Curriculum Implementation in Teaching Strategies: Enhancing Creativity within Secondary Mathematics Classrooms

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Abstract

The predominance of teacher-centered instruction constrains the integration of creative approaches in secondary mathematics classroom practices. The main aim of the study was to enhance innovative strategies in mathematics teaching for enhancing creativity gradually multifaceted and active in mathematics classroom practices through curriculum implementation. To achieve the main aim, a qualitative particularly, the narrative inquiry, was applied to explore how innovative teaching strategies affect the 21st century competencies in secondary level. the data were collected through in-depth interviews, from six students (two each school), three mathematics teachers from three community schools (one teacher from each school) and one curriculum expert. The results revealed that continuing classroom practices remain traditional, teacher- centered and rote- learning oriented, relying on paper-pencil approaches. The required policies employed to improve creative work, innovative performance, and critical thinking to provide hands on experiences weak and inadequately emphasized. The study indorses the traditional strategies and prescribed curricula must be updated to enhance 21st century skills in the learners.

Keywords: curriculum, creativity, critical thinking, innovative performance, global trends

Introduction

The curriculum of mathematics has been found to increase the students' engagement and improve the problem-solving skills through classroom practices(Belluigi & Cundill, 2017). The curriculum implementation needs to emphasize beneficial effects of advanced mathematics classroom instruction for developing key cognitive abilities among the secondary level students (Pathoumma, 2024). In this context, a well-designed curriculum must integrate decisive strategies, content and instructional strategies which promote insightful thinking enhancing students' critical thinking of the students (Ismail et al., 2022; Tan et al., 2024). Moreover, pre-determined answers can hinder for the innovation and critical thinking which succeeds on cognitive and meta- cognitive skills like as intuition, curiosity, perseverance and transformation.

Fundamentally, three critical factors such as curriculum, content, and learning environment influence creativity and critical thinking in classroom practices (Behar-Horenstein & Niu, 2011; Padget 2013). Additionally, creative solutions may emerge naturally to develop over time by critical thinking (Catarino et al., 2019). Moreover, teachers creativity has been connected with transformative culture in the classroom practices over critical thinking (Adams et al., 2016; Basic et al., 2022). Though, creativity does not occur in isolation; it also depends on depth knowledge and proficiency within specific field of critical solution of classroom practices (Indarasati et al., 2019). Actual classroom teaching and learning starts with careful and well planning of curriculum by mathematics teachers (Mcloughlin & Hodson 2013) without it, classroom management can become disorganized and hinder in learning process (Omar et al., 2019). Therefore, careful curriculum implementation and planning is essential for effective teaching and smooth classroom practices.

The curriculum encompasses a collection of knowledge, ideas, concepts and skills to be taught over a specific period, shaping cognitive tasks of the learning journey (Padget, 2013; Schoevers et al., 2019). Innovative classroom practices and accepting creative learning methods to engage over the curriculum practices in stimulating ways (Pathoumma, 2024). In spite of its, content dominated nature in classroom practices need to change learners' cognitive, social, and dispositional growth (European Commission, Joint Research Centre, 2010). Additionally, teacher educators can encourage creativity after involving with students in flexible learning experiences as well as providing them classroom practices (Indarasati et al., 2019; (Kandemir et al., 2019). Here, the process of implementation of curriculum reflects productivity and explain difficulties

(Wijaya et al., 2021). However, despite mathematics teachers' constant and effective application of the curriculum, students are not achieving satisfactory learning performance (Cattarino et al., 2019; Jamil et al., 2024).Basically, innovation indicates creative thinking and considerable procedure of creating new opinions and investigating with different ideas and practices.

The use of compulsory mathematics curriculum of class ten mainly highlights inquiry-based learning to promote the advanced thinking. It also utilized the open-ended questions, peer groups projects and solving controversial issues (Munawaroh, 2018). Likewise, Socrates and Freire support dialectical approach which employs questioning to encourage learners to think deeply (Fedoryshyn & Shtanko, 2022). In mathematics classroom, students' participation and their achievement as well as performance are affected by their classroom instruction and cultural factors (Hrivnak, 2019). Not only this, critical thinking is rooted in psychological and philosophical thought of both teachers, educators, experts and students (Wang & Abdullah, 2024), as well as teachers and students' creativity in implementation of curriculum(Arisoy & Aybek, 2021; Chukwuyenum, 2013). Lastly, innovation in mathematics classroom practices refers effective instructional methods and skills which enhance learners' thoughtful, engagement and problem-solving skills (Hunter et al., 2020; Tan et al., 2024). However, mathematics classroom practices in Nepalese context remains mainly theory based, teachers centered, focused more in unfair practices in teaching and learning mathematics system which increase rote learning (Panthi & Belbase, 2017). This study attempts to explore how the effective implementation of the mathematics curriculum through innovative and students centered teaching strategies fosters students' problem-solving skills, and conceptual understanding at secondary level.

Context Setting

The main concept of critical thinking has been applied across various disciplines such as logical, pedagogical, ethical, ontological, epistemological dimensions. The crucial aspects of classroom practices promote begins cultivating mathematics teachers (Behar-Horenstein & Niu, 2011; Lorencová et al., 2019 School based assessment is needed to recognize the process of confidence and effective for the self-efficacy and beliefs for the ability in pedagogical practices. Moreover, Klassen and Tze's (2014) focus that meta-analysis and self-efficacy with teaching performance over correlated with students' academic achievement (Belluigi & Cundill, 2017)

and it highlights mathematics teachers' self-confidence and deep competence in nurturing serious thoughtful in the classroom (Alsaleh, 2020).

Classroom creativity requires supportive pedagogy which encourages open learning environments and innovative thinking to create and engage meaningful beyond the traditional learning activities (Kozlowski et al., 2019; Maass et al., 2019; Wijaya et al., 2021). Furthermore, school-based assessment promotes creativity in mathematics classroom practices ensuring deep learning (Basic et al., 2022; Hunter et al., 2020; Schoevers et al., 2019). Mathematics teachers with humanistic philosophical attitude who encourage their own creativity and instructional techniques tend to enhance decreasing traditional instructional methods (de Almeida & Viana, 2023; Hrivnak, 2019; Huizinga et al.,2019; Remillard & Heck, 2014).

Generally, classroom instruction is based on moral performance which plays a decisive role in shaping students' capacity for critical thinking in logical and problem-solving approach (Handelzalts, 2019; Munawaroh, 2018). In present context , mathematics classroom practices need to move beyond rote learning, memorization over the analytical reasoning among the learners (Ellerton & Kelly, 2021; Kelly et al., 2019). Though, inquiry- based learning, real-life problem solving and conceptual understanding, curriculum implementation can create opportunities for learners to question, explore and construct knowledge independently in regular classroom teaching (Beswick, 2021; Indarasati et al., 2019; Kandemir et al., 2019).

Despite these situations, everyday classroom practices in teaching mathematics in Nepal lack creativity because mathematics teachers only solve the text book problems and the questions asked in previous examinations. They primarily concentrate themselves in improving examination results i. e. increasing pass percentage rather than empowering creativity and criticality in the learners. So, this study can offer valued contributions for improvement mathematics classroom practices together with increasing students' achievement as well as quality. The main aim of this study is to explore how the existing mathematics curriculum can be effectively implemented to foster the classroom practices detecting the challenges and issues related to the implementation of curriculum.

Basically, curriculum implementation in instruction expected at enhancing creativity within secondary mathematics classrooms is very important because mathematics classroom practices demand not only procedural fluency but also reasoning, creative thinking and problem-solving skills which reduces rote learning (OECD, 2019). Moreover, it is important how

mathematics teachers enact the curriculum through inquiry-based learning, problem-based tasks, collaborative learning which allows explore ideas and constructive learning (Boaler, 2016; Silver, 1997).

Philosophically, this approach is grounded primarily in constructivism, which opinions learning as an active process where students construct knowledge through experience and classroom reflection (Piaget, 1972), and social constructivism, which emphasizes classroom dialogue, interaction, and cultural tools in mathematical meaning making (Hausfather, 1996; Vygotsky & Cole, 2018). Furthermore, it aligns with pragmatism, as advocated by Dewey (1998), which stresses learning through problem-solving, and humanistic educational philosophy as well as self-expression. Hence creative curriculum implementation in mathematics is philosophically justified as it enhances meaningful learning, intellectual freedom and learners' autonomy (Ernest, 1991).

Inside this background, a narrative inquiry is used for the in-depth exploration of how mathematics teachers implement the curriculum in mathematics classroom; how students learn and how curriculum experts view their insight about the curriculum implementation for critical thinking, which also shows lived experiences and transformative practices that shape meaningful mathematics learning.

Method

This study is based on constructivist paradigm which seeks to understand the subjective experiences and meanings that mathematics teachers create within mathematics classroom (Creswell, 2007). This study utilizes a narrative inquiry, a qualitative research design for exploring the subjective experiences of secondary level mathematics teachers in Nepal. Moreover, constructivism in creative thinking asserts that learners build their own understanding through active engagement and classroom exploration (Creswell, 2009).

In mathematics classroom this research supports implementing curricula and emphasize problem solving skills, reasoning and creative exploration rather than memorization (Almulla, 2023; Lunenburg, 2011). Furthermore, it also emphasizes the learners seeks to build their new understanding through participation, collaboration, interaction rather than passive learners. Not only this, it gives to the curriculum designer in depth feedback for the 21st century skills. Furthermore, we used Vygotsky's constructivism theory for the linkage of the study, because,

constructivism represents another closely related movement in education that actively shapes the connection between teaching and learning

Consequently, this study focused purposive sampling procedure to explore the creativity and critical analysis of participants' views, perspectives, challenges in curriculum implementation over the learner development. Through purposive sampling, we have selected three community secondary schools from Kathmandu district. We also have taken three mathematics teachers, six students (two from each school) in grade ten, one curriculum expert from the municipality for exploring comprehensive insights into the research problem.

In this context, we explained the research objective to the participants as well as we took consent of the respondents. They agreed about the involvement of the research process. We used interview guidelines for the participants. All ethical considerations were followed during the data collection procedure from the participants. The systematically collected data were carefully transcribed, cleaned, coded, and organized into themes. Moreover, we analyzed the collected data on the basis of thematic categorizes (Creswell et al., 2006; Creswell & Creswell, 2018).

Finally, we shared the responses provided by the participants and explained how we analyzed it and reached our conclusions. We also consulted the concerned participants to decide whether the study should be published and confirmed that the information presented is accurate as well as not misleading. We also took detailed feedback from the participants which confirmed to us. The presentations were free from misinterpretation; based on their confirmation and consent the findings were finalized for the publication.

Results

In this section we explored how the implementation of curriculum to the development of critical thinking, innovative performance and creativity among teachers, learners and curriculum experts. Also, it explored the association among classroom practices, impact on their learners' creative, cognitive and metacognitive over the curriculum implementation. For the results and discussion part, themes were created through an inductive thematic analysis such as transcribing data, reading the data repeatedly. After repeated reading of the transcripts, meaningful parts of the data were coded. Similar codes were grouped into categories, which were then abstracted into global themes aligned with the research objectives. To ensure ethical standards, pseudonyms were given to all participants to protect their anonymity.

Integrating Creativity into Classroom Learning.

Necessity of creativity in mathematics classroom activities denotes the parts of originally plays in effective teaching and learning procedures. It highlights the imaginative thinking, flexible problem solving and innovative instruction that move beyond rote memorization and mechanical problem-solving skills (Kandemir et al., 2019). Moreover, creativity prepares both students and teachers over critical, innovative and problem-solving skills. However, creativity is very challenging due to multidimensional factors like environment, motivation and cognitive development (Adam et al., 2016). In this context, barriers perceptual, cultural and emotional must be overcome to enhance creativity (Hilal et al., 2013). However, Nepal's policies emphasizing creative capacity, educational innovation remains limited (National Education Commission, 2018). Therefore, in mathematics classroom promoting creativity is crucial for students, teachers and curriculum experts for readiness and academic growth. The experiences of teachers, students, and curriculum expert regarding creativity, innovation and problem-solving skills in mathematics classroom were explored through their respective statement. We arranged the statements of three teachers; students' views were incorporated in group based on their similarities and expert views was also incorporated separately.

Teacher A with 12 years of experience in a community school, reflected:

I always used to teach strictly the textbook, finishing one chapter after another. But I noticed students lost interest in classroom practices.

> *When I used to teach strictly from prescribed textbook, completing one chapter after another chapter. But I noticed students were lazy. After I taught by using creative tasks like preparing questions, designing word problems, preparing instructional materials, then students began to enjoy in mathematics classroom. They also started to connect the formula with their physical material like room, chair, desk, bench.*

From the above Teacher A's view reflected that a shift from traditional instruction to procedural teaching to creative engagement, revealing how creativity brought relevance and enthusiasm into the mathematics classroom. His viewed was that creativity not as more additional task in teaching but as a means of inspiration curiosity and ownership among learners.

Teacher B who teaches more than two decades in community school, shared his view

> *"My students have different learning capacity and levels. If I only follow the prescribed curriculum step by step, some students get bored and other get lost in the classroom*

activities. So, I use games in mathematics, linking verbal problems of arithmetic into real life problems, gives different examples, storytelling, and art to make lessons inclusive. For example, during a lesson for fractions and geometry, we used paper activity, everyone participated even the shy ones"

Here, his experiences reflect that creativity serves as a bridge between diverse learners and helping teachers address varied abilities and their learning styles. For teacher creativity become a tool for equity and inclusion, enabling students to access mathematical ideas through multiple representation.

Teacher C, a newly appointed teacher in school, expressed frustration:

I love the ideas of creative teaching, but it's not easy. We have large classes, lack of resources, pressure to complete the course on time, classroom instruction is a marathon race for completing the course. Sometimes, I want to try new methods, but other teachers say it is a waste time, in Nepalese context and situation lecture method is the best approache. Still, I try like letting students come to the blackboard to create their own self examples and help to solve for them.

The above statement highlights the cultural and structural barriers in classroom practices. However, eagerness, mathematics teachers often face several constrains from rigid assessment system and lack of formal institutional support.

In group, grade 10 students shared their students:

We used to think mathematics is only about the remembering formulas, when our teachers asked us to create new types of problems and projects about the real-life mathematical problems in classroom practices. We all realized that mathematics could solve real problems. It made us confident and proud.

The above statement reveals that creative and project-based activities help learners to see mathematics as a useful, empowering and useful subject instead of abstract set of rules. It means creativity enhances motivation and joy in learning of learners. It transforms the classroom practices from the place of problem-solving anxiety to one of study of joyful real-life context.

A curriculum expert who involved in preparing and revising the mathematics curriculum explained:

The mathematics curriculum focuses the competency based and helps to develop critical and creative thinking skills. However, many mathematics teachers only solve

mathematical problems in blackboard serially, starting from one to end. Moreover, some mathematics teachers still equate creativity with art or fun activities. Creativity in mathematics refers allowing flexibility in reasoning and connecting concepts to everyday life. Mathematics teachers seek and need professional and pedagogical support and autonomy to make creativity possible.

The above statements highlight that the curriculum expert's view on role of creativity in curriculum goals, its regular implementation depends upon mathematics teachers' knowledge, understanding, skills, training, freedom and institutional supports to innovate in classroom practices.

Curriculum Supports and Enhances Creative and Innovative Approaches

The main role of curriculum for innovative and creative teaching-learning refers providing a flexible and student-centered framework that fosters problem solving in instruction and learning process (Ellerton & Kelly, 2021). In addition, a well- trained teacher drives classroom progress, applying an innovative curriculum that enhances creativity, critical thinking and holistic growth (Padget, 2013). In this situation, engaging students in exploratory and ownership-based learning promotes creative thinking and innovative approaches (Morley, 2010). In Nepal's context, creative teaching and learning is to complete the course on time and students able to solve whole problems that have been asked in final exam. Though creative and internal assignment related learning are often overlooked in favor of final exam-focused learning due to lack of time, resources and efforts.

In this context, Teacher A, who has been teaching mathematics for over a decade, shared:

"The curriculum gives us the topics, but it is up to us to make them meaningful. I often design small projects where students can connect mathematical ideas to daily life, like calculating household expenses or measuring local fields. When students see math around them, they become more creative and confident."

His view underlines that the curriculum serves as a guiding framework rather than a strict boundary. For him, creativity in teaching emerges when the curriculum in interpreted flexibly allowing teachers to connect prescribed content with real-life applications that engage learners' interest.

Moreover, teacher B expressed about the concern of rigid structure of the curriculum:

> *We are told to complete the syllabus on time; there is hardly any room for creative activities. The exams are based on memorization, so even when I try to use new methods, students ask, will this come in the exam? That question stops me.*

The above statement illustrates the tension between curricular goals and assessment practices. Though the curriculum aims to promote critical and creative thinking, its implementation often develops confined by time pressure and assessment demands.

Teacher C described that how he incorporated innovative techniques within the curriculum:

> *In my class, I encourage students to design their own math problems. It is a simple technique, but it helps them think differently. When they create problems, they understand the concepts better. The curriculum allows such activities, but it depends on how teachers interpret it.*

His view enhances that innovation flourishes when students are active participants. Teacher C sees the curriculum as an open creativity for classroom flexibility.

A grade 10 students shared:

When our teacher asked us to make a

> *"When our mathematics teacher asked us to make a model showing how area and volume are related, we really enjoyed it. We could see how words problems of mathematics connect in real life. Such live experiences and activities make learning is more interesting to us for remembering problems better. Moreover, most of the time, we just solve mathematics problems from the prescribed text books, which makes the subject mathematics is too dry.*

From the above statement, creative, innovative hands-on tasks make learning make learning enjoyable and meaningful. Students highlight the curriculum becomes more effective only when interdisciplinary and creative methods is applied in classroom instruction that connect it real life connection.

The curriculum expert said that:

> *The curriculum aims to develop creative, critical and innovative thinkers; however, implementation is very challenging work. Teachers and administrative planner always think curriculum as a fixed content. Teachers give more emphasis to complete the course in given academic calendar instead of real-life application. We are now planning to include project-based learning to make learning more practical.*

The above statement shows that curriculum's intent and classroom reality often diverge. Although the official design aspires to foster creativity in its implementation relies on teachers' expertise, classroom resources and administrative supports.

Practical Enactment of the Curriculum in day-to-day Classroom Instruction

Basically, praxis of curriculum in teaching-learning over the classroom denotes to the practical realization of curriculum goals and philosophies within real classroom contexts. It also involves how mathematics teachers interpret, adapt and implement curriculum content through creative and reflective teaching practices that connect philosophy to action (Belluigi & Cundill, 2017). Furthermore, practice- based implementation of curriculum is a dynamic process that provides experimental learning which is grounded in the theoretical knowledge of curriculum (Jamil et al., 2024). In this context, the implementation of curriculum makes a bridge gap between living experience of learners in classroom practices (Gyawali, 2023; Hrivnak, 2019). A dynamic and competency-based curriculum goes together with the changeable syllabi, together with learners' needs and interests. Finally, mathematics teachers play a significant role in implementing the curriculum and creating new teaching and learning (de Almeida & Viana, 2023). Though, existing teaching- learning process is shaped by top-down approach in mathematics classroom.

In this context, teacher A shared his experiences:

I used to think curriculum was something to be tracked word by word, a mathematics teacher with fifteen years of experiences. However, over time, I realized that teaching is not just completing the course content of syllabus, it is about describing and interpreting for the students sitting in front of me. The curriculum gives direction, but it is our responsibility to transfer it into meaningful learning experiences.

He pronounced how he accepts his lessons based on scholars' willingness levels, using existing materials and real- life difficulties. Curriculum is a race course of the teachers and learners.

Teacher B, expressed a different view.

> *Sometimes, I feel trapped between what I know learners need and what the curriculum demands. The pacing guide is strict, and assessments are standardized. I want to create inquiry-based lessons, but the time pressure and administrating expectations pull me back.*

He waited and sighed; I think that the praxis is a thoughtful reflective action to search spaces for beyond the prescribed text-book. Even those small moments feel like freedom.

Teacher C, expressed his view:

Reflective thinking such as praxis is a social commitment. Our classrooms are diverse so learners arrive from different social and cultural backgrounds. The curriculum should be flexible enough to reflect their voices.

He highlights how the stories and examples connect the real-life problems of mathematics content. When learners see their life reflected on the content, they will feel valued and lucky. Moreover,

Curriculum becomes alive when it connects knowledge with culture and experience." He added thoughtfully, Praxis is not only applying the curriculum but transforming it in the process of teaching.

Students grade ten, expressed their perspective:

"We like while mathematics teachers relate the lessons to our daily life, we also remember that we measured our classroom by using tape to learn area, perimeter and diagonal length which makes us it is only real application of mathematics in classroom practices. However, sometimes teacher solves the problems in blackboard for completing the curriculum. Moreover, most of the time, we just listen and copy the solution in white copy. Teachers are hurry to finish the course before final exam. We want more practical work and discussion in classroom practices.

From the above view, students see the values of practical implication of mathematics lessons that connects to real life experiences and implication as well as practical activities. However, curriculum pressure and exam-oriented instruction make limited interaction leading learners to want classroom discussion.

The curriculum expert, provided a broader lens:

The prescribed curriculum is a living document; it becomes meaningful only through reflective practices and knowledge transfer from one person to another.

In this context, mathematics teachers are not passive implementers. They need to become co-creators of educational experiences. We must view that curriculum as a dialogical process between policy and practices, teachers and learners as well as philosophy and realism.

From the above his view, he emphasized actual praxis demands practical instruction, continual feedback, pedagogical implication and professional collaboration. Not only this, curriculum praxis is the heartbeat of quality education, it transforms the policy into pedagogy and pedagogy into lived learning.

Discussion

In this section, the main the results were interpreted, findings were summarized, and compared with existing literature, the outcomes were generalized, study was critically explored, main conclusion were presented and implications were discussed. The finding of this study demonstrated that the curriculum implementation in secondary level mathematics classrooms plays a vital role in shifting classroom practices away from rote memorization toward meaningful and collaborative learning. The narratives of mathematics teachers, students and the curriculum expert collectively revealed that the creativity emerges not merely from curriculum but how teachers interpret enact and adopt the mathematics curriculum within their classroom practices. Mathematics learning in contemporary classrooms requires more than practical fluency; it demands reasoning, creative thinking and the capacity to apply new knowledge to unfamiliar contexts((Chukwuyenum, 2013; Huizinga et al., 2019; OECD, 2019). It means creativity functions as a pedagogical strategy that connects abstract mathematical concepts with concrete understanding of mathematical problems.

Participants' experiences explore a gradual transition from traditional, textbook-driven instruction to more creative and students center practices. Participants emphasized that how strict adherence to prescribed textbooks initially resulted in student disengagement, whereas the introduction of creative tasks such as designing word problems and using instructional materials revitalized students' interest and understanding. This finding aligns with Boaler's (2016) argument that inquiry- based and context- rich mathematics instruction supports conceptual understanding and student's activity.

Likewise, respondent emphasizes that creativity as a tool for equity and inclusion, not only these live experiences and creative activities make learning is more interesting to us for remembering problems better. By employing games, storytelling, real-life examples and hands-on activities, participant was able to address diverse learning capacities within the same classroom. In Nepal's classrooms, lack of equity, gender imbalance, linguistic diversity, cultural diversity and traditional curricula further hinder creative and innovative learning (Almulla, 2023;

Panthi & Belbase, 2017). This supports Silver's (1997) view that problem-based and open-ended mathematical tasks provide multiple entry points for students, enabling students with varied abilities to participate meaningfully. Creativity, therefore, helps not only cognitive goals but also social dimensions of learning, ensuring that mathematics classrooms are inclusive rather than selective.

In contrast participants experiences explores the structural and cultural constraints that limit creative curriculum implementation in Nepalese secondary schools. Moreover, large class sizes, limited resources, and rigid assessment systems and peer competition to innovative practices shows barriers (Adam et al. 2016; European Commission, Joint Research Centre, 2010; Hilal et al., 2013; Indarasati et al., 2019). Despite these challenges, mathematics teachers attempt to allow students to generate their own examples indicate that even small pedagogical shifts can promote critical thinking. Furthermore, this suggests that creativity in curriculum implementation is not an extra activity but a pedagogical stance that can be integrated within existing constraints, provided mathematics teachers get institutional support and pedagogical as well as professional autonomy. From the philosophical basis, the findings strongly support constructivist foundations of creative curriculum implementation, which emphasizes learning as an active process of learners construct meaning through interaction with project works, materials and ideas (Piaget, 1972).

Additionally, this study explored mathematical concepts connect the household expenses, classroom measurement or local contexts enacted a pragmatic curriculum that valued usefulness, relevance and real-life learning. The findings align with pragmatism particularly Deway's (1998) view of learning as problem-solving grounded in real -life experience. Classroom practices validate the implementation of living discipline rather than a collection of abstract rules.

This study also explored that pedagogical value of creative curriculum performing over the learners. Project-based activities, mathematical modeling construction increased learners confidence, motivation, and sense of pride. These findings resound with constructivist learning theory which views knowledge as actively constructed through experience and reflection rather than passively perceived (Piaget, 1972). When students engage in creating problems or applying concepts to authentic situations, they develop deeper conceptual understanding and transferable problem-solving skills (de Almeida & Viana, 2023 ; Ellerton & Kelly, 2021; Gnawali, 2023; Karki, 2014; Kozlowski et al., 2019). Social constructivism further emphasizes the role of

dialogue, collaboration, and cultural context in learning (Vygotsky & Cole, 2018; Hausfather, 1996). Group work, discussion, and shared problem-solving are observed in creative mathematics classrooms which enabled learners to co-construct understanding through social interaction.

The study found that the curriculum expert's insights further illuminate the gap between curricular intentions and classroom practices. While curriculum emphasizes competency-based learning and the development of creative and critical thinking, its implementation is often forced by exam-oriented practices as fixed content. This discrepancy echoes the concerns raised by the National Education Commission [NEC] (2018), which notes that the policy-level commitments to creativity is not always realized in classroom practices. It enhances meaningful learning, nurtures intellectual freedom, and promotes learner autonomy, as argued by Ernest (1991).

It means professional development, pedagogical supports and mathematics teachers autonomy highlights that creativity cannot flourish without systematic alignment between curricular goals, assessment practices and institutional expectations(Almulla, 2023; Budnyk, 2023; Gyawali, 2023; Heilmann & Korte, 2010; Hilal et al., 2013; Indarasati et al., 2019).

Overall, this study highlighted that creative curriculum implementation in secondary mathematics classroom practices is both pedagogically and philosophically justified. However, this study also revealed that creativity is not automatically guaranteed by competency-based curriculum design alone. Its ground realization depends on teachers' beliefs, interpretive flexibility, professional competence and institutional and assessment support.

Conclusion

This study examined the implementation of curriculum is required to promote creativity, critical thinking, and innovative instruction in teaching and learning activities. Though, enhancing, providing and explaining teaching learning mathematical content alone does not improve students' critical thinking, creativity and innovative skills. Implementation of curriculum including content aimed at nurturing creativity and innovation, its application in most of the school is often weak and insufficient to empower students and teachers as intended. Moreover, the finding of the study focused that the traditional curriculum needs to reform and give prioritize competency based, creativity and critical thinking and innovative skills. The teachers should be trained over demand-based training rather than supply-based training. Not only this demand-based training enhances the learners learning habits and make learners'

multiple intelligences. Moreover, this study highlights the need for the local, provincial and federal government to implement result-oriented educational programs which inspire creativity and critical thinking.

This study focused the varying global scenery demands critical thinking and creativity as well as innovative skills in problem solving strategies. However, our classroom is a traditional, teacher- centered, rote- learning oriented and paper pencil test. In addition, the competency-based curriculum focused inductive methods and is required to promote essential creativity skills and critical thinking among the students. In the context of Nepal, the implementation of curriculum has not yet fully succeeded in focusing these essential skills during implementation of innovation and creativity. The required activities are even more effective when students activate autonomously in their own work and performance.

Finally, this study concludes that adequate resources, mathematics teachers training to create and implement learner- friendly, reasonable and innovation-oriented classroom practices as well as the role of relevant authorities in promoting a innovative learning environment.

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