that there is significant relationship between smart classroom implementation and academic motivation of the students.

METHODOLOGY

The foregoing describes the research design used, the location of the research, the sample and sampling size method, the research instrument, the data collection procedure, and the statistical method.

Research Locale: The research site is Huaibei Normal University in Anhui Province, China. The school has a building area of 750,000 square meters and more than 5 million Chinese and foreign paper books and electronic documents. The laboratory has advanced equipment and complete functions. It has more than 3,3000 teaching and scientific research instruments and equipment, and several intelligent classrooms, with a total value of 287 million yuan.

Sample and Sampling Method: Exactly 198 students were recruited using the effect size as the basis for sample size computation, with the parameters $\alpha = 0.05$, $\beta = 0.80$ and an effect size of 0.20. Convenience sampling was used to recruit the respondents. The inclusion criteria were as follows: (1) enrolled as college students and (2) able to read and write.

Research Instrument: The main research instruments of this study were two questionnaires, the Smart Classroom Evaluation Questionnaire (SCEQ) and the Academic Motivation Scale (AMS). These questionnaires were adapted from their original sources. The first questionnaire was the Smart Classroom Evaluation Questionnaire developed by Yang and colleagues (2018). This 24-item questionnaire evaluated the implementation extent of smart classroom and was used to understand the perspective of the students on smart classroom resources, environment, enhancement, management, and presentation. This perspective is evaluated using a 5-point scale (1 = Almost Never, 2 = Seldom, 3 = Sometimes, 4 = Often, and 5 = Almost Always). The SCEQ exhibited good psychometric properties, with good factor loading scores and a Cronbach alpha of 0.867 (Yang, Pan, Zhou, & Huang, 2018). To assess the students' academic motivation, the Academic Motivation Scale (AMS) was used. Originally, the scale consisted of 28-item, 7-point Likert scales. The scale showed a very high level of internal and external consistency in various researches, with a Cronbach alpha of 0.787, which exhibits good internal consistency. The scale measures seven subscales: intrinsic motivation to know and learn, intrinsic motivation towards achievement and accomplishment, intrinsic motivation to experience stimulation and engagement, extrinsic motivation through rewards and constraints, introjected regulation, internalization of extrinsic motives, and amotivation. An additional questionnaire was used to collect demographic data about the college students' age, sex, and year level.

Data Gathering Procedure: The researcher personally sent a request for permission to carry out this study in Huaibei Normal University. After approval, the questionnaire was distributed to the target respondents for data collection. This research was conducted in the second semester of academic year 2022–2023. The electronic version of the questionnaire was developed using the Questionnaire Star and was distributed to the college students who were willing to be part of the study. All data were aggregated, summarized, and analyzed for final output.

Statistical Treatment of the Data: The following statistical tools and treatments were employed to ensure ease of analysis of the data gathered:

The analysis of the hypotheses was carried out using the 0.05 level of significance.

RESULTS

The study's findings are presented in the succeeding parts.

Respondents' Demographic Profile: The respondents' demographic profile is shown in table 1.

Table 1. Distribution of the Respondents According to Sex

Sex	Frequency	Percentage (%)
Male	84	42.4
Female	114	57.6
Total	198	100

Table 1 shows that the sample size included more females ($n = 114$, 57.6%) compared to the males ($n = 84$, 42.4%).

Table 2. Distribution of the Respondents According to Age

Age	Frequency	Percentage (%)
20	31	15.7
21	122	61.6
22	45	22.7
Total	198	100.0

Table 2 shows the distribution of respondents by age. The bulk of study participants were students aged 21 ($n = 122$; 61.6%) followed by students aged 22 ($n = 45$; 22.7%). The fewest respondents ($n = 31$, 15.7%) were students aged 20.

Smart Classroom Implementation

Table 3. Extent of Smart Classroom Implementation in Terms of Resources

Indicators	Mean	SD	Interpretation	Rank
I can share digital resources with peers	3.27	1.00	Fully implemented	1
I can get digital learning resources	3.20	1.10	Fully implemented	2
I can get on the internet	3.05	1.04	Fully implemented	3
I can get the video that the teachers use in class	3.18	1.04	Fully implemented	4
I can find the computer sockets in classroom when I need to use them	2.96	1.18	Moderately implemented	5
I can get on the internet to search for learning materials	2.82	1.18	Moderately implemented	6
Composite Mean	3.08	0.85	Moderately implemented	NA

*Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 3 shows the extent of smart classroom implementation in terms of resources. The top three indicators are: ability to share digital resources with peers ($\bar{x} = 3.27$, $SD = 1.00$), acquiring digital learning resources ($\bar{x} = 3.20$, $SD = 1.10$), and ability to log in to the internet ($\bar{x} = 3.05$, $SD = 1.04$). The lowest ranking indicator is getting learning materials from the internet ($\bar{x} = 2.82$, $SD = 1.18$).

Table 4. Extent of Smart Classroom Implementation in Terms of Environment

Indicators	Mean	SD	Interpretation	Rank
Light in classroom is enough for reading books or digital books	4.03	0.89	Fully implemented	1
I can hear teacher and other students clearly	3.87	0.89	Fully implemented	2
Temperature in classroom is suitable for concentrating on learning	3.80	0.87	Fully implemented	3
No unnecessary noises exist in classroom	3.56	1.02	Fully implemented	4
I don't feel sleepy in the classroom because of fresh air in the classroom	3.37	1.04	Fully implemented	5
Composite Mean	3.73	0.73	Fully implemented	NA

*Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 4 shows the degree of smart classroom implementation in terms of environment. The top three indicators are: adequacy of lighting in classrooms ($\bar{x} = 4.03$, $SD = 0.89$), clear voices from teachers and students ($\bar{x} = 3.87$, $SD = 0.89$), and suitable temperature for concentrating on learning ($\bar{x} = 3.80$, $SD = 0.87$). The lowest ranking indicator is getting fresh air in the classroom ($\bar{x} = 3.37$, $SD = 1.04$).

Table 5. Extent of Smart Classroom Implementation in Terms of Enhancement

Indicators	Mean	SD	Interpretation	Rank
I can get the correct answer for questions	3.90	0.87	Fully implemented	1
I can get learning guidance from devices	3.76	0.89	Fully implemented	2
I can work with peers for learning task	3.75	0.95	Fully implemented	3
I can accomplish tasks by using devices	3.53	0.95	Fully implemented	4
Teachers can assess my practice instantly	3.46	1.01	Moderately implemented	5
Composite Mean	3.68	0.77	Fully implemented	NA

*Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 5 displays the enhancement levels of smart classroom implementation. The top three indicators are: feedback of correct answers for questions ($\bar{x} = 3.90$, $SD = 0.87$), getting learning guidance from devices ($\bar{x} = 3.76$, $SD = 0.95$), and ability to work with peers ($\bar{x} = 3.75$, $SD = 0.95$). The lowest ranking indicator is having teachers assess students' practice easily ($\bar{x} = 3.46$, $SD = 1.01$).

Table 6. Extent of Smart Classroom Implementation in Terms of Management

Indicators	Mean	SD	Interpretation	Rank
The podium, blackboard, and projector are at the right place for teaching and learning	3.84	0.91	Fully implemented	1
The layout in classroom is suitable for my ways of learning	3.68	0.99	Fully implemented	2
I have adequate workspace for the placement of textbooks, tablet PCs and other resources	3.48	1.11	Moderately implemented	3
Adequate space exists for easy movement among workstations, resources and exits	3.44	1.09	Moderately implemented	4
Composite Mean	3.61	0.86	Fully implemented	NA

*Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

The management tiers for smart classrooms are shown in Table 6. The top three indicators are: correct placement of teaching materials ($\bar{x} = 3.84$, $SD = 0.91$), suitable layout ($\bar{x} = 3.68$, $SD = 0.99$), and adequate workspace ($\bar{x} = 3.48$, $SD = 1.11$). The lowest ranking indicator is adequate space for movement ($\bar{x} = 3.44$, $SD = 1.00$).

Table 7. Extent of Smart Classroom Implementation in Terms of Presentation

Indicators	Mean	SD	Interpretation	Rank
I understand teaching content better with multi-screen display	3.82	0.85	Fully implemented	1
I feel the digital devices promote my sharing	3.74	0.89	Fully implemented	2
I feel the network promote my sharing	3.69	0.93	Fully implemented	3
Composite Mean	3.75	0.82	Fully implemented	NA

*Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 6 displays the presentation domain for smart classrooms. The indicators include better understanding of teaching content with multi-screen display ($\bar{x} = 3.82$, $SD = 0.85$), presence of digital devices ($\bar{x} = 3.74$, $SD = 0.89$), and presence of network ($\bar{x} = 3.69$, $SD = 0.93$).

Table 8. Summary of Smart Classroom Implementation

Aspect	Mean	SD	Interpretation	Rank
Presentation	3.75	0.82	Fully implemented	1
Environment	3.73	0.73	Fully implemented	2
Enhancement	3.68	0.77	Fully implemented	3
Management	3.61	0.86	Fully implemented	4
Resources	3.08	0.85	Moderately implemented	5
Overall Score	3.57	0.68	Fully implemented	NA

*Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

dimensions are ranked as follows, in descending order: presentation aspect ($\bar{x} = 3.75$, $SD = 0.82$), environment ($\bar{x} = 3.73$, $SD = 0.73$), enhancement ($\bar{x} = 3.68$, $SD = 0.77$), management ($\bar{x} = 3.61$, $SD = 0.86$), and aspect of resources ($\bar{x} = 3.08$, $SD = 0.85$). Considering the average value and standard deviation of the five factors, the average value is 3.57, greater than 3.51, which shows that the implementation of smart classroom is still very good as a whole, meeting most of the students' needs.

Academic Motivation: The following is a list of the statistics presented on the levels of academic motivation and the interpretation that follows.

Table 9. Level of Academic Motivation in Terms of Intrinsic Motivation to Know

Indicators	Mean	SD	Interpretation	Rank
For the pleasure that I experience in broadening my knowledge about subjects which appeal to me	5.14	1.47	High motivation	1
For the pleasure I experience when I discover new things never seen before	5.12	1.54	High motivation	2
Because my studies allow me to continue to learn about many things that interest me	4.96	1.54	Moderate motivation	3
Because I experience pleasure and satisfaction while learning new things	4.90	1.52	Moderate motivation	4
Composite Mean	5.03	1.35	High motivation	NA

Scale: 0–2.99 Low Motivation; 3–4.99 Moderate Motivation; 5–7 High Motivation

Table 9 displays the level of academic motivation in terms of intrinsic motivation to know. The following indicators are arranged in ranked order: appeal of subject ($\bar{x} = 5.14$, $SD = 1.47$), experiencing new things ($\bar{x} = 5.12$, $SD = 1.54$), continuous learning ($\bar{x} = 4.96$, $SD = 1.52$), and pleasure and satisfaction in learning new things ($\bar{x} = 4.90$, $SD = 1.52$).

Table 10. Level of Academic Motivation in Terms of Intrinsic Motivation towards Accomplishment

Indicators	Mean	SD	Interpretation	Rank
For the satisfaction I feel when I am in the process of accomplishing difficult academic activities	5.07	1.49	High motivation	1
Because college allows me to experience a personal satisfaction in my quest for excellence in my studies	4.92	1.60	Moderate motivation	2
For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments	4.90	1.52	Moderate motivation	3
For the pleasure I experience while surpassing myself in my studies	4.75	1.50	Moderate motivation	4
Composite Mean	4.91	1.36	Moderate motivation	NA

Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

The level of academic motivation in terms of intrinsic motivation toward accomplishment is shown in table 10. The following indicators are arranged in ranked order: satisfaction in the process of completing difficult tasks ($\bar{x} = 5.07$, $SD = 1.49$), satisfaction in the quest for excellence ($\bar{x} = 4.92$, $SD = 1.60$), satisfaction from personal accomplishments ($\bar{x} = 4.90$, $SD = 1.52$), and pleasure from surpassing self in studies ($\bar{x} = 4.75$, $SD = 1.36$).

Table 11. Level of Academic Motivation in Terms of Intrinsic Motivation to Experience Stimulation

Indicators	Mean	SD	Interpretation	Rank
For the pleasure that I experience when I feel completely absorbed by what certain authors have written	5.19	1.46	High motivation	1
For the pleasure that I experience when I read interesting authors	4.91	1.54	Moderate motivation	2
For the "high" feeling that I experience while reading about various interesting subjects	4.89	1.48	Moderate motivation	3
For the intense feelings I experience when I am communicating my own ideas to others	4.88	1.48	Moderate motivation	4
Composite Mean	4.97	1.27	Moderate motivation	NA

Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 11 displays the degree of intrinsic motivation to experience stimulation in relation to academic motivation. The following indicators are arranged in ranked order: satisfaction from being absorbed in a given task ($\bar{x} = 5.19$, $SD = 1.46$), pleasure from experience when reading interesting authors ($\bar{x} = 4.91$, $SD = 1.54$), satisfaction from reading interesting subjects ($\bar{x} = 4.89$, $SD = 1.48$), and pleasure from surpassing self in studies ($\bar{x} = 4.88$, $SD = 1.48$).

Table 12. Level of Academic Motivation in Terms of Extrinsic Motivation – Identified

Indicators	Mean	SD	Interpretation	Rank
Because this will help me make a better choice regarding my career orientation	5.38	1.44	High motivation	1
Because I think that a college education will help me better prepare for the career I have chosen	5.34	1.62	High motivation	2
Because eventually it will enable me to enter the job market in a field that I like	4.89	1.54	Moderate motivation	3
Because I believe that a few additional years of education will improve my competence as a worker	4.73	1.52	Moderate motivation	4
Composite Mean	5.09	1.26	High motivation	NA

Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 12 displays the degree of extrinsic motivation – identified in relation to academic motivation. The following indicators are arranged in ranked order: career orientation ($\bar{x} = 5.38$, $SD = 1.44$), career preparation ($\bar{x} = 5.34$, $SD = 1.62$), enable one to enter the job market they like ($\bar{x} = 4.89$, $SD = 1.54$), and improving competence as a worker ($\bar{x} = 4.73$, $SD = 1.52$).

Table 13. Level of Academic Motivation in Terms of Extrinsic Motivation – Introjected

Indicators	Mean	SD	Interpretation	Rank
Because of the fact that when I succeed in college I feel important	5.12	1.54	High motivation	1
To prove to myself that I am capable of completing my college degree	5.08	1.55	High motivation	2
Because I want to show myself that I can succeed in my studies	4.93	1.61	Moderate motivation	3
To show myself that I am an intelligent person	4.57	1.71	Moderate motivation	4
Composite Mean	4.92	1.35	Moderate motivation	NA

Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 13 displays the degree of extrinsic motivation – introjected in relation to academic motivation. The following indicators are arranged in rank order: recognizing that completing college will make one important ($\bar{x} = 5.12$, $SD = 1.54$), proving that one can complete college ($\bar{x} = 5.08$, $SD = 1.55$), showing to self that one can succeed in studies ($\bar{x} = 4.93$, $SD = 1.61$), and showing that one is an intelligent person ($\bar{x} = 4.57$, $SD = 1.71$).

Table 14. Level of Academic Motivation in Terms of Extrinsic Motivation – External Regulation

Indicators	Mean	SD	Interpretation	Rank
Because I want to have "the good life" later on	5.59	1.46	High motivation	1
In order to have a better salary later on	5.46	1.38	High motivation	2
In order to obtain a more prestigious job later on	5.06	1.61	High motivation	3
Because with only a high-school degree I would not find a high-paying job later on	3.92	2.13	Moderate motivation	4
Composite Mean	5.01	1.22	High motivation	NA

Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 14 displays the degree of extrinsic motivation – external regulation in relation to academic motivation. The following indicators are arranged in ranked order: wanting a good life later on ($\bar{x} = 5.59$, $SD = 1.46$), wanting to have a better salary ($\bar{x} = 5.46$, $SD = 1.38$), getting a prestigious job ($\bar{x} = 5.06$, $SD = 1.61$), and believing that a high school degree is not enough to find a high-paying job later on ($\bar{x} = 3.92$, $SD = 2.13$).

Table 15. Level of Academic Motivation in Terms of Amotivation

Indicators	Mean	SD	Interpretation	Rank
I once had good reasons for going to college; however, now I wonder whether I should continue	3.88	1.90	Moderate motivation	1
I don't know; I can't understand what I am doing in school	3.28	1.83	Moderate motivation	2
Honestly, I don't know; I really feel that I am wasting my time in school	3.16	1.82	Moderate motivation	3
I can't see why I go to college and frankly, I couldn't care less	2.96	1.88	Low motivation	4
Amotivation	3.32	1.51	Moderate motivation	NA

Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

Table 15 displays the degree of amotivation in academics. The following indicators are arranged in ranked order: wondering whether to continue collegiate studies ($\bar{x} = 3.88$, $SD = 1.90$), ambiguity in school tasks ($\bar{x} = 3.28$, $SD = 1.83$), getting a feeling of wasting time in school ($\bar{x} = 3.16$, $SD = 1.82$), ambivalent feelings in going to college ($\bar{x} = 2.96$, $SD = 1.88$).

Table 16. Summary of Level of Academic Motivation

Factors	Mean	SD	Interpretation	Rank
Extrinsic Motivation – Identified	5.09	1.26	High motivation	1
Intrinsic Motivation to Know	5.03	1.35	High Motivation	2
Extrinsic Motivation – External Regulation	5.01	1.22	High motivation	3
Intrinsic Motivation to Experience Stimulation	4.97	1.27	Moderate motivation	4
Extrinsic Motivation – Introjected	4.92	1.35	Moderate motivation	5
Intrinsic Motivation toward Accomplishment	4.91	1.36	Moderate motivation	6
Amotivation	3.32	1.51	Moderate motivation	7
Overall Academic Motivation	4.75	1.01	Moderate motivation	NA

Scale: 0.00–1.75 – Poorly Implemented; 1.76–3.50 – Moderately Implemented; 3.51–5.00 – Fully Implemented

The academic motivation of students using the smart classroom is shown in Table 4. On a scale of 1–7, with 7 being the greatest, it can be noted that the component on extrinsic motivation – identified ($\bar{x} = 5.09$, $SD = 1.26$), intrinsic motivation to know ($\bar{x} = 5.03$, $SD = 1.35$), and extrinsic motivation – external regulation ($\bar{x} = 5.01$, $SD = 1.22$) exhibited high levels of motivation. On the other hand, the factors on intrinsic motivation to experience stimulation ($\bar{x} = 4.97$, $SD = 1.27$), extrinsic motivation – introjected ($\bar{x} = 4.92$, $SD = 1.35$), and amotivation ($\bar{x} = 3.32$, $SD = 1.51$) displays moderate motivation on the part of the students. The overall academic motivation score ($\bar{x} = 4.75$, $SD = 1.01$) reflects the moderate motivation of the respondents in light of the smart classroom implementation.

Smart Classroom Implementation and Academic Motivation: This section discusses the relationship of smart classroom implementation and academic motivation of the college students. Pearson product moment correlation was used to identify the relationship.

Table 17. Relationship of Smart Classroom Implementation and Academic Motivation

Independent Variable	Dependent Variable	Pearson r value	p-value	Decision
Smart Classroom Implementation	Academic Motivation	-0.02 (negligible)	0.78	Accept H ₀

There is negligible negative correlation between smart classroom implementation and academic motivation ($r = -0.02$). It can be seen that even if there is a large increase in the extent of smart classroom implementation, there is little to no change in academic motivation. The resultant p-value of 0.78 led to the decision that the result was caused by chance fluctuation. Table 17 also shows that the implementation of smart classroom has little impact on students' learning motivation at present.

DISCUSSION

The adoption of smart classrooms is now going well overall. Although it has contributed somewhat to raising students' learning motivation, it has not had the desired effects. This is connected to a few factors in the smart classroom implementation, most especially in enhancing resource, as this is a key determinant in the access and realization of smart classrooms. In the smart classroom environment, teachers can teach students according to their aptitude in the setting of teaching objectives, provide teaching resources that meet students' cognitive level, and guide them to carry out cooperative learning, independent inquiry, and other learning activities. Reasonable learning objectives and task arrangements can enable students to experience the self-confidence brought by success, improve their self-efficacy and improve their learning motivation by working hard to complete learning tasks. Teachers should also have the courage to change the classroom teaching method and classroom structure, innovate the teaching mode, let students become the masters of the classroom, and mobilize fully the enthusiasm of students in learning. When carrying out teaching design, teachers should combine the characteristics of the smart classroom at this stage, apply various technical means to teaching practice, design flexible and interesting teaching activities, and improve the frequency of effective classroom teaching interaction. Additionally, teachers can use electronic interactive whiteboard, intelligent interactive systems, and other technical means to actively and effectively interact with students in the classroom, and give timely feedback to students' interactive process and learning results, so as to promote students' effective learning.

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