

A Study On Teacher Effectiveness In Relation To Techno-Pedagogical Competency Among Higher Secondary School Teachers In Nalbari District, Assam

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Abstract

Teachers play an important role in maintaining the quality of education. In today's technology-driven world, teachers need to be effective and able to use technology along with appropriate teaching methods. Techno-pedagogical competency helps teachers in using digital tools and teaching strategies to make learning more effective and engaging. The present study is grounded in the philosophical foundations of Pragmatism, Constructivism, Humanism, and Idealism. The present study tries to find out the level of Teacher Effectiveness and Techno-Pedagogical Competency of 200 higher secondary school teachers in Nalbari District, Assam. A descriptive survey method was used for data collection, with 100 male and 100 female teachers as the sample. Data were collected by using the 'Teacher Effectiveness Scale' by Nasrin Suraiya and Mohd. Shakir (2023) and 'Techno-Pedagogical Competency Scale' by Mir Rahul Ahmad and Dr. Gulshan Wani (2023). Mean, Standard Deviation, and t-test were used for data analysis. The findings revealed that the majority of teachers demonstrated a high level of Teacher Effectiveness, whereas their Techno-Pedagogical Competency was found to be extremely low. The study also revealed a significant positive relationship between Teacher Effectiveness and Techno-Pedagogical Competency among higher secondary school teachers.

Keywords: Teacher Effectiveness, Techno-Pedagogical Competency, Higher Secondary School Teachers...

INTRODUCTION

Teachers play an important role in shaping individuals as well as society. They are not only responsible for delivering knowledge but also responsible for guiding, motivating, and supporting students in their overall development. Therefore, teaching is not simply the process of providing information; it also involves understanding students' needs, emotions, abilities, and difficulties and developing a positive and supportive relationship with them (Patil & Kumar, 2019).

In this 21st century, people specially teachers face a major transformation due to the rapid development of ICT in the field of education. The traditional approach of using chalk and talk for classroom instruction gradually gives a way to the advanced technology-based method. Digital tools and technical devices are now becoming an essential component of teaching-learning process, because it makes the education more participatory, engaging, and productive (Sindhvani, 2019). For making teaching-learning process more interesting, effective and meaningful; techno-pedagogical competencies should be improved (Qurashi & Jan, 2022). In education, techno-pedagogical competency refers to a teacher's ability to effectively combine

A Study On Teacher Effectiveness In Relation To Techno-
Pedagogical Competency Among Higher Secondary
School Teachers In Nalbari District, Assam

technological knowledge with pedagogical skills to facilitate meaningful learning experiences. For college teachers, it involves planning, execution, stimulation, and evaluation of teaching through appropriate use of technology.

Along with technological competency, teacher effectiveness is equally important. An effective teacher can create a positive learning environment, communicates clearly, encourages students to participate, and helps them to develop confidence and interest in learning. Such teachers set meaningful expectations for their students and use appropriate teaching methods to make the learning process more engaging and purposeful. They are also concerned with classroom management, lesson planning, student participation, assessment, and the overall progress of their learners.

At the higher secondary levels, the role of teachers becomes particularly significant because this is a crucial stage in students' academic, personal, and social development. At this stage, students gradually develop their attitudes, values, skills, and future aspirations. Therefore, teachers have the responsibility to help them become responsible, confident, skilled, and socially aware individuals (Chaliha, 2013).

In the present educational environment, where technology and teaching practices are changing rapidly, teachers need to continuously develop their skills and competencies. Thus, techno-pedagogical competency may play an important role in enhancing teacher effectiveness and helping teachers meet the changing needs of learners. Understanding the relationship between these two aspects is therefore important for improving the quality of teaching and learning at the higher secondary level.

The present study is grounded in the philosophical foundations of Pragmatism, Constructivism, Humanism, and Idealism. These philosophical perspectives provide a comprehensive foundation for understanding how teachers can effectively integrate technology with pedagogy to facilitate meaningful learning.

Pragmatism, particularly associated with John Dewey, emphasizes learning through experience, activity, problem-solving, and practical application. From a pragmatist perspective, technology becomes meaningful when it helps teachers create experiential and problem-based learning situations. Technologically competent teachers can use digital resources to connect classroom learning with real-life experiences and encourage active participation. Thus, teacher effectiveness involves the ability to use technology purposefully to achieve educational objectives.

Constructivism views learners as active participants in the construction of knowledge rather than passive recipients of information. Technological-pedagogical competency enables teachers to create learner-centred, collaborative, inquiry-based, and interactive learning environments. Digital tools can provide opportunities for learners to explore information, solve problems, communicate, collaborate, and construct knowledge. Therefore, an effective teacher acts as a facilitator who appropriately integrates technology with pedagogical strategies.

Humanism emphasizes the holistic development of the learner and gives importance to individuality, emotions, creativity, autonomy, empathy, and interpersonal relationships. From this perspective, technology should complement the human dimensions of education rather than replace teacher-student interaction. Teacher effectiveness therefore includes the ability to use technology while remaining sensitive to learners' emotional, social, intellectual, and individual needs.

Idealism provides the value-oriented dimension of the framework. Education is not merely the acquisition of knowledge and technical skills; it also contributes to character formation, ethical development, responsible citizenship, and the cultivation of values. Teachers must therefore employ technology responsibly, ethically, and inclusively, while addressing issues such as digital citizenship, academic integrity, misinformation, privacy, and equitable access.

Thus, the philosophical framework considers technological-pedagogical competency as a means rather than an end. Effective teaching emerges when technological knowledge is meaningfully integrated with pedagogical knowledge, subject knowledge, human values, and the broader aims of education. The study consequently views an effective teacher as a reflective, adaptive, ethical, learner-centred, and technologically competent professional who uses technology to promote meaningful learning and the holistic development of learners.

SIGNIFICANCE OF THE STUDY

Teacher effectiveness is one of the most important determinants of the quality of education. Effective teachers facilitate meaningful learning by using appropriate instructional strategies, maintaining positive classroom environments, managing classroom activities efficiently, and fulfilling their professional responsibilities. Teacher effectiveness not only enhances students' academic achievement but also contributes to their overall personality development and the achievement of educational goals. Therefore, maintaining a high level of teacher effectiveness is essential for ensuring quality education and the overall development of educational institutions.

In this 21st century, teachers experienced a rapid transformation with the integration of technology which has brought a new dimension to the entire education sector. People of this modern life widely use multiple technological gadgets as an integral part for their daily life activities. To provide quality education teachers have to understand the nature and functioning of educational technology. In this context, the ability of a teacher to combine technology with teaching methods in an effective way indicates the importance of Techno-Pedagogical Competency. So, teachers should know about the proper usability of the technology for making teaching-learning process more effective.

Techno-Pedagogical Competency helps teachers in integrating technology with appropriate teaching methods which make the learning process more effective and engaging. It also enables teachers to use digital tools through which they explain concepts clearly, design interactive lessons, and address as per the diverse needs of learners.

In this context, techno-pedagogical competency may have an important connection with teacher effectiveness. Technology by itself cannot ensure effective teaching; rather, its effectiveness depends on how appropriately teachers use it for instructional purposes. A teacher who can select suitable technological tools and integrate them with appropriate pedagogical methods may be better able to engage students, manage classroom activities, communicate effectively, and support meaningful learning. Therefore, understanding the relationship between teacher effectiveness and techno-pedagogical competency is important in the present educational context.

Higher secondary school teachers play a crucial role in shaping the academic and personal development of students, as this stage of education is very significant in a student's life. When teachers are well effective, they can guide students more effectively and support them in achieving their academic and personal goals, helps in improving teaching process, and strengthening the overall quality of education system. However, the number of studies related to the Teacher Effectiveness in relation to Techno- Pedagogical Competency among the higher secondary school teachers in Nalbari district of Assam is very limited. This study provides findings on the level of higher secondary school teachers on Teacher Effectiveness and Techno- Pedagogical Competency. and also provides the valuable insights that can enhance teaching practices, improve student outcomes.

STATEMENT OF THE PROBLEM

The present study is mainly dealt with to investigate the level of Teacher Effectiveness in relation to Techno-Pedagogical Competency among the higher secondary school teachers of Nalbari District of Assam.

On the basis of the need and significance of the study the investigator stated the problem with the following title as-

"A STUDY ON TEACHER EFFECTIVENESS IN RELATION TO TECHNO-PEDAGOGICAL COMPETENCY AMONG HIGHER SECONDARY SCHOOL TEACHERS IN NALBARI DISTRICT, ASSAM"

OBJECTIVES OF THE STUDY

The main objectives of the study are-

1. To find out the level of Teacher Effectiveness of Higher Secondary school teachers.
2. To find out the level of Techno- Pedagogical Competency of Higher Secondary school teachers.
3. To find out the relationship between Teacher Effectiveness and Techno- Pedagogical Competency of

A Study On Teacher Effectiveness In Relation To Techno-
Pedagogical Competency Among Higher Secondary
School Teachers In Nalbari District, Assam

Higher Secondary school teachers.

HYPOTHESIS

Objective III:

H01: There exists no significant relationship between Teacher Effectiveness and Techno- Pedagogical Competency of Higher Secondary school teachers.

OPERATIONAL DEFINITIONS OF THE TERMS

- **Teacher Effectiveness:** Teacher effectiveness refers to a teacher's ability to enhance students' learning outcomes through effective instructional practices, appropriate classroom management, high expectations, proper organization, and the efficient utilization of available resources.

In the present study, Teacher effectiveness refers to the score obtained by the respondents in the Teacher Effectiveness Scale, which was developed and validated by Nasrin Suraiya and Mohd. Shakir (2023).

- **Techno-Pedagogical Competency:** Techno-Pedagogical Competency indicates the ability of teachers to effectively use technology in the teaching-learning process.

In the present study, Techno-Pedagogical Competency refers to the scores obtained by the respondents on the Techno-Pedagogical Competence Scale developed by Mir Rahul Ahmed and Dr. Gulshan Wani (2023).

- **Higher Secondary School Teachers:** Higher secondary school refers to that schools which offer education to students who have completed their primary and secondary education.

In the present study higher secondary school teachers refer specially to the teachers working in twelve (12) government higher secondary schools.

DELIMITATIONS OF THE STUDY

The present study is delimited as follows-

- The study is delimited to the only twelve (12) Government Higher Secondary Schools of Nalbari district, Assam.
- The study is delimited to only Higher Secondary School teachers of Nalbari District.
- The study is delimited to only three educational blocks (namely- Pub-Nalbari, Paschim Nalbari and Borigog- Banbhag) of Nalbari District, Assam.

METHODOLOGY

In the present study, descriptive survey method has been used for data collection procedure.

POPULATION

There are total 333 teachers (male and female) from 12 Govt. higher secondary schools of Nalbari district are the population of the present study. Out of 333 teachers, 212 are Male and 121 are Female. Among these twelve schools, four are located in Pub-Nalbari educational block, four are from the Paschim Nalbari educational block and four are from Borigog-Banbhag.

POPULATION				
THREE EDUCATIONAL BLOCKS				
TOTAL NO. OF HSS=12				
TOTAL NO. OF HSS TEACHERS (Twelve Govt. Schools)= 333				
Name of the Educational Blocks	Name of the HSS	Male	Female	Total
	DEBIRAM PATHSALA HSS	18	16	34
	KARIA HSS	20	08	28

PUB-NALBARI	BARBHAG KALAG HSS	11	06	17
	B R MEDHI HSS	17	11	28
PASCHIM NALBARI	CHAMATA HSS	28	11	39
	KAKAYA HSS	10	10	20
	BANGAON HSS	19	08	27
	BELSOR HSS	16	10	26
BORIGOG BANBHAG	P.B. DHIDUTTA HSS	19	12	31
	DHAMDHAMA HSS	23	11	34
	PASCHIM BANBHAG HSS	12	11	23
	BARAJOL HSS	19	07	26
Total:		212	121	333

Table-1: Population distribution on the basis of gender

SAMPLE

Sample for this study consist of 200 teachers from twelve (12) selected Govt. Higher Secondary Schools of Nalbari District, Assam. The samples are selected by using Simple Random Sampling technique. Out of the total 333 teachers, 100 are Male and 100 are Female selected as sample.

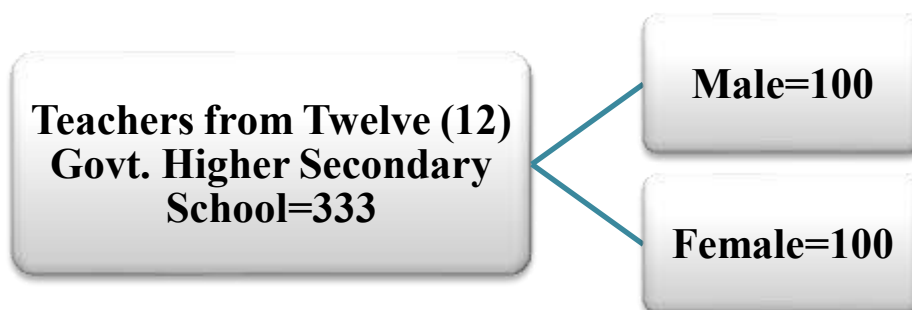


Figure-1: Flow chart showing the Sample distribution

DESCRIPTION OF TOOL

For collecting primary data, the investigator has used-

- 'Teacher Effectiveness Scale', which was developed and validated by Nasrin Suraiya and Mohd. Shakir (2023). In this scale, there are 46 items categorized into (06) major dimensions – 'Interpersonal relationship with students', 'Preparation for teaching and learning', 'Teacher Capabilities', 'Classroom Management', 'Professional Responsibilities' and 'Ethical Practices'.
- 'Techno-Pedagogical Competency Scale', developed and validated by Mir Rahul Ahmad and Dr. Gulshan Wani (2023). In this scale, there are 32 items categorized into (04) dimensions- 'techno skills for planning and preparation', 'for stimulation', 'for execution' and 'for evaluation cum feedback'.

STATISTICAL TECHNIQUES USED

In the present study, both descriptive and inferential statistics has been used as a statistical technique by the investigator.

A Study On Teacher Effectiveness In Relation To Techno-
Pedagogical Competency Among Higher Secondary
School Teachers In Nalbari District, Assam

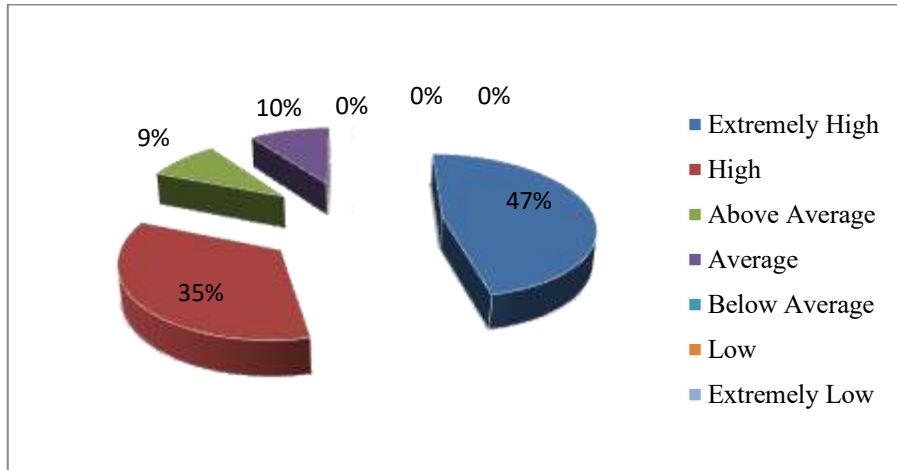
ANALYSIS AND INTERPRETATION OF DATA

OBJECTIVE-1: To find out the level of Teacher Effectiveness of Higher Secondary school teachers.

Table-2: Showing percentage distribution of Higher Secondary Teachers towards Teacher Effectiveness (N=200)

Level of Teacher Effectiveness	Range of Raw Score	N	Percentage (%)
Extremely High TE	187 and above	93	46.5%
High TE	169 to 186	69	34.5%
Above Average TE	151 to 168	18	9%
Average TE	126 to 150	20	10%
Below Average TE	108 to 125	0	0%
Very Low TE	90 to 107	0	0%
Extremely Low TE	89 and below	0	0%
Total:		200	100%

Figure-2: Pie chart showing percentage distribution of Higher Secondary Teachers towards Teacher Effectiveness



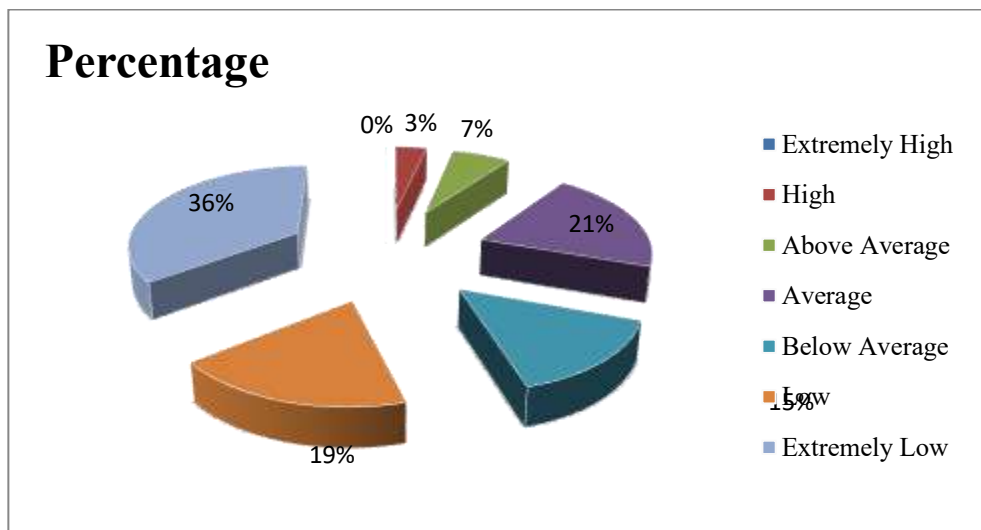
Interpretation: The Table-2 and Figure-2 shown above describe the level of Teacher Effectiveness of Higher Secondary school teachers. Out of 200 higher secondary school teachers (male-female), 93 teachers (46.5%) teachers have extremely high level of Teacher Effectiveness, 69 teachers (34.5%) teachers have high level of Teacher Effectiveness, while 18 teachers (9%) fall within the above average range. In contrast, 20 teachers (10%) of teachers show average level of Teacher Effectiveness. However no teachers fall under the 'below average', 'low' and 'extremely low' level of Teacher Effectiveness.

OBJECTIVE-2: To find out the level of Techno- Pedagogical Competency of Higher Secondary school teachers.

Table-3: Showing percentage distribution of Higher Secondary Teachers towards Techno- Pedagogical Competency (N=200)

Level of TPC	Range of Raw Score	N	Percentage (%)
Extremely High	148 and above	0	0%
High	135-147	7	3.5%
Above Average	122-134	13	6.5%
Average	104-121	41	20.5%
Below Average	91-103	30	15%
Low	79-90	38	19%
Extreme Low	78 and below	71	35.5%
Total:		200	100%

Figure-3: Pie chart showing percentage distribution of Higher Secondary Teachers towards Techno-Pedagogical Competency



Interpretation: Table 3 and Figure 3 presented above illustrate the level of Techno-Pedagogical Competency among higher secondary school teachers. Out of 200 higher secondary school teachers included in the study, 7 teachers (3.5%) were found to have a high level of Techno-Pedagogical Competency, while 13 teachers (6.5%) fell within the above-average category. Furthermore, 41 teachers (20.5%) were found to have an average level of Techno-Pedagogical Competency, whereas 30 teachers (15%) fell under the below-average category. In addition, 38 teachers (19%) exhibited a low level of Techno-Pedagogical Competency, while 71 teachers (35.5%) were found to have an extremely low level of Techno-Pedagogical Competency.

OBJECTIVE-3: To find out the relationship between Teacher Effectiveness and Techno- Pedagogical Competency of Higher Secondary school teachers.

Ho1: There exists no significant relationship between Teacher Effectiveness and Techno- Pedagogical Competency of Higher Secondary school teachers.

A Study On Teacher Effectiveness In Relation To Techno-Pedagogical Competency Among Higher Secondary School Teachers In Nalbari District, Assam

Table-4: Showing the relationship between Teacher Effectiveness and Techno-Pedagogical Competency of Higher Secondary School Teachers

Variables	N	df	'r' value	Relationship
Teacher Effectiveness	200	198	0.98**	Very High
Techno-Pedagogical Competency				Positive Correlation

**Significant at both 0.01 and 0.05 level

Interpretation:

The Table-4 shows the relationship between Teacher Effectiveness and Techno-Pedagogical Competency of higher secondary school teachers. The obtained coefficient of correlation ($r = 0.98$) indicates a very high positive relationship between the two variables. The calculated value of 'r' is greater than the critical value at both the 0.05 level of significance (0.137) for 198 degrees of freedom. Therefore, the relationship is significant at both levels of significance. This indicates that Teacher Effectiveness and Techno-Pedagogical Competency are very highly and positively correlated with each other.

Hence, the Null Hypothesis, "H01- There exists no significant relationship between Teacher Effectiveness and Techno-Pedagogical Competency of higher secondary school teachers" is rejected.

MAJOR FINDINGS OF THE STUDY

On the basis of analysis of data, the following findings are drawn:

Based on Objective I:

The study shows that out of 200 higher secondary school teachers (male-female), 93 teachers (46.5%) teachers have extremely high level of Teacher Effectiveness, 69 teachers (34.5%) teachers have high level of Teacher Effectiveness, while 18 teachers (9%) fall within the above average range. In contrast, 20 teachers (10%) of teachers show average level of Teacher Effectiveness. However no teachers fall under the 'below average', 'low' and 'extremely low' level of Teacher Effectiveness.

Based on Objective II:

The study shows that out of 200 higher secondary school teachers included in the study, 7 teachers (3.5%) were found to have a high level of Techno-Pedagogical Competency, while 13 teachers (6.5%) fell within the above-average category. Furthermore, 41 teachers (20.5%) were found to have an average level of Techno-Pedagogical Competency, whereas 30 teachers (15%) fell under the below-average category. In addition, 38 teachers (19%) exhibited a low level of Techno-Pedagogical Competency, while 71 teachers (35.5%) were found to have an extremely low level of Techno-Pedagogical Competency.

Based on Objective III:

From the study it was found that the calculated value of 'r' ($r=0.98$) is greater than the critical value at both the 0.05 level of significance (0.137) for 198 degrees of freedom, which shows a very high positive and statistically significant relationship between Teacher Effectiveness and Techno-Pedagogical Competency. Therefore, the relationship is significant at both levels of significance. Hence, the Null Hypothesis, "H01" is rejected.

CONCLUSION AND RECOMMENDATIONS

The findings of the present study provide valuable insight into the levels of Teacher Effectiveness and Techno-Pedagogical Competency among higher secondary school teachers in Nalbari District, Assam. The results reveal that the majority of teachers possess an extremely high level of Teacher Effectiveness, with a considerable proportion also demonstrating high and above-average levels. Only a smaller proportion of teachers fall within the average category, and none were found in the below-average, low, or extremely low

categories. This indicates that the higher secondary school teachers generally exhibit a high level of Teacher Effectiveness.

In contrast, the findings regarding Techno-Pedagogical Competency reveal a different pattern. A large proportion of teachers were found to have extremely low, low, and below-average levels of Techno-Pedagogical Competency, while comparatively fewer teachers demonstrated above-average or high levels. This suggests that despite the generally high level of Teacher Effectiveness, there is a considerable need to strengthen teachers' techno-pedagogical competencies.

The study further reveals a very high positive and statistically significant relationship between Teacher Effectiveness and Techno-Pedagogical Competency ($r = 0.98$ with $df=198$). This indicates that teachers with higher levels of Techno-Pedagogical Competency tend to demonstrate higher levels of Teacher Effectiveness. Therefore, strengthening teachers' techno-pedagogical competencies may contribute to enhancing their effectiveness in teaching and learning.

Recommendations

1. Since the majority of teachers demonstrate high and extremely high levels of Teacher Effectiveness, educational authorities should continue to recognize and encourage effective teaching practices through various professional appreciation, incentives, and opportunities for their career development.
2. As a substantial proportion of teachers were found to have low, below-average, and extremely low levels of Techno-Pedagogical Competency, regular training programmes, workshops, and hands-on professional development should be organized to strengthen teachers' technological and pedagogical skills.
3. Teachers with lower levels of Techno-Pedagogical Competency should be provided with mentoring, technical guidance, and continuous support to help them effectively integrate technology into teaching and learning.
4. School administrators should create a supportive and collaborative environment where teachers can share technological resources, teaching strategies, and best practices related to technology-integrated education.
5. Future researchers may undertake similar studies with larger and more diverse samples and examine other relevant variables such as teaching experience, educational qualification, digital competence, professional adjustment, school management, and teacher effectiveness to gain a deeper understanding of factors related to effective teaching.

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