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CONTENTS

INNOVATIVE TEACHING APPROACHES THAT ENHANCE STUDENTS' ATTITUDES TOWARDS CHEMISTRY EDUCATION 30

K. Thangavel
Ph.D Research Scholar
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ACADEMIC PROCRASTINATION AND EXAM ANXIETY OF HIGH SCHOOL STUDENTS

1

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INTRODUCTION

Time is an important resource in the life of every student. Things not done in time are rarely done right. The ability to manage time efficiently prepares students for future challenges and paves the way for a successful life. Many students intend to complete their academic tasks within the time frame but they lack the motivation to get started. Due to this self-defeating behaviour they tend to procrastinate their work which leads to poor academic performance.

ACADEMIC PROCRASTINATION

Ellis and Knaus (1977) defined "Procrastination is the failure to initiate or complete a task or activity by predetermined time". Students worry about their own procrastination, and are left feeling anxious, guilty, and even more pressured (Pychyl et al. 2000). Procrastination can lead to serious consequences because it compromises one's ability to set and achieve personal, academic, and career goals. Solomon and Rothblum (1984) stated that students' explanations for their own procrastination were related to fear of failure, taking on such specific forms as performance anxiety, perfectionism, and lack of self-confidence.

EXAM ANXIETY

Examination anxiety is an excessive worry about upcoming exams, fear of being evaluated. It is an irrational thinking about exams and outcomes. Examination anxiety is a major factor contributing to a variety of negative outcomes including psychological distress, academic underachievement, academic failure, and insecurity (Hembree, 1988). While some students may experience increased motivation and effort due to exam anxiety, others may suffer from crippling consequences, such as an inability to focus or procrastinate, leading to poor grades and even dropout rates.

SIGNIFICANCE OF THE STUDY

Adolescence is a critical period in which the students are allured towards various distractions and hence they

delay their work. In academic settings, procrastination affects fellow students, the teacher and sometimes even the organization, if the procrastinator engages in academic misconduct or is unable to complete his studies. Most students who procrastinate suffer from anxiety and poor quality of work compared to those who do not procrastinate. Through the present study, the investigator aims to find out the academic procrastination and exam anxiety of high school students and suggests a better way to avoid procrastination and minimize their exam anxiety.

REVIEW OF RELATED LITERATURE

Caner Borekci (2022) investigated high school students' personality traits and academic procrastination with cluster analysis and found that there was a positive relationship between the level of procrastination and neurotic personality traits. Himani (2022) conducted a study on academic procrastination among higher secondary students in relation to their personality traits, parental education and academic motivation. The study results showed that procrastinators had much higher levels of neuroticism and significantly lower levels of conscientiousness than projected. Manjeet Kaur (2022) revealed that the adolescents having low academic self-efficacy and low level of emotional intelligence exhibit higher level of academic procrastination. Mustafa Pamuk (2022) stated that academic procrastination was positively correlated with academic self-handicapping and negatively correlated with academic grit. Manju Bai (2020) studied about academic procrastination, academic stress and aggression in relation to personality locus of control, and found that there existed significant main effect of gender, personality and locality on academic procrastination.

Yefei Wang (2021) stated that academic procrastination lead to an increase in test anxiety, but test anxiety did not predict the future level of academic procrastination. Eyup Celik and Selami Yildirim (2019) examined test anxiety in terms of academic expectations stress and motivation. It was revealed that family/ teacher expectations, self-expectations, amotivation, and extrinsic motivation significantly predicted exam anxiety.

OBJECTIVES

- To find out the level of academic procrastination of high school students.
- To find out whether there is any significant difference among government, private and government aided high school students in their academic procrastination.
- To find out whether there is any significant difference among high school students from boys, girls and co-education schools in their academic procrastination.
- To find out the level of exam anxiety and its dimensions of high school students.

- To find out whether there is any significant difference among government, private and government aided high school students in their exam anxiety and its dimensions.
- To find out whether there is any significant difference among high school students from boys, girls and co-education schools in their exam anxiety and its dimensions.
- To find out the relationship between academic procrastination and exam anxiety and its dimensions of high school students.

HYPOTHESES

- There is no significant difference among government, private and government aided high school students in their academic procrastination.
- There is no significant difference among high school students from boys, girls and co-education schools in their academic procrastination.
- There is no significant difference among government, private and government aided high school students in their exam anxiety and its dimensions.
- There is no significant difference among high school students from boys, girls and co-education schools in their exam anxiety and its dimensions.
- There is no significant relationship between academic procrastination and exam anxiety and its dimensions of high school students.

METHODOLOGY

The study was carried out by using descriptive survey method. The main variables included academic procrastination and exam anxiety of high school students. The sample of the present study consisted of 326 students studying in IX standard who were selected by using simple random sampling technique from 12 schools in Kanyakumari district. The investigators used Procrastination Behaviour Scale developed by Vishwanath (2020) and Exam Anxiety Scale developed by H.T. Shah (2019) for collecting the data. Percentage Analysis, F test and Karl Pearson's Product Moment Correlation were used to analyse the data.

ANALYSIS AND INTERPRETATIONS OF DATA

Academic Procrastination of High School Students

Table 1: Level of Academic Procrastination of High School Students

Variable	High		Moderate		Low	
	N	%	N	%	N	%
Academic Procrastination	51	15.6	226	69.3	49	15

It is inferred from the table 1 that 15.6% students are at high level, 69.3% of students are at moderate level and 15% students are at low level in their academic procrastination. Therefore, it is stated that the level of academic procrastination of high school students is moderate.

Hypothesis 1:

There is no significant difference among high school students from government, private and government aided schools in their academic procrastination.

Table 2: Difference among High School Students from Government, Private and Government Aided Schools in their Academic Procrastination

Variable	Sources of Variation	Sum of Squares	Mean Square Variation	Calculated 'F' Value	Remarks
Academic Procrastination	Between Groups	1513.410	756.705	3.04	S
	Within Groups	80316.295	248.657		

(At 5% of significance. The table value of 'F' is 3.02)

It is inferred from the table 2 that the calculated 'F' value of academic procrastination (3.04) is greater than the table value (3.02) at 5% level of significance. Therefore, it is stated that there is a significant difference among high school students from government, private and government aided schools in their academic procrastination. Hence the null hypothesis is rejected.

Table 2 (a): Post Hoc Test

Academic Procrastination of Students based on Type of School

Type of School	Number	Subset for Alpha
Government	131	81.52
Private	81	81.68
Government Aided	114	86.10

While comparing the mean scores of academic procrastination among the students in government (81.52), private (81.68) and government aided (86.10) schools, the students studying in government aided schools have higher level of academic procrastination than their counterparts.

Hypothesis 2:

There is no significant difference among high school students from boys, girls and co-education schools in their academic procrastination.

Table 3: Difference among High School Students from Boys, Girls and Co-education Schools in their Academic Procrastination

Variable	Sources of Variation	Sum of Squares	Mean Square Variation	Calculated 'F' Value	Remarks
Academic Procrastination	Between Groups	5181.853	2590.927	10.92	S
	Within Groups	76647.852	237.300		

It is inferred from the table 3 that the calculated 'F' value of academic procrastination (10.92) is greater than the table value (3.02) at 5% level of significance. Therefore, it is stated that there is a significant difference among high school students from boys, girls and co-education schools in their academic procrastination. Hence the null hypothesis is rejected.

Table 3 (a): Post Hoc Test

Academic Procrastination of Students based on Nature of the School

Nature of the School	Number	Subset for Alpha
Girls	46	76.48
Co-education	218	82.57
Boys	62	90.18

While comparing the mean scores of academic procrastination among the students studying in girls schools (76.48), co-education (82.57) and boys schools (90.18), the students studying in boys schools have higher level of academic procrastination than the other school students.

Exam Anxiety and its Dimensions of High School Students

Table 4: Level of Exam Anxiety and its Dimensions of High School Students

Variable and its dimensions	High		Moderate		Low	
	N	%	N	%	N	%
Anxiety before Exam	50	15.3	235	72.1	41	12.6
Anxiety during Exam	43	13.2	232	71.2	51	15.6
Anxiety after Exam	53	16.3	225	69	48	14.7
Overall Exam Anxiety	**45**	**13.8**	**235**	**72.1**	**46**	**14.1**

The table 4 showed the level of exam anxiety of high school students. It showed that 15.3 % students are at higher level, 72.1% students are at moderate level and 12.6% students are at low level in their anxiety before exam, 13.2% students are at high level, 71.2% students are at moderate level and 15.6% students are at low level in their anxiety during exam, 16.3% students are at high level, 69%

students are at moderate level and 14.7% students are at low level in their anxiety after exam, 13.8% students are at high level, 72.1% students are at moderate level and 14.1% students are at low level in their exam anxiety. Therefore, it is stated that the level of exam anxiety and its dimensions of high school students is moderate.

Hypothesis 3:

There is no significant difference among high school students from government school, private school and government aided school in their exam anxiety and its dimensions.

Table 5: Difference among High School Students from Government, Private and Government Aided Schools in their Exam Anxiety and its Dimensions

Variable	Sources of Variation	Sum of Squares	Mean Square Variation	Calculated 'F' Value	Remarks
Anxiety before Exam	Between Groups	15.719	7.859	0.20	NS
	Within Groups	12688.379	39.283		
Anxiety during Exam	Between Groups	212.956	106.478	0.88	NS
	Within Groups	38839.869	120.247		
Anxiety after Exam	Between Groups	51.269	25.634	3.50	S
	Within Groups	2364.817	7.321		
Overall Exam Anxiety	**Between Groups**	**124.907**	**62.454**	**0.24**	**NS**
	Within Groups	**85510.752**	**264.739**		

It is inferred from the table 5 that the calculated 'F' values of anxiety before exam (0.20), anxiety during exam (0.88) and overall exam anxiety (0.24) are less than the table value (3.02) at 5% level of significance. Therefore, it is stated that there is no significant difference among high school students from government school, private school and government aided school in their anxiety before exam, anxiety during exam and overall exam anxiety. Whereas, the calculated 'F' value of anxiety after exam (3.50) is greater than the table value (3.02) at 5% level of significance. Therefore, it is stated that there is a significant difference among high school students from government school, private school and government aided school in their anxiety after exam. Since the overall exam anxiety level showed that there is no significant difference among high school students it is stated that the null hypothesis is accepted.

Table 5 (a): Post Hoc Test

Students' Anxiety after Exam based on the Type of School

Type of School	Number	Subset for Alpha
Private	81	11.30
Government Aided	114	11.41
Government	131	12.17

The comparison of the mean scores of anxiety after exam among the students showed that students studying in government high schools (12.17) have higher anxiety after exam than students in private schools (11.30), government aided schools (11.41).

Hypothesis 4:

There is no significant difference among high school students from boys, girls and co-education schools in their exam anxiety and its dimensions.

Table 6: Difference among High School Students from Boys, Girls and Co-education School in their Exam Anxiety and its Dimensions

Variable	Sources of Variation	Sum of Squares	Mean Square Variation	Calculated 'F' Value	Remarks
Anxiety before Exam	Between Groups	361.424	180.712	4.73	S
	Within Groups	12342.675	38.213		
Anxiety during Exam	Between Groups	1596.503	798.251	6.88	S
	Within Groups	37456.322	115.964		
Anxiety after Exam	Between Groups	133.040	66.520	9.41	S
	Within Groups	2283.046	7.068		
Overall Exam Anxiety	**Between Groups**	**4779.745**	**2389.872**	**9.55**	**S**
	Within Groups	**80855.915**	**250.328**		

It is inferred from the table 6 that the calculated 'F' values of anxiety before exam (4.73), anxiety during exam (6.88), anxiety after exam (9.41) and exam anxiety (9.65) are greater than the table value (3.02) at 5% level of significance. Therefore, it is stated that there is a significant difference among students studying in boys schools, girls schools and co-education schools in their anxiety before exam, anxiety during exam, anxiety after exam and exam anxiety. Hence the null hypothesis is rejected.

Table 6 (a): Post Hoc Test

Students' Anxiety before Exam based on the Type of School

Type of School	Number	Subset for Alpha
Girls	46	28.63
Co-education	218	31.60
Boys	62	31.81

The comparison of the mean scores of anxiety before exam among the students showed that students studying in boys schools (31.81) have higher level of anxiety before exam than students in girls schools (28.63) and co-education schools (31.60).

Table 6 (b): Post Hoc Test

Students' Anxiety during Exam based on the Type of School

Type of School	Number	Subset for Alpha
Girls	46	59.39
Co-education	218	64.38
Boys	62	67.11

The comparison of the mean scores of anxiety during exam among the students showed that students studying in boys schools (67.11) have higher level of anxiety during exam than students in girls schools (59.39) and co-education schools (64.38).

Table 6 (c): Post Hoc Test

Students' Anxiety after Exam based on the Type of School

Type of School	Number	Subset for Alpha
Girls	46	10.37
Co-education	218	11.70
Boys	62	12.61

The comparison of the mean scores of anxiety after exam among the students showed that students studying in boys schools (12.61) have higher level of anxiety after exam than students in girls schools (10.37) and co-education schools (11.70).

Table 6 (d): Post Hoc Test

Students' overall Exam Anxiety based on the Type of School

Type of School	Number	Subset for Alpha
Girls	46	98.39
Co-education	218	107.68
Boys	62	111.53

The comparison of the mean scores of overall exam anxiety among the students showed that students studying in boys schools (111.53) have higher level of exam anxiety than students in girls schools (98.39) and co-education schools (107.68).

Hypothesis 5:

There is no significant relationship between Academic Procrastination and Exam Anxiety and its dimensions of high school students.

Table 7: Relationship between Academic Procrastination and Exam Anxiety and its Dimensions of High School Students

Variable and its dimensions	Calculated 'γ' value	Remarks
Anxiety Before Exam	0.411	S
Anxiety During Exam	0.439	S
Anxiety After Exam	0.138	S
Overall Exam Anxiety	0.478	S

(At 5% level of significance for 4df, the table value is 0.098)

It is inferred from the table 7 that the calculated 'γ' values of anxiety before exam (0.411), anxiety during exam (0.439), anxiety after exam (0.138) and exam anxiety (0.478) are greater than the table value (0.098) at 5% level of significance. Therefore, it is stated that there is a significant relationship between Academic Procrastination and Exam Anxiety with all its dimensions. Hence the null hypothesis is rejected.

FINDINGS

- The level of academic procrastination and exam anxiety of high school students is moderate.
- There is a significant difference among high school students studying in government, private and government aided schools in their academic procrastination. The mean score difference stated that students in government aided schools have higher level of academic procrastination than their counterparts.

- There is a significant difference among high school students studying in boys, girls and co-education schools in their academic procrastination. The mean score difference stated that students in boys schools have higher level of academic procrastination than their counterparts.
- There is no significant difference among high school students from government schools, private schools and government aided schools in their anxiety before exam, anxiety during exam and in overall exam anxiety. But, there is a significant difference among high school students in their anxiety after exam. The mean score difference showed that government high school students have higher level of anxiety after exam than their counterparts.
- There is a significant difference among high school students from boys, girls and co-education schools in their anxiety before exam, anxiety during exam, anxiety after exam and exam anxiety. The mean score differences showed that students studying in boys schools have higher level of anxiety before exam, during exam and after exam than their counterparts.
- The correlation analysis showed that there is a significant relationship existed between academic procrastination and exam anxiety with all its dimensions among the high school students.

CONCLUSION

The study showed that the level of academic procrastination and exam anxiety among high school students is generally moderate, with notable differences across school types and gender. Students in government-aided schools and boys' schools exhibited higher levels of academic procrastination compared to their peers, while government school students also experienced greater exam anxiety after exams. Boys' school students demonstrated higher anxiety levels before, during, and after exams than those in other schools. Furthermore, the correlation analysis revealed a significant relationship between academic procrastination and exam anxiety across all its dimensions, indicating that these factors are interrelated among high school students. Based on the results it is recommended that all schools should introduce regular workshops focused on improving time management and study skills to help students reduce procrastination and prepare effectively for exams, also all schools should provide accessible counseling services and exam anxiety management programmes that can help students to manage stress before, during, and after exams.

REFERENCES

Caner Borekci. (2018). Family attitude, academic procrastination and test anxiety as predictors of academic achievement. *International Journal of Psychology, 4* (4)23-30.

Goswami, Vandana. (2020). Procrastination behaviour and life satisfaction of school teachers an exploratory study. Unpublished Thesis, Banasthali Vidyapith University.

Himani. (2022). Academic procrastinations among higher secondary school students in relation to their personality traits parental education and academic motivation. Unpublished Thesis, Maharshi Dayanand University.

Piers Steel. (2010). *The Procrastination Equation.* Canada: Random House.

Shah, H.T. (2019). Construction and Standardisation of Exam Anxiety and Scale. Rai University.

Solomon, L. J., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counselling Psychology, 31*(4), 12-20.

Yefei Wang. (2021). Academic procrastination and test anxiety: A cross- lagged panel analysis. *Journal of Psychologists and Counsellors in Schools, 3* (1), 34-41.

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A COMPARATIVE STUDY ON AWARENESS ON MOOCS AMONG B.ED., STUDENTS

2

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INTRODUCTION

The digitization of every facet of contemporary life is another trend impacting education. There is a long history of higher education growing to accommodate new student populations. Universities started experimenting with online and hybrid learning as the web gained popularity. The three guiding principles of education policy—access, equity, and quality—are what MOOCs aims to accomplish. Because they provide insight into the current status of digital learning and higher education in general, MOOCs are crucial to understanding what education is becoming. In this way, MOOCs serve as a lens and a mirror for comprehending the extent of change in education. Without a doubt, MOOCs have a big impact on higher education reform. They represent a significant advancement in the potent fusion of two long-term, significant advancements in the directions of online and open education, respectively. Massive Open Online Courses is referred to as MOOCs for short. MOOCs refer to online courses. In contrast to OCW, MOOCs offer free open course materials as well as expanded access to the full learning process. MOOCs are more concerned with the real learning outcomes attained by students and provide greater support for the learning process than simply posting lecture recordings.

MOOCs aim to promote large-scale online learning through learning support services including chapter quizzes, course exams, and teacher-student interaction. While open course resources use Web 1.0 technologies to display course content, MOOCs that use Web 2.0 technologies are able to completely reorganize knowledge through user comments and sharing, enabling learners to gain deeper understanding. An online course's success is largely dependent on how actively engaged students are with the instructor, other students, the content, technology, and course management tools. MOOCs are able to enhance internationalization and international cooperation among

universities. Online learning is an emerging technology that offers dynamic features to enhance an individual's learning experience through self-discipline manner. The key success of this system is delivering content over internet and it can be accessed by the learners over internet and it can be accessed by readers anywhere and anytime. Such online based educational software strives to fulfill the learners' expectations in terms of providing comfortable online environment. MOOCs platforms need to be built with dynamic open learning communities in mind. Interoperability and relevant content challenges should be ensured via cloud-based services and open standards. Even now, there are still many unknowns surrounding the evolution of MOOCs. One issue is that MOOCs have not yet addressed all of the issues raised by those who have criticized them. Furthermore, MOOCs, as a paradigm for online learning, continue to struggle between being what they ought to be and what they are, particularly in the face of an educational system that leans conservative. There's still a long way to go for MOOCs.

STATEMENT OF THE PROBLEM

In response to the growing importance of digital learning in the field of education, Tamil Nadu Teachers Education University has made it compulsory for B.Ed., and M.Ed., students to enroll in MOOC (Massive Open Online Courses) as part of their curriculum. SWAYAM, a government-initiated online learning platform, was introduced at the M.Ed. level, followed by its inclusion in the B.Ed. curriculum in the university. Currently, SWAYAM online courses are mandatory for all B.Ed. and M.Ed. students at the university. Given this shift towards integrating online courses into teacher education, it is crucial to assess the level of awareness among students regarding these MOOC courses. Understanding students' awareness and familiarity with MOOC courses, particularly through platforms like SWAYAM, is vital for evaluating the effectiveness of this initiative and ensuring that students are well-equipped to utilise these online learning opportunities. This study, therefore, aims to explore and analyze the awareness of B.Ed., students about MOOC courses, with respect to their gender and locality of the institutions.

OBJECTIVES

- To study the level of awareness of MOOCs between male B.Ed. students studying in urban colleges and rural colleges.
- To find out the significant difference in the level of awareness of MOOCs between male B.Ed. students studying in urban colleges and rural colleges.
- To find out the significant difference in the level of awareness of MOOCs between female B.Ed. students studying in urban colleges and rural colleges.

HYPOTHESES

- The level of awareness of MOOCs among B.Ed., students studying in urban colleges and rural colleges is moderate.
- There is no significant difference in the level of awareness of MOOCs between male B.Ed. students studying in urban colleges and rural colleges.
- There is no significant difference in the level of awareness of MOOCs between female B.Ed. students studying in urban colleges and rural colleges.

METHODOLOGY

The study was conducted by using descriptive survey method. The population of study included B.Ed. students studying in II year from different colleges of education in the rural and urban area of Tenkasi District. The sample consisted of 150 urban college B.Ed. students and 150 rural college B.Ed. students. The sample was selected by using random sampling technique. The data was collected from 300 B.Ed. students consisting both male and female students from the colleges of education. Inorder to collect the data, the researcher developed the Awareness on MOOCs scale. The scale consisted of 44 items with five alternate responses ie., Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. The validity and reliability of the tool was established. It was found that the coefficient correlation of the Split-Half Method was 0.7677.

ANALYSIS AND INTERPRETATIONS OF DATA

Hypothesis : The level of awareness of MOOCs among B.Ed., students studying in urban colleges and rural colleges is moderate.

Table 1: Awareness on MOOCs among B.Ed., Students Studying in Urban and Rural Colleges with respect to their Gender

Location of the College	Male						Female					
	Low		Avg		High		Low		Avg		High	
	N	%	N	%	N	%	N	%	N	%	N	%
Urban	10	13.7	44	60.3	19	26.0	6	7.7	54	69.2	18	23.1
Rural	15	19.5	54	70.1	8	10.4	9	12.5	53	73.6	10	13.9

The table showed the level of awareness on MOOCs among B.Ed. students in urban and rural college with respect to their gender. With regard to male students, 60.3 % of B.Ed. students in urban colleges have average level of awareness on MOOCs and 70.1 % of students in rural colleges have average level of awareness on MOOCs. With regard to female students, 69.2 % of students in urban college have average level of awareness on MOOCs and 73.6 % of students in rural colleges have average level of awareness on MOOCs.

Hypothesis 2: There is no significant difference in the level of awareness of MOOCs between male B.Ed. students studying in urban colleges and rural colleges.

Table 2: Mean Score Difference in the Level of Awareness of MOOCs between Male B.Ed., Students Studying in Urban and Rural Colleges

Variable	Location of College	N	Mean	S D	Calculated 't' Value	Tabulated 't' Value	Remark
Awareness on MOOC	Urban	73	67.08	5.07	2.97	1.98	S
	Rural	78	64.46	5.74			

S – Significant at 5% level of significance

It is inferred from the above table that, the calculated 't' value 2.97 is greater than the table value 1.98 at 5% level of significance. The mean values showed that the Male B.Ed., students studying in urban colleges have higher level of awareness on MOOCs than their rural counterparts. Therefore, it is stated that there is a significant difference existed in the level of awareness of MOOCs between male B.Ed. students studying in urban colleges and rural colleges. Hence the null hypothesis is not accepted.

Hypothesis 3: There is no significant difference in the level of awareness of MOOCs between female B.Ed. students studying in urban colleges and rural colleges.

Table 3: Mean Score Difference in the Level of Awareness of MOOCs between Female B.Ed., Students studying in Urban and Rural Colleges

Variable	Location of College	N	Mean	S D	Calculated 't' Value	Tabulated 't' Value	Remark
Awareness on MOOC	Urban	77	64.97	3.95	2.09	1.98	S
	Rural	72	63.21	6.05			

S – Significant at 5% level of significance

It is inferred from the above table that, the calculated 't' value 2.09 is greater than the table value 1.98 at 5% level of significance. The mean values showed that the female B.Ed., students studying in urban colleges have higher level of awareness on MOOCs than their rural counterparts. Therefore, it is stated that there is a significant difference existed in the level of awareness of MOOCs between female B.Ed. students studying in urban colleges and rural colleges. Hence the null hypothesis is not accepted.

FINDINGS

- The results from the study showed that, with regard to male students, 60.3% of B.Ed. students in urban

colleges have average level of awareness on MOOCs and 70.1% of students in rural colleges have average level of awareness on MOOCs. With regard to female students, 69.2% of students in urban college have average level of awareness on MOOCs and 73.6% of students in rural colleges have average level of awareness on MOOCs.

- Male B.Ed., students studying in urban colleges have higher level of awareness on MOOCs than their rural counterparts. Similarly, Female B.Ed., students studying in urban colleges have higher level of awareness on MOOCs than their rural counterparts.

CONCLUSION

The research study conducted highlighted a significant difference in the awareness levels of MOOCs (Massive Open Online Courses) between B.Ed students studying in urban colleges and those in rural colleges. The findings clearly indicated that students in urban colleges possess a higher level of awareness and familiarity with MOOC courses compared to their rural counterparts. This disparity can be primarily attributed to several factors prevalent in urban settings, such as better infrastructure, the availability of technology-enabled classrooms, and greater exposure to digital learning platforms. Urban colleges, with their advanced facilities and access to modern educational technologies, provide students with more opportunities to explore and engage with online courses, which contributes to their higher awareness levels. On the other hand, rural colleges often face challenges such as inadequate infrastructure, limited access to technology, and fewer opportunities for exposure to global educational resources. These limitations restrict the ability of students in rural areas to access and benefit from MOOC courses, resulting in a lower level of awareness.

To bridge this gap and ensure equitable access to MOOC courses for all B.Ed students, irrespective of their location, awareness programmes specifically targeting students in rural colleges should be conducted to educate them about the availability, benefits, and utility of MOOC courses. These programs can play a crucial role in motivating students to explore and enroll in online courses. Improving the infrastructure in rural colleges is imperative. Providing technology-enabled classrooms, reliable internet access, and other necessary facilities will create an environment conducive to digital learning. This will empower rural students to explore MOOC courses more effectively. Moreover, efforts should be made to motivate students in rural areas to study online courses. Encouragement from teachers, peers, and educational institutions can significantly influence students' willingness to engage with MOOC courses.

REFERENCES

Curtis, J. Bonk. (2015). *MOOCs and Open Education Around the World.* United Kingdom: Taylor & Francis.

Pomerol, J., Epelboin, Y., & Thoury, C. (2015). *MOOCs: Design, Use and Business Models.* Germany: Wiley.

Zheng, Q., Chen, L., Burgos, D. (2017). *The Development of MOOCs in China.* Switzerland: Springer Nature Singapore.

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ATTITUDE TOWARDS LEARNING THROUGH SOCIAL MEDIA AMONG STUDENT TEACHERS IN COLLEGES OF EDUCATION

3

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INTRODUCTION

Social media facilitates the easy exchange of both personal and professional information, fostering expressive thoughts, creativity, and individuality. It serves as an online platform where student-teachers can connect, share, and communicate for various purposes including educational, entertainment, and social interactions. Rapidly emerging as a major communication medium, social media leverages technologies such as mobile devices and computers to support a broad range of applications. Student-teachers are increasingly using these platforms to share their daily activities and interact with educators, friends, family, and discuss their interests. Platforms like Facebook, Google+, YouTube, Twitter, and WhatsApp have introduced new social dimensions in recent years. Social media is predominantly used by students, teachers, and educational institutions as a tool for exchanging ideas and information. It capitalizes on the convenience of the Internet to provide users with instant access to personalized content, including documents, videos, and photos.

NEED AND SIGNIFICANCE OF THE STUDY

Social media is crucial for supporting the goals and development of student-teachers. When educational institutions utilize social media, it becomes easier to interact with student-teachers. Social media is set to play a significant role in the future of student-teachers by enhancing their learning and teaching experiences. Both teachers and students can leverage these platforms to benefit from interactions with their peers, thereby fostering a more effective learning and teaching environment. Social media facilitates communication between students and teachers, and as students increasingly engage with new technologies, they become more adept with computers and other electronic devices. Emphasizing technology in

education helps to further develop the skills of student-teachers. So, the investigator decided study the attitude towards learning through social media among the student teachers in colleges of education.

STATEMENT OF THE PROBLEM

Social media platforms like WhatsApp, Google+, Twitter, Facebook, YouTube, WordPress, Edmodo, Blogger, LinkedIn etc., are there for student teachers to communicate and exchange information easily. It is mostly used by many educational institutions and student-teachers. Educational institutions consider communicating information through the use of technology as a critical component of student teachers' success. Social media creates innovation in teaching learning process. Online communication carries information previously inaccessible for the people. Social media creates awareness of what is happening in all areas of education. Social media is especially useful for student teachers to learn and teach.

OBJECTIVES

- To find out the level of attitude towards learning through social media among student teachers in colleges of education.
- To find out the significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to gender.
- To find out the significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to locality of the college.
- To find out the significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to residence.

HYPOTHESES

- There is no significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to gender.
- There is no significant difference in mean scores on the level of attitude towards learning through social media among student teachers in colleges of education with respect to locality of the college.
- There is no significant difference in mean scores on the level of attitude towards learning through social media among student teachers in colleges of education with respect to residence.

METHODOLOGY

Descriptive research method using survey technique was adopted for the present study. A sample of 100 Student Teachers who were studying in Colleges of Education in Trichy District was chosen through random sampling

technique. The Investigators developed the Attitude towards Learning through Social Media Scale for the present study. The five point rating scale (Agree, Strongly Agree, Undecided, Disagree and Strongly Disagree) consisted of 27 items (which are scored 5, 4, 3, 2 and 1for positive items and 1, 2, 3, 4 and 5 for negative items respectively. The scale was administered among the sample and the data was collected from the Student Teachers. The collected data was analysed using descriptive and differential analysis.

ANALYSIS AND INTERPRETATION OF DATA

Hypothesis–1 : There is no significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to gender.

Table – 1 : Difference in the Level of Attitude towards Learning through Social Media among Student Teachers with respect to Gender

Variable	Gender	N	Mean	SD	't' Value
Attitude towards Learning through Social Media	Male	15	61.40	3.64	0.28 NS
	Female	85	61.11	3.73	

NS - Not Significant at 0.05 level

It is observed from the table 1 that, the calculated 't' value 0.28 is lesser than the table value 1.96 at 0.05 level of significance. Hence it is stated that there is no significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to gender. The mean score difference showed that male and female student teachers do not differ in their level of attitude towards learning through Social Media. Hence the framed null hypothesis is found to be accepted.

Hypothesis – 2: There is no significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to locality of the college.

Table – 2 : Difference in the Level of Attitude towards Learning through Social Media among Student Teachers with respect to Locality of the College

Variable	Locality of the College	N	Mean	SD	't' Value
Attitude towards Learning through Social Media	Rural	56	60.84	3.80	0.95 NS
	Urban	44	61.55	3.57	

NS - Not Significant at 0.05 level

It is observed from the table 2 that, the calculated 't' value 0.95 is lesser than the table value 1.96 at 0.05 level of significance. Hence it is stated that there is no significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to locality of the college. The mean score difference showed that rural and urban area student teachers do not differ in their level of attitude towards learning through social media. Hence the framed null hypothesis is found to be accepted.

Hypothesis – 3 : There is no significant difference in mean scores on the level of attitude towards learning through social media among student teachers in colleges of education with respect to residence.

Table – 3 : Difference in the Level of Attitude towards Learning through Social Media among Student Teachers with respect to Residence

Category	Residence	N	Mean	SD	't' Value
Attitude towards Learning through Social Media	Hostel	47	60.77	3.63	0.97 NS
	Home	53	61.49	3.76	

NS - Not Significant at 0.05 level

It is observed from the table 3 that, the calculated 't' value 0.97 is lesser than the table value 1.96 at 0.05 level of significance. Hence it is stated that there is no significant difference in the level of attitude towards learning through social media among student teachers in colleges of education with respect to their residence. The mean score difference showed that students residing at home and college hostel do not differ in their level of attitude towards learning through social media. Hence the framed null hypothesis is found to be accepted.

FINDINGS

The following findings were drawn from the study.

- The mean values stated that the level of attitude towards learning through social media among the student teachers in colleges of education is moderate.
- The male and female student teachers do not differ in their level of attitude towards learning through Social Media.
- The rural and urban area student teachers do not differ in their level of attitude towards learning through social media.
- The students residing at home and college hostel do not differ in their level of attitude towards learning through social media.

CONCLUSION

From the findings of the study it is stated that though the student teachers' level of attitude towards learning through social media is moderate, they do not differ significantly in the level of attitude with respect to their gender, locality of the college and their residence. Hence it is concluded that the student teachers have been using social media for learning purpose and to satisfy some other purposes as well. However, the demographic variables namely gender, locality of the colleges and the residence of the student teachers do not influence their level of attitude towards learning through social media.

REFERENCES

Abbas, J., Aman, J., Nurunnabi, M., & Bano, S. (2019). The impact of social media on learning behavior for sustainable education: Evidence of students from selected universities in Pakistan. *Sustainability, 11*(6), 1683. https://doi.org/10.3390/su11061683

Can, M.S., & Gokcee, S.A.I. (2019). The use of social networks among university students. *Educational Research and Reviews, 14*(6), 190–199. https://doi.org/10.5897/err2018.3654

Rahul Kushwaha. (2017). Social media enhance the learning attitude of students in higher education: A study. *Paripex Indian Journal of Research, 6* (4),616-617.

Sivakumar, R. (2016). Whatsapp in Education. *Glokalde - International Journal, 2*(2), 18-22.

Sivakumar, R, (2020). Use of social media and its effect on academic performance of the students. *Samwaad, 9*(2), 7-20.

Sreedevi, P.S. (2020). Attitude of students towards social media enabled learning in the digital era. *Psychology and Education, 57*(8), 877-881.

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AWARENESS TOWARDS TRANSGENDER AMONG SECONDARY SCHOOL TEACHERS

4

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INTRODUCTION

The term gender was coined by John William Money in 1955. It refers to "the socially and culturally constructed roles and responsibilities, behaviours/ characteristics, expressions and identities expected from girls, women, boys, men, and gender diverse people." Gender refers to what it means to be a male or a female or a transgender in society and culture. It is socially constructed and determines the roles, behaviour, activities and attributes that a particular society considers appropriate for men, women and transgender. Thus, gender has 3 categories: masculinity, femininity and queer (transgender).

TRANSGENDER

Transgender is the third gender. It is an umbrella terms for persons whose gender identity, gender expression or behaviour does not conform to that typically associated with the sex to which they were assigned at birth (American Psychological Association). Transgender are not totally masculine or feminine and thus identify with varying degrees of both masculinity and femininity. Transgender people are individuals of any age or sex whose appearance, personal characteristics, or behaviours differ from stereotypes about how men and women are "supposed" to be. Transgender people have existed in every culture, race, and class since the story of human life has been recorded (Satashivam, 2012). Most of the transgender experiences gender dysphoria. Transgender persons have been documented in many indigenous, Western, and Eastern cultures and societies from antiquity until the present day. However, the meaning of gender nonconformity may vary from culture to culture. Transgender have a long history in Indian history. Transgenders/ Hijras in India, who are also known by different names in different parts of India, such as Kinnar, Aravani, Kothi, Shiv-Shakti, Jogtas/Jogappas etc.

According to the 2011 census, India's transgender population was around 4.88 lakh. However, estimates from transgender community members and organizations working for them are much higher. According to the 2011 census, a literacy rate of transgender is 56.07%. In Karnataka, the total population of transgender is about 20,266, with a literacy rate of 58.82%. Transgender people face many challenges, including discrimination, gender dysphoria, lack of education and social recognition, etc. Even today, most of the people do not recognize transgender as third gender. Research has shown that transgender people are at high risk of experiencing prejudice and mental-health problems. Non-recognition of identity of transgender also results in them facing discrimination in all spheres of society like work, education, public accommodations, cinemas, shops, malls, restaurants healthcare etc. A 2018 study commissioned by the National Human Rights Commission (NHRC) found that over 96% of transgender people were denied jobs and are forced to take low paying or undignified work for livelihood like begging. 89% of them said there are no jobs for even qualified ones. 50-60% of them have never attended schools and those who did face severe discrimination. NHRC said 52% of them were harassed by their classmates and 15% by even teachers, a reason due to which they DROPPED THEIR STUDIES. Only 6% of them were employed in private sectors or NGOs. Monthly income of only 1% of those people was above Rs.25,000; majority-26.35% earn between Rs. 10,000 - Rs.15,000.

The goal 5 of UN Sustainable Developmental Goals (SDGs 2015) says that gender equality is not only a fundamental human right, but a necessary foundation for a peaceful, prosperous and sustainable World. The Indian Constitution drafted by Dr. B.R. Ambedkar has given due importance to the gender equality. In 2009, Election Commission of India took a first step by allowing transgender to choose their gender as "other" on ballot forms. The Supreme Court of India in 2014, recognized transgender as the third gender to eradicate the discrimination suffered by them and to safeguard their rights.

NEED AND IMPORTANCE OF THE STUDY

Teachers pass on knowledge, foster critical thinking skills, inspire students, parents and community, serve as role models, and play a role in the holistic development of children. Teachers are also promoters of peace, motivators for pursuing dreams, and builders of communities, thereby influencing society positively. It is important that teachers should have awareness of third gender, their needs, their issues, etc. The better awareness of the third gender they have, they can be open and accommodating to the different gender behaviour among school students and treat everyone and involve everyone actively in learning. A teacher with good

awareness of third gender can play vital role in providing authentic information on gender and sex diversity among human beings to the students. This can enable students and community not only to have better awareness but also better disposition of feelings (attitudes) towards accommodating transgender towards peaceful, prosperous and sustainable World. Hence the present study was conducted to examine the awareness of transgender among teachers working in secondary schools in Bengaluru city in Karnataka, India.

REVIEW OF RELATED LITERATURE

The literature on attitudes towards transgender students highlights a range of perspectives and challenges faced by this community in educational settings. Gegenfurtner (2021) explored the attitudes of pre-service teachers toward transgender students, identifying key associations with factors such as social contact, religiosity, and political preferences. Similarly, Sharma and Kishan (2021) examined the attitudes of teachers in India towards the education of transgender students, revealing a general lack of awareness and understanding, which often hampers inclusive education efforts. In contrast, Begona et al. (2023) focused on the absence of transgender identities in the training of primary education teachers, emphasising the implications this gap has for classroom inclusivity. This lack of formal training highlights the broader systemic barriers that transgender students face in their educational journeys.

Studies conducted in India, such as those by Das (2018) and Golden Kisha (2017), have shed light on the specific challenges and opportunities for transgender students in higher education. Das (2018) pointed out the limited opportunities available to transgender students, with societal and institutional barriers playing a significant role. Meanwhile, Ali (2021) and Hussain (2020) examined teachers' attitudes and awareness of educational facilities for transgender students, noting the crucial role educators play in fostering social change. Nitisha and Kumar (2023) emphasised the importance of raising awareness among teacher educators about transgender inclusion in higher education, while Poddar (2018) found that even M.Ed. students lacked sufficient awareness of transgender issues, underlining the need for enhanced training and sensitisation.

OBJECTIVES

- To construct a questionnaire to measure the awareness of transgender among secondary school teachers.
- To study the awareness towards transgender among secondary school teachers in relation to their demographic variables namely gender, teaching subject and nature of the school.

HYPOTHESES

- There is no significant difference in the awareness towards transgender between male and female secondary school teachers.
- There is no significant difference in the awareness towards transgender between science and arts teachers.
- There is no significant difference in the awareness towards transgender between teachers working in government schools and private schools.

METHODOLOGY

The study was conducted using a survey method. The main variable of the study was Awareness towards Transgender among school teachers. The sample included 103 teachers working in government and private secondary schools in Bengaluru city in Karnataka, India., who were selected by simple random sampling technique. To collect the data, the researcher constructed a tool and established the standardisation norms. The collected data was analysed using descriptive and differential analysis.

ANALYSIS AND INTERPRETATION OF DATA

Hypothesis 1: There is no significant difference in the awareness towards transgender between male and female secondary school teachers.

Table 1: Awareness towards Transgender among Secondary School Teachers based on their Gender

Demographic Variable	Group	N	Mean	Standard Deviation	't' Value	Remark
Gender	Female	79	12.93	0.96	2.25	S
	Male	24	12.20	1.09		

S – Significant at 0.05 level

It is observed from the table 1 that the obtained 't' value of 2.25 is greater than the table value of 1.96 at 0.05 level of significance. It means that there is a significant difference in the awareness towards transgender between male and female secondary school teachers. Hence the null hypothesis is not accepted.

The mean value is found to be in favour of female teachers. Hence it can be inferred that the female teachers have better awareness towards transgender than male teachers.

Hypothesis 2: There is no significant difference in the awareness towards transgender between science and arts teachers.

Table 2: Awareness towards Transgender among Secondary School Teachers based on their Subject of Teaching

Demographic Variable	Group	N	Mean	Standard Deviation	't' Value	Remark
Subject of Teaching	Science	43	12.83	0.89	0.10	NS
	Arts	60	12.80	1.09		

NS – Not Significant at 0.05 level

It is observed from the table 2 that the obtained 't' value 0.10 is lesser than the table value 1.96 at 0.05 level of significance. It means that there is no significance difference in the awareness towards transgender between science and arts teachers. So, the null hypothesis is accepted.

It is inferred from the mean score difference that, science teachers have slightly better awareness towards transgender than arts teachers.

Hypothesis 3: There is no significant difference in the awareness towards transgender between teachers working in government schools and private schools.

Table 3: Awareness towards Transgender among Secondary School Teachers based on the Nature of the School

Demographic Variable	Group	N	Mean	Standard Deviation	't' Value	Remark
Nature of the School	Government	30	12.98	1.06	0.70	NS
	Private	73	12.16	0.87		

NS – Not Significant at 0.05 level

It is observed from the table 3 that the obtained 't' value 0.70 is lesser than the table value 1.96 at 0.05 level of significance. It means that, there is no significance difference in the awareness towards transgender between the teachers working in government schools and private schools. So, the null hypothesis is accepted.

It is inferred from the mean score difference that teachers working in government schools have slightly better awareness towards transgender than the teachers working in private schools.

FINDINGS

- It is observed from the analysis based on gender that the female teachers have better awareness towards transgender than male teachers. There is a significant difference in the awareness towards transgender between male and female secondary school teachers.
- Analysis based on the subject of teaching revealed that there is no significance difference in the awareness towards transgender between teachers teaching science

subjects and arts subjects. However, the mean score difference showed that science teachers have slightly better awareness towards transgender than arts teachers.

- Analysis based on the nature of school stated that there is no significance difference in the awareness towards transgender between the teachers working in government schools and private schools. However, the mean score difference showed that teachers working in government schools have slightly better awareness towards transgender than the teachers working in private schools.

CONCLUSION

The awareness towards transgender among secondary school teachers is a critical aspect of fostering inclusive and supportive educational environments. This study found that there is an increased understanding and sensitivity among secondary school teachers towards transgender issues. However, constant efforts are needed from educators, administrators, and community stakeholders to enhance awareness towards transgender among teachers. The efforts can include targeted training programs, professional development opportunities, and inclusive curriculum initiatives. In addition, school policies and practices must be revised to reflect a commitment to equity and inclusivity for individuals irrespective of their gender identity. The study advocates that addressing bias, stereotypes, and discrimination within school communities is essential for fostering a culture of acceptance. Teachers must strive to be allies and advocates for all genders.

REFERENCES

Andreas Gegenfurtner (2021). Pre-service teachers' attitudes toward transgender students: Associations with social contact, religiosity, political preference, sexual orientation, and teacher gender, *International Journal of Educational Research, 110, 87-94.*

Anjul Sharma., & Ram Kishan. (2021). Attitude of teachers towards education of transgender. *International Journal of Advance Research and Innovative Ideas in Education, 7*(6), 317-322.

Begona, S.T., Alejandro G.A., & Jesus Esteban, M. (2023). Absence of transgender identities in primary education teachers' training and its implications in the classroom: A phenomenological study. *Education Science, 13*(8), 1-14.

Das, P. (2018). Higher education of transgenders in India: Opportunities and challenges. *International Journal of Research in Engineering, Science and Management, 2*(2), 371–375.

Golden Kisha, B. (2017). A study of attitude of society towards transgender in South India. *International Journal of Science and Research, 6*(8), 1564-1569.

Mahasin Ali. (2021). Attitude of school teachers towards transgender students inclusion in education. *Journal of Emerging Technologies and Innovative Research, 8*(5), 661-670.

Nitisha and Gautam Kumar. (2023). Awareness on transgender and their inclusion in higher education institutions: Through the lens of teacher educators. *Juni Khyat, 13*(5), 185-190.

Rabbul Hussain. (2020). A study on transgender awareness about educational facilities and its impact on social change. *PalArch's Journal of Archaeology of Egypt/Egyptology, 17*(9), 9746-9756.

Srimoyee Poddar. (2018). Awareness of transgender issues among M.Ed. students of regional institute of education, Bhubaneswar, *International Journal of Creative Research Thoughts, 6*(1), 147-155.

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INNOVATIVE TEACHING APPROACHES THAT ENHANCE STUDENTS' ATTITUDES TOWARDS CHEMISTRY EDUCATION

5

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INTRODUCTION

Chemistry, often considered the central science, is crucial in understanding the world and driving technological advancements. However, many students perceive chemistry as a difficult, abstract subject, leading to negative attitudes that can hinder learning and discourage the pursuit of chemistry-related careers. This perception presents a significant challenge for educators and has far-reaching implications for scientific literacy and the future workforce in STEM fields.

Traditional teaching approaches in chemistry, often characterized by lecture-based instruction and rote memorization, have been found to contribute to these negative attitudes. Students may struggle to see the relevance of chemical concepts to their daily lives or future careers, further diminishing their interest and motivation. In response to these challenges, innovative teaching approaches have emerged, aimed at transforming the way chemistry is taught and perceived by students. These approaches seek to make chemistry more engaging, accessible, and relevant, thereby enhancing student attitudes towards the subject.

This paper focuses on several key innovative approaches: guided discovery, inquiry-based learning, blended learning, flipped learning, and project-based learning. Each approach offers unique strategies for engaging students, promoting active learning, and connecting chemical concepts to real-world applications. By examining these approaches, we aim to provide educators with a comprehensive understanding of effective strategies for improving student attitudes towards chemistry. The paper will explore the theoretical foundations, practical implementation, benefits, and challenges associated with each approach, as well as their potential impact on student engagement, motivation, and overall perception of chemistry education.

CONCEPTUAL FRAMEWORK

The conceptual framework for this study is grounded in constructivist learning theory and the cognitive-affective theory of learning. Constructivism posits that learners actively construct their understanding by connecting new information with prior knowledge and experiences. In the context of chemistry education, this suggests that students' attitudes and perceptions play a crucial role in their ability to grasp and apply chemical concepts.

The cognitive-affective theory of learning emphasizes the interplay between cognitive processes and emotional states in the learning process. This theory is particularly relevant to chemistry education, where negative emotions such as anxiety or frustration can significantly impede learning, while positive emotions like curiosity and excitement can enhance it.

The relationship between teaching approaches and student attitudes is bidirectional. Innovative teaching approaches can positively influence student attitudes by making the subject more engaging and relevant. Conversely, improved attitudes can lead to increased motivation, better engagement with the material, and ultimately, enhanced learning outcomes (Osborne, Simon, & Collins (2003).

This framework suggests that by adopting teaching approaches that address both the cognitive and affective dimensions of learning, educators can create a positive feedback loop. Improved teaching approaches lead to better attitudes, which in turn facilitate more effective learning, potentially sparking a genuine interest in chemistry that extends beyond the classroom.

SIGNIFICANCE OF THE STUDY

Innovative teaching approaches are transforming chemistry education, aiming to enhance student attitudes towards the subject. Context-based learning is gaining popularity, connecting chemical concepts to real-world applications. This helps students see the relevance of chemistry in their daily lives and future careers. Hands-on experimentation remains crucial, with many institutions upgrading lab facilities to provide more sophisticated, industry-like experiences. Technology is also playing an increasing role, with computer simulations and molecular modelling software becoming more common in classrooms. Collaborative learning strategies, such as group projects and peer-led team learning, are being implemented to foster engagement and deepen understanding. The flipped classroom model is emerging to maximize interactive learning time during class hours.

Educators are strengthening connections between chemistry education and potential careers through industry partnerships, internships, and guest speakers. This approach helps students envision diverse career paths in chemistry-related fields. By adopting

these innovative approaches, educators aim to shift perceptions of chemistry from a challenging, abstract subject to an exciting and relevant field of study. The goal is to improve learning outcomes, increase retention in chemistry programs, and inspire more students to pursue chemistry-related careers.

OBJECTIVES

- The primary objective of this study is to explore and analyse teaching approaches that enhance students' positive attitudes towards Chemistry Education.
- Describe innovative teaching approaches that improve student attitudes towards Chemistry.
- Examine the theoretical foundations and practical implementation of these approaches in Chemistry Education.
- Provide recommendations for educators to integrate these approaches into their teaching practices.

THE EVOLUTION OF CHEMISTRY EDUCATION: INNOVATIVE TEACHING APPROACHES

Guided Discovery and Inquiry-Based Learning: Fostering Active Exploration

The field of chemistry education has seen a significant shift towards innovative teaching approaches designed to enhance student engagement and understanding. Among these, the Guided Discovery Approach stands out as a method that bridges traditional lecture-based teaching with more open-ended inquiry. This approach positions the teacher as a facilitator, guiding students through carefully structured activities that encourage active exploration of chemical concepts. This method fosters critical thinking and problem-solving skills while increasing student motivation by incorporating pre-lab questions, structured experiments, post-lab analysis, and concept mapping (Mayer (2004).

Inquiry-based learning in chemistry education mimics the scientific method, allowing students to experience the process of discovery firsthand. This approach emphasizes starting with questions or problems, encouraging active investigation, and promoting critical reflection. In practice, this can involve open-ended lab experiments, real-world problem-solving scenarios, analysis of scientific literature, and student-led demonstrations. The impact on student attitudes is profound, fostering curiosity, improving confidence in scientific abilities, and enhancing the perceived relevance of chemistry to real-world issues.

Blended and Flipped Learning: Leveraging Technology for Personalized Instruction

The Blended Learning Approach offers a flexible and personalized method by combining traditional face-to-face instruction with online learning components. This approach utilizes

a variety of tools and technologies, including learning management systems, virtual labs, online quizzes, and interactive tutorials. By allowing for self-paced learning and providing multiple modes of engagement, blended learning caters to diverse learning styles and can significantly reduce anxiety associated with chemistry education.

The Flipped Learning Approach takes this concept further by inverting the traditional teaching model. Students engage with instructional content outside of class, freeing up classroom time for interactive learning activities. This method increases active participation, allows for more personalized instruction, and promotes peer learning and collaboration. The practical implementation in chemistry courses often involves pre-class videos, in-class problem-solving sessions, hands-on experiments, and collaborative projects (Seery,2018).

Project-Based Learning: Connecting Chemistry to Real-World Challenges

Project-based learning in chemistry education involves students working on complex, authentic projects that address real-world chemistry problems. This approach is centered around open-ended driving questions or challenges, requiring sustained inquiry, critical thinking, and collaboration. Examples of chemistry projects might include designing water purification systems, investigating local environmental issues, or developing new consumer products. This approach not only demonstrates the real-world relevance of chemistry but also encourages creativity, builds confidence, and fosters a sense of purpose among students.

While these innovative approaches offer numerous benefits, they also present challenges. They can be time-consuming to design and implement, require careful scaffolding, and may initially be challenging for students accustomed to more traditional teaching methods. However, the potential to enhance student attitudes towards chemistry, improve conceptual understanding, and develop crucial skills makes these approaches valuable tools in modern chemistry education.

BENEFITS AND CHALLENGES OF INNOVATIVE TEACHING APPROACHES

These innovative teaching approaches in chemistry education represent a significant shift from traditional methods, aiming to create more engaging, relevant, and effective learning experiences. The Guided Discovery Approach and Inquiry-Based Learning share similarities in their focus on active student participation and the construction of knowledge. However, they differ in the level of guidance provided. While Guided Discovery offers more structured activities and teacher-led facilitation, Inquiry-Based Learning leans towards more open-ended exploration, allowing students greater

autonomy in designing experiments and solving problems.

The Blended Learning Approach and Flipped Learning Approach both leverage technology to enhance the learning experience, but with different emphases. Blended Learning combines face-to-face instruction with online components, offering flexibility and personalization. It allows students to engage with foundational content through online modules and virtual labs while reserving classroom time for more complex concepts and collaborative work. On the other hand, the Flipped Learning Approach radically restructures the traditional classroom model by moving lecture content online and dedicating in-class time to interactive activities, problem-solving, and peer learning (Eichler, & Peeples (2016).

Project-Based Learning takes a more holistic approach, immersing students in complex, real-world chemistry challenges. This method not only reinforces chemical concepts but also develops crucial skills such as critical thinking, problem-solving, and teamwork. By working on projects like designing water purification systems or analyzing the chemistry of local environmental issues, students see the direct application of their learning to societal needs, which can significantly boost motivation and engagement.

These innovative approaches share common benefits in terms of enhancing student attitudes towards chemistry (King (2012). They all aim to increase student engagement, improve conceptual understanding, and develop critical thinking skills. By demonstrating the relevance of chemistry to real-world issues and future careers, these methods can transform students' perceptions of the subject from an abstract, difficult discipline to an exciting and impactful field of study.

As chemistry education continues to evolve, we'll likely see further refinement and integration of these approaches. The future may involve more personalized learning pathways that combine elements from various approaches, designed to individual student needs and learning styles. Additionally, as technology continues to advance, we can expect to see more sophisticated virtual labs, augmented reality applications, and adaptive learning platforms integrated into chemistry education.

Ultimately, the goal of these innovative teaching approaches is to create a new generation of chemists and scientifically literate citizens who are not just knowledgeable about chemical concepts but also equipped with the skills to apply this knowledge creatively and ethically to solve real-world problems. By transforming how chemistry is taught and perceived, these approaches can significantly impact not just individual student outcomes, but also the future of scientific innovation and global problem-solving.

ADAPTING TO NEW TEACHING PARADIGMS: THE EDUCATOR'S ROLE

The implementation of these innovative approaches in chemistry education requires a paradigm shift in how educators view their role and how institutions structure their curricula. Teachers must transition from being primarily lecturers to becoming facilitators of learning, guiding students through their discovery process rather than simply imparting information. This shift demands ongoing professional development and a willingness to embrace new pedagogical techniques.

For instance, in the context of Guided Discovery and Inquiry-Based Learning, teachers need to develop skills in asking probing questions that stimulate critical thinking without providing direct answers. They must learn to create scaffolded learning experiences that gradually build students' confidence and abilities in scientific inquiry. This might involve designing open-ended experiments that allow for multiple correct approaches or outcomes, challenging the traditional notion of "right" and "wrong" answers in science education.

The Blended and Flipped Learning approaches necessitate a different set of skills from educators. Teachers must become proficient in creating or curating high-quality digital content, such as video lectures and interactive online modules. They also need to redesign their in-class activities to maximize the benefits of face-to-face interaction time. This could involve facilitating group discussions, overseeing collaborative problem-solving sessions, or providing individualized guidance to students struggling with concepts.

Project-based learning in chemistry requires educators to develop interdisciplinary knowledge and project management skills. Teachers need to design projects that not only cover required chemical concepts but also integrate aspects of other disciplines such as environmental science, biology, or even economics and social studies. This approach often involves collaboration with industry partners or community organizations, requiring teachers to build and maintain these external relationships.

RECOMMENDATIONS

Considering the significance of applying innovative teaching strategies in teaching, the following recommendations are proposed.

- Educators should introduce innovative teaching approaches incrementally, starting with one method and progressively incorporating others. This allows for proper evaluation and adjustment of each approach.
- Institutions should provide training and support for educators to effectively implement these innovative approaches. This includes workshops, peer mentoring, and access to relevant resources.

- Teaching methods should be designed to suit specific educational contexts, considering factors such as class size, available resources, and student demographics.
- Educators should implement innocative student centric active learning methods and strategies in classroom transactions rather than the traditional methods of teaching.
- Evaluation methods should be redesigned to align with the goals of innovative teaching approaches, focusing on conceptual understanding and problem-solving skills rather than rote memorization.
- Regular collection and analysis of student feedback should be integrated into the implementation process to continuously refine and improve teaching strategies.
- Curriculum design should emphasize the relevance of chemistry to real-world issues and potential careers, enhancing perceived value and student engagement.

CONCLUSION

This study has explored various innovative teaching approaches aimed at enhancing student attitudes towards Chemistry Education. The application of innovative approaches such as guided discovery, inquiry-based learning, blended learning, flipped learning, and project-based learning have the potential to improve student engagement, motivation, and overall perception of chemistry as a subject. The study indicates that these approaches when properly implemented, can address many of the challenges associated with traditional chemistry education. Promoting active learning fosters critical thinking, and demonstrating real-world relevance can transform student experiences with chemistry, potentially leading to improved learning outcomes and increased interest in chemistry-related fields.

It is concluded that innovative teaching approaches have the potential to significantly enhance student attitudes towards chemistry education. By embracing these approaches and continuously refining their implementation, educators can play a crucial role in fostering a new generation of scientifically literate citizens and future chemists.

REFERENCES

Chang, R., & Goldsby, K. A. (2018). *Chemistry (13th ed.)*. New York : McGraw-Hill Education.

Eichler, J. F., & Peeples, J. (2016). Flipped classroom modules for large enrollment general chemistry courses: A low barrier approach to increase active learning and improve student grades. *Chemistry Education Research and Practice, 17*(1), 197-208.

King, D. (2012). New perspectives on context-based chemistry education: Using a dialectical sociocultural approach to view teaching and learning. *Studies in Science Education, 48*(1), 51-87.

Mayer, R. E. (2004). Should there be a three-strikes rule against pure discovery learning?. *American Psychologist, 59*(1), 14-19.

Osborne, J., Simon, S., & Collins, S. (2003). Attitudes towards science: A review of the literature and its implications. *International Journal of Science Education, 25*(9), 1049-1079.

Seery, M. K. (2018). Flipped learning in higher education chemistry: Emerging trends and potential directions. *Chemistry Education Research and Practice, 16*(4), 758-768.

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