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Mathematics Teachers' Perspectives on Emergent Issues in Teaching and Learning Mathematics in Nepal

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Abstract: *Researchers and scholars of mathematics education have discussed several issues in teaching and learning mathematics in general. However, there is minimal discussion of such issues in the Nepalese context. This study aimed to explore teaching-learning issues in mathematics in Nepal. A researcher-constructed questionnaire with 37 items had been administered to 101 mathematics teachers in Kathmandu valley. An exploratory factor analysis revealed six key components to highlight the significant issues in mathematics teaching-learning: Social and Cultural Issues, Issues with Equity and Justice, Technological and Pedagogical Issues, Professional Issues, Political and Social Issues, and Theoretical Issues. A one-sample t-test was applied to each of these components to analyze the issues from the perspectives of the research participants to emphasize their critical concerns in teaching and learning mathematics in Nepal.*

Keywords. Teaching-learning mathematics, issues in mathematics education, Nepal

INTRODUCTION

We (all five authors) grew up in rural areas of Nepal, studied in public schools, and received higher education degrees (bachelors and masters) in mathematics education from the largest and oldest university in Nepal. Three of us earned Ph.D. in mathematics education from the same university where we all received earlier degrees, and one of us received Ph.D. from a university in the US, and one of us is continuing his Ph.D. in the same largest university in Nepal. We all have teaching experience of school mathematics, and mathematics and pedagogical courses in higher education in Nepal with a varying period. We all faced several issues and challenges in teaching and learning mathematics from schools to higher education in Nepal. Therefore, the motivation to conduct this

study on emergent issues of teaching and learning mathematics in Nepal stemmed from our own practical and professional experiences. Our time of learning mathematics and teaching mathematics changed rapidly due to social, cultural, and political transformations that influenced educational policies and practices in the last four decades. Now, we are moving towards a fast-changing educational scenario due to technological advancement and the new crisis due to COVID-19. In this context, the explosion of new knowledge has been creating many issues within the discipline of mathematics education and others (Wolters, 2010) among various social issues, norms, and cultures that have influenced social identities in most places and so in Nepal too (Ryan & Williams, 2007). Swade (2018) noted that society and mathematics are greatly influenced by technological innovation that is being updated too rapidly. We have been experiencing different teaching and learning issues in mathematics, such as socioeconomic issues, social justice issues, achievement gap issues, technological issues, and these issues can be coped with through improving curriculum, applying equity pedagogy, using new technology, and practicing multicultural education (Panthi & Belbase, 2017).

In the rest of the paper, first, we introduced and explored the issues of teaching and learning mathematics from the literature. Then, we explained the methodology. We presented results followed by discussion, conclusion, and implications.

Introducing the Issues

No doubt, we could not limit the issues in teaching-learning mathematics; however, we could explore our experiences regarding the circumstance of teaching-learning mathematics that we face in Nepal. Students have different backgrounds in the classroom, so it is obvious to have differences among students from multiple perspectives like cultural, social, psychological, cognitive, and many more (Gollnick & Chinn, 2002; Panthi & Belbase, 2017). In this context, selecting the best teaching approaches for all the students might always be a challenge. It is also apparent to have different learning abilities and interests among students in a mathematics classroom (Gardner, 1995). As students are different in many ways, their learning style also differs accordingly (Rhodes & Bellamy, 1999), but still, there is a considerable debate and conflict among learning theories regarding the best learning mode.

Among several teaching and learning issues, equity and fairness are the critical tenets of social justice in mathematics (OECD, 2012). Equity and fairness in teaching-learning mathematics are critical issues (Cotton, 2013). Besides, in the context of Nepal, the same courses are being taught for a long time that leads to the unmatched situation between 'what schooling is providing?' and 'what the society is demanding?' that leads students to tag themselves as a failure in mathematics (Hodgen & Marks, 2009). In this context, teachers should be competent not only in content and pedagogical approaches but also in adapting new technological tools. Preparing teachers for

today's mathematics classroom from the perspective of technological awareness is a great challenge (Waits & Demana, 2000), which implies that most mathematics teachers are not technologically skilled enough. Yusuf (2005) pointed out that Information and communication technologies are at the center of the teaching and learning process, primarily in mathematics. However, it has always been challenging to decide what shorts of technological tools are suitable for the subject to be taught and according to students' level.

Assessing the students is also one of the critical issues in mathematics education in Nepal. In the context of Nepal, existing assessment practices are formative assessments such as project works, classwork, homework, attendance, unit tests, remedial supports, extracurricular activities, field visits, group discussions, weekly tests, and use of summative evaluations and formative assessment tool (Acharya, 2019). Though various student and learning-centered assessment tools and techniques have been developed, it has not been working as expected. We can always experience the conflict among the experts regarding the meaning of assessment between 'assessment of learning,' 'assessment for learning and 'assessment as learning' (Qutoshi, 2016). There is still a considerable conflict between the continuous/ formative assessment system and the summative assessment system. Another concern is the images of mathematics that significantly influence the quality of teaching and learning mathematics in Nepal (Lamichhane & Belbase, 2017). Unfortunately, in most Nepalese societies, it is still believed that mathematics is a challenging subject; only god gifted can learn mathematics; it is a male-dominated and a dry subject (Ernest, 1996). Mathematics teaching and learning in Nepal is still dominated by decontextualized curriculum and assessment practices (Luitel, 2009; Wagley et al., 2008). Studies on teaching and learning issues in mathematics have not yet been seriously realized and studied in Nepal. In order to fill up this gap in the literature, we formulated the research question for this study: What are the emergent issues of teaching-learning mathematics in the context of Nepal from the viewpoints of mathematics teachers?

This study was needed to fill the gap in the literature in the area of teaching and learning mathematics in Nepal. This need was even more prominent when the country was reforming its education in general and mathematics education in particular by introducing an integrated curriculum and a new framework for school education in Nepal (CDC, 2019).

Exploring Issues in the Literature

Several scholars (e.g., Boaler & William, 2001; Cotton, 2001; Dubrovsky & Bulychev, 2017; Gates, 2001; Karp, 2017; Ovesyannikova, 2017; Polikokarpov, 2017) have discussed teaching and learning issues in mathematics. Karp (2017) discussed the challenges facing mathematics education that manifested in many spheres, including rapid technological advancement and fundamental social change (Karp, 2017). Karp (2017) raised some vital questions on mathematics

teaching in the changing context: Why do we study mathematics? Who should study mathematics? Who teaches mathematics? How should we study mathematics?

Moreover, how to make mathematics teaching effective? Dubrovsky and Bulychev (2017) proposed that interactive mathematical systems (IMS) and the creation and development of Math Kit *(*MK) are some of the alternative approaches for making mathematics teaching more effective to Russian schoolchildren. These approaches enhance more constructive problems, a broader space for self-study and self-control, and experimental and research activity in mathematics teaching and learning. Likewise, Ovsyannikova (2017) found that teachers' central problem is that teachers work in isolation; they are not accustomed to using technology for communication, the exchange of experiences, and professional development. In this context, Polikokarpov (2017) also found an unusual formulation of the problem and the rejection of reforms on the part of the educational community. On behalf of the Russian Federation's Ministry of Education, Polikokarpov (2017) and a Moscow State Pedagogical University team held a series of interviews. The team conducted interviews with more than 40 universities offering engineering and natural sciences programs as the key recipient of mathematically well-prepared applicants. The team was concerned with the quality of preparation of high school graduates coming to study. The study found that 90% of the university professors expressed their view on the low quality of mathematical skills.

Gates (2001) opined, "being successful at mathematics brings with it opportunities and riches; one stands a better chance of higher-paid careers if one holds a higher qualification in mathematics" (p.7). However, several issues are yet to be addressed in teaching and learning mathematics as several critical issues have emerged on the ground. Those issues are social justice, social class, language, social inclusion, and ethnicity, and teacher's dimension of mathematics teaching, and pupils' perspectives and emotions on their learning (Gates, 2001). Likewise, Cotton (2001) highlighted social justice issues in mathematics teaching, curriculum, pedagogy, assessment methods, and the social and cultural environment of mathematics teaching. At the same time, Boaler and William (2001) also researched the issues of setting ability groups, their placement, and students' achievement in mathematics in the United Kingdom. The findings indicated that significant numbers of students experienced difficulties working at the pace of the particular set in which they were placed. Boaler and Wiliam (2001) found that one-third of the students in the highest ability groups were found to be disadvantaged by the placement in the groups. The reason behind this were high expectations, fast-paced lessons, and pressure to succeed.

Delaney (2001) carried out a study in the area of teaching mathematics resourcefully at the school level. The study focused on social and political factors that affected the choice and use of resources and the understanding and selection of resources by a mathematics teacher in different circumstances. The study pointed out to constructivists' view that children have to make sense of their mathematics. In another study, Ainley (2001) concentrated on the use of computers in

mathematics teaching at the school level. The study generated the potential advantages of a computer as a tool and the computer as a tutee. From both perspectives, the computer can positively affect mathematics learning; however, this accessory also has raised some challenges regarding the access and professional empowerment of teachers. The cultural aspect of children also is one of the critical factors in learning mathematics. In relation to this assumption, Malloy and Malloy (1998) already carried a study on the school education of Afro-American children in the US. The study pointed out that mathematics teaching deserves to be culturally responsive. There is an ongoing issue with children with disabilities in the areas of mathematical computing, problem-solving, and applying concepts and mathematics skills in the classroom where differently able children study (Little, 2009).

The modern formal education system in Nepal began in 1950. The educational plans were formed and reformed repeatedly under the influence of the British-Indian education system in the beginning and then heavily led by donor agencies (Aryal, 1977). Mathematics education in Nepal is no exception in being negatively impacted by externally imposed educational theories and donor interest in curriculum and teacher training. These practices in the country did not create positive images of mathematics among the public and students, which further developed students' negative attitude towards mathematics (Sam, 2000; Sam & Ernest, 2008). Teacher education in mathematics suffered severely with lack of modern training and development facilities. Therefore, mathematics teachers were not able to use their creativity and empirical insights and student evaluation portrayed low performance each year in the national examination of high school mathematics (Mathema & Bista, 2006). In this context, many issues of teaching and learning have been emerged out such as curricular, equity and fairness, economic, pedagogical, technological, multilingual, multicultural, ethnicity, gender, social justice, achievements, teachers' organizations, and professionalism to name the major ones (Panthi & Belbase, 2017).

RESEARCH METHODOLOGY

We applied quantitative study with a cross-sectional survey to gather data at a particular point in time to explore issues in teaching and learning mathematics (Cohen, Mannion, & Morrison, 2007) by using a positivist claim for developing knowledge with a predetermined instrument (Creswell, 2003) based on Panthi and Belbase (2017).

Population and Sample

The study site was Kathmandu valley, with three districts—Kathmandu, Lalitpur, and Bhaktapur. The population of the study was all the mathematics teachers in the three districts teaching in public and private schools from elementary grades to high schools. The sample for the study included randomly selected twenty public and eighty-one private school mathematics teachers in

Kathmandu Valley. Therefore, a total number of 101 mathematics teachers selected randomly from the Kathmandu valley constituted the sample for the study.

Construction of Tool

The researchers constructed a five-point Likert-type scale with a questionnaire based on the theoretical article (Panthi & Belbase, 2017). The questionnaire was constructed with the number of items such as issues of social constructivism (2), radical constructivism (2), social issues (5), gender issues (3), assessment issues (1), ethnicity (3), technological issues (1), insufficient skills of technology (1), equity and fairness (6), issues of achievement (1), cultural issues (1), pedagogical issues (2), political issues (2), issues of using technology (2), issues of affordance of technology (2), resolving the issues of teaching and learning mathematics(3). In this way, all together, there were 37 Likert-type items in the questionnaire with potential responses of strongly disagree, disagree, neutral, agree, and strongly agree. The items covering the different issues were constructed based on the theoretical constructs of significant issues in Panthi and Belbase (2017). The questionnaire also included demographic information of the teachers, such as gender, school type, school location (urban or rural), teaching experience, and teaching levels.

Validity and Reliability

Two mathematics education experts helped in the construct and content validity of the questionnaire through a moderation, examination, and suggestion on items in the questionnaire. They had a long experience of teaching and research in mathematics education from school to the university level. The questionnaire represented and measured the teaching and learning issues in mathematics. The questionnaire was examined based on the usefulness and relevancy of items for predicting the main teaching and learning issues in mathematics in the Nepalese context. The data from thirty-seven items in the questionnaire were analyzed for internal reliability with Cronbach's Alpha, which was found to be 0.76 in the acceptable range (> 0.6), indicating that the tool was reliable.

Data Collection Procedures

The first author made a list of schools by sample random sampling from the list of all public and private schools in the three districts—Kathmandu, Lalitpur, and Bhaktapur. The list of schools was collected from the district education offices of the respective districts. The first author contacted each sampled school, informing the headteacher about the study and seeking permission to collect data from mathematics teachers of those schools. After getting permission from the sampled schools, the first author visited the schools with a printed questionnaire with 37 Likert-type items related to issues of teaching and learning mathematics. During his visit to the schools and meeting with the mathematics teachers, the researcher (first author) informed them about the study purpose, the potential risks and benefits of the study, their rights as participants in the study, anonymity,

and confidentiality of their personal identity and use of the data. After receiving informed consent, the researcher (first author) provided instructions to the respondents to circle one of the five alternatives (strongly disagree to strongly agree) on each item of the questionnaire. He collected the filled-up questionnaire from the schools. The data from the questionnaire were coded into Excel Spreadsheet before transforming them into IBM SPSS 26 for further statistical analysis and interpretations.

Analysis and Interpretation

After entering the data on the computer in IBM SPSS 26, the data were analyzed and interpreted with factor analysis and one-sample t-tests. Factor analysis was administered with a Principal Component Analysis (PCA) to reduce the data into composite variables related to the issues of teaching and learning mathematics from school-level mathematics teachers' views. The PCA was used to find the main components among 37 variables reducing them into distinct categories. The factor analysis showed that only six categories were appropriate for the study despite ten potential number of categories based on the Eigenvalues greater than one criterion. Factor analysis showed that each variable that contained various items was reliable as the internal reliability Coefficient of Cronbach's alphas was greater than 0.6 for each category. Composite average values for each category were computed from the associated items. These composite average values were used for further analysis and interpretation (i.e., one-sample t-test).

RESULTS

First, the results of exploratory factor analysis have been discussed. Then, results of one-sample t-tests have been presented and explained.

Factor Analysis

An Exploratory Factor Analysis with PCA was conducted to reduce the data from the 37 variables (items) in the questionnaire to a fewer number of composite variables in terms of significant dimensions of issues related to teaching and learning mathematics from the participants' viewpoint. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.589 in Bartlett's Test of Sphericity was significant ($\chi^2_{(df=465)} = 1064.64$, $p < 0.001$).

The communalities with extractions below 0.3 were eliminated to achieve robust dimensions (components). This way, six items were eliminated from further analysis and interpretation, keeping the total number of items in the final factor analysis to be thirty-one. The total variance analysis showed that there were ten potential components based on the total Eigenvalues greater than one. However, only six of them explained a 5% or more significant variance in total and 51% cumulative total variance. The scree plot also demonstrated six elbow points as significant dimensions that could be extracted from the distribution of all potential components (Figure 1).

Therefore, the number of factors retained was fixed to be six instead of ten. The extraction method of principal component analysis by using the rotation method of Varimax with Kaiser Normalization converged the results in twelve iterations. These six components had at least four items loaded with factor loading coefficients greater than 0.3. If the same item was loaded with more than one factor, then it was accounted for the factor with the highest loading coefficient. The results of the factor analysis have been presented in Table 1 (Total Variance) and Table 2 (Commonalities, Loading Coefficients, and Major Factors).

Table 1. *Total Variance Explained for the Principal Components*

Total Variance Explained			
	Initial Eigenvalues		
Component	Total	% of variance	Cumulative %
1	**4.757**	**15.346**	**15.346**
2	**3.078**	**9.928**	**25.274**
3	**2.366**	**7.634**	**32.907**
4	**2.044**	**6.593**	**39.500**
5	**1.901**	**6.132**	**45.632**
6	**1.705**	**5.500**	**51.132**
7	1.450	4.676	55.808
8	1.323	4.269	60.077
9	1.154	3.723	63.800
10	1.090	3.517	67.317
11	.973	3.137	70.454
12	.841	2.713	73.167

Extraction Method: Principal Component Analysis.

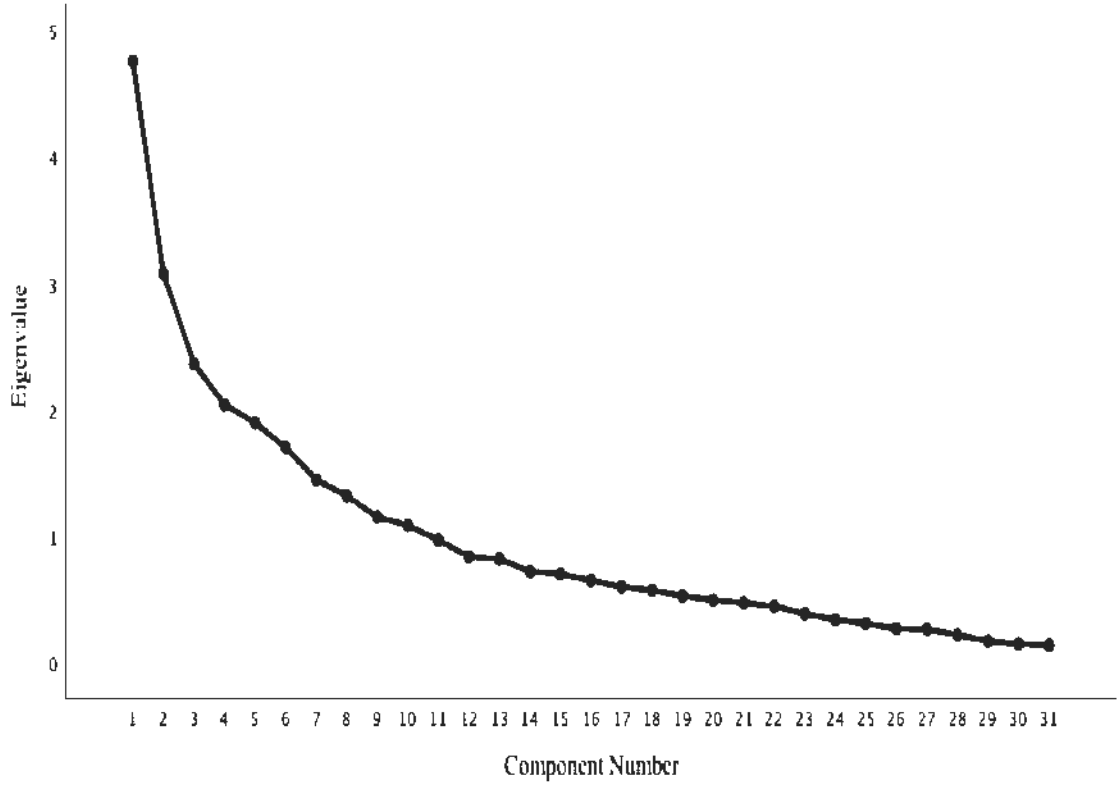


Figure 1. Scree plot for the principal component analysis

The components were named based on the characteristics of the items loaded in the components. The first component was related to gender, family, students' background, language, and ethnicity. Therefore, this component was named as Social and Cultural Issues. The internal reliability of Cronbach's alpha for this component was 0.77 (>0.60, acceptable). The second component was related to opportunity, access, and priority and named Equity and Justice. The internal reliability of Cronbach's alpha for this component was 0.73 (>0.60, acceptable). The third component was related to technological and classroom aspects and named as Technological and Pedagogical issues, which had Cronbach's alpha 0.71 (>0.60, acceptable). The fourth component was associated with the issues of professional qualities and fairness in classroom practice. The internal reliability of Cronbach's alpha was 0.55 (<0.60, weak). The fifth component was concerned with political and economic aspects and was named as the Political and Social Issues with Cronbach's alpha of 0.54 (< 0.60, weak). The sixth component, Theoretical Issues, was related to the process of knowledge and knowing of mathematics. The internal reliability of the sixth component with

Cronbach's alpha was 0.53 (< 0.60, weak). Table 2 demonstrates the results of the principal component analysis.

Table 2. *Principal component analysis of teacher perceptions on teaching and learning issues*

Rotated Component Matrix			
Item in components	Communalities	Coefficients of Factor Loading	Components and Cronbach's Alpha
Q.10. The female students may have less interest in studying mathematics beyond school.	0.551	.718	Component 1: Social and Cultural Issues
Q.11. The parents give their daughters less priority, and their daughters are not getting equal opportunities as their sons.	0.524	.653	Cronbach's Alpha = 0.77
Q.13. The parents do not help their children with their math homework.	0.527	.627	
Q.25. The teachers might have insufficient skills in teaching techniques to teach students from different cultural backgrounds.	0.523	.609	
Q.12. The parents have an extra burden to take care of the home and accomplish their responsibilities, so they need help from their daughters.	0.600	.607	
Q26. There is an unequal cultural power relation, which is reflected in the mathematics classrooms.	0.398	.538	
Q.8. There is a lack of understanding because students speak different languages at home than the language they use at school.	0.569	.493	
Q.24. Each ethnic groups and sub-groups have different cultural traditions that affect mathematics teaching and learning.	0.456	.490	
Q.21. Each student cannot get equal opportunity in the classroom activities due to the application of traditional pedagogies.	0.689	.785	Component 2: Equity and Justice Issues
Q.20. Each student cannot get equal opportunity in the classroom activities due to a large number of students.	0.592	.706	Cronbach's Alpha = 0.73
Q.32. Many mathematics teachers have insufficient skills to use computers and applications in teaching mathematics.	0.574	.661	
Q.19. The teacher does not care about all the students in his/her classroom because they focus on good students.	0.347	.543	
Q.22. Teachers have less focus on children with a learning disability.	0.309	.433	

Q.31. There is a lack of a broader application of technology in teaching and learning mathematics.	0.388	.369	
Q.36. The schools and the government have implemented the policy to enhance the use of technology to demonstrate mathematical phenomena.	0.685	.802	Factor 3: Technological-Pedagogical Issues
Q.37. The schools and the government have implemented the use of technology for the investigation of mathematical phenomena.	0.629	.764	Cronbach's Alpha = 0.71
Q.35. The teachers should be professional in providing their service to the students by creating an equitable classroom environment.	0.604	.736	
Q.28. Teachers' pedagogical choice to engage students in higher-order thinking, reasoning, and problem-solving has a direct influence on their performance in mathematics.	0.398	.465	
Q.4. Teachers should guide and give feedback to their students.	0.400	.425	
Q.30. The professional organizations of mathematics teachers provide training, workshop, and publications which affect teaching and learning mathematics.	0.503	.680	Factor 4: Teacher Professionalism
Q.5. Mathematics knowledge is both individual and social.	0.549	.651	Cronbach's Alpha = 0.55
Q. 23. There is not a wide gap in students' achievements in the rural and urban regions.	0.580	.646	
Q. 18. The existing classroom practice is entirely fair in teaching and learning mathematics.	0.322	.397	
Q.29. The teacher unions look at everything through the lenses of politics and ideology.	0.596	.690	Factor 5: Political and Economic Issues
Q.34. Most of the students and teachers in public schools cannot afford to buy new technological tools.	0.680	.641	
Q.17. There is a hierarchical power relation between students and mathematics teachers.	0.438	.490	Cronbach's Alpha = 0.54
Q.33. The technological tools might have a great significance in teaching and learning mathematics, but they are expensive.	0.412	.436	
Q.3. Mathematical knowledge is constructed through social interaction.	0.546	.640	Factor 6: Theoretical Issues
Q.2. Mathematics teachers focus on helping students with the building of mathematical concepts.	0.477	.637	Cronbach's Alpha= 0.53
Q.1. Students actively build mathematical concepts when they learn in the classroom.	0.497	.592	
Q.14. There are different ethnic backgrounds of the students and teachers.	0.347	.475	

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 12 iterations.

Social and Cultural Issues

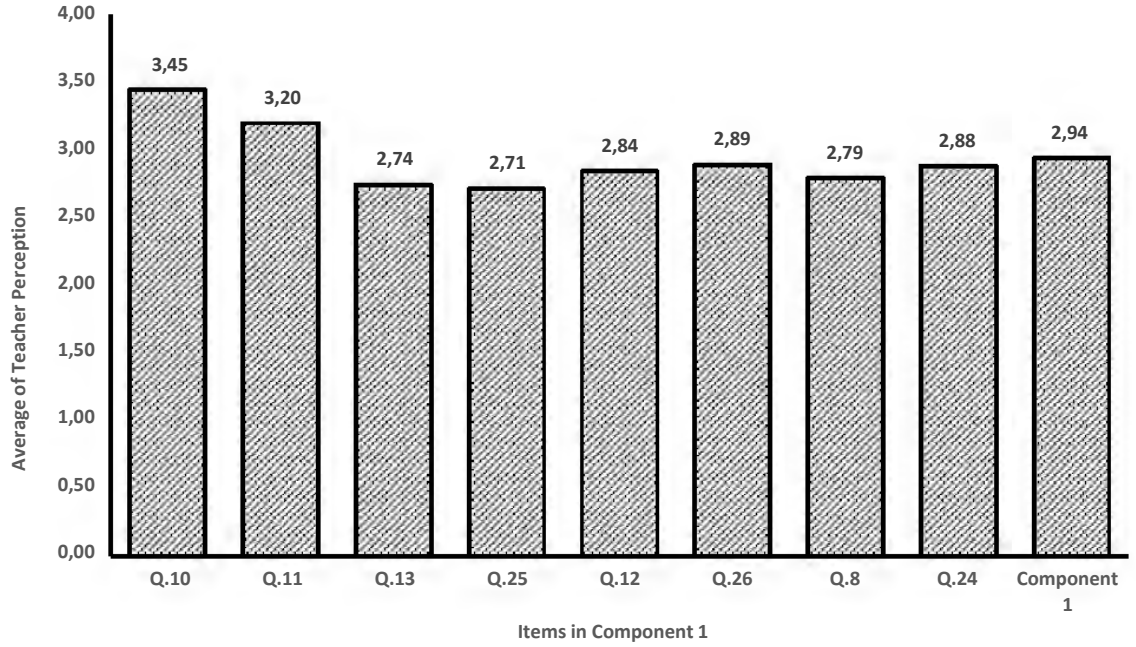
One-sample statistics of means and standard deviations and t-test with t-values and significance values (two-tailed) were administered for the items of each component. The mean of teacher perceptions from the Likert-scale was compared with the middle score of 3.0 out of five potential scores of 1-5, representing strongly disagree to strongly agree. Any score less than three were considered as disagreement, and greater than three was considered an agreement with the statement.

Concerning the Social and Cultural Issues items, the participants seemed to agree with the view that female students have less interest in mathematics (Mean = 3.44, SD = 1.25, $p < 0.05$). However, they disagreed with the statement that teachers have insufficient skills to teach students from different cultural backgrounds (Mean = 2.7, SD = 1.11, $p > 0.05$). However, their opinions on priority on daughters' education, support at home to study math, unequal power relations, language, and ethnicity were not significantly different from the neutral views ($p > 0.05$) (Table 3 and Figure 2).

Table 3. *One sample statistics and t-test of social and cultural issues*

One-Sample Statistics and t-Test (test value for mean = 3.0)						
Items (Variables)	No	Mean	Std. Dev.	t	df	Sig. (2-tailed)
Q.10. The female students may have less interest in studying mathematics beyond school.	101	3.4455	1.25280	3.574	100	.001
Q.11. The parents give less priority to their daughters, and their daughters are not getting equal opportunities as their sons.	101	3.1980	1.29630	1.535	100	.128
Q.13. The parents do not help their children with their math homework.	101	2.7426	1.30118	-1.988	100	.050
Q.25. The teachers might have insufficient skills in teaching techniques to teach students from different cultural backgrounds.	101	2.7129	1.10758	-2.605	100	.011
Q.12. The parents have an extra burden to take care of the home and accomplish their responsibilities, so they need help from their daughters.	101	2.8416	1.01718	-1.565	100	.121
Q26. There is an unequal cultural power relation, which is reflected in the mathematics classrooms.	101	2.8911	.95813	-1.142	100	.256
Q.8. There is a lack of understanding because students speak different languages at home than the language they use at school.	101	2.7921	1.13417	-1.842	100	.068

Q.24. Each ethnic groups and sub-groups have different cultural traditions that affect mathematics teaching and learning.	101	2.8812	1.06101	-1.125	100	.263
Component 1 (Overall)	101	2.9381	.71253	-.873	100	.385



Scale: Strongly disagree = 1, Neutral = 3, Strongly Agree = 5.

Figure 2. Teacher perception of social and cultural issues in teaching and learning mathematics

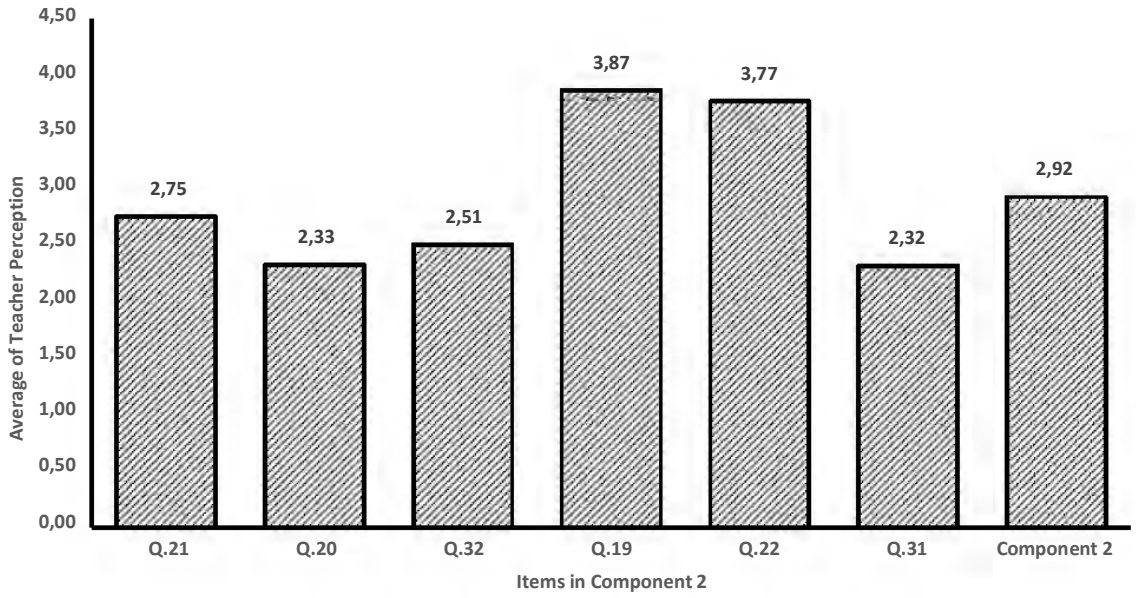
Equity and Justice Issues

In the Issues of Equity and Social Justice, the participants seemed to disagree that students cannot have equal opportunities in the classroom (Mean = 2.75, SD = 1.24, $p < 0.05$), each student cannot get equal opportunity in the classroom due to a large number of students (Mean = 2.33, SD = 1.24, $p < 0.05$), and teachers have sufficient knowledge of content and technology such as computers in teaching math (Mean = 2.51, SD = 1.15, $p < 0.05$). However, they also agreed that teachers do not care about all the students and they focus more on the students who are good at math (Mean = 3.87, SD = 1.18, $p < 0.05$), and they do not focus on students of learning disability (Mean = 3.77, SD = 1.21, $p < 0.05$) (Table 4 and Figure 3).

Table 4. *One-sample statistics and t-test for issues in equity and social justice (test value for mean = 3.0)*

One-Sample Statistics and t-Test

Items (Var.)	No	Mean	Std. Dev.	t	df	Sig. (2-tailed)
Q.21. Each student cannot get equal opportunity in the classroom activities due to the application of traditional pedagogies.	101	2.7525	1.24423	-1.999	100	.048
Q.20. Each student cannot get equal opportunity in the classroom activities due to a large number of students.	101	2.3267	1.24184	-5.449	100	.000
Q.32. Many mathematics teachers have insufficient skills to use computers and applications in teaching mathematics.	101	2.5050	1.14563	-4.343	100	.000
Q.19. The teacher does not care about all the students in his/her classroom because they focus on good students.	101	3.8713	1.18037	7.418	100	.000
Q.22. Teachers have less focus on children with learning disabilities.	101	3.7723	1.20732	6.429	100	.000
Q.31. There is a lack of a broader application of technology in teaching and learning mathematics.	101	2.3168	1.00926	-6.803	100	.000
Component 2 (Overall)	101	2.9241	.76504	-.997	100	.321



Scale: Strongly disagree = 1, Neutral = 3, Strongly Agree = 5.

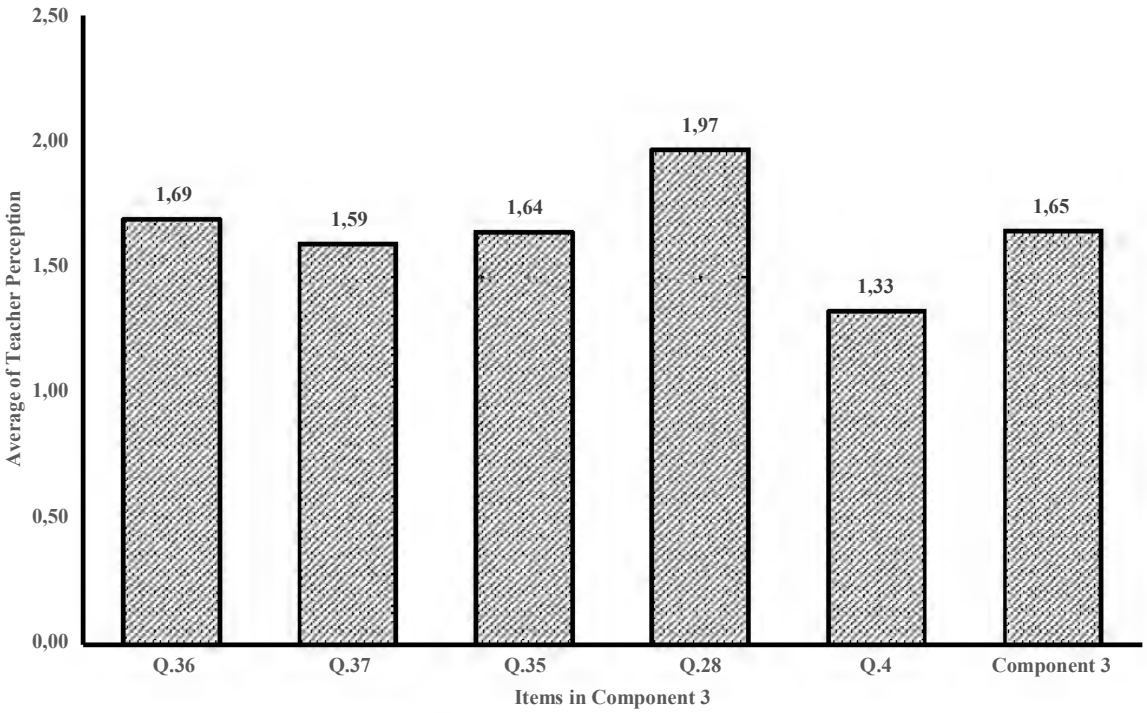
Figure 3. Teacher perception of equity and social justice issues in teaching and learning mathematics

Technological-Pedagogical Issues

The participants' perception of Pedagogical Issues had five items loaded whose mean values were less than 3.0, indicating that they disagreed with these views. They seemed to disagree with the view that the schools and the government have implemented the policy to enhance the use of technology to demonstrate mathematical phenomena (Mean = 1.69, SD = 0.73, $p < 0.05$). Similarly, they disagree with the view that the schools and the government have implemented technology to investigate mathematical phenomena (Mean = 1.59, SD = 0.72, $p < 0.05$). The opposing views on these and other items in the Pedagogical Issues showed a critical condition of pedagogical contexts of mathematics classes in Nepal (Table 5 and Figure 4).

Table 5. *One-sample statistics and t-test for pedagogical issues (test value for mean = 3.0)*

One-Sample Statistics and t-Test						
Items (Var.)	No	Mean	Std. Dev.	t	df	Sig. (2-tailed)
Q.36. The schools and the government have implemented the policy to enhance the use of technology to demonstrate mathematical phenomena.	101	1.6931	.73134	-17.960	100	.000
Q.37. The schools and the government have implemented the use of technology for the investigation of mathematical phenomena.	101	1.5941	.72358	-19.527	100	.000
Q.35. The teachers are professional in providing their service to the students by creating an equitable classroom environment.	101	1.6436	.78210	-17.430	100	.000
Q.28. Teachers' pedagogical choice engaged students in higher-order thinking, reasoning, and problem-solving that has directly influenced their performance in mathematics.	101	1.9703	.88832	-11.649	100	.000
Q.4. Teachers guide and give feedback to their students.	101	1.3267	.49212	-34.171	100	.000
Component 3 (Overall)	101	1.6455	.49870	-27.295	100	.000



Scale: Strongly disagree = 1, Neutral = 3, Strongly Agree = 5.

Figure 4. Teacher perception of technological-pedagogical issues in teaching and learning mathematics

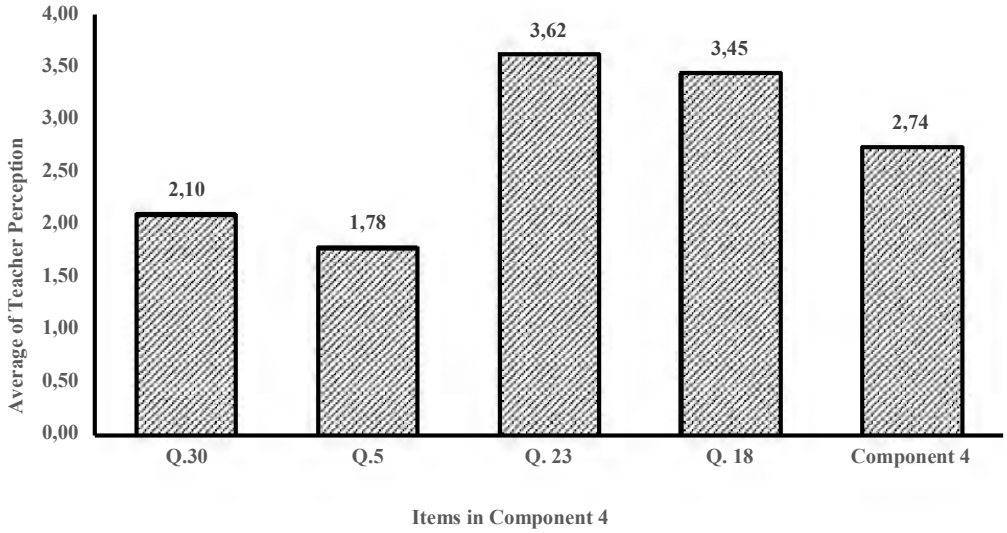
Teacher Professionalism

The participants' views on Teacher Professionalism indicated that they seemed to disagree with the view that the professional organizations of mathematics teachers provide training, workshop and publications which affect teaching and learning mathematics (Mean = 2.1, SD = 1.01, $p < 0.05$), and mathematics knowledge is both individual and social (Mean = 1.7, SD = 0.89, $p < 0.05$). However, they agreed that there is not a wide gap on students' mathematics achievement in the rural and urban regions (Mean = 3.62, SD = 1.04, $p < 0.05$). They also seemed to agree that the existing classroom practice is entirely fair in teaching and learning mathematics (Mean = 3.45, SD = 1.12, $p < 0.05$) (Table 6 and Figure 5).

Table 6. *One-sample statistics and t-test for teacher professionalism (test value for mean = 3.0)*

One-Sample Statistics and t-Test						
Items (Var.)	No	Mean	Std. Dev.	t	df	Sig. (2-tailed)
Q.30. The professional organizations of mathematics teachers provide training, workshop,	101	2.0990	1.01494	-8.922	100	.000

and publications which affect teaching and learning mathematics.						
Q.5. Mathematics knowledge is both individual and social.	101	1.7822	.88999	-13.752	100	.000
Q. 23. There is not a wide gap in students' achievements in the rural and urban regions.	101	3.6238	1.03780	6.040	100	.000
Q. 18. The existing classroom practice is entirely fair in teaching and learning mathematics.	101	3.4455	1.11781	4.006	100	.000
Component 4 (Overall)	101	2.7376	.66462	-3.967	100	.000



Scale: Strongly disagree = 1, Neutral = 3, Strongly Agree = 5.

Figure 5. Teacher perception on issues of teacher professionalism in teaching and learning mathematics

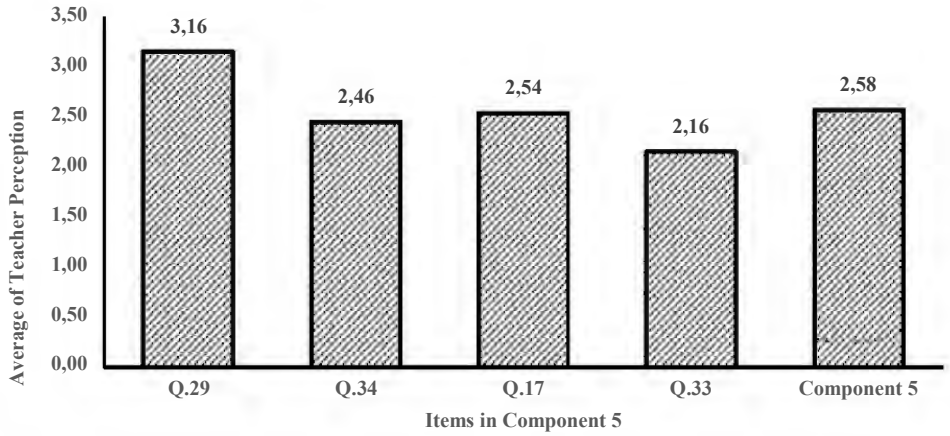
Political and Economic Issues

Concerning the Political and Economic Issues, the participants seemed to disagree with the view that most of the students and teachers in public schools cannot afford to buy new technological tools (Mean = 2.46, SD = 1.28, $p < 0.05$), there is a hierarchical power relation between the students and mathematics teachers (Mean = 2.54, SD = 0.99, $p < 0.05$), and the technological tools might have a great significance in teaching and learning mathematics. However, they are expensive (Mean = 2.15, SD = 0.71, $p < 0.05$). However, regarding the role of the teacher unions, the participants seemed neutral on the view that the teacher unions look at everything through the lenses of politics and ideology (Mean = 3.16, SD = 1.25, $p < 0.05$) (Table 7 and Figure 6).

Table 7. *One-sample statistics and t-test for political and economic issues (test value for mean = 3.0)*

One-Sample Statistics and t-Test

Items (Var.)	No	Mean	Std. Dev.	t	df	Sig. (2-tailed)
Q.29. The teacher unions look at everything through the lenses of politics and ideology.	101	3.1584	1.24686	1.277	100	.205
Q.34. Most of the students and teachers in public schools cannot afford to buy new technological tools.	101	2.4554	1.27691	-4.286	100	.000
Q.17. There is a hierarchical power relation between students and mathematics teachers.	101	2.5446	.99524	-4.599	100	.000
Q.33. The technological tools might have a great significance in teaching and learning mathematics, but they are expensive.	101	2.1584	.84537	-10.005	100	.000
Component 5 (Overall)	101	2.5792	.71496	-5.915	100	.000



Scale: Strongly disagree = 1, Neutral = 3, Strongly Agree = 5.

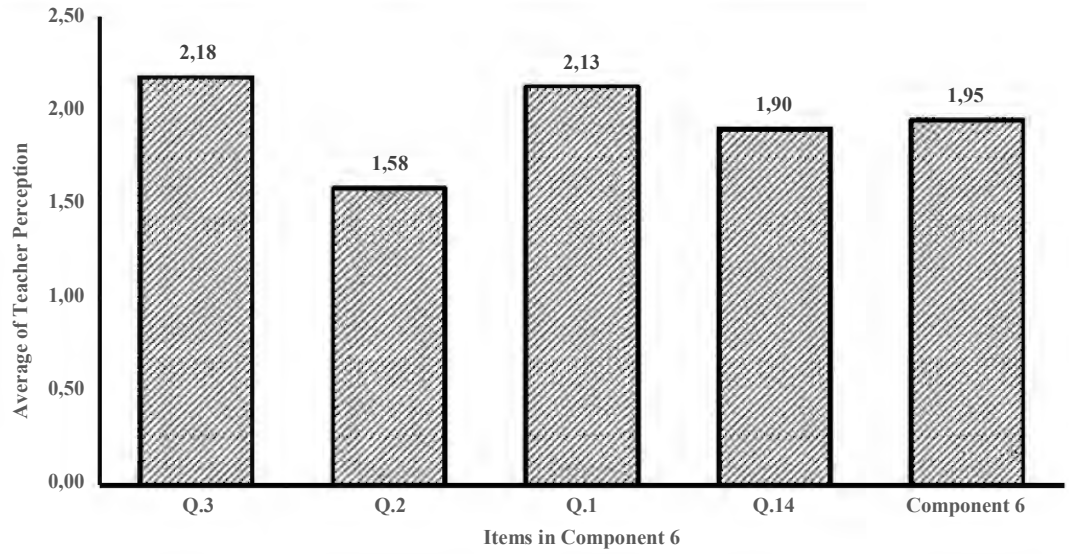
Figure 6. Teacher perception of political and economic issues in teaching and learning mathematics

Theoretical Issues

The participants' perception on Theoretical Issues on teaching and learning mathematics revealed that they seemed to disagree with the view that Mathematical knowledge is constructed through social interaction (Mean = 2.18, SD = 0.96, $p < 0.05$), mathematics teachers focus on helping students with the building of mathematical concepts (Mean = 1.58, SD = 0.68, $p < 0.05$). Further, they disagreed that students actively build mathematical concepts when they learn in the classroom (Mean = 1.90, SD = 0.81, $p < 0.05$) (Table 8 and Figure 7).

Table 8. *One-sample statistics and t-test for theoretical issues (test value for mean = 3.0)*

One-Sample Statistics and t-Test						
Items (Var.)	No	Mean	Std. Dev.	t	df	Sig. (2-tailed)
Q.3. Mathematical knowledge is constructed through social interaction.	101	2.1782	.96329	-8.574	100	.000
Q.2. Mathematics teachers focus on helping students with the building of mathematical concepts.	101	1.5842	.68216	-20.859	100	.000
Q.1. Students actively build mathematical concepts when they learn in the classroom.	101	2.1287	.80825	-10.834	100	.000
Q.14. There are different ethnic backgrounds of the students and teachers.	101	1.9010	.91110	-12.123	100	.000
Component 6 (Overall)	101	1.9480	.54580	-19.370	100	.000



Scale: Strongly disagree = 1, Neutral = 3, Strongly Agree = 5.

Figure 7. Teacher perception of theoretical issues in teaching and learning mathematics

DISCUSSION

There is a gender disparity in mathematics in terms of interest and continuity in higher-level mathematics study. Harper (2019) outlined equity and justice issues in mathematics education regarding race, gender, and socioeconomic status. In this context, the study carried out by Kaleva

et al. (2019) found that mathematics attracted more males than females. There are six reasons for females' under-representation in mathematics, such as occupational interests or preferences, lifestyle values or work/family balance preferences, field-specific ability and beliefs, gender-related stereotypes and biases, cognitive ability, and cognitive strengths (Wang & Degol, 2016). Kaleva et al. (2019) also reported that females often feel a lack of self-efficacy, ability, and competence towards studying mathematics compared to males.

Similarly, the participants in the current study seemed neutral to the view that parents give less priority to their daughters' education and their daughters are not getting equal opportunities as their sons. Unterhalter, North, and Arnot (2014) argued that teachers' views and attitudes towards girls and gendering perception play a key role in girls' education and their learning achievements. Further, the major factors effecting daughters' education are-- geography, socio-culture, social beliefs and structure, early marriage, child labor, girls' health, abuses, parental education, economic condition, religion, politics, household works, school environment, teachers' attitude, and academic achievements (Alabi & Alabi, 2014).

However, the participants in the current study disagreed that teachers have insufficient skills to teach students from different cultural backgrounds. If teachers are familiar with students' background and issues of diversity, they teach students being culturally responsive (Lin & Bates, 2014). In against of fear, uncertainty and discomfort of the teachers, they are aware of using language, heritage, customs, values, ceremonies, and culture to meet student-friendly environment (Gay, 2002). Further, they are aware of building trust, building a collection of instructional strategies, becoming culturally literature, using effective questioning techniques, providing effective feedback, analyzing instructional materials and establishing positive home-school relations (Lin & Bates, 2014). Nonetheless, their opinions on support at home to study math, unequal power relations, language and ethnicity were not significantly different from the neutral. In regard to provide support to study at home, the effective teaching needs mastery over content and delivery process but all parents have no idea about those matters so they cannot teach what they don't know (Gay, 2002). The teachers are if not formally trained for gender equality (power relations), inclusion and ethnicity along with dialect and tolerance; they have no more such a sensitivity (Unterhalter, North & Arnot, 2014). The average perceptions of teachers (as depicted, greater than 3.0) showed that they agreed that female students have less interest in mathematics beyond schools and less priority to daughters' education so that they have fewer opportunities than sons. However, they denied that teachers have insufficient skills to teach students from different cultural backgrounds.

The result shows that students have a lesser chance of equal opportunities in the classroom. This situation may be aroused due to teachers' behavior and carelessness, curriculum, teaching methods, social and cultural environment, sitting arrangement, ability difference, interest in learning, and

available materials/resources. The teachers should create equal opportunities for students in the classroom. To provide equal opportunity to all students, teachers have to consider educational, physical, social, emotional, and psychological aspects. "Equity does not mean that every student should receive identical instruction; instead, it demands that reasonable and appropriate accommodations be made as per the need to promote access and attainment for all students" (NCTM, 2000, p. 12). Mathematics teachers should educate students with examples related to students' culture. Researchers argue that mathematics teachers have accountabilities to instruct for equity, and they need to pay attention to the methods that curricular instances may help cultural and social awareness (Boaler, 2008; Frankenstein, 1990; Gutstein et al., 1997; Noddings, 2005). Teachers observe the different social backgrounds of students and treat them unequally in the classroom. Gutierrez (2013) finds teachers as knowledge brokers who deserve supporting students recognizing learners' identity and abilities. These unfair practices are causing injustice in the mathematics classroom (Panthi, 2016). This idea also was supported by Cotton (2001), who recognized the curriculum, teaching method, appraisal of the techniques, and backgrounds, and cultural environment of mathematics instructing as the prime areas of the propagation of social injustice. The connection of mathematical concepts and social justice issues (Gutstein, 2003; Harper, 2019) balances mathematical goals and social justice goals (Bartell, 2013). Gallivan (2017) also focuses on culturally relevant pedagogy to address the needs of students.

The finding shows that many students in the classroom also are one of the distractors to get equal opportunity in the classroom. Teachers do not pay attention to all the students, and they emphasize more on the students who are intelligent in mathematics. It is found that teachers do not care about students with learning disabilities. Baraldi et al. (2019) also suggest that change in the education process is necessary for teachers who teach mathematics to make the inclusion of disabled students. This finding is supported by the study of Panthi and Belbase (2017), which states that “in our classroom teaching and learning of mathematics, each student cannot get equal opportunity in the classroom activities because of inappropriate classroom size, the number of students, and the application of traditional pedagogy” (p. 12). Teachers cannot monitor the activities of each student. He/she cannot provide adequate care and engage them in learning when there are many students in the classroom. The teachers care for front sitters and talented students instead of equally observing all students, which creates discrimination in the classroom (Panthi & Belbase, 2017). Panthi and Belbase further state that due to students' diverse backgrounds, teachers might not be able to fulfill the desires of all the students in the classroom, which naturally favors a few and disapprove of others. The finding indicates that mathematics teachers have sufficient knowledge of content and technology such as computers in teaching mathematics, but there is still a lack of knowledge of integration of ICT in teaching mathematics. Panthi and Belbase (2017) point out that there is no clear direction for teaching and learning mathematics by applying technology in the existing mathematics curriculum of Nepal. Many mathematics teachers in Nepal may have

general knowledge of technology, but they do not have sufficient technological, pedagogical and content knowledge (TPACK) (Mishra & Koehler, 2006) to integrate ICT in teaching and learning mathematics (Panthi & Belbase, 2017).

The use of technological tools may play a significant role in the quality of students' engagement in learning mathematics. The Government of Nepal has issued some policies regarding technological tools in the National Curriculum Framework (2007) and a recently revised framework in 2019 (CDC, 2007; CDC, 2019). However, the research participants seemed to disagree that the schools and the government have implemented the policy to enhance classroom demonstrations in teaching mathematics. Likewise, technology plays a vital role in teaching-learning mathematics for the better performance of students. Technology reduces abstractness in learning and creates a suitable environment for students' life situations (Dikovic, 2009). Dikovic (2009) further explores that ICTs encourage learners' engagement and motivate them to reject memorization-based or rote learning pedagogy, which leads a learner to be an active constructor of knowledge. Likewise, the appropriate use of ICTs positively encourages more interaction among teachers and students, resulting in better collaborative outcomes (Koc, 2005). Information and communication technologies are at the center of the teaching and learning process, primarily in mathematics (Yusuf, 2005). However, our research participants did not agree with it. The schools and the government have not implemented the use of technology for the investigation of mathematical phenomena. Regarding the teachers who are professional in providing their service to the students by creating an equitable classroom environment, most teachers in this study disagree with this statement. To become professional teachers, we provide their service to the students by creating an equitable environment using equity pedagogy, collaborative and cooperative learning in the classroom, and teachers apply multitier support systems in classroom teaching (Acharya, 2017).

Pedagogy is an essential weapon in the fair teaching-learning process. One size may not fit in all cases; using appropriate pedagogy help to empowering, and supporting the diverse academic, social and cultural learning of all students in a shared environment (Villa & Thousand, 2016). Nevertheless, the teachers did not believe that teachers' pedagogical choice to engage students in higher-order thinking, reasoning, and problem-solving that has directly influenced their performance in mathematics. That type of situation may occur due to lack of knowledge of pedagogies. In this regard, Panthi and Belbase (2017) claimed that facilitators' pedagogical selection is a teacher's skill, empowering or disempowering students in the classroom through their actions. Generally, in Nepal, mathematics teachers mainly apply traditional pedagogy such as lecture and transmission approaches. This kind of situation may create social injustice. Instead of this, we may use transformative pedagogy, which encourages the practitioner to question, doubt, and challenge the existing knowledge, i.e., challenging the status quo with the hopes to enhance

the critical awareness, which leads to the meaningful understanding of the content and context (Mezirow, 1997 & 2003). The teachers' guide is one of the printed instructional materials for teachers through appropriate preparation of teaching contents, aware of teaching strategies, assessing the students' performance, and preparing the excellent planning (Panhoon & Wongwanich, 2013). Feedback is another most potent influence on teaching-learning. Teachers need to improve their teaching and assessment performance through appropriate feedback systems, which can be used to enhance their effectiveness in the classroom on teaching and learning (Panhoon & Wongwanich, 2013). However, our research participants disagreed that the teacher guide did not work correctly, and feedback from the teachers helped improve our teaching-learning process.

The role of a professional organization is vital in developing teachers in their respective professional knowledge, skills, and dispositions. In this regard, the National Council of Teachers of Mathematics (NCTM) has played a significant role in developing mathematics teachers' professional skills in the United States through building content knowledge and apply this knowledge in classroom teaching (pedagogical knowledge), enhance teachers' ability to notice students' thinking, reasoning, and problem-solving, building their productive habits of teaching-learning and developing positive professional relationships (NCTM, 2010). The NCTM emphasized lifelong learning, collaboration, leadership, and advocacy for making mathematics teachers professional with all required competencies and values (Kojak, 2014). Mathematics teachers' collaboration and interaction are highly emphasized in European countries and professional development activities in which both the government and professional organizations play a crucial role (Parveva et al., 2011). The role of professional organizations of mathematics teachers has been outlined as bridging, facilitating the exchange of ideas, improving mathematics education, promoting mathematics to other community members, communicating new policies and practices, and influencing policies in the mathematics curriculum, pedagogy, and assessments (Hahn, Morony, & Recio, 2012). However, the findings of the current study showed that mathematics teachers' professional organizations in Nepal are not being effective in providing training, workshops, and publications to influence teaching and learning. There should be an effort to focus on students' images, anxieties, and attitudes toward mathematics in order to develop positive dispositions toward the subject matter and its value in students' future careers (Belbase, 2013).

The issues of teaching and learning mathematics arose due to students' differential performance in the rural and urban areas. In a study in the US showed that students in the rural communities demonstrated lower educational attainment than the urban communities in the years 1952, 1960, 1970, and until 2000 (Howley & Gunn, 2003). However, the case may not be generalizable every time and contexts. Tayyaba (2012) reported mixed results of urban and rural students in Pakistan.

The variations in the students' performance may not depend only on rural and urban characteristics, but there are several other factors that influence students' performance, for example, school environment, family background of students, and teacher related variables (Tayyaba, 2012). There is a discrepancy in mathematics teachers' roles in rural and urban areas in Nepal. Studies showed that mathematics teachers in rural areas are more absent than teachers in urban areas and hence affecting students' achievement in mathematics and other subjects (Budhathoki et al., 2014; Mathema & Bista, 2006). However, in the current study, the mathematics teachers agreed that there is not a wide gap on students' achievement in mathematics in the rural and urban regions in Nepal. Their perception about students' achievement in mathematics in the rural and urban areas seems too biased due to their location, mostly teaching in Kathmandu valley and not being aware of rural contexts outside Kathmandu. The participants in this study seem to agree that teaching and learning mathematics is fair in the classrooms, which is consistent with the results in (Panthi, Luitel, & Belbase, 2018) despite the fact that past studies showed teachers' not being serious in their profession, and teaching-learning and assessments are not fair (Mathema & Bista, 2006). Fairness is not a matter of self-satisfaction of teachers, but it is a social justice issue in teaching-learning and assessment practices in mathematics and other subjects (Sonnleitner & Kovacs, 2020). In this context, teaching and learning mathematics by making it culturally relevant and appropriate is a paramount issue in Nepal (Acharya et al., 2021).

There are several organizations of mathematics teachers in Nepal. For example, Council for Mathematics Education, Nepal Mathematical Society, Nepal Mathematics Center, Mathematical Sciences Trust, Women of Nepal in Mathematical Sciences (WoNiMS), to name a few. The Council for Mathematics Education mainly organizes pedagogical training and workshops for mathematics teachers. The Council also publishes a magazine (Mathematics Education Forum) and a journal (Journal of Mathematics Education). The Council has several district committees that also offer different professional development programs for mathematics teachers. However, Nepal Mathematical Society (http://www.nms.org.np/) and Nepal Mathematics Center organize mathematics conferences and workshops focusing on mathematics and mathematics education research, theories, and issues. These professional organizations are non-political organizations. Several other professional organizations of teachers in Nepal are mostly politically affiliated to different political factions or groups in Nepal. There is an umbrella organization of teachers' unions called the Federation of Nepalese Teachers Union. These unions mostly organize campaigns and advocacy programs for teachers' rights and identities more than other professional development workshops and training. Therefore, the participants' views about the teachers' union seem to align with these unions' political functions and activities in Nepal. The research participants in this study disagreed that the professional organizations of mathematics teachers in Nepal provide adequate training and workshops that affect teaching-learning of mathematics.

Although technological tools are essential in today's mathematics classes to present, demonstrate, construct, communicate, disseminate information, interact, and collaborate in teaching and learning mathematics (NCTM, 2011), many students and teachers in Nepal cannot afford such tools due to high cost of the tools and Internet connectivity in those tools (Asian Development Bank, 2017). However, the research participants seemed to disagree with these views. They also disagreed on the significance of such tools in teaching and learning mathematics. That means these tools are not yet in the centrality of mathematics teaching-learning in Nepal. The participants' unfavorable views toward ICT might have stemmed from their lack of experience using such tools in learning and teaching mathematics due to the lack of such resources in schools (Rana, Greenwood & Fox-Turnbull, 2019). Interestingly, they also disagreed that there exists a hierarchical power relation between students and teachers in Nepalese classrooms.

Mathematics teachers' awareness of theories may affect their classroom practices. Therefore, researchers are interested in learning what theories do mathematics teachers hold and how their awareness and perception of these theories may influence their classroom behavior (Oonk, Verloop, & Gravemeijer, 2020). The nexus between theory and practice in mathematics teaching and learning has been emphasized by Dewey (1904), Schön (1983), Freudenthal (1991), and Goos and Bennison (2018). The nexus between theory and practice may help bridge the gap and inform and support each other to promote teaching and learning of mathematics (Lampert, 2010). The way teachers believe about students' social interaction and engagement in learning mathematics is reflected in their students' performance (Durksen et al., 2017). However, the mathematics teachers in this study seemed to disagree that mathematics knowledge is constructed through social interaction. They also disagreed that mathematics teachers' focus on helping students build mathematical concepts, and students actively build mathematical concepts when they learn in the classroom. These views reflect their beliefs toward the traditional approach to teaching mathematics. These beliefs might be the reasons behind students' low performance in mathematics in national-level assessments, such as the School Leaving Certificate Examination (SLC) in the past (Mathema & Bista, 2006).

IMPLICATIONS

The discussion of the finding regarding equity and social justice states that students do not have equal access and opportunity to learn mathematics in the classroom. Teachers are not using technology in teaching and learning mathematics. In this context, our mathematics teachers should be aware of equity and social justice perspectives while teaching mathematics in the classroom. The National Council of Teachers of Mathematics [NCTM] (2014) also clearly focuses on "creating, supporting, and sustaining a culture of access and equity require being responsive to students' backgrounds, experiences, cultural perspectives, traditions, and knowledge when designing and implementing a mathematics program and assessing its effectiveness" (p. 1). This

statement emphasizes that equity is a crucial factor in promoting access to learning opportunities for students. Equity, equality, and fairness are the issues to be addressed in the curriculum to be aware of and provide the situations to promote these issues in the classroom. This can be possible only when the mathematics curriculum is designed in such a way that it provides high-quality instruction with inclusive education. Curriculum designers should be aware of the current situation and practices of social justice in mathematics classrooms, which provides visions for transforming mathematics curricula endorsing social justice in the classroom. The mathematics curriculum should provide a clear direction with appropriate ICT tools for teaching different mathematical content areas. The categorical findings are also applicable in our professional practice in developing preservice and inservice mathematics teachers with a greater awareness of these issues and concerns related to equity, access, socio-political, cultural, and technological. We are more conscious of these issues after knowing them from this study (data analysis and literature review).

Policy implications refer to imply research findings in policymaking and implementing processes. Pedagogy is an elusive concept in Nepalese education. It is largely decontextualized. The government has to focus on developing policies to promote more flexible, emergent, and contextual pedagogical practices with ICT integration. The local education actors are to be responsible for developing curricular materials as per the need/expectation, and aspiration of students and parents. Frequent feedback provision should be in practice for meaningful learning. For this purpose, this research finding will be helpful for concerned organizations and persons making their policies. The study results have both theoretical and research implications. The six dimensions (components) of teaching and learning issues in mathematics included -- Social and Cultural Issues, Equity and Justice, Technological and Pedagogical Issues, Professional Issues, Political and Social Issues, and Theoretical Issues. The findings and discussion on each of these components contributed to the theory of mathematics education in general and mathematics teaching-learning issues in Nepal in particular. The findings from the study have limited generalizability due to the small sample size in the Kathmandu valley. However, future researchers can extend it to larger sample size, including several schools from different demographic areas (geographical region, school characteristics, teacher characteristics, students, and school leaders).

CONCLUSION

In the existing practices of teaching mathematics, learners are unable to get equal opportunities in the mathematics classroom. Teachers lack the awareness to maintain social justice for students from diverse backgrounds. This situation's major cause resembles the existing education system, teachers' awareness, and lack of resources. As a result, teachers are not techno-friendly, culturally responsive, and critically aware of equity and social justice issues in teaching and learning mathematics in the classroom. Similarly, the literature review shows that teachers need formal training to transform their teaching process into a culturally responsive form to build up ethnic

students' ownership over mathematics and make their learning meaningful. From the findings of the study related to Professional Issues, Political and Social Issues, and Theoretical Issues, it can be concluded that mathematics teachers from school to university level are not satisfied with the professional organizations in terms of professional development programs. There are some initiatives by the schools and government to implement ICT and other technological tools in mathematics teaching-learning; however, these efforts are not yet in the high priority and action in practice. Mathematics teachers in Nepal (most of them) seemed guided by traditional teaching and learning approaches, which might have hindered students' achievement in mathematics.

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