

Teaching Trajectories of Mathematics Teachers: Teachers' Attitudes Towards Commitment to Students' Learning

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Abstract

This research examines the influence of teachers' years of experience on their attitudes and perceptions towards various aspects of commitment to learners. Using a survey design and a Likert Scale as a survey instrument, the data collected from 140 teachers teaching mathematics at Kathmandu-based community and community schools across five experience groups (1-3, 4-6, 7-18, 19-31, and 31+ years), this study analyzes ten dimensions of teacher-student commitment. Results indicate significant variations in attitudes of teachers based on their teaching experience, with mid-career teachers (4-6 and 7-18 years) generally demonstrating the most positive attitudes, while the most experienced teachers (31+ years) often showed the least positive attitudes towards supporting students' learning. The findings suggest a potential experience-related pattern in teachers' commitment that may have implications for professional development and educational policy. This study contributes to understanding how teachers' attitudes change throughout their careers and offers recommendations for sustaining positive engagement with learners across all career stages.

Keywords: Commitment to learners, experimentation, disengagement, stabilization, survival

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Introduction

Research studies in education have explored the connection between instructors' attitudes and students' learning outcomes. Hattie (2012) and Stronge (2018) have emphasized the critical role of teacher beliefs and commitment in educational performance. Similarly, a study by Rosenthal and Jacobson (1968) demonstrated that teacher expectations had a major impact on student accomplishment. Effective teaching practices are said to be largely dependent on the attitudes that teachers have for their students (Darling-Hammond, 2017).

Sensitivity to student needs, support for holistic development, comprehension of individual learning processes, fostering positive relationships, giving constructive criticism, exercising patience, motivating progress, fostering student interests, improving students' quality of life, and crafting enjoyable learning experiences are just a few of the many aspects that make up teachers' commitment to their students (Noddings, 2013; Van Manen, 2016). Although the significance of these commitments has been well studied, minute is known about how these attitudes may develop or shift throughout the course of a career of teacher. Different models have been developed proposing distinct phases of development from novice to expert in the professional life cycle of teachers (Day & Gu, 2010; Huberman, 1989).

It is essential to comprehend how experience affects teachers' views toward their students and how that affects the students' learning outcomes. Such things need to be part of programs for teacher preparation and induction, assisting new educators in forming positive attitudes early in their professions. Doing so can help instructors at various phases of their careers receive personalized professional development support and interventions to them in advancing their knowledge of the effectiveness and resiliency over the course of their careers. Some studies in Nepal have also shown that teachers require systematic support for their continuous professional development throughout their career trajectories, enabling them to adapt in changing educational backgrounds (Borg & Poudel, 2024; Poudel, 2022).

Despite the recognition that teacher attitudes impact student outcomes, there is insufficient research examining how these attitudes may differ across a teacher's career span. Most studies focus either on novice teachers or on comparing novice and experienced teachers without considering the nuanced changes that may occur across multiple stages of the teaching career. This gap in understanding may lead to 'one-size-fits-all approach' to teacher development that fails to address the specific needs and challenges of teachers at different career stages. Additionally, there is limited research specifically examining

how commitment to learners, as opposed to general teaching effectiveness or satisfaction, differs with experience. Since commitment to learners represents a core aspect of teacher quality, understanding how this commitment evolves could provide valuable insights for educational leaders and policymakers. The main research problem in this research is the lack of a comprehensive understanding of how teachers' attitudes towards various dimensions of commitment to learners change across different experience levels, from early-career teachers to those with over three decades of experience. Therefore, the present study was conducted to achieve the following objectives.

- i. To analyze variations in teachers' attitudes towards commitment to learners across five experience groups: 1-3 years, 4-6 years, 7-18 years, 19-31 years, and 31+ years.
- ii. To identify specific perceptions/attitudes of teachers in the dimensions of commitment to learners based on their years of experience.

Review of Relevant Literature

According to studies on the career paths of mathematics teachers, attitudes and perceptions have a big impact on how dedicated they are to helping students' learning. Philipp (2007) asserts that instructional decisions that ultimately affect students' mathematical achievements are based on the attitudes and beliefs of teachers. Complex interactions between institutional environments, professional growth, and personal experiences shape these views, resulting in what Ball et al. (2008) refer to as "mathematical knowledge for teaching" in the combination of pedagogical skill and content knowledge. Teachers who have positive attitudes toward mathematics teaching and see themselves as facilitators rather than knowledge carriers are more likely to be committed to modifying their methods to accommodate a range of student needs, as further evidenced by Goos and Bennison (2018).

The dedication to student learning is demonstrated by certain teaching practices that reflect the attitudes of the teachers. According to Tatto et al. (2012), mathematics teachers are more likely to use student-centered strategies that promote conceptual comprehension if they view education as an ongoing learning process. When educators cultivate what Schoenfeld (2011) refers to as "professional noticing," or the capacity to identify and meaningfully address students' thought processes, this dedication is further reinforced. The professional trajectory of mathematics teachers is also cyclical rather than linear (Charalambous & Praetorius, 2018). This suggests that teacher commitment to student learning is a dynamic construct that changes over the course of a teacher's career, with perceptions and attitudes being continuously reshaped

through classroom experiences, collaborative reflection, and engagement with educational research.

Methodology

This section includes research design, population, sampling, sampling procedures, data analysis procedures, followed by findings and discussion.

Research Design

This study employed a quantitative cross-sectional research design to examine teachers' attitudes toward commitment to learners across different experience levels. The cross-sectional approach allowed for the comparison of multiple teacher groups simultaneously, providing a snapshot of attitudes across the career span.

Participants

The study involved 140 teachers teaching in different community and institutional schools of the Kathmandu Valley, which were selected by using a purposive sampling method considering different experience groups of teachers. The experiences of teachers were categorised into five experience groups based on their years of teaching.

Table 1

Distribution of Participants by Experience Level

Experience Stage	Years	Frequency	Per cent	Cumulative Percent
Stage 1	1-3 years	34	24.3%	24.3%
Stage 2	4-6 years	17	12.1%	36.4%
Stage 3	7-18 years	51	36.4%	72.9%
Stage 4	19-31 years	24	17.1%	90.0%
Stage 5	31+ years	14	10.0%	100.0%
Total		140	100.0%	

The sample distribution reflects the career progression of teachers, with the largest group (36.4%) falling in the 7-18 years range (Stage 3), which represents the established career phase in most educational systems. Early-career teachers (Stages 1 and 2) constitute 36.4% of the sample, while late-career teachers (Stages 4 and 5) make up 27.1%. This distribution allows for meaningful comparison across experience levels while acknowledging the natural attrition that occurs in the teaching profession over time. From the above table, it was found that most of the teachers belong to experiences of the years (7-18 years).

In this time, teachers remain more sustainable in their teaching profession. Before this experience level, teachers struggle for survival by developing different skills and searching for multiple opportunities. In a similar manner, teachers with more experience are found in different administrative posts and the time for retirement. In this context, researcher has found more teachers in the specified experiences years in the selection of 140 teachers randomly. The categorization follows established models of teacher career stages (Huberman, 1989; Day & Gu, 2010), recognizing distinct phases of professional development:

- Stage 1 (1-3 years): Survival and discovery
- Stage 2 (4-6 years): Stabilization
- Stage 3 (7-18 years): Experimentation and activism
- Stage 4 (19-31 years): Serenity and/or conservatism
- Stage 5 (31+ years): Disengagement

Tools for Data Collection

The study tool for this study was a survey instrument measuring teachers' attitudes toward ten dimensions of commitment to learners. They were:

1. Compassion and awareness to address children's needs; 2. Assistance for children's holistic growth; 3. Recognizing individual learning journeys; 4. Fostering teacher-student connections; 5. Offering essential feedback, 6. Accepting and rectifying errors; 7. Motivating children's advancement; 8. Nurturing children's passions and independence; 9. Enhancing the quality of life for children; 10. Ensuring that learning is fun. Responses were collected using a Likert-scale format and converted into a descriptive statistics table representing attitudes toward each dimension.

Data Collection and Analysis

The data were collected through survey instruments administered among 140 mathematics teachers teaching in different schools and colleges. These teachers belonged to different age groups within each experience category. Percentage scores were calculated to represent the level of positive attitude in each dimension according to the experience groups of teachers. The data were analyzed based on different experience groups, focusing on the most and least positive attitudes for each dimension mentioned above.

Findings and Discussion

This section deals with the analysis of teachers' commitment towards learners in different dimensions. The data were analyzed under the different themes and categories.

Overall Patterns in Teacher Attitudes across Experience Groups

Analysis of the data reveals several noteworthy patterns in teachers' attitudes towards commitment to learners across different experience levels. Table 2 presents the complete dataset showing attitude levels (percentage scores) for each dimension across the five experience groups.

Table 2

Attitude/Perception Levels (%) According to Teaching Experience

Theme of the Statements	1-3 yrs	4-6 yrs	7-18 yrs	19-31 yrs	31+ yrs	Most/least positive attitude
1. Love and sensitivity to meet children's demands	68.2	74.0	54.5	67.5	60.0	4-6 / 7-18 years
2. Support for overall development	68.8	76.5	66.3	57.5	44.3	4-6 / 31+ years
3. Understanding personal learning processes	60.0	70.1	68.6	49.2	42.9	4-6 / 31+ years
4. Developing teacher-learner relationships	61.2	75.3	69.8	55.8	51.4	4-6 / 31+ years
5. Providing necessary feedback	58.8	71.8	73.7	58.3	61.4	7-18 / 19-31 years
6. Tolerance and correction of mistakes	60.6	62.4	71.4	60.8	48.6	7-18 / 31+ years
7. Inspiring children's progress	64.0	74.0	64.7	55.0	50.0	4-6 / 31+ years
8. Supporting interests and empowerment	56.5	71.8	69.0	52.5	55.7	4-6 / 19-31 years
9. Developing quality of life	54.0	60.0	65.5	63.3	54.3	7-18 / 1-3 years
10. Making learning enjoyable	53.0	65.0	69.4	55.8	74.3	31+ / 1-3 years
Average across all dimensions	60.5	70.1	67.3	57.6	54.3	4-6 / 31+ years

Note: Analyzed by using SPSS 27

The most striking pattern observed is that teachers with 4-6 years of experience consistently demonstrate the most positive attitudes across multiple dimensions of commitment to learners. This group shows the highest positive attitude percentages in six out of ten dimensions (1, 2, 3, 4, 7, and 8) and ranks second highest in two others. Their average positive attitude score across all dimensions (70.1%) is highest among all experience groups. It is to be noted that this group constitutes only 12.1% of the sample (n=17), representing teachers who have moved beyond the survival phase but have not yet reached

potential career plateaus. Teachers with 7-18 years of experience (36.4% of the sample, $n=51$) also demonstrate remarkably positive attitudes, showing the highest scores in three dimensions (5, 6, and 9) and an overall average of 67.3%, the second highest among all groups. This substantial group represents the largest segment of the teaching workforce in the sample and demonstrates generally positive attitudes, though with some variability across dimensions.

Conversely, teachers with 31+ years of experience (10% of the sample, $n=14$) demonstrate the least positive attitudes in five dimensions (2, 3, 4, 6, and 7) and have the lowest overall average (54.3%). However, this group does show the highest positive attitude in one dimension of making learning enjoyable (74.3%). This suggests that while long-career teachers may have diminished attitudes in some areas, they maintain strengths in specific aspects of teaching. Early-career teachers with 1-3 years of experience (24.3% of the sample, $n=34$) demonstrate moderate attitudes overall (60.5% average) but show the least positive attitudes in dimension 9 (developing quality of life) and dimension 10 (making learning enjoyable). This reflects their focus on mastering basic teaching skills over more nuanced aspects of student development. Teachers with 19-31 years of experience (17.1% of the sample, $n=24$) show moderate to low positive attitudes across most dimensions (57.6% average), and demonstrate the least positive attitudes in two dimensions (5 and 8). The analysis of specific dimensions under different themes is presented as below:

Love and Sensitivity to Children's Demands

Teachers with 4-6 years of experience show the most positive attitude (74.0%) toward being sensitive to children's needs, while those with 7-18 years demonstrate the least positive attitude (54.5%). This considerable difference (19.5 percentage points) is noteworthy given that the 7-18 year group shows positive attitudes in many other dimensions. This suggests that sensitivity to children's demands may diminish as teachers move from early stabilization to the experimentation and activism phase of their careers.

Support for Overall Development

The most significant gap between experience groups appears in this dimension, with 4-6 year experience teachers showing the highest positive attitude (76.5%) and 31+ year teachers showing the lowest (44.3%), a difference of 32.2 % points. This considerable difference may reflect changing educational philosophies across generations of teachers or potentially indicate professional fatigue among very experienced teachers. The consistent decline across successive experience groups (76.5% → 66.3% → 57.5% → 44.3%) suggests a progressive reduction in commitment to holistic development as teaching experience increases.

Understanding Personal Learning Processes

Teachers with 4-6 years of experience exhibit the most positive attitude (70.1%), closely followed by those with 7-18 years (68.6%). The significant drop in positive attitudes among teachers with 19-31 years (49.2%) and 31+ years (42.9%) suggests a potential disconnection from contemporary learning theories or reduced commitment to individualizing instruction among more experienced teachers. This dimension shows wider divisions between early/mid-career teachers and late-career teachers.

Developing Teacher-Learner Relationships

Mid-career teachers (4-6 years) show the strongest commitment to developing positive relationships with students (75.3%), while the most experienced teachers (31+ years) show the least positive attitude (51.4%). This 23.9 percentage point difference may reflect the emotional investment required to maintain strong teacher-student relationships, which might diminish career longevity. The relationship-building aspect of teaching appears to peak during the stabilization phase (4-6 years) when teachers have mastered basic classroom management but still maintain high emotional engagement.

Providing Necessary Feedback

Teachers in the 7-18 years' experience group show the highest positive attitude towards providing feedback (73.7%), closely followed by those with 4-6 years (71.8%). Teachers with 19-31 years show the least positive attitude in this dimension (58.3%). This suggests that mid-career teachers may be most involved in the formative assessment process, while teachers in the serenity/conservatism phase may place less emphasis on continuous feedback.

Tolerance and Correction of Mistakes

Teachers with 7-18 years of experience demonstrate the highest positive attitude towards being tolerant and constructively addressing student mistakes (71.4%), while those with 31+ years show the lowest (48.6%). This substantial difference (22.8 % points) reflects changing perspectives on error management in education or potentially decreased patience among the most experienced teachers. The experimentation and activism phase (7-18 years) may provide teachers with both the skills and perspective to view mistakes as learning opportunities rather than problems.

Inspiring Children's Progress

Mid-career teachers (4-6 years) show the most positive attitude (74.0%) towards inspiring student progress, while the most experienced teachers (31+

years) show the least positive attitude (50.0%). This 24 % point difference aligns with several other dimensions, suggesting a potential decline in motivational approaches with increased experience. The progressive decline across successive experience groups (74.0% → 64.7% → 55.0% → 50.0% after the 4-6 years peak) indicates a consistent pattern of reduced emphasis on inspiration as careers advance.

Supporting Interests and Empowerment

Teachers with 4-6 years' experience demonstrate the highest positive attitude toward supporting student interests and empowerment (71.8%), followed closely by those with 7-18 years (69.0%), while those with 19-31 years show the lowest (52.5%). This dimension shows a clear decline after the 7-18 years' period, potentially suggesting decreased commitment to student-centered approaches among more experienced teachers. The relatively low score of early-career teachers (56.5%) suggests that empowerment may require some experience to implement effectively.

Developing Quality of Life

In contrast to most other dimensions, teachers with 7-18 years' experience showed the highest positive attitude towards developing students' quality of life (65.5%), while early-career teachers (1-3 years) showed the lowest (54.0%). This reflected the need for some experience to develop a broader perspective on the role of education in students' overall well-being. This is one of the few dimensions where the most experienced teachers (31+ years) do not show the lowest positive attitude, suggesting they maintain some commitment to this broader educational goal.

Making Learning Enjoyable

This dimension presents a unique pattern, with the most experienced teachers (31+ years) demonstrating the highest positive attitude (74.3%) and early-career teachers (1-3 years) showing the lowest (53.0%). This 21.3 % point difference suggests that very experienced teachers may prioritize enjoyment in learning, perhaps having developed effective strategies for creating engaging environments over their long careers. This is the only dimension where the 31+ year group leads, indicating a potential area of strength for late-career teachers.

Experience-Related Patterns

The findings suggest that teachers' attitudes toward commitment to learners follow an inverted U-shaped pattern across the career span for most

dimensions, with attitudes generally peaking in the 4-6 or 7-18 year range and declining with greater experience. This pattern aligns with Huberman's (1989) model of teacher career stages, which suggests that teachers typically move through phases of survival and discovery (1-3 years), stabilization (4-6 years), experimentation and activism (7-18 years), followed by potential serenity or conservatism (19-31 years), and finally disengagement (31+ years).

Table 3

Factors Affecting Attitudes of Most Experienced Teachers (31+ Years) Towards Learners

Affecting Possible Factors	Descriptions with literature
Professional burnout	Long-term exposure to educational challenges may reduce emotional resources (Maslach & Leiter, 2016).
Generational differences	Different educational philosophies during formative professional years may affect attitudes (Hargreaves, 2005).
Contextual changes	Substantial changes in educational policies, student demographics, and expectations may create a misalignment between experienced teachers' training and current demands (Goodson et al., 2006).
Shifting priorities	Late-career teachers may focus more on curricular coverage and less on socio-emotional characteristics of teaching (Day & Gu, 2010).

The exception to this pattern is dimension 10 (making learning enjoyable), where the most experienced teachers show the highest positive attitude. This suggests that while some aspects of commitment may decline, experienced teachers may develop a stronger appreciation for the importance of enjoyment in the learning process. When considering the sample distribution, it's worth noting that the most positive attitudes come from the smallest group (4-6 years, $n=17$, 12.1% of sample), while the largest group (7-18 years, $n=51$, 36.4% of sample) shows the second-highest positive attitudes. This suggests that the stabilization phase (4-6 years) may represent an optimal period for teacher attitudes toward learners, but this phase involves relatively few teachers compared to the subsequent experimentation and activism phase.

Conclusion and Implications

This study examined teachers' attitudes towards commitment to learners across five experience groups, revealing significant differences based on years of teaching experience. The findings demonstrated that mid-career teachers (particularly those with 4-6 years' experience) generally showed the most positive attitudes across multiple dimensions of commitment to learners, while the most experienced teachers (31+ years) often demonstrated the least positive attitudes. These patterns suggest an inverted U-shaped trajectory of teacher commitment across the career span, with attitudes towards most aspects of commitment to learners peaking in mid-career and declining afterwards. This trajectory aligns with established models of teacher career stages and highlights the importance of career-specific support for maintaining positive teacher attitudes. The sample distribution provides important context for these findings, with 36.4% of teachers in Stage 3 (7-18 years), 24.3% in Stage 1 (1-3 years), 17.1% in Stage 4 (19-31 years), 12.1% in Stage 2 (4-6 years), and 10% in Stage 5 (31+ years). This distribution is consistent with typical teacher career progressions and strengthens the generalizability of the findings.

This study has several limitations as well. This include its cross-sectional design, which cannot definitively establish whether the observed differences are due to career progression or cohort effects. Future research should utilize longitudinal designs to monitor attitude changes within teacher cohorts over time. Additionally, qualitative research that explores the reasons behind attitude differences would provide valuable context for interpretation. Despite these limitations, this study offers important insights into how teacher attitudes toward commitment to learners vary across the career span, laying a foundation for more nuanced approaches to supporting teacher effectiveness throughout the professional lifecycle.

The findings of the study have several implications. Educational institutions should develop differentiated professional development programs addressing the specific needs and challenges of teachers at different career stages. Similarly, pairing teachers from different experience groups (particularly connecting mid-career teachers with both early-career and late-career colleagues) may help sustain positive attitudes across the profession. In addition to this, generating structured opportunities for experienced teachers to renew their commitment to learners through retreats, role divergence, or specialized professional learning communities. From the broader perspective, teacher education programs should emphasize aspects of commitment where early-

career teachers show lower positive attitudes, particularly concerning quality of life and making learning enjoyable, which can be enabled through systematic support from several governmental and non-governmental organizations. More specific implications have been listed below.

- The consistently high positive attitudes among teachers with 4 to 6 years of experience suggest that this may be an optimal period for teacher effectiveness regarding commitment to learners. Professional development programs could focus on maintaining this commitment beyond this period.
- The significant decline in positive attitudes among late-career teachers across most dimensions highlights the necessity for targeted support and renewal opportunities for experienced educators.
- The low scores of early-career teachers with experience (1-3 years) are related to quality of life and making learning enjoyable, suggesting these areas should receive greater emphasis in teacher preparation programs.
- The diverse patterns across dimensions indicate that professional development should be differentiated according to both career stage and specific aspects of commitment to learners.
- Given that the largest group of teachers in the sample (7-18 years, 36.4%) showed inconsistency across dimensions, professional development for this group should target specific areas of lower commitment rather than using a general approach.

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