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Perceived Effects of Innovative Teaching Strategies Utilized by Junior High School Teachers

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Abstract — Perceived effects of using innovative teaching strategies was examined. Descriptive comparative research design was used in this study. Using innovative teaching strategies such as gamification, interactive materials, IT integration, project-based learning, and task-based learning had noticeable improvements in learning outcomes and student engagement. Significant differences were found between profile variables and the effect of using innovative teaching strategies. Project-based learning was frequently utilized in the teaching-learning process. There were also noteworthy concerns in the utilization of innovative teaching strategies. Together, these findings suggest a learning development plan to address the problems encountered in utilizing innovative teaching strategies. It can be noted that there are noteworthy concerns in the utilization of innovative teaching strategies and there is a need to propose learning development plan to improve the problems encountered in utilizing innovative teaching strategies. The proposed learning development plan is highly acceptable and comprehensively meets the objectives of the plan. There is a need to increase the number of participants to have more conclusive and generalized findings. Moreover, for future research the researchers recommend to focus only on one area of specialization to have a more conclusive generalization of the effect of innovative teaching strategies to student's performance. Researher recommends that a three-day division training about innovative teaching strategies be conducted. Moreover, the activities must include workshops, presentation of outputs, and demonstration teaching. Participants in the training must be encouraged to conduct re-echo to disseminate the learned concepts from the training.

Keywords — Innovative Teaching Strategies, Gamification, Interactive Materials, IT Integration, Project-Based Learning, Task-Based Learning, Learning Development Plan

I. Introduction

Innovative teaching strategies can have several benefits for both teachers and students. By creating an engaging environment that encourages active learning, innovative teaching strategies can help to create a more effective learning experience for students. Such strategies can also help to foster critical thinking skills and creativity, which can lead to improved problem-solving and decision-making abilities in the long run. In addition, innovative teaching strategies can help to improve student retention and engagement. When students are actively involved in their learning process, they are more likely to remember and apply the lessons they learn (Setaiwan et al., 2021).

In addition, Khursid and Ansari (2012) found out in their study that the innovative teaching methodologies outperform the traditional classroom teaching. The impacts are found on the level of performance of the participants both in individual and group level. It satisfies the individual learning requirements and increases the interest level among the students. At the group level, more students are found scoring higher grades and with the special focus on the students who performed less in the pretest the frequencies of lower grades are remarkably reduced.

Legaki et al., (2020) examined the effect of a challenge-based gamification application called "Horses for course" on students and it was reported that students' who used this gamification program had better performance than the traditional learning method. Araya et al. (2019) examined the effect of an online gamification platform called Connect Ideas on the mathematics achievement of primary school students; it was revealed that the students who use the application are more successful than the students who do not use the application.

In Chen & Yang's (2019) review, the effects of project-based learning and teachers' direct instruction on students' academic achievement in primary, secondary, and tertiary education were compared. Project-based learning in this study indicates a learning process in which students are engaged in working on authentic projects and the development of products. The results demonstrated that project-based learning had a more positive impact on students' academic achievement than direct instruction did.

According to Branch (2015), applying information technology in project-based learning could be effective in raising student academic achievement.

In the light of innovative classroom teaching strategies, previous literatures provided an exceptional concept as to how these teaching strategies failed to implement. In addition, the specified innovative classroom teaching strategies have been lacking, and so, the nature of the said literatures was only focused on the general concepts of innovative classroom teaching strategies but failed to simplify. To shed light on the different innovative classroom teaching strategies being used or implemented by various teachers, this study served as an emerging source to determine the various kinds of innovative classroom teaching strategies that are commonly used in this era of modernization. Moreover, this study focused on how these innovative classroom teaching strategies were related or associated with the personal background or profile of the teachers.

Literature Review

This study was anchored on the ideas of Adult Learning Theory.

Adult Learning Theory. This theory was proposed by Malcom Knowles which is also called as Theory of Andragogy that gave emphasis on the ability of adults to learn and acquire knowledge as compared to children. In fact, this theory also elucidated that adults have more internal motivation to learn than children and want to learn information that they can use to achieve personal goals. The term "Adult Learning Theory" can refer to a group of learning theories that

apply to adults or be interchangeable with the term andragogy — the practice of teaching adults. In relation to the study, since the main goal is to determine the innovative classroom teaching strategies of the secondary teachers, this theory shed a light the principles of Adult Learning Theory to the training programs for adult learners that improve and boost their teaching strategies to cater the needs of the learners. Upon the innovative classroom teaching strategy, this theory will help the researcher to navigate a program design through practices like performance learning that can improve teachers' teaching strategy. Adult Learning Theory principles place teacher-learners intervention as equals instead of repeating the power structure from traditional schooling as this study centered on innovative classroom teaching strategy.

On the other hand, based on the concepts and theory presented, the paradigm of the study is being conceptualized as shown in Figure 1. The profile of the junior high school public-school teachers, particularly in the Division of Pangasinan II, effect of the innovative teaching strategies, and problems encountered by the teachers in utilizing the innovative teaching strategies were the input of the study. The profile of the junior high school public-school teachers was correlated to the innovative teaching strategies being used by them. The profile of the junior high school public-school teachers, effect of the innovative teaching strategies, and problems encountered by the teachers in utilizing the innovative teaching strategies was determined using a self-constructed questionnaire. Lastly, the researcher proposed an enhancement program for the junior high school public-school teachers to enhance their innovative teaching strategies.

Statement of the Problem

This study aimed to determine the effect of innovative teaching strategies of junior high school public-school teachers. Specifically, it sought to answer the following questions:

1. What is the profile of the respondents according to:
    a. age;
    b. sex;
    c. highest educational attainment;
    d. number of years in service; and
    e. relevant trainings on innovative teaching strategies; and
    f. frequency of innovative teaching strategies?
2. What is the effect of innovative teaching strategies of junior high school public-school teachers in terms of:
    a. Gamification

b. Use of Interactive Materials

c. IT Integration

d. Project-Based Learning

e. Task-Based Learning

3. What is the degree of seriousness of the problems encountered by the junior high school public-school teachers in utilizing the innovative teaching strategies?

II. Methodology

This chapter presents the research design and strategy, population and locale of the study, data gathering tools, data gathering procedure, and statistical treatment of data.

Research Design and Strategy

The study employed a quantitative research approach, specifically descriptive-correlational research. Descriptive research design is defined as a type of quantitative research approach that describes a certain phenomenon or the characteristics of the population being studied. It deals with answering the question "what" other than the "why" (Siedlecki, 2020). This research design is suitable in this study to make valuable description on profiles of the respondents in terms of age, sex, highest educational attainment, length of service, relevant trainings attended on innovative teaching strategies and the frequency of innovative teaching strategies. The effect of innovative classroom teaching strategies being used by the junior high school public-school teachers, and problems encountered in utilizing the innovative teaching strategies can best explained using descriptive research.

On the other hand, comparative design is also a type of quantitative research approach that is mainly concerned with investigating the difference and similarities of two variables or cases (Iranifard & Rodsari, 2022). This research design is helpful for the researchers as this study wants to determine if there is a significant difference between the effects of the innovative classroom teaching strategies across their profile variables.

Population and Locale of the Study

The respondents in this study were the junior high school public-school teachers in Pangasinan II during the School Year 2023-2024. The division is divided into 4th, 5th, and 6th district which are composed of 2, 934 junior high school teachers. The number of samples to represent the population was based on Raosoft Sample Size Calculator with 95% confidence interval and a .5 margin of error. The respondents in this study were randomly selected from the junior high school teachers in Pangasinan II Division.

Table 1
Population of the Study

District	Participants
4th District	79
5th District	103
6th District	158
Total	340

In attaining the number of samples, the researcher used purposive sampling. Specifically, homogenous purposive sampling is a type of purposive sampling that generates samples with the same characteristic or set of characteristics (Crossman, 2020). In relation with this study, this sampling helped the researcher only the junior high school public-school teachers.

Data Gathering Tools

The researcher used a self-constructed questionnaire which composed of four sections. The first part determined the profile of the respondents in terms of age, sex, highest educational attainment, length of service, relevant trainings on innovative teaching strategies and frequency of innovative teaching strategies and the second part comprised the effect of innovative teaching strategies of junior high school public-school teachers in terms of gamification, use of interactive materials, IT integration, Project-Based Learning, and Task-Based Learning. The last part looked for the problems encountered by the junior high school public-school teachers in utilizing the innovative teaching strategies and was measured through frequency counts, percentages and mean.

To establish the content validity of the self-constructed questionnaire, the researcher consulted professionals and experts in the field of education to assure that the questions were understandable and could measure the effect of innovative teaching strategies.

Data Gathering Procedure

The purpose of this study is to determine the effect of junior high school public-school teachers' innovative teaching strategies and its difference across the profile of the respondents. Upon the approval of the questionnaires, the researcher administered a face-to-face data gathering. The researcher provided the hardcopies of the questionnaire to the target respondents which are the junior high school public-school teachers from Pangasinan II Division. In answering the questionnaires, the researcher provided an informed consent to the respondents to give them enough information about the study. The information that was collected through the surveys was analyzed and interpreted using the Statistical Package for the Social Sciences (SPSS).

Treatment of Data

To measure the profile of the respondents in terms of age, sex, highest educational attainment, length of service, relevant trainings on innovative teaching strategies, and frequency of innovative teaching strategies, frequency count and percentage were used. Furthermore, to measure the effect of innovative teaching strategies in terms of Gamification, use of interactive

materials, IT integration, Project-Based Learning, and Task-Based Learning, weighted mean was employed. Below is the five-point Likert scale with descriptive interpretation and analysis.

Scale	Description	Interpretation
4.51-5.00	Strongly agree (SA)	Very Highly Perceived
3.51-4.50	Moderately agree (MA)	Highly Perceived
2.51-3.50	Agree (A)	Moderately Perceived
1.51-2.50	Disagree (D)	Slightly Perceived
1.00-1.50	Strongly disagree (SD)	Not Perceived

Legend: SA (Strongly Agree), MA (Moderately Agree), A (Agree), (Disagree) & (SD) Strongly Disagree)

To find out how serious are the problems encountered by the junior high school public-school teachers in utilizing the innovative teaching strategies, weighted mean was used. The five-point Likert scale in the next page presents interpretation and analysis of seriousness of the problems encountered.

Scale	Description	Interpretation
4.51-5.00	Very Serious (VS)	Very Highly Serious
3.51-4.50	Serious (S)	Highly Serious
2.51-3.50	Fairly Serious (FS)	Moderately Serious
1.51-2.50	Slightly Serious (SS)	Slightly Serious
1.00-1.50	Not Serious (NS)	Not Serious

Legend: VS = Very Serious, S = Serious, FS (Fairly Serious), SS (Slightly Serious) & NS (Not Serious)

To determine if there is any significant difference between the profile variable of the junior high school public-school teachers and the effect of the innovative teaching strategies One Way ANOVA was used. One Way ANOVA is a statistical test used to analyze the difference between the means of more than two groups (Bevans, 2020).

In designing the proposed learning development plan to improve the innovative teaching strategies of junior high school public-school teachers, the researcher based her preparation on the results of the problems encountered of the respondents to each of the indicators therein. Finally, the proposed learning development plan was presented for validation to the same group of experts who validated the questionnaire of this study and decided on its acceptability, taking into consideration its purpose in this study. The researcher and his adviser had set the criteria for determining its level of acceptability prior to its presentation to the validators.

III. Results and Discussion

This chapter interprets, presents, and analyzes the data of the study.

Profile of the Respondents

Table 2 shows the profile of the respondents in terms of age, sex, highest educational attainment, length of service, and trainings attended related to innovative teaching strategies for the last three years.

Profile of the Respondents

Profile	Category	Frequency	Percentage
Age	21-35	158	46%
	36-50	104	31%
	51-65	78	23%
Sex	Male	134	39%
	Female	206	61%
Highest Educational Attainment	Bachelor's Degree	42	12%
	With MA Units	129	38%
	With MA Degree	79	23%
	With PhD/EdD Units	53	16%
	With PhD/EdD Degree	37	11%
Length of Service	1-10 years	148	44%
	11-20 years	114	34%
	Above 21 years	78	22%
Number of trainings attended related to innovative teaching strategies for the last three years	0-3	216	64%
	4-6	91	27%
	Above 7	33	9%
Frequency of innovative teaching strategies	Gamification	60	18%
	Use of Interactive Materials	36	10%
	IT Integration		
	Project-based Learning	105	31%
	Task-Based Learning	122	36%
		17	5%

It can be gleaned from the table that 158 or 46% of the respondents were young adult with age bracket of 21-35 years old whereas 104 or 31% were 36-50 years old which were in between young adulthood and middle adulthood. Meanwhile, 78 or 23% of the respondents belong to age bracket of 51-65 years old who are near retirement stage. Data implies that most of the junior high school public school teachers were young adults. This result is supported by the study of (Danilo, 2018) on Why Young Filipino Teachers Teach?, found out that most of the teachers today were young adults as they were more passionate on setting their goals to inspire students, raise the bar for educational excellence, cure social problems, help others realize their dreams, prepare them for life, inspire students, inspire values, transform lives, and teach with passion.

Effect of Innovative Teaching Strategies

Table 3 presents the innovative teaching strategies of junior high school public-school teachers on student performance in terms of using Gamification, use of interactive materials, IT integration, Project-Based Learning, and Task-Based Learning.

Table 3

Perceived Effects of Innovative Teaching Strategies in terms of Gamification

Indicators	Mean		DE
A. Gamification			
1. The integration of gamification in the classroom has positively impacted my students' overall engagement.	4.58	SA	Very Highly Perceived
2. Gamification has enhanced my students' motivation to participate actively in learning activities.	3.94	MA	Highly Perceived
3. Students find gamified elements effective in reinforcing and applying new concepts.	4.42	MA	Highly Perceived
5. Gamification has contributed to a more enjoyable learning experience for my students.	4.34	MA	Highly Perceived
6. My students' academic performance has improved as a result of incorporating gamified elements into the curriculum.	4.27	MA	Highly Perceived
7. Gamification has effectively promoted a sense of competition among my students, driving them to excel in their studies.	4.22	MA	Highly Perceived
8. My students believe that gamification helps in better understanding complex topics.	4.44	MA	Highly Perceived
9. Gamification has fostered a collaborative learning environment among my students.	4.26	MA	Highly Perceived
10. I find that gamification facilitates easier tracking of individual student progress.	4.43	MA	Highly Perceived
11. The use of gamification has positively influenced my students' attitudes towards challenging tasks.	3.79	MA	Highly Perceived
Weighted Mean	4.27	MA	Highly Perceived

Legend: SA (Strongly Agree), MA (Moderately Agree), A (Agree), (Disagree), (SD) Strongly Disagree) & DE (Degree of Effect)

It can be gleaned in table 3.A the perceived effect of gamification as an innovative teaching strategy utilize by Junior High School Teachers. As can be seen from the table, the average weighted mean posted is 4.27 which is moderately agree. This implies that there are noticeable improvements in learning outcomes and student engagement in using gamification as observed by the respondents. One indicator was given strongly agree rating, while nine indicators were rated moderately agree. Findings of this study confirmed the result of the study of Legaki et al., (2020), and Araya et al. (2019) that using gamification can be an effective innovative teaching strategy that utilized by the teachers in order to deliver their learning objectives.

Table 4

Perceived Effects of Innovative Teaching Strategies in terms of Interactive Materials

Indicators	Mean		DE
B. Use of Interactive Materials			
1. Interactive materials have enhanced my students' participation during class discussions.	3.84	MA	Very Highly Perceived
2. My students believe that interactive materials make learning more interesting and enjoyable.	4.58	SA	Very Highly Perceived
3. The use of interactive materials has improved my students' retention of information.	4.82	SA	Very Highly Perceived
4. Interactive materials have made abstract concepts more tangible and easier to comprehend.	3.93	MA	Highly Perceived
5. My students feel more motivated to complete assignments that involve interactive materials.	3.87	MA	Highly Perceived
6. I find that interactive materials facilitate a more dynamic and inclusive classroom atmosphere.	4.39	MA	Highly Perceived
7. The incorporation of interactive materials has encouraged my students to ask more questions.	4.57	SA	Very Highly Perceived
8. Interactive materials have contributed to a more student-centered learning environment.	4.13	MA	Highly Perceived
9. Students find that interactive materials provide valuable real-world applications of theoretical knowledge.	4.79	SA	Very Highly Perceived
10. I observe that the use of interactive materials promotes critical thinking among students.	3.83	MA	Highly Perceived
Weighted Mean	4.27	MA	Highly Perceived

Legend: SA (Strongly Agree), MA (Moderately Agree), A (Agree), (Disagree), (SD) Strongly Disagree) & DE (Degree of Effect)

Table 3.B presents the perceived effect of interactive materials as an innovative teaching strategy used by the Junior High School Teachers. Four indicators, as shown in the table was rated strongly agree while six indicators were evaluated as moderately agree. It can be noted that four of the 10 items survey registered strongly agree as an effect of using interactive material. These statements are students believe that interactive materials make learning more interesting and enjoyable (4.58), the use of interactive materials has improved my students' retention of information (4.82), the incorporation of interactive materials has encouraged my students to ask more questions. (4.57), and students find that interactive materials provide valuable real-world applications of theoretical knowledge (4.79). The computed weighted mean of 4.27 revealed a moderately agree rating which means there are noticeable improvements in learning outcomes and student engagement in using interactive materials as perceived by the teachers.

Table 5

Perceived Effects of Innovative Teaching Strategy in terms of IT Integration

Indicators	Mean		DE
C. IT Integration			
1. The integration of technology in teaching has enhanced my students' interest in the subject matter.	4.52	SA	Strongly Agree
2. My students believe that the use of technology has improved their understanding of complex topics.	4.47	MA	Moderately Agree
3. Technology integration has made learning more flexible and accessible for my students.	4.68	SA	Strongly Agree
4. My students find that technology-enhanced assignments better prepare them for real-world challenges.	3.57	MA	Moderately Agree
5. The use of technology has increased my students' independence in their learning process.	4.04	MA	Moderately Agree
I have observed an improvement in students' collaboration skills through the integration of technology.	4.03	MA	Moderately Agree
6. Technology integration has facilitated quicker and more effective communication between teachers and students.	4.57	SA	Strongly Agree
7. My students believe that technology has positively impacted their overall academic performance.	3.60	MA	Moderately Agree
8. I find that technology integration allows for personalized learning experiences.	4.10	MA	Moderately Agree
9. The integration of technology has encouraged my students to explore and discover information independently	3.15	A	Agree
Weighted Mean	4.07	MA	Moderately Agree

Legend: SA (Strongly Agree), MA (Moderately Agree), A (Agree), (Disagree), (SD) Strongly Disagree) & DE (Degree of Effect)

Table 3. C displays the effect of integrating information technology in the teaching-learning process. It can be seen in the table that the average weighted mean posted is 4.07 which is moderately agree. Three indicators were given strongly agree rating, six indicators were rated moderately agree, and one indicator rated agree. Its average weighted mean shows a noticeable effects of IT in delivering lessons.

Table 6

Problem Encountered in Utilizing the Innovative Teaching Strategies

Indicators	Mean	DE	
1. Resistance in adapting the innovative teaching strategies due to a preference to the traditional methods.	3.88	S	Highly Serious
2. Inadequate access to technology, interactive materials, or other resources can hinder the implementation of innovative strategies.	4.16	S	Highly Serious
3. Lack sufficient training or professional development opportunities to effectively integrate and execute innovative teaching methods.	3.39	FS	Moderately Serious
4. Limited time for teachers to plan and implement innovative teaching strategies.	4.34	S	Highly Serious
5. Having large class sizes or classroom structures making it difficult in implementing interactive or collaborative activities effectively.	4.47	S	Highly Serious

6. Traditional assessment methods may not align with innovative strategies, making it difficult to measure and evaluate student performance accurately.	3.84	S	Highly Serious
7. Technical issues, such as unreliable internet connectivity or lack of access to devices, can impede the seamless integration of technology into lessons.	4.45	S	Highly Serious
8. Resistance on the part of the students to unconventional teaching methods, leading to challenges in maintaining engagement and participation.	4.9	VS	Very Highly Serious
9. Parents may have traditional expectations of education, making it challenging for teachers to gain support for innovative approaches.	4.69	VS	Very Highly Serious
10. School policies that favor traditional teaching methods or a school culture that does not embrace change can create obstacles for teachers attempting to introduce innovative strategies.	4.26	S	Highly Serious
Weighted Mean	4.23	S	Highly Serious

Legend: VS (Very Serious), S (Serious), FS (Fairly Serious), SS (Slightly Serious), NS (Not Serious) & DE (Degree of Effect)

Table 7 displays the problems encountered in utilizing innovative teaching strategies in Pangasinan II Division. As can be seen from the table, the average weighted mean posted is 4.23 which is serious. Seven indicators were given serious rating, one indicator was rated fairly serious, and two indicators were rated very serious. Its average weighted mean shows that there are noteworthy concerns in the utilization of innovative teaching strategies.

IV. Conclusion

Majority of the respondents were females, under the age bracket of 21-35 years old, most of them acquired MA with a maximum of ten years in service, only attend few seminars and project-based learning was commonly utilized. Gamification and Interactive Materials acquired the highest weighted mean which implied that these two innovative teaching strategies which were highly perceived its effects to junior high school teachers. There were serious problems encountered in utilizing innovative teaching strategies based on the acquired weighted mean thus, it is subjected to enhancement and development. There is a significant difference between effects of utilization of innovative teaching strategies of junior high school teachers across their profile variables. thus, the null hypothesis is rejected. Researcher proposed learning development plan to enhance the innovative teaching strategies of Junior High School teachers. The researcher recommends for the improvement of the study to explore the effects of the utilization of innovative teaching strategies of Junior High School Teachers. For the Pangasinan II Division specifically the teachers, the researcher recommends that a three-day division training about innovative teaching strategies be conducted. Moreover, the activities must include workshops, presentation of outputs, and demonstration teaching. Participants in the training must be encouraged to conduct re-echo to disseminate the learned concepts from the training. In terms of methodology, there is a need to increase the number of participants to have more conclusive and generalized findings. Moreover,

for future research the researchers recommend to focus only on one area of specialization to have a more conclusive generalization of the effect of innovative teaching strategies to student's performance. Lastly, the proposed learning development plan be adopted to enhance the innovative teaching strategies of Junior High School Teachers.

REFERENCES

[1] Araya, R., Arias Ortiz, E., Bottan, N. L., & Cristia, J. (2019). Does gamification in education work? Experimental evidence from Chile (No. IDB-WP-982). IDB Working Paper Series.
[2] Brock, T. (2022). Pearson Coefficient. *Investopedia*. https://www.investopedia.com/terms/p/pearsoncoefficient.asp
[3] Chen, C. H., & Yang, Y. C. (2019). Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators. *Educational Research Review, 26*, 71-81.
[4] Crossman, A. (2020). Understanding purposive sampling: An overview of the method and its applications. *ThoughtCo*.[https://www.thoughtco.com/purposive-sampling
[5] 3026727](https://www.thoughtco.com/purposive-sampling-3026727)
[6] Eli, T. (2021). Students' Perspectives on the Use of Innovative and Interactive Teaching Methods at the University of Nouakchott Al Aasriya, Mauritania: English Department as a Case Study. *International Journal of Technology, Innovation and Management (IJTIM)*, *1*(2), 90–104. https://doi.org/10.54489/ijtim.v1i2.21
[7] French, R., Imms, W., & Mahat, M. (2020). Case studies on the transition from traditional classrooms to innovative learning environments: Emerging strategies for success. *Improving Schools, 23*(2), 175–189. https://doi.org/10.1177/1365480219894408
[8] Kamran, Farrukh, Kanwal, Ayesha, Afzal, Dr, & Rafiq, Shahid. (2023). Impact of Interactive Teaching Methods on Students Learning Outcomes at University level, *7*, 86-102.
[9] Legaki, N.-Z., Xi, N., Hamari, J., Karpouzis, K., & Assimakopoulos, V. (2020). The effect of challenge-based gamification on learning: An experiment in the context of statistics education. *International Journal of Human-Computer Studies, 144*.
[10] Setiawan, R., Nath, K., Cavaliere, L. P. L., Villalba-Condori, K. O., Arias-Chavez, D., Koti, K., ... & Rajest, S. S. (2021). The impact of teaching innovative strategy on academic performance in high schools (Doctoral dissertation, Petra Christian University).
[11] Siedlecki, Sandra. (2020). Understanding descriptive research designs and methods. *Clinical Nurse Specialist CNS, 34*, 8-12. [DOI: 10.1097/NUR.0000000000000493](DOI: 10.1097/NUR.0000000000000493).
[12] Zhang, L., & Ma, Y. (2023). A study of the impact of project-based learning on student learning effects: A meta-analysis study. *Frontiers in Psychology, 14*, 1202728. doi: 10.3389/fpsyg.2023.1202728