

Students' Assessment of Mathematics Teachers' Teaching Styles in Private and Public Schools in Kathmandu Valley

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Abstract

This paper attempts to investigate the students' assessment of teaching styles of their mathematics teachers. The study examines how do the students assess the teachers' teaching styles and what effect does it have in the mathematics achievement of students by public and private schools in Kathmandu valley. Sequential explanatory mixed method was adopted in the study as research method. The descriptive cross-sectional survey study used the questionnaire and FGD as the tools to collect data from the population sampled purposively. The study was carried out in 14 schools which were selected purposively and 469 students from these schools were selected using census sampling as respondents in the study. The findings shows that there is no significant difference between, public and private school students, in their assessment of teachers' teaching styles. This result was substantiated by qualitative data analysis that the assessment of teaching styles by public and private school students were not found different. Students from both public and private school preferred inductive method and respect and encouragement with practical methods in teaching mathematics. The output of the study can enhance the developing and improving teaching style of teachers in classroom practices.

Keywords: *Mathematic teacher, teaching styles, public and private school, student assessment*

Background

Assessment from students is most effective when they provide teachers with guidance on how to improve their performance. It is essential that teachers provided with the support, professional development, and resources to perform their jobs. Incorporating the effective teaching practices from Principles to Actions (NCTM, 2014) as domains of the evaluation process can create a more complete picture of a teacher's effectiveness. Observation, artifacts, and a teacher's self-analysis are other aspects that should have a role in the process.

Personal behaviors and characteristics in the teaching-learning process indicate the way educators teach (Grasha, 1996) and show that various teaching styles exist. While selecting and using appropriate strategies, teachers display their own preferred teaching styles. Thus, teaching styles affect mathematics instructions adopted by teachers. Instead of relying on their preferred teaching style, teachers should understand that one style of instruction may not meet the needs of all students. Students differ in the way they approach the learning process and deal with various learning activities (Callahan, Clark, & Kellough, 2002). One good way to have teachers consider individual learning differences and recognize the need to modify their own teaching style is to have them learn from the student's perspective. Much research has been devoted to teaching styles and learning strategies in higher education. However, there is little research on concerning secondary school students' assessment of their mathematics teacher's teaching styles and achievement in mathematics.

Knowing how students perceive teaching styles and use their learning strategies may help educators see their role from a different viewpoint and understand the importance of reflecting on as well as adjusting their teaching styles. Many researchers and theorists have tried to define teaching styles. But they have not provided any suggestion regarding how students perceive or assess their mathematics teachers' teaching styles. This research aims to address these difficulties and thereby contribute to the advancement of mathematics education. The objectives of the study are to analyze the differences in students' assessment of teaching styles by school type and to determine relationship between students' assessment of teachers' teaching styles and student

Mathematics Teacher's Teaching Styles and Student Assessment

Since student achievement is influenced by factors other than the teacher's actions, it is also important to understand students' assessment of teaching styles, as these relate to their own learning. Accordingly, research studies have been conducted to examine students' assessment of teaching styles. The studies enable teachers to be aware of students' perspectives and to recognize the need to make adjustments in teaching. In a study conducted by Norzila, Fauziah, and Parilah (2007), 175 college students took a questionnaire adapted from Grasha's Teaching Style Inventory (1996) to see if there were differences between students' perceptions and preferences of their English language lecturers' teaching styles. The researchers found that there were no gender differences in students' preferred and perceived teaching styles. However, students preferred learner

centered teaching styles, whereas the most frequently used teaching styles of lecturers were teacher-centered in nature.

Hughes (2009) studied the relationships between teaching styles perceived by students and teaching styles adopted by instructors. A total of 117 students participated in the study and were put into either a control group or an experimental group. The instructor taught control-group students pre-calculus with a conventional lecture-based approach. On the other hand, two instructors in the experimental group adopted a teaching style that increased student involvement; they also provided real-life examples and sufficient time for students to learn a concept by asking questions. The results showed a significant difference in students' perceptions of teaching styles between the control group and experimental group. The results also revealed that students felt they learned better when instructors employed a teaching style that was more interactive than when instructors adopted a conventional lecture style.

An instrument for investigating junior high school students' perceptions of their teachers' teaching styles was developed by Chen (2008) as part of his thesis project. He produced the Junior High School Teacher's Teaching Style Questionnaire in an effort to classify teaching styles of educators (i.e., authoritarian, democratic, laissez-faire, or indifferent), based on Sun's (2007) teachers' discipline style inventory. In his research of 1,587 students, Chen found that the most prevalent teaching style perceived by students was the indifferent teaching style. The study showed that there were significant differences between students' perceived teaching styles and their academic achievement. Students who perceived that their teachers employed an authoritarian or a democratic teaching style scored higher on tests than students who perceived laissez-faire or an indifferent teaching style. Chen concluded that students performed better academically if they felt that their teacher established rules to manage their learning, but at the same time listened to students' opinions toward learning and gave them feedback.

Another tool used by McCollin (2000) was Principles of Adult Learning Scale (PALS) to investigate instructors' teaching styles. The PALS was also adapted to measure teaching styles as perceived by students. The sample consisted of 84 faculty members and 585 college students. The data analysis, utilizing an independent t-test, indicated a significant difference between instructors' self-perceived teaching styles and students' perceptions of teaching styles. In another study, Kulinna, Cothran, and Zhu (2000) also examined teachers' perceived teaching styles. The researchers compared the results of their study with those of Cothran, Kulinna, and Ward (2000), since the latter investigated college students' views of teaching styles.

The study revealed, again, that teachers' and students' perceptions of teaching styles differed significantly. Teachers used slightly more styles than students observed. The study also showed that teachers and students valued different teaching styles; however, the two groups had different opinions about which teaching styles enhanced motivation and learning. Gifford (1992) also studied how instructors and students viewed teaching styles. Her research participants were 34 instructors and 519 adult students. Gifford discovered that there was a disparity between faculty's and students' perceptions of teaching styles.

In looking at the aforementioned examination of teaching styles, one can see that several studies have shown that students have greater learning gains when their teacher takes account of the learners' needs to experience meaningful learning, encourages active engagement, empowers students to direct their own learning, and demonstrates flexibility in his or her teaching styles. The author has considered Vygotsky's social constructivism, Grasha's teaching style (1996) and Boethel and Dimock (2000) outline that constructivist-learning theory as theoretical referents in the study.

Research Questions

Researchers have studied the ways in which learners perceive teaching styles and how these perceptions impact learning. However, most studies have focused on teaching styles in adult education. Moreover, these studies have not examined secondary school students' assessment of mathematics teachers' teaching styles. Research has not reported on the literature suggesting that secondary school students' assessment of teaching styles influence their achievement. Therefore, this study tries to answer the research question: Is there any difference between public and private school students' assessment of their mathematics teachers' teaching styles? If so why and how?

Methods and Materials

The study employed sequential explanatory mixed method (Creswell, 2014) as research method. The descriptive cross-sectional survey study used the questionnaire and FGD as the tools to collect data from the population sampled purposively. The area of the research was public and private schools of Kathmandu valley. 14 schools (6 public and 8 private) were selected purposively. 469 students from these schools were selected using census sampling as respondents in the study. A Teachers Teaching Style Questionnaire originally developed by Chen (2008) was adapted and utilized to carry out the survey. Two FGDs were conducted in a public and a private sample school. The reliability and validity of test items were maintained by pilot-testing in two schools (one public and another private) other than sample schools. To test the reliability

of questionnaire Cronbach alpha value was calculated. It was 0.792, which is in the acceptable range ($0.60 \leq \alpha \leq 1$) hence the questionnaire tool used in the study was reliable. Validity of questionnaire and FGD guidelines were established after consultation with the research experts and language expert. The author built the good rapport among stakeholders, generated data then kept close contact with key respondent until the satisfactory interpretation was made. Major variables of quantitative data were based on students of public and private school. The data were analyzed on the comparison of students' assessment of teachers' teaching styles, differences in assessment of teaching styles by public and private school students. Descriptive statistics such as frequency, percentage and Chi-square test were used in quantitative analysis and thematic analysis was used in analyzing qualitative data. Both quantitative and qualitative results were integrated in sequential order and interpreted using numbers, tables, diagrams, texts and narrations.

Results and Discussion

Results were drawn by analyzing both quantitative and qualitative data. Quantitative data were analyzed using Statistical Program for Social Science (SPSS version 20). Both descriptive and inferential statistics were used while analyzing the data. Qualitative information was collected for answering the research questions related to mathematics teachers' teaching style as assessed by students of public and private school. Analysis and interpretation of data were made using different theoretical perspectives as explained in the theoretical framework of the study. This section describes students' assessment of teaching styles in public and private school along with two themes emerged from qualitative data analysis.

Table 1 *School Type and Dominant Teaching Style Cross tabulation*

Dominant Teaching Style	School Type		Private		Total	
	Public Observed Count	Expected Count	Observed Count	Expected Count	Observed Count	Expected Count
Democratic	58	51.6	24	30.4	82	82.0
Authoritarian	90	90.6	54	53.4	144	144.0
Laissez-faire	140	144.7	90	85.3	230	230.0
Indifferent	7	8.2	6	4.8	13	13.0
Total	295	295.0	174	174.0	469	469.0

From the Table 1, the number of public schools' students is 295 and the number of private schools' students is 174. Among 295 students of public school 140 students assessed their math teacher as laissez faire, 90 students assessed their math teacher as authoritarian, 58 students assessed their math teacher as democratic and seven students assessed their math teacher as indifferent.

Table 2 *Chi-Square Tests for school type*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.028 ^a	3	.387
Likelihood Ratio	3.089	3	.378
Linear-by-Linear Association	2.582	1	.108

Students' assessment of teaching styles in public and private school

To find whether school type makes variation in selecting the teaching style, a comparison between public and private school students was made. The comparative result of teaching styles assessed by public and private school students is given in the Figure 1.

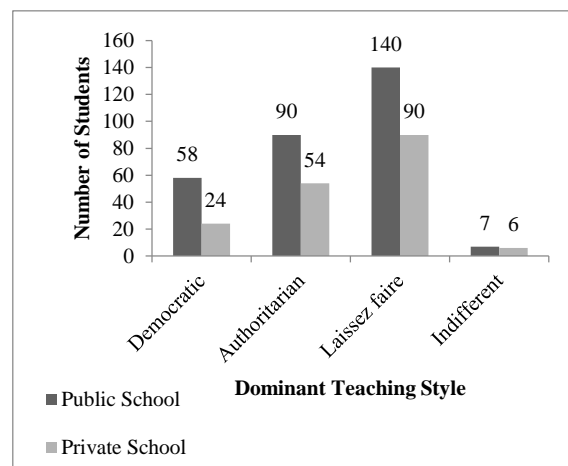


Figure 1 Students' assessment of teaching styles by school type

Figure 1 shows that the highest number (140) of students of public school assessed their math teacher as laissez faire, 90 students assessed as authoritarian, 58 students assessed as democratic and seven students assessed as indifferent out of 96 students. Similar trends are found in private school students' assessment. Table 1 also elaborates the distribution of students by school type.

students assessed his math teacher as indifferent. Among 174 private schools' students 90 students assessed their math teacher as laissez faire, 54 students assessed their math teacher as authoritarian, 24 students assessed their math teacher as democratic and 6 students assessed their math teacher as indifferent.

Table 2 shows that the null hypothesis is accepted at $p (=0.387) > 0.05$ and concluded that there is no significant difference between public and private school students in their assessment of teaching styles. Qualitative FGD data analysis results were explained in the theme of behavior of mathematics teacher, teaching styles, teacher's activities inside and outside classroom, students' expectation and good and bad aspects of mathematics teacher based on public and private school type. In this section the researcher put two FGDs including public and private schools' students to study students' assessment of secondary school math teachers' teaching styles assessed by students in Kathmandu district.

The FGD including private schools' students was held at 2074/07/06 in school B3 located at Ramkot. 12 students were selected from grade IX. Out of 12 students 6 students were girls and 6 were boys. FGD was facilitated by supervisor principal investigator and recorded by co-researcher. Facilitator recorded in audio tape and noted the statement of participants in the diary. Before discussion the facilitator made the intuitive environment for students to express their feeling and opinion without any fear and hesitation. After the introduction, the facilitator put the all the four issues turn by turn. Private school students found their teachers behavior friendly, cooperative and supportive. This view contradicts among the students in public school. Public school students stated:

He is quite strict. So students can't ask question to him. They are afraid to him because what he says or what he does. He behaves rudely and dominates the students. If someone do mistake then he immediately comes in temper and beats them. He doesn't try to understand actually what the matter is. He also becomes angry when students ask same question again.

But some of girls informed that the behavior of the math teacher was good and they liked their math teacher. The math teacher suggested them to not to do mistake again (2074/08/19, FGD, Public school A1, Dallu). Love (2003) investigated the relationship between urban teachers' beliefs and student outcomes. She surveyed 46 out of 244 teachers of African American children. Results indicated that reading achievement significantly related to teachers' beliefs. Similar to the finding the teacher guided by the authoritarian style showed the behavior unfavorable to the learners. This shows that teachers' teaching styles should be favourable to the learning activities of the students. In the same line Chang (2010) and Khanal (2011; 2015; 2016) state that teaching styles of teachers

and students' learning style should be matched for better performance of the students in mathematics.

Inductive vs. deductive method of teaching

From the FGD of private schools' (B3) students stated: He motivates the students by saying several jokes and funny activities. Our math teacher uses students oriented teaching methods while teaching. He tells students to read the problem turn by turn and finally he solves the problem by making students understand better. He is serious to the students' need and interest. He used to be serious to the students and try to make better to understand by giving various examples; explaining the entire related concept about the lesson. Their math teacher used to teach by students oriented teaching methods. Sometimes, he let students to solve problems on the board. He used to teach only one question and give all exercise for homework. He used to tell jokes for refreshment. From the FGD of public schools' (A1) students stated, "He uses inductive and deductive methods for teaching." He used to solve every problem that students have felt very difficult. He used descriptive method to teach and explain lessons in loud voice. He gives various examples to make students to understand. He used available materials for teaching."

Respect and reward encourage us

The private schools' students expected that their math teacher should add some more jokes and social activities while teaching. He should explain not only difficult or big problems but also the small or simple ones. "If he gives reward for doing well at math, then the student like me can improve math." He should teach us by interesting way and should give related concept or previous knowledge about the new lesson. (FGD, Private School, B3, Ramkot) Participants from public school (A1) expected that he should respect the students instead of disgracing them. He should give opportunity to improve students' mistake or fault. He should make figure to explain the subject matter and should give hints to solve the problems. He should not be angry when students ask question to him and he should behave politely with the students. He should be patience and give chance students to realize their mistakes making quiet environment of the class for teaching and learning. He should become strict to handle the students. He should teach students by making groups and playing some related games." According to Eble (1980) teaching style is represented by those personal qualities and behaviors that appear conducting our classes. Students should be encouraged to think creatively and discuss on learning content. This situation can be created in the classroom using constructivist teaching approach. Chang's (2002) study also suggested that the constructivist teaching style fosters greater flexibility in teaching, and brings about students' use of

deep learning strategies (thinking and discussing) and knowledge construction. Qualitatively also the students expected the laissez faire and authoritative teaching styles of teachers.

One of the boys from private school was not satisfied from behavior of his math teacher. But other students said, "He cares to student who is attentive to the teacher. He let students to practice by making classroom interesting by sharing his past events and saying jokes. He tries to teach students well solving the problems when students can't." The students stated their teacher's weakness as: Results both quantitative and qualitative data show that the assessment of teaching styles by public and private school students were not found different. Therefore, the result there is no difference in the evaluation by the students on the basis of type of school. According to Eble (1980) teaching style is represented by those personal qualities and behaviors that appear conducting our classes. Though, people believe that teachers of private schools are more effective than the public schools. But this concept contradicts with the view of students. Therefore, the effective teaching style depends on teachers' presentation in the classroom.

Conclusion

This research included 62.9% students from public schools and 37.1% students from private schools. Out of 469 students 295 were from public and rest of from private schools. From the analysis of chi square test the researcher concluded that there is no significant difference between public and private school students in their assessment of teaching styles. Both quantitative and qualitative data analysis results show that the assessment of teaching styles by public and private school students were not found different. Therefore the result is no difference in the assessment by the students on the basis of types of school. Generally, guardians think that the teachers of private schools are more effective than the public schools. But this concept contradicts with the view of students. Therefore, the effective teaching style depends on teachers' presentation in the classroom. However, students from all the groups expect motivation, good care, laissez faire and democratic behavior, practical teaching and feedback from their teachers. The study implies to motivate learners and to improve teaching styles of teachers. It further becomes useful resources to teachers, students, curriculum designers, text book writers including policy makers. The study can contribute to improve teaching and learning in the classroom pedagogy, materials development and to reform teacher training packages.

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