Mathematics Pedagogies and Assessment Practices in Semester System at Tribhuvan University

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Abstract

The study sought to evaluate the goal of developing a student-friendly semester system in the context of Tribhuvan University, Nepal, by examining the teaching-learning and evaluation methodologies used in the semester system of mathematics education. Using a qualitative research methodology, this study was conducted. Three mathematics educators and six students were carefully chosen as the study's primary participants. Guidelines for interviews, observations, and focus group discussions (FGD) were utilized to collect data. Transcribing, coding, classifying, and producing themes sequentially were employed to examine the textual material. It was discovered that mathematics teacher educators utilized collaborative and communicative teaching-learning practices, resulting in more student involvement with learning. In addition, they have chosen a blended approach to instruction that emphasizes using information and communication technology (ICT) resources. They have been used in a variety of ways for teaching-learning mathematics. However, they have placed less emphasis on think pair and share tactics in the mathematics teaching-learning process. Thus, the delightful teaching of mathematics through digital tools, the Moodle platform, flipped pedagogy, art-based learning, and transformative techniques represented shifts in educational practices.

Keywords: *Teaching-learning, assessment strategies, semester system, and art-based learning.*

Introduction

The semester system for higher education programs, particularly at Tribhuvan University, is in transformation. The oldest university in Nepal (as of 2016 B.S.), Tribhuvan University is also the largest national university in Nepal. The Executive Council's board meeting on the 32nd of Shrawan, 2068 B.S., approved the semester system as a result of TU's recent transformation in the semester system. The agenda for the semester system in four-year Bachelor of Teacher Education (B. T. Ed.) programs as a standard higher education program has been approved at the board meeting. Similarly, the Bachelor of Teacher Education (B. T. Ed.) and the Master of Teacher Education (M. T. Ed.) were implemented via Open and Distance learning. Similarly, the semester system in the additional stream of higher education was approved at the following meeting of the Executive Board on Ashwin 7, 2069 BS. Subsequently, Physics Education at Mahendra Ratna Campus, Biology Education at Sanothimi Campus, Sanothimi Bhaktapur, and Gorkha Campus, Gorkha, have been conducted on a semester basis. The executive board meeting on 28 Jestha, 2070 B.S., decided to establish the semester system in several subjects of the Central Department at Kirtipur. Tribhuvan University implemented the semester system for the master's degree at Central Department for the first time in the 2071/2072 BS academic year. In the Kathmandu Valley, the second phase of the semester system for master's degrees

was adopted in 2072/2073 BS. Similarly, since the academic year 2073/2074 BS, all of TU's constituent and affiliated campuses have offered master's degree programs on a semester basis. Currently, all master's degrees and Master of Philosophy (M. Phil.) degrees in education, as well as a portion of bachelor's degrees, are administered on a semester basis. Although the semester system is applied in 61 constituencies and 1111 associated campuses (Subedi, 2019), it has a variety of practices, problems, and chances for its continued existence.

Nepal's higher education system must be urgently reformed in order to conform to international standards. The semester system is a fundamental modification to the higher education system in Nepal. Due to globalization, a new course can be implemented in the new education system (Bista et al., 2019). The semester system is a method of reforming the annual system in response to its deficiencies but not the ultimate solution. The key concern is how it may be carried out efficiently, systematically, and effectively. It could transfer some of the emphasis from teaching to learning, knowledge to skills, tests to diverse evaluation, degrees to disciplinary identity, and changes in the classroom to the larger culture (Sharma, 2018). Both the annual and semester systems have their advantages and disadvantages. The yearly system represents curriculum-based topic matter and directs students to memorize the material by the end of the year or session.

In contrast, the semester system depicts students' accomplishments in detail over the course of a few months (generally at six months). This approach provides assistance to students based on their acquired knowledge and abilities. The annual system appears to create boredom in students due to its lengthy process evaluation, whereas the semester system evaluates the students' achievement in a variety of forms throughout the year, such as presentations, group work, project works, and tests, which encourages students to be inquisitive, enthusiastic, and self-motivated in their learning. In addition, while studying, pupils develop self-awareness. Similarly, the semester system has a set number of working days, which facilitates a more efficient allocation of time and resources. As both instructors and students are predominantly engaged in the teaching and learning process, this approach discourages laziness on their part. Under the semester system, the curriculum emphasizes hands-on learning and frequent internal evaluation. The system is very interactive and student-centric (Dahal, 2021). Due to the advancement of technology and the diversity of students, traditional (lecture), instructional patterns are being replaced with contextual (group discussion to discover a new subject matter topic) situations. Learning areas consisting of chalk/marker boards and rows of armless chairs are no longer effective. Multiple institutions and schools are likely to seek venues that reflect the use of multiple pedagogical models in the classroom. This style of pedagogy has aided in integrating teaching and learning methodologies, so making learning contextual and accessible to a broad spectrum of learners.

The Central Department of Education, T. U., has been implementing a semester system for master's degrees in each faculty for the past seven years in an effort to replace the old annual education system with the competent performance of students (Dahal, 2021). However, the results have not been as anticipated. The primary objective of the semester system is to implement activities such as knowledge-to-action and written examination to diverse assessment (Acharya, 2019). However, educational practices are roughly the continuation of the annual system (Acharya & Rai, 2021). The semester system is relatively new, yet it faces numerous obstacles, such as various problems. Some of this system's challenges can be traced to its physical infrastructures (classroom, campus building,

furniture, toilet, drinking water, garden, light, heat, ventilation, canteen), technological infrastructures (including computer, projector, internet, multimedia, sound system, speaker, computer lab, air condition...), academic supports (library, e-library, mentor support...), and administrative supports (fee structure, follow the rules and regulations, uniform, orientation program, interaction, and discussion forum).

However, American universities were the source of the semester system concept. In the United States, the system is functional due to the fact that the process of valuing is essentially internal. During the implementation process at Indian universities, the number of students, faculty, and colleges becomes considerable. Students, professors, and college administrators agree that the semester system is not advantageous for general education classes (Jain, 2017). Fewer practical tasks and a lowered learning objective are the primary causes. People view the semester system from various vantage points, and as a result, they hold various opinions. The goal of the semester system is to engage both students and instructors, yet it has proven incapable of fostering enhanced learning. Beginning with the 2008-2009 academic year, the Higher Education of the MP Government implemented the semester system for all degree and post-graduate programs in Madhya Pradesh. Numerous impracticalities were introduced with this system. Signatures were required for each time of attendance, which was a burden for every student. Colleges were required to take the semester's final examination. To familiarize students with a particular component of their individual studies, a job-oriented project was required for all students. The traditional annual approach was chosen for the number of theory and practical papers (Jain, 2017). Exams were administered twice a year, either at the end of the semester or six months after the beginning of the session. Before classes began, training courses were held at varying levels to orient the teaching staff with the semester. The goal of the semester system in Pakistan, was to ensure that students regularly attended class, to make learning more engaging and meaningful, to keep students engaged in constructive activities, and to make college instructors more proactive. The use of the semester system in colleges ensured uninterrupted instruction throughout the academic year. While the semester system in higher education has a few flaws, it also has a number of advantages. As tests are administered every six months, and the entire course must be studied, the semester system has the advantage of requiring students to study diligently and continually. The exam preparation burden of the students has been divided in half, allowing them to study half the material every six months. A commendable endeavor to ensure the success of students in Pakistan is the job-oriented project. The semester system increases the amount of work instructors and universities must complete. Exam administration, evaluation, and result reporting every six months have increased the burden by twofold. Declaration of results, appraisal, and re-totaling at the appropriate moment appear challenging (Krishnamoorthy, 2010 as cited by Jain, 2017). In the current environment of Pakistan, the semester system has numerous challenges. Exams were lasting longer than six months, late results, financial burden, incomplete course, lack of time, lack of learning, project work, marking scheme, lack of full attendance, workload increase, lack of creativity, lack of quality instruction, academic plan failure, and student dissatisfaction are some of the major problems with the semester system (Edmund, 2011). These difficulties have presented the semester system with several challenges. The semester system is not flawed, but it simply does not fit the concept of Indian universities (Jain, 2017). This statement suggests that the semester system in higher education in India is not new, whereas in certain Pakistani areas it is.

Similarly, in the case of Nepal, implementation and achieving objectives present a number of difficulties. After the return of democracy, this has been the norm. Implementing the semester system may have numerous opportunities and obstacles, such as sustaining ICT-integrated pedagogy and administering a free Wi-Fi zone and e-library (Chhetri, 2019). For the semester system to produce the expected academic achievements, the current teaching techniques and assessment methodology should be thoroughly assessed as a teacher who is examining these concerns closely. Consequently, this study aims to investigate the existing teaching-learning and evaluation modality utilized in the semester system at Tribhuvan University, together with its difficulties and potential, in an effort to make substantial improvements. Secondly, the annual higher education system is practiced from the commencement of official higher education at TU. Since eight years ago, the Central Department and, progressively, the constitution campuses and community campuses have been utilizing the semester system. However, the semester system has been applied in transitional forms for programs in higher education. It is anticipated that the existing yearly education system would be replaced by a semester-based system in which pupils perform competently. The characteristics and organization of these two formal education systems are distinct. In Nepal, educationists and exports continue to complain that the semester system is not achieving the intended results. As we have observed, various components of teaching-learning practices, such as objectives, contents, teaching-learning strategies, evaluation procedures, the orientation of the nation, the globalization of knowledge, the explosion of new knowledge, etc., significantly impact the degree of academic program success. Even if the annual formal education system has several flaws and limits, it has not been completely analyzed and enhanced. Despite the fact that the semester system is meant to eliminate these flaws, this is not the case. As with the annual system, the majority of classes have been filled with a large number of students since the commencement of its introduction. It impairs the teaching-learning process and impedes the achievement of higher learning outcomes. Even though the rules of higher education in the semester system are meant to be mostly based on various practical, project-based, problem-based activities, it is still given priority on the periodic examination. In particular, the courses in the semester system are the divided halves of the annual system course. In light of the above, how is the current practice of mathematics teaching-learning activities within the semester system? How have mathematics teacher educators and students adopted the assessment procedures of the semester system? How have they envisioned the semester system's student-friendly pedagogical and evaluation practices? In a similar vein, neither teachers nor students have a favorable view of internal assessments; in most cases, they view them as a mere formality rather than a thorough evaluation of students. Additionally, questions include how the teaching-learning and assessment methodologies have been integrated into the semester system. From the standpoint of local realities, how do we envision the semester system's student-friendly structure? are the focus of the study.

Theoretical Referents

Theories are proven concepts or ideas. They help us explain the research's occurrences. The following theories support this study.

The System Theory Approach

General System Theory by Bertal affy is the origin of systems theory (GST). A systems perspective is a worldview grounded in systematic inquiry. In the broadest definition, a system is an arrangement of parts linked and interconnected by a network of relationships. A system is a collection of interconnected, interdependent, and interacting

actions that constitute a cohesive whole. If any of the system's components or operations appear weakened or misaligned, the system makes the appropriate adjustments to achieve its objectives more efficiently. For instance, the method is ineffective if students do not receive feedback on their work before taking tests. An essential characteristic of a system is that it is motivated by a need for survival and stability (which ties in with the survival motive). A system is intended to be self-maintaining, and in the process of self-maintenance, it generates creative forces that allow it to transform its environment. In summary, the system cannot remain healthy if it prohibits change (Cain, 1999). Systems theory and systems thinking underpins one of the most significant advances in how individuals comprehend and direct organizational transformation. In addition, context is a crucial notion in generic systems theory. For instance, who are our students and where are they located, i.e., what do our student profiles look like? The focus is on the individual's participation in interactive processes. According to systems theory, the primary source of complexity and interdependence is the link between organizations and the environment. In this sense, the system theory assists us in gaining a comprehensive knowledge of whatever components of the semester system are not well-organized or efficient.

Adult Learning Theory

Knowles (1980) argued that as people grow and develop, they acquire a growing reservoir of experience that becomes a richer resource for learning - both for themselves and for others. Roger (1996) views adult learning as a natural process. According to him, "learning involves establishing meanings, discovering the keys, and making sense of experience - a natural process for all adults" (p. 107). This suggests that adult learning theory primarily guides teacher professional development. According to Malcolm Knowles, an adult learns by informal means such as self-motivation, self-direction, and self-financing. Adult education is problem-focused, context-specific, and job-integrated. Learning becomes a lifetime journey for people. UNESCO defines adult education as the "entire body of organized educational processes, whatever the content, level or method, whatever formal or otherwise, whatever they prolong or replace initial education in schools, colleges, and universities, as well as apprenticeship, whereby person regarded as an adult by the society they belong develop their abilities, enrich their knowledge, improve their technical or professional qualifications, or turn them in a more employable manner" (UNESCO, 1976 as cited in Rogers, 1996). Adult learners have traits that distinguish them from younger students. Figure 1 depicts six distinguishing traits of adult learners identified by Malcolm Knowles (1984).
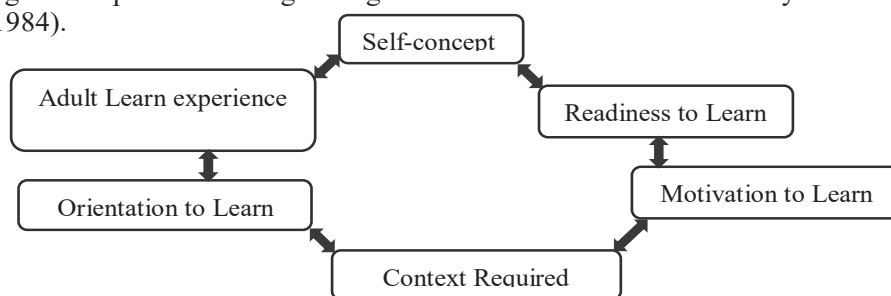

Figure 1: Six characteristics of the adult learners

As discussed in the preceding cycle, the adult learning process differs from the child's learning method. This theory has helped us to comprehend and investigate how an

adult student learns a subject, as well as to imagine the student-friendly semester system in mathematics education in particular and education as a whole.

Constructivism

Students cannot passively acquire knowledge through their senses or speech; rather, they must actively grasp and comprehend the subject to do so. The adaptive role of cognition assists the subject's organization of the experiencing world (schemas, perceptions, values, and knowledge), rather than the discovery of a single reality (Von Glasersfeld, 1996). To connect the findings, we utilized constructivist learning theory in light of our study questions. Constructivism's central tenet is that learning is an active process in which students develop new ideas via the application of their experiences and existing knowledge (Kanselaar, 2002). Von Glasersfeld (1992) argues that knowledge is not passively acquired, but rather the consequence of an individual's active cognition in making sense of their experience. A teacher's position is that of a mentor, and students are more invested in learning.

Deconstruction and Reconstruction Theory

Derrida (1930–1997), who founded deconstruction theory, said that it is a new mode of thinking and a post-structural manner of knowing. He went on to say that this theory aids in the deconstruction of our educational heritage's hierarchical and discriminatory ways of thinking about learners, teaching, and learning. It proposes disassembling the framework in order to promote better practices and to promote thinking "outside the structure" (Guney & Guney, 2008). Derrida's reading approach, known as Derridean deconstruction, asserted that texts are not accurate representations of reality and that each reader can get a unique interpretation from a text (Guney & Guney, 2008). Furthermore, they asserted that Derrida felt that all of these various interpretations of his work are accurate and that none of them can be refuted or labeled as wrong. On the other hand, deconstruction asserts that meaning is unlimited and that its goal is to topple the hierarchy of dualism, regardless of the text's author (Guney & Guney, 2008).

Additionally, the reconstruction theory (Dewey, 1930–1988) encourages re-structuring the learning process as a post-structural action from the perspective of conventional learning structures as it goes beyond the basic structures of frontal classwork, conventional group work, or socio-metrically conducted classroom management. It recommends developing new structures to dismantle the existing learning structures in a classroom pertaining to the same learning group and foster cooperation among students from various backgrounds for improved educational practices and results.

At the intersection of Dewey's philosophy of reconstruction and Derrida's philosophy of deconstruction, education can be seen as an ongoing process in which students are asked to construct, reconstruct, and deconstruct their ideas, their language, the texts they read, and the images they see in order to advance to deeper learning. In this regard, the concepts of deconstruction and reconstruction theories recommend challenging the current practices of the yearly system as well as the semester system and promoting the development of the vision for reformation and improved execution of the semester system.

Transformative Learning Theory

Transformative learning is a process that transforms problematic frames of reference and fixed assumptions to make them more inclusive, open-minded, and flexible as well as to create a democratic learning environment (Mezirow, 2003). Transformation is a mental shift or transformation that involves self-awareness, raising consciousness, creating new self-views or perspectives, transforming deeply ingrained values and beliefs, and

creating meaning via critical self-reflection (Mezirow, 2003). By challenging the current quo and examining ideas and presumptions from various angles, the transformation takes place within the individual (Hamm, 2016). Transformative pedagogy is the process of changing educational practices in the classroom and other settings through critical self- and other reflection on experiences to enhance current teaching practices. It emphasizes establishing self-perspective through an investigation based on past assumptions and presuppositions and creating meaning through critical self-reflection. It values critical ideas, reflection, analysis, synthesis, and creation that need higher-order thinking in practice. Mezirow (1997) goes on to say that the transformative pedagogy encourages students to practice doubting, challenging, and questioning what they already know—challenging the status quo—in order to develop their critical awareness, which in turn will help them understand the content and context in a deeper way. In transformational pedagogical methods, teachers serve as the learning's mediators by giving students the chance to think, reflect, critique, experience, explore, compare, and contrast one another, which improves academic results. Critical pedagogy is a process that involves rethinking, reevaluating, reorganizing, becoming a critic, and always challenging the status quo of norms and values for justice and equality. Questioning the status quo will require learning strategies for encouraging a colleague to challenge their widely held beliefs and practices that help people understand their lives in new ways and consider how to change a system that routinely oppresses a particular group, which is a prerequisite for transformative education (Larrivee, 2000). The realization of that subjective knowledge is the transformation of teachers and students. Transformative education includes five distinct interconnected ways of knowing: cultural self-knowing, relational knowing, critical knowing, visionary and ethical knowing, and knowing in action (Taylor, 2013). According to Menzirow (1997), Taylor and Cranton (2012), and the theory's foundations in humanism and critical social theory, the constructivist assumptions at the foundation of the transformational learning theory, and the theory's foundations in humanism and critical social theory are for the development of new knowledge. Similar to this, Taylor et al. (2009) asserted that comprehending people's thoughts, beliefs, values, and related social action requires context-based knowledge generation. In order to equip students to create an equal mathematical society, critical mathematics education places a strong emphasis on social justice in mathematics. Because of this, the primary goal of critical mathematics education is to produce in each student a critical reflector who also has a growing sense of critical awareness. The most recent areas of critical mathematics education that are assisting in the transformation of education are ethno-mathematics, culturally sensitive teaching, and equity challenges in schools (Tutak et al., 2011). According to Larrivee (2000) when instructors become reflective practitioners, they evolve beyond a knowledge base of discrete abilities to a stage when they integrate and alter skills to meet particular settings and to a point where the skills are internalized, enabling them to design new tactics. They gain the confidence they need in their own ability to solve challenges. Students who are actively engaged in class using MOODLE and other ICT tools are inspired to share and incorporate their native knowledge into teaching-learning activities, which aids in the transformation of teaching-learning methods (Acharya & Rai, 2021; Dahal et al., 2022c).

Methodology

For qualitative research, we must define the methodology we will employ, the collection and creation of data, and the quality criteria we will implement. To answer the

research questions, we must have a clear understanding of the following philosophical foundations: ontological and epistemological assumptions, design, approach, study area, sample, sampling method, data collection tools, quality standards, data collection procedure, and analysis procedure. Therefore, we have provided a brief explanation of their components in this section.

The interpretive paradigm primarily focuses on producing a context-based understanding of people's thoughts, beliefs, values, and related social activities (Taylor et al., 2012). In this sense, this paradigm gives recommendations for researching contextual and reality-based teaching-learning tactics and evaluation modes based on teachers' and students' subjective/objective experiences. In addition, we established a context-based knowledge of semester practices, investigated the subjective viewpoints of mathematics educators and students, and interpreted what was observed and heard. The critical research paradigm encourages the researcher to engage in "deep democracy" (Kincheloe & McLaren, 2000), which entails identifying and altering unjust societal structures, policies, attitudes, and practices (Taylor & Madina, 2011). This research paradigm assists us in challenging the semester system's present ideas, values, and practices, raising awareness of unjust practices, and establishing a vision for more equitable practices. It also helped us increase our critical awareness so that we could formulate a student-friendly vision for improved semester system practices. We adopted the critical research paradigm for these reasons.

The purpose of the study is to investigate and analyze the present teaching-learning tactics and evaluation methodology employed in the semester system, along with its advantages and disadvantages. In the last part of the study, it is anticipated that a vision for a student-friendly semester system in Nepal will be developed. Therefore, the qualitative research design is deemed appropriate for effectively conducting this investigation. Case studies, personal experience, introspective, life narrative, interviews, observational, historical, interactional, and visual texts are collected for qualitative research to explore ordinary and problematic events and their significance in persons' practices (Denzin & Lincoln, 2011). As the purpose of the study is to investigate the reality-based practices and experiences of teachers and students regarding teaching-learning and assessment modalities, as well as their opportunities and challenges, ethnographic approaches are deemed to be the most suitable for addressing these research questions. Ethnography is a form of fieldwork; it is the study of real-world circumstances (Brewer & Pierce, 2005). Therefore, field researchers watch individuals in their natural habitats and during their normal routines. In this regard, we were directed by the concepts developed by this technique.

This study was conducted at three Kathmandu Valley campuses that administer mathematics education. These campuses were selected because they implemented the semester system and extended durations before to other universities. We chose this topic because teachers and students have extensive knowledge of teaching-learning, assessment procedures, and the obstacles they confront when implementing the semester system. Qualitative research may pick small samples for an in-depth examination. Considering this, three example instructors from the Kathmandu valley who teach mathematics at the master's level under the faculty of education were selected. The teachers were picked in a manner that allows us to collect data from diverse views, including those of male and female teachers as well as teachers with competence in implementing semester systems. Similarly, six students studying M.Ed. in mathematics teaching in the Kathmandu valley were selected as a sample for an interview, and a total of twenty-one individuals were chosen for the FGD.

Tools and Techniques of Data Collection Procedure

As we intended to employ an ethnographic design for the study, the following data collection/generation instruments were created and utilized:

Interview

The interview is a method of communication or contact in which the subject or interviewee verbally provides the required information in a face-to-face setting (Lokesh, 1984). This instrument is used to investigate teachers' experiences regarding the practices of assessment strategies and teaching-learning modalities, their opportunities and challenges, and their vision for making the semester system more student-friendly from the perspectives of both teachers and students.

Observation

The participant-observer method integrates the researcher into the group and permits observation of the phenomena in its natural environment. This tool is primarily utilized to gain a deeper understanding of classroom teaching approaches.

FGD

Focus groups are a type of group interviews used to develop a shared knowledge of research concerns (Morgan, 1996). Students and instructors use the FGD to develop a shared understanding of the teaching-learning and assessment processes of the semester system.

We began the data collection process by obtaining consent from the sample teachers and students to administer the research instruments. In the first step, in-depth interviews with sample teachers and students were conducted. The real classroom observation was then conducted on a daily basis for several days. Then, in the third phase, teachers and students conducted FDG independently. And in the third phase of the study, the sampled teachers were asked to compose reflective essays based on their experiences related to the research questions. And the collected responses from respondents are deemed the study's data.

Qualitative data analysis involves identifying, studying, and interpreting patterns and themes in textual data and determining how these patterns and themes contribute to answering the research objectives (Thomas, 2006). There are various ways to analyze qualitative data, such as thematic analysis, thematic network analysis, the general inductive approach, and the constant and comparison approach. Among these strategies, we utilized Thomas's (2006) general inductive method to examine the data.

Discussions

Based on the developed research questions and methodological map, this section discusses the research's spirit. In the following section, the themes are discussed to generate meaning.

Existing Practices of Teaching- Learning Strategies in Semester System in Mathematics Education

What are the current teaching-learning methods used in semester-based mathematics classrooms? , which serves as the study's main research question. We interviewed teachers and students as well as observed the teaching-learning activities taking place in a mathematics classroom in order to provide an answer to this research question. We asked them all a number of questions throughout the interview. Throughout a discussion with a focus group, we presented the agenda. Everyone had a different way of relating their experiences. We recorded, analyzed, and categorized the emotions they expressed after hearing their voices numerous times in order to find common themes. The main themes that we discovered were as follows:

Space Communication with Teachers and Students

In the semester system, good communication has been established between teachers and students. The teachers create a friendly environment with the students in the classroom. Students should talk to the teachers politely. When students do not understand, teachers must teach repeatedly and correctly. The teachers shared their knowledge. In this direction, one of our student participants, S_1 shares his view,

In the semester system, classroom teaching is very different from than the annual system in many ways. Courses are based on the need of the students and interests, and they want to know what students need in the semester system. Good communication skills of teachers with students are the basic need of students' academic success. We are focused on student-centered learning, with good communication with teacher and student for the construction of mathematical knowledge.

Similarly, S_2 student participant shares his view

In the semester system, teachers use constructivist classrooms to create a mathematics learning environment for students. The teacher creates an environment where students can actively participate during mathematics learning. Learning mathematics for students must be attractive to teachers, and students and the teachers must be good at communicator with the good delivery of the subject matter.

Likewise, student participant S_3 shared her point of view as

In the semester system, teachers and students communicate with each other in mathematics learning. Teachers make the students friendly classroom. Effective mathematics teaching requires good communication with teachers and students. Face-to-face communication is the most effective way to learn mathematics. Communication is a dynamic process, and one needs to learn mathematics. The communication process will be successful when we have a clear and easy-to-understand knowledge of mathematics.

Participant S_4 shared her point of view, such as

Teacher with good communication makes mathematics learning easier to understand. Effective communication skills are useful for teachers to teach mathematics, management of the classroom, and interaction with students in the classroom are important factors. The communication skills of the teachers are the basis for students to succeed. Teacher's poor communication skills may be the cause for students' mistakes. Students need to understand what is right and what is wrong depending on the teacher's communication skills in the classroom. So, in the classroom, our teachers should be aware of good communication with students.

Similarly view obtained of our participants S_5 and S_6 like s_1, s_2, s_3, s_4.

From the above information about our student participation, we understand that there is good communication between teachers and students. The course and delivery of instruction address students' problems, interests, and needs. The teacher creates an environment where students can actively participate during mathematics learning. Good communication makes mathematics learning easier to understand. Teachers create good conditions of communication with the students. Learning mathematics must be attractive to teachers, and students must be good in communication. If the teachers' and students' communication skills are poor, it may lead failure of students. In the semester system, a good relationship between teacher and students is well established in the teaching-learning process through good communication among them. In this regard, Han and Tosten (2016) claimed that the level of teacher-student communication is high, the level of students' achievement is also high. Similarly, Vygotsky (1978) believes that high-level psychological functions have a

social form and are spread through culture. Cognitive development is regulated by the language dialogue between knowers (teachers) and learners. He believes that educational information is gradually changing from teacher-student dialogue to internal discourse. In this discourse, students' thinking becomes organized and becomes an internal mental function. Furthermore, Vygotsky (1978) argued that an understanding of how knowledge develops requires an understanding of the social and historical origins of knowledge and of changes in that knowledge. Vygotsky argued that human knowledge originates in socially meaningful activity and is shaped by language. According to Vygotsky, cognitive development does not happen just in the head of the child. Rather, it is a process of learning to operate with physical, symbolic, and cognitive tools in ways that in themselves change cognitive processes. The key concept of Vygotsky's social theory focuses on social interaction, more knowledgeable others, and the zone of proximal development. Likewise, Daddow et al. (2020) suggested that to create an interactive classroom environment through addressing different cultures as well as learning beliefs, values, customs, and perspectives of others, there should be a natural part of the curriculum and use of high academic standards. Students should be instructed to adopt a curriculum that fosters cultural competency, demonstrate respect for students' identities and welcome a diverse community to participate in schools, acknowledge students' diverse learning styles, ensure qualified personnel for all students and provide extra help for schools and students who need it. Likewise, Freire (1970, 2005) shared that traditional methods like lecture method does not tend to foster interactive, critical thinking, creative thinking, and collaborative problem-solving. So, teachers at present are beginning to show an increased awareness of the importance of the interactive way to students learns.

Similarly, for the validity claim of the participants I managed class observation of my sample campus. It was 16 November 2021. The principal investigator (I) was waiting for the day to be in one of the valley's old education campuses, which is a bit far from a crowded area. The environment of the campus was not new for me. I have always found it interesting to enter the peaceful environment of the campus. With a huge eagerness to visit the campus time and again, I reached the campus gate in the early morning at around 7 am.

As it was early in the morning, the sky was also clear, without any dark clouds. Most of the teachers reached there and started preparing for their duty. The mission of reaching the ground of that campus was different for that time than other times as I usually used to be there for the class observation for our research work. I went directly to the new managed staff room of campus and greeted the teachers there. My eyes were looking for my respondent in the staff room, but I could not see her. Thus, I immediately got information that she was in the classroom. I was waiting for her in the same room for her arrival. Just after around 10 minutes, she entered into the same room came near me with the formal greetings:

Respondent: Namaskar sir

(Her face seemed quite surprised of getting me as I had not informed her about the particular day for the observation of her class. I had informed and taken permission from her informally).

Me: Namaste….ji, how are you? I am here for disturb you.

Respondent: (Smiling for a while*) fine sir. Your presence will never disturb me…it's my pleasure.*

Me: Thank you…I was just joking. I also feel the time spent with you is meaningful in many ways.

Respondent: Thank you, sir…I feel great hear this from you.
Me: I got rich information regarding the semester system implementations from you through last week's interview. I am again thankful to you for your kind co-operation. However, I am here to observe the students' involvement/ encouragement/ practices in the classroom.
Respondent: Sure sir. My class is in   M.Ed. the final semester. It will begin at 7:30 am. of course, we will go together.
Me: Thank you so much.
(Just after around 5 minutes, we went to the class together)
Students got surprised to see me with their teacher.
With their formal greetings, we entered into the class. Meanwhile, students were looking at each other with curious face. Then, I immediately responded to the students saying,
Me: Dear friends, today I am here just to experienced/recall my college life as a student. Please perceive me as your friend.
Then, I felt that they took me in the class normally.
(Just after saying that) their teacher (my key respondent) started her class.
She: Ok dear students; let us begin our formal class. I think you all have read the document I shared last week via email.
(Oh good, I feel happy to know that they have well communication through another digital mode of communication, I immediately noted it)
Students: (*some of few*) Yes mam, but it was very difficult to understand the paper.
She: Thank you so much for your nice attempt.
(Then pointing to those who did not respond to her.) She further said, only a few of us have tried to understand it. Didn't you get time to read it? *(Looking at her targeted students)*
(I think it was great to know that she observed students' activities and involvement in the assigned tasks at home.)
Most of her targeted students kept silent.
She further added, please I always request you to read the documents at least once that I shared before getting to the class. It directly helps us to understand the content deeply.
(Her encouraging words impressed the students. Her activities were matching with her responses in the interview as she said as I always encourage students for reading the shared documents before entering the class)
Then, students were symbolizing in some ways, they would read then onwards.
She further adds: (looking at the students who had read the documents) would you please share your understanding about the documents?
(Ok, it was interesting to see how she encouraged students to active participate in the classroom as well)
(Just after a few seconds, one of the students tried to explain his understanding among them.)
She thanked him, and requested for others, "anyone else"?
(The class was silent for a while.) She added, "Ok, let's begin our discussion".
(Her words should encourage for students.)
Then, she started her lecture. Meanwhile, in her teaching, she continuously inspired students for participation in the discussion. And, at the same time, she crosses checked the understanding of the students by asking questions.
The above classroom observation concluded that there was room for communication between teachers and students in teaching-learning mathematics in the semester system. The teachers encourage the students for learning. The teachers used

different strategies in learning mathematics. Moreover, the teacher provided learning resources before the formal class. In this context, Han and Tosten (2016) believed that students are expected to play an active role as a teacher; communication effectiveness is closely linked with the effectiveness of education. Teachers' communication is affected the learning environment. Likewise, they believed that teachers perceive their behavior to establish a positive relationship and to be able to predict the response of students' effective communication is required (Han &Tosten, 2016).

The teacher encouraged all the students to learn the subject matter. In this line, Mezirow (1997) explains, that transformative pedagogy encouraged the practitioner to learn and be involved in classroom discussion. In this context Tripathi et al. (2019) asserted the need for greater is balance by moving the weight of education from teaching to learning, knowing to doing. Likewise, a diversified assessment like classroom tasks given individually or in a group, group discussions in the given task, presentation in the classes, home assignment, writing paragraphs, reviewing writing pieces, and writing articles can be included to make assessment practical. This saves time and the task of both the teachers and the students.

Blended Mode of Teaching-learning: More Emphasize on Use of ICT Tools.

The semester system has been implemented at the master's level in Tribhuvan University. Four semesters have been fixed by adjusting the curriculum of the two-year annual program conducted earlier. As one semester of 6 months has been fixed, there is a provision to complete four semesters in two years. In the prescribed period, we conducted the semester system's different types of teaching-learning activities. I asked our student participant (S_6) about the teaching-learning practices of the semester system, she shared her view as,

The teaching and learning activities of the semester system are very different from the teaching and learning activities of the annual system. The teaching-learning activities of the semester system are mainly based on technology. The teaching activity is carried out by showing the slides prepared in PowerPoint through a projector. Teaching-learning is done through discussions methods and projects work. To facilitate students to learn various mathematics subjects, some teachers also showed digital work, and in some subjects like algebra marker pen white boards, are used for teaching. To increase students' participation in theoretical subjects such as the foundation of mathematics education, studies in mathematics education, a large number of project work and group work are given to students in the period of mathematics teaching, which is related to students' internal evaluation.

From the above information of our student participants, we learned that the teaching-learning mathematics implemented in the classroom are mixed types. Some teachers use ICT tools frequently such as presenting PowerPoint, showing videos, searching resource materials, using different search engines but other used marker board as the nature of the subject. In this line, IT policy (2015) mentions that there will be an expansion of access to the internet to all schools; development of human resources, and special IT programs for students and teaching/learning in all schools. Accordingly, the ICT master plan (2013-2017) aims to provide students with ICT skills and use ICT as an important tool to improve classroom delivery; increase access to learning materials; and improve educational governance and management effectiveness and efficiency. Periodic plan (2017-2018) aimed at integrating ICT in all aspects of education by using ICT in education to increase access to quality education in rural areas.

Again, I managed time for class observation of the   Central Department of Education, Department of Mathematics Education fourth semester students.

The same routine but mission was different. I was with my laptop, field notes, research participants' voices, and many unanswered questions in my mind, at the same place as usual with the same table and chair. I was working on the same research project for digging out the key points through the discussion with my participants for the last 5 hours. My wife knocked at the door. I was still denying her saying '*wait…wait…wait for a while…*' Then she started shouting, '*won't you go to the college today?*' Then I immediately turned my head towards the clock hanging on the wall. I got surprised to find out it was already 9:30 am. Even it was too late, I feel proud of getting too engaged with my work. I requested my wife to serve me food for me…and prepare to move towards the campus.

It could be the day of Nov 17, 2021. I was speeding the speed of my bike to reach the college on time. It was not usual day for me at the college. I planned to observe the classroom practices of one of my teaching staffs who have been teaching in the same system since the beginning of the semester system.

No doubt, everyone was attracted by the environment of the University campus Kirtipur. I was waiting for my targeted staff in my room with warm sunny rays. I opened the laptop which was in front of me for the same mission. Just then, I came to hear a sound, 'Sir namaskar…'.

Me: Namaskar sir…(looking towards him)*, I am waiting for you.*

Respondent: Oh? It means, you are going to observe my class today, aren't, you?

(He guessed as I informally shared a few days ago for taking permission to observe his class)

Me: Sure. You have a good estimating capacity.

(Both laughed….)

Respondent: It's ok sir…let us move to the class…

(We both moved towards the classroom)

We: Good morning, dear students.

Students responded to us saying 'Good morning, sir'

My colleague (key respondent) immediately said, 'Ok we two are here today. Don't get surprised. Our sir (showing me) will support us.'

Then I moved to the last desk of the classroom and sat.

My colleague got ready for the regular class. He at first took out his laptop from the back and connected it to the projector.

(It was really good to know, my teaching staff has been continuously using such ICT tools in classroom teaching)

My colleague, then opened a well-animated Power Point file and showed the list of major headings that were designed for that particular class and started his lecture.

(His gesticulation showed that he was well trained in using ICT tools and software. He showed many images and videos files that were supported well for his lecture. However, as he was teaching more theoretical mathematics content, ICT-based activities for the students were not found well.

From the classroom observation, it was found that teachers used different tools of ICT in mathematics classes. ICT tools help the students visualize the three-dimensional

figure easily. In addition, students were less activated in classroom presentation as they are habituated with theoretical knowledge. On top of that, though we are in the transitional phase of the semester system, teachers are well motivated to use ICT blended classrooms. However, students are more confused in using ICT tools properly.

Moreover, to deal with the research question having a theme of pedagogical practices of mathematics in semester system, we conducted a Focus Group Discussion (FGD) with the Center Department of Mathematics Education students with six students as our research participants. We conducted FGD after college time which took approximately 55 minutes. The discussions were open-ended; the theme guided them under investigation. We found from the FGD that some teachers followed the traditional teaching methods, and some were using digital tools to teach their classes. Teachers having little knowledge of ICT and operating digital devices prefer the traditional teacher-centered lecture method of teaching. In the class, students are trying to become active learners, courses remain incomplete and students' learning is limited. Teachers who have good knowledge of ICT, use ICT-based teaching and learning as they have a good command over ICT and digital devices. In such classes courses are completed in time and learning becomes effective. Teachers provide enough sources as self-learning materials. Assignments, quizzes, term paper writing, project works, group works are regular activities of the classes. Students gain a good knowledge of subject matter creatively as they are self-learners and more engaged in learning and allocated tasks. But lack of regular supply of electricity, low bandwidth of internet facility hampers the classroom teaching and learning. As per the discussion, to make effective and successful teaching and learning in the semester system, every teacher must follow ICT based digital mode of teaching and learning. Traditional teachers must be trained with ICT Knowledge, and every class must relate to appropriate resources, networks, and devices. Moreover, teachers and students should be provided access to online libraries, resources, and textbooks. Similarly, we have realized that learning mathematics through mathematical apps and digital tutors makes it joyful. In this regard, Brinkmann (2019) argues that children need the freedom to use their inner resources to solve problems just as much as they need guidance in making the best use of their natural talents as learners. We believe that to create a child-friendly environment, the teacher should take responsibility and should be committed to meeting the diverse needs of students. A child-friendly learning environment encourages the use of different teaching methods and techniques for the learners and the subject matter as well. Similarly, in this line Shakya et al. (2017) explained that Nepal, in recent years, has made remarkable achievement in developing ICT infrastructure and human resources, however, the achievements are still not adequate to fulfill the nation's demand and lack of use of e-learning, lack of human resource (skilled manpower) in rural areas of Nepal are the major problems of ICT in Nepali context. Dhakal (2022) claimed that the face-to-face learning improves study habits and provides an opportunity to learn and relearn with more interactions. In this regard, face-to-face learning is the preferable mode of learning in mathematics as it allows multiple options of promoting creativity for sustained learning.

Multi- Methods is the Keys for Teaching-learning Mathematics

In the semester system, we can use different teaching methods in the teaching-learning subject matter in general and mathematics in particular. The choice of teaching method is based on the objective and the nature of the subject matter. We asked one of my teacher participants T_1 about the use of teaching method in his classroom teaching. He replied,

In my classroom, teaching-learning activities, to engage students in the semester system application of think-pair-repair, brainstorming, concept mapping, discussion, reflective writing, role play, interactive demonstrations, case studies, and problem-based learning can be used.

In this concern, I asked one of our students participant S_2, shared his view as,

A semester system is a type of system which divides the academic year into two terms of equal length. So, in the semester system, one year of academic course is divided into two equal terms of 6 months each. It is the new system in the field of the education system of Nepal. I think this system was applied regularly on University Campus since last eight years. So, this system is new for the teachers and students. Let's talk about the existing teaching-learning practices in the semester system. In this system, the student-centered teaching method is used which focused on the interaction between student-student and student-teacher. In our own experience, there is less use of lecture method and with more preferences on student-centered method like problem-solving, guided discovery method, inductive method, discussion method, etc. Also, there is a space for the use ICT by teachers while teaching and presenting his/her lesson in order to make the class more attractive. So, in our experiences, pedagogically the semester system is modern and suitable, and it is also applicable for the teaching-learning process in our campuses.

From the above information of our participants, we came to the conclusion that, in the semester system we applied multi-methods for delivering the subject matter to the students. Teachers use student centered pedagogies in the classroom to engage students in the semester system through application of think-pair-share, brainstorming, concept mapping, discussion, reflective writing, role play, interactive demonstrations, case studies, and problem-based learning and use of ICT added pedagogy.

With the hope of verifying the responses of the teacher and student as well as observing the actual classroom practices from the methodological perspectives, we planned and managed for observing a class of our key respondents.

It could be the day of 19 November 2021. The day was cold enough. I reached the college in the evening time. I called my key informant, knowing he had already moved into his class. Then, I went directly to his classroom.

Me: Excuse me, sir. Could you please allow me to get an entry?

He (respondent): Please sir.

Me: Thank you so much.

And I went to the last desk of the class and sat there. At the same time, students were looking at me curiously.

Then immediately their teacher introduced me and moved with his regular class.

I knew he was just creating an environment for that day's class.

He invited one of the students for his presentation on a regular schedule.

(It was great to know that students took part in content presentation, in front of the class, at the scheduled time.)

The student presented his presentation with some well-decorated slides through a projector.

At the end of his presentation, the teacher summarized the key concepts of the content. And, then he (the teacher) requested all the students to share their understanding and confusion to continue the discussion.

At last, it was really impressive to know that he requested students to reflect on the classroom discussion and suggested to prepare a short note.

With these practices, I came to a decision that the semester mode of the teaching-learning system in some ways is the turning point for the shift in methodological perspective from only lecture method to student-centric discussion mode.

Likewise, to deal with the research question, existing practices of semester system in the mathematics classroom, we conducted the other focus group discussion (FGD) comprising six participants. It was conducted in M.R. campus, Tahachal. The principal investigator raised the issues in the FGD. The co-investigators recorded the participants' voices and took photos of FGD. The FGD continued about one hour.

From the FGD, we concluded that in the semester system, the main teaching-learning strategies in the mathematics classroom were slide presentation of the teachers in the classroom, demonstration, interaction method, project work, classwork, group-work, participatory work. Moreover, there is collaboration with the students, participating. However, all students were not equally active in classroom discussions. In a classroom, we should emphasize scaffolding, reinforcement, motivation. In this line, constructivism theory of Vygotsky (1978), focuses on scaffolding which makes learning fruitful. On November 23, 2021, in order to carried out our research, we conducted the other FGD. We formed a group of seven members. After forming the group, we decided to take me as the principal investigator and other co-investigators would take the responsibility. I as the principal investigator, raised the issues. Others two co-investigators took the responsibility of recording the responses provided by the students and also took the photos during the discussion period.

After distribution of the role of the members in a group, we decided to go to the field. For our task, we were assigned with the topic entitle 'Existing Practices of Semester System on TU'. Our aim was finding out views of the learners towards the pedagogical practice of the semester system on TU,

As the classes of M.Ed were running in the morning at Sano-Thimi Campus, we went to the campus in the morning, at 9 o'clock. It was not new for me. We directly went to the class of M. Ed fourth semester. We chose seven students to conduct the discussion. We asked them to sit making a circle for easy to discussion. After clarifying our purpose, the issues viz existing teaching-learning practices carried out the semester system in

mathematics classes by principal investigator; the responses of all the seven participants were recorded and photos were taken by co-investigator. After taking the responses of the students, we thanked them for their active participation in FGD. It took about one and a half hours' time to complete our task with the students. After that, we went to the campus canteen to have some snacks. We had tea and samosas for our snacks. Then, we sat in a circle on the campus ground and discussed the responses that we had with us. Students responded that the semester system was better than the annual system and the assessment system was also more scientific whereas, only two students responded that it was not flexible like annual because of regular attendance and term-wise assessment.

Likewise, regarding the activities of the semester system, students responded that they were involved in group work, self-study, report writing, discussion, pre-reading activities, and internal and external examinations to complete their semester. After discussing the responses, we found that the semester system is more effective than the annual one. There is the use of student-centered techniques and activities in the classroom. Each semester runs for six months; there is regular evaluation and feedback, the assessment system is also more practical and activity-oriented, and learners try to become independent. We also found that group work, self-study, report writing, discussion, class presentation activities were practiced in the semester system. Although the semester is not bad, like everything, it is not free from demerits. Some of the demerits are lack of proper treatment to all the units and contents from the side of the teachers and work-burden to complete the assignment on time (Dahal et al., 2022c). In this line, Arowolo et al. (2019) also found that assessments of teachers utilized of innovative teaching strategies in enhancing achievement in mathematics among secondary school students have highlighted the selection of teaching strategies, mathematics teacher choice for innovative strategies, and the mathematics teachers' response to the computer-assisted instruction. The study also found that the teachers used four innovative strategies: discussion web, manipulative, problem solving, and project-based learning strategies (Arowolo et al., 2019).

Use of Summative Assessment as a Formative Assessment Tool

Theoretically, we are aware of the appropriate use of assessment but there was practical miss-match of use of assessment of learning, assessment for learning, and assessment as learning meaningfully. In this line, one of our teacher participants T_1 share his view as

Summative assessment is a type of assessment that evaluates student's learning and overall competencies at the end of an instructional module by comparing it to a benchmark. It focuses on the outcome. It provides information about the attainment of knowledge and skills. It requires more time from students and lecturers, and it is done outside of class. So, it is a standards-based assessment. On the other hand, formative assessment is an assessment that is for monitoring student learning and providing ongoing feedback that students can use to improve their learning. It focuses on the process than the product. And it provides information about knowledge and skills. It requires little time from students and lectures, and it is done inside the class. So, it is the observations-based assessment.

Let's talk about our semester system. In my opinion, the semester system should be based on a formative assessment system. But our master-level courses do not adopt the summative assessment evaluation system. So, our semester evaluation system of the student is based upon the paper-pencil test. It is because only 10% of an evaluation is based on formative evaluation, and 90% of the evaluation is based on paper-pencil tests i.e. based on summative assessment system. So knowingly or unknowingly our semester system now seems

like a traditional annual system. As a name of internal and external evaluation, 90% evaluation is done with paper-pencil test. In internal evaluation, only 10% evaluation is done using formative assessment but 30% is done with paper-pencil test of 1.5 hours exam. In external evaluation 60% of the evaluation is done using paper-pencil test of 3 hours exam. This shows that our semester system couldn't break out the culture of paper-pencil tests. I think the semester system should be 100% based on a formative evaluation system and it should break out the traditional assessment system then only our semester system's value exists in our university. Thus, I want to say that the formative assessment system is the need of today but in practice, it is a mismatched.

From the above information of our participants, we came to know that the evaluation system of the students should change from using paper-pencil test to the project work, field visit, presentation record, and through maintain a portfolio.

This type of scenario is not seen for evaluation of the students' performance. From the above interview, we have come to realize that the semester system focuses on the holistic development of learners. So assessment was taken according to them. However, there are certain drawbacks as well. Course design is quite vague. So, it is difficult to complete the syllabus within the allotted time. Students have to manage the syllabus in a short time. This hinders their course comprehension part. Every learner's detailed classroom evaluation is out of the reach of teachers as they are also always in a rush of course completion. The above-mentioned conversation is good evidence that students do not get enough opportunity to evaluate the students' performance. However, we should gradually improve our assessment practices.

Diversify Assessment is the Key to Semester System of Mathematics Students

Assessment measures all-round capacity of the students. It is possible only using diversify assessment. To address this issue and gather participants' information, we concluded Focus Group Discussion (FGD) with the students' participants. To conduct the FGD effectively and successfully, we selected the Department seminar hall on 11 December 2021, at 3 o'clock. We made the plan for the role of researchers. As the principal investigator, I raised the issues of FGD that are assessment practices in the semester system in the department of mathematics education. Co-investigators took down the notes of the discussion and Video recording of the discussion and for other management as well. The principal investigator opened the focus group discussion saying good morning, everyone! First, I would like to thank you for being with us during your busy schedule. The purpose of this FGD is to talk about the status of assessment practices in students in semester system that you all have experienced and observed in your semester classes. Therefore, our whole discussion is around the assessment practice in the semester system at the Central Department of Mathematics Education. We expect your important and factual views frequently. Please feel free to put your exact experience and thoughts. Everyone would get a chance to put views one by one. Moreover, everything you express is kept confidential and anonymous and only used for our research purpose. Besides, we need to record a video of this discussion to ease for data analysis process. Do you agree to be a participant in this FGD? If yes, let us start without delay.

From the   FGD, we found that teachers have been using both formative and summative assessments. The project works, the group works reflective writing is used to evaluate the students' performance. Based on the regular attendance in the semester system, the teachers try to follow the e-assessment.

Likewise, we conducted FGD in the Sano-Thimi campus to apply assessment practices in the mathematics classroom in the semester system. It was conducted FGD to explore students' perspectives on assessment practice in the semester system within M.Ed. level mathematics students under the Sanothimi campus. We conducted FGD with sixty minutes long started at 10' clock after finish of their regular class, on 18th December, 2021 at one of the Campus rooms. For this purpose, we selected six students enrolled in M.Ed. the fourth semester with Mathematics major as the participants of FGD from the campus. Before conducting the discussion, we planned the activities for making the discussion more systematic, effective, and informative through the allocation of responsibilities to each researcher. According to our plan, the principal investigator visited the campus chief, subject teacher, and our participants on 16th December, informed him about the purpose and significance of the study, built a good rapport with him, and requested him for getting support and authority to conduct the discussion. Then, the campus chief introduced the researcher to his students, informed them about the researcher's purpose of visiting there, and called them to support him. The researchers again informed the students about the research purpose and significance and requested for participation in the discussion as per their interest. Thereafter, six students were interested to take part in the discussion and were informed about the time, duration, date, and place of FGD. Besides, the principal researcher had to play the role of moderator in the FGD program. Similarly, the first co-investigator had to play the role of facilitator with the responsibility of taking down the notes of key views of participants, and the second co-investigator, as a facilitator, had to take photographs and audio recording of the whole discussion.

We started the FGD as follow: Good morning, everybody! Today, on 18th December 2021, we will conduct a focus group discussion on the topic of existing practice of assessment in the semester system. First of all, I would like to thank you for giving your valuable time for us. The purpose of this focus group discussion is to identify the students' perceptions about the assessment practices in the semester system that you experienced and observed in your semester courses. Therefore, our whole discussion will be concentrated on the purpose. The findings will help suggest concerning authorities to bring changes and improvements in weak aspects of the existing semester system and make it more reliable, valid, and appropriate with the 21st century's global trend of assessments which will ultimately be beneficial for you too.

In this discussion, you will be asked questions based on our purpose, which took nearly one hour. We expect your significant, factual, and critical views frequently. Please feel free to put your views and thoughts about the system. Everyone has a chance to put views one by one. Moreover, everything you express will be kept confidential and your identity will be anonymous and used only for our research purpose. Besides, we need to take photograph and make an audio recording of this discussion for comprehensive data collection, and for the data analysis process.

The main themes obtained from the discussion are: The assessment follows a global trend based on a continuous evaluation system with a range of tools. The 40% weight in internal assessment tools (Assignments, Quiz, Attendance, Presentation, Term Paper, Group Work, and Mid-Term Exam) and the 60% weight in external assessment (end-

semester written exam) are allocated. Students' achievements are expressed in grade points. In internal assessment, most of the teachers intended to carry out all tools while students perform these tasks as formality breaking the time limits. Subjective (long and short) and objective questions are kept in the written test. Strengths- performance-based, focused on knowledge and skill development, globally valued, continuous engagement of teachers and students, the better chance of success, not published timely results of Dean office. Weaknesses- the gap between policy and practice, more pressure on students, expensive, chances of favoritism and biases in internal evaluation, lack of timely submission of assignments, lack of proper feedback are the semester system's limitations. The system has provisioned 80% of mandatory attendance to be eligible to attempt final exam; and project work, assignment, quiz, term paper writing, presentation have made students more engaged in their learning that will finally result in skilled, self-dependent, dynamic, knowledge proficient and globally competent academicians. Moreover, better chances of success are also considered as the positive aspects of this system. In this context, Tripathi et al. (2019) believed that we are shifting from written examinations to diversified assessments to effectively use the semester system.

Findings

This section deals with the findings, conclusions, and implications based on the analysis and interpretation of data. The findings are articulated in line of research questions with the themes a) teaching-learning practices, b) assessment practices, and c) visions of teacher educators and students. The conclusion is drawn based on the findings of the study. Finally, the implications of the findings are presented in four aspects: on pedagogies, theories, policies, and professional development of teacher educators.

Existing Teaching-learning Practices in Semester System

In the semester system, there was more meaningful communication between teachers and students so that they could enjoy the freedom of sharing the ideas and concepts of mathematics. The opportunity of two-way communication was instrumental to engage meaningfully in conceptualizing the ideas. Thus, way how the teachers and students exchanged their views was supportive to develop stronger relationships, interaction, and interdependency among each other. This was a collaborative learning in which they participated in dialogue and discussion making the classrooms livelier for clarification of abstract mathematics concepts.

The teacher educators were in attempt of integrates ICTs in teaching learning practices. Some teachers used ICT tools frequently such as presenting PowerPoint, showing videos, searching resource materials (Dahal et al., 2022d), using different search engines but other used marker boards as the nature of the subject matter. Generally, teachers used multi-methods in teaching-learning of mathematics. In many cases, the teachers used student centered pedagogies in the classroom to engage students applying the strategies such as think-pair-shares, brainstorming, concept mapping, discussion, reflective writing, role play, interactive demonstrations, case studies, and problem-based learning.

Assessment Practices in Semester System

The mathematics teacher educators were able to diversify the assessment practices. They adopted assessment of learning, assessment for learning, and assessment as learning for maintaining social justice for all types of learners. The introduction of internal and external evaluation systems were likely to promote alternative assessment practices such as performance based assessments. The 40 percent was carried out from internal evaluation and 60 percent was carried out by external examination at the end of the semester. Out of 40

percent of the internal evaluation, 5 marks were given for attendance, 5 for classroom activities, and 30 for three internal assignments and exams. And the final examination of 60 marks was marked through the use of paper-pencil test i.e., the summative ways. Likewise, in the internal assessment, teachers used various ways of assessing the students' performance such as project work, portfolio, reflective writing in the classroom, and home assignment.

Likewise, teachers use alternative assessment: towards dialectical positioning were the main assessment techniques used in the semester system to assess the students' performance. In the semester system, teachers practice both types of assessment, formative as well as a summative assessment. More focus is given on alternative assessment such as performance-based assessments, group work, and portfolios, project work, reflective writing, reviewing the papers, peer assessment, self-evaluation. Using alternative assessment helps to create a thinking challenge through which critical analysis skills and informed opinions can be developed. Alternative assessment promotes open-mindedness and a willingness to take relevant evidence and argument into account in forming or revising our own beliefs and values. It creates alternative possibilities for problem-solving.

Promoting Teaching-Learning and Assessment Strategies to the Semester System Students

Teaching- learning mathematics should be joyful because it is a continuous growth and self-reflection process. Mathematics teachers are very good in coming up with ideas and helping to motivate students through fun activities namely games, puzzles, and manual exercises. All mathematics teachers should use practical daily solutions as much as possible to teach their students so that their courses can be learned meaningfully. When the students learn through fun, the success rate of mathematics may be high. Likewise teaching-learning mathematics through the digital tutor is another strategy for making mathematics students friendly.

The concerned department/campus must provide adequate computer and internet facilities for the students. Then the students can start learning mathematical concepts through the use of Digital Tutor like use of social sites, Facebook heading videos, YouTube, and the success rate of students may increase gradually. Mathematicians tend to use virtual learning environments (VLE) less when teaching mathematics in universities because they believe that this type of learning can reduce the rigor of mental thinking required learning mathematics.

On the top of that making semester system is students friendly through teaching-learning mathematics using moodle platform. For this, in moodle platform, we can upload various activities to make a more iterative learning environment. Moodle provides opportunities for creating a profile of the course facilitators so that it is easy to know the area of expertise of the facilitators to anyone. In the moodle platform activities like discussion forum, quiz, assignment, video, grading etc. are included so that students can enjoy learning mathematics and increasing the performance of the students (Dahal, 2019; Dahal, 2022; Dahal et al., 2022a; Dahal et al., 2022b). For using flipped pedagogy students are motive to learn mathematics in the classroom. The flipped pedagogy helps students to be prepared already at the home regarding what is going to be discussed in the next class so that they feel more responsible in learning and open the door to discussion subject matter in the classroom teaching-learning. And it helps to extend their understanding to the depth in the subject matter.

To make the semester system student friendly, teachers need to use indigenous art-based learning in mathematics classes and all subjects in general. If teachers incorporate mathematics teaching into students' diverse arts and traditions, the process of teaching and learning mathematics becomes fruitful. Enhanced theoretical knowledge of contextualization and use in the students' day-to-day community of practices and learning mathematics is a more practical way. We can apply teaching methods based on local knowledge to stimulate learning and make learning meaningful for the integration of various arts and cultural heritage. Furthermore, it increases the understanding of mathematical ideas. For this, we developed practical knowledge from the theoretical knowledge and developed skills to connect both theoretical and practical knowledge of contextualization, so that learning occurs in a sociocultural context, allowing them to interact and discuss their culture and community knowledge and practices. Making semester students' friendly use of transformative pedagogy is another strategy. In transformative pedagogy rather than being content-focused, transformational teachers help students become critical participants in the learning process and well-practiced at critical thinking, goal setting, and reflection. There should be self-awareness, self-inquiry, and self-reflection for transformative learning in teachers and students.

Through use of comprehensive assessment for better the semester system. Comprehensive assessments help students record their progress towards their learning goals and help teachers change instructions when necessary. Real evaluation requires students to show their learning by creating products or completing assignments, demonstrations to show what they know. The subject's real score determines the work's quality based on various abilities such as mastering basic content, communication skills, teamwork skills etc. Likewise shifting assessment of learning to assessment for learning and then assessment as learning. However, more focus should be on the assessment of learning instead of the assessment of learning. The assessment for learning, promotes teaching and learning comprehensively, motivates learners to learn, promotes the development of thinking skills, and continuous self-assessment, so it is essential to emphasize assessment for learning in the semester system. Similarly, the assessment as learning is embedded in the learner's self-reflection. It makes students responsible for developing self-control. It emphasizes students' understanding of real-life situations.

For promoting the students' friendly semester system, an academic calendar could be needed to run in its rule. Exams and results were conducted on time and there are problems in the GPA system, and it does not match to other faculty and another university, so it was made scientifically. Likewise, co-curricular activities should be conducted regularly. This is the age of the 21st Century, so our teaching-learning activities and assessment system should be applied to address the demand of this age. In 21st century, we created an environment to develop the learning skills such as critical thinking, creative thinking, collaborating, and communication. Likewise, literacy skills, information, media, technology literacy, and life skills can be used for the students' flexibility, initiative, social skills, productivity, and leadership. To address these issues, the teacher scaffolding by using different techniques like modeling, providing examples, working one-on-one with students, using visual aids. Scaffolding, helps to student helps to motivate the learner, minimizes frustration of the learner, allows the learner to learn quickly, provides a personalized teaching experience, and allows for efficient learning. So, it could be addressed the students' needs for 21st-century learners.

Conclusions

The semester system at Tribhuvan University's Central Department of Education has undergone a radical transformation in terms of pedagogical practices, particularly in mathematics. By implementing shared learning strategies, teacher educators have improved student interactions and relationships. The annual system of hierarchy has been reduced among them. The use of ICTs in teaching and learning methods further improved the collaborative learning. Teachers used a variety of techniques and strategies that were more effective at helping students conceptualize the abstract ideas and concepts in mathematics. They were able to cultivate critical thinking skills regarding the topics they discussed in the classroom.

The use of alternative assessment methods was probably going to improve students' learning. The tests promoted learning rather than just grading the students' skills. On the one hand, the emphasis on testing students' higher order thinking skills helped create newer knowledge. Contrarily, the varied assessment methods were advancing social justice for all categories of students. The availability of internal and external evaluation systems was beneficial in helping learners develop multiple competencies or their overall development. The students' learning was boosted and motivated by the assessments.

Using a variety of teaching strategies and incorporating newer technologies will help make learning mathematics more enjoyable. The university as a structure must consider the resources for the management of ICTs while doing this. It is important to use newer pedagogical techniques to increase students' cognitive, affective, and behavioral engagement with mathematics learning. Adopting transformative pedagogy, which helps to contextualize mathematical learning, is essential. To make learning more meaningful, it should be encouraged to incorporate indigenous or local cultural artifacts into lessons. Additionally, it is critical to assist students in tracking their progress toward their learning objectives and support teachers in making necessary instruction changes through the use of comprehensive assessment.

Implications

The findings of this study will help teachers and students of mathematics by offering recommendations to Tribhuvan University's Faculty of Education on how to strengthen areas that need improvement. This study also has implications for teachers who want to employ the most effective strategies for instructing students and evaluating their performance. The results will assist the relevant authorities in strengthening the weak points of the current semester system and making it more dependable, valid, and in line with the global assessment trend of the twenty-first century, which will ultimately be advantageous for you all. All interested parties should promote the biannual-friendly system. The results of this study will help all researchers conduct research in related areas and make for interesting reading for students, teachers, the Ministry of Education, and other institutions. Additionally, several implications can be listed, including those for education, policy, theory, and our own professional development.

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