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# EXPLORING TEACHERS' KNOWLEDGE, UNDERSTANDING AND REWARD PRACTICES: A MOTIVATIONAL ORIENTATION PERSPECTIVE IN MATHEMATICS LEARNING

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## Abstrak

Memahami bagaimana guru mengonseptualisasikan dan menerapkan penghargaan masih menjadi isu penting namun kurang berkembang dalam pendidikan matematika. Studi ini mengkaji bagaimana orientasi motivasi guru matematika, yang didefinisikan sebagai pendorong intrinsik atau ekstrinsik yang memengaruhi keputusan pengajaran mereka, membentuk pengetahuan dan praktik mereka terkait penghargaan. Orientasi motivasi diidentifikasi melalui skala laporan diri dan wawancara lanjutan yang mengeksplorasi tujuan pengajaran guru. Desain studi kasus kualitatif eksploratif digunakan. Sebanyak 114 guru matematika SMP dari daerah perkotaan, pinggiran kota, dan pedesaan di Provinsi Sulawesi Selatan berpartisipasi, dan 14 dipilih untuk observasi kelas menggunakan purposive maximum variation sampling. Analisis tematik lintas kasus mengikuti kerangka kerja Braun dan Clarke. Guru menggunakan berbagai jenis penghargaan, termasuk pujian verbal, umpan balik berbasis penguasaan, token nyata, dan pengakuan publik. Guru yang berorientasi intrinsik cenderung menanamkan penghargaan dalam dialog instruksional untuk mendukung otonomi dan penguasaan. Guru yang berorientasi ekstrinsik menggunakan penghargaan terutama untuk mengatur perilaku atau mengamankan kepatuhan tugas. Sebagian besar guru menunjukkan orientasi yang beragam, menunjukkan adanya kontinum alih-alih dikotomi. Analisis lintas kasus menghasilkan tiga tema: orientasi proses, orientasi hasil, dan kesadaran sosial. Temuan ini menunjukkan bahwa penghargaan tidak hanya berfungsi sebagai alat teknis, tetapi juga sebagai pilihan pengajaran yang bergantung pada konteks, yang dibentuk oleh orientasi motivasi guru. Studi ini menawarkan implikasi praktis untuk mengembangkan program profesional yang membantu guru menyempurnakan strategi penghargaan mereka berdasarkan pemahaman yang lebih jelas tentang pendorong motivasi mereka.

**Kata kunci**: Motivasi Ekstrinsik; Motivasi Intrinsik; Orientasi Motivasi; Praktik Penghargaan

## Abstract

Understanding how teachers conceptualize and implement rewards remains an important yet underdeveloped issue in mathematics education. This study examined how mathematics teachers' motivational orientations, defined as intrinsic or extrinsic drivers that influence their instructional decisions, shape their knowledge and practices related to rewards. Motivational orientation was identified through a self-report scale and follow-up interviews that explored

teachers' instructional goals. An exploratory qualitative case study design was employed. A total of 114 junior secondary mathematics teachers from urban, suburban, and rural areas in South Sulawesi Province participated, and 14 were selected for classroom observation using purposive maximum variation sampling. Cross-case thematic analysis followed Braun and Clarke's framework. Teachers used different types of rewards, including verbal praise, mastery-based feedback, tangible tokens, and public recognition. Intrinsically oriented teachers tended to embed rewards in instructional dialogue to support autonomy and mastery. Extrinsically oriented teachers used rewards primarily to regulate behavior or secure task compliance. Most teachers demonstrated mixed orientations, suggesting a continuum rather than a dichotomy. Cross-case analysis generated three themes: process orientation, outcome orientation, and social awareness. These findings indicate that rewards function not simply as technical tools but as context-dependent instructional choices shaped by teachers' motivational orientations. The study offers practical implications for developing professional programs that help teachers refine their reward strategies based on a clearer understanding of their motivational drivers.

**Keywords:** Extrinsic Motivation; Intrinsic Motivation; Motivational Orientation; Reward Practices

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## INTRODUCTION

Although reward systems are widely employed in mathematics classrooms, their implementation varies significantly among teachers. Some are able to use rewards effectively to foster students' motivation and engagement, while others apply them merely as routine practices with limited pedagogical impact (Akiba, 2017; Maulana et al., 2021; Levatino et al., 2024). This variation highlights a persistent gap between teachers' conceptual knowledge of reward mechanisms and their actual classroom practices.

Previous studies on rewards in mathematics learning tend to examine their influence on participation and achievement, yet rarely link these outcomes to the internal motives that guide teachers' instructional decisions. This limitation makes it difficult to understand how teachers' intrinsic or extrinsic orientations shape their interpretations and use of rewards.

In mathematics education, rewards are understood as reinforcement strategies that include tangible forms such as gifts or tokens and intangible forms such as praise and social recognition. Their primary purpose is to enhance students' motivation, participation, and academic performance (Sari et al., 2024; Sorić, 2021). Prior studies emphasize that the effectiveness of rewards is not determined solely by their type or frequency but also by how they are delivered, whether immediate or delayed, general or specific, effort-based or outcome-based, and adapted to the classroom context (Xiao & Hew, 2024).

Theoretical perspectives on rewards have shifted from simple behaviorist frameworks toward multidimensional approaches that consider psychological, sociocultural, and epistemological dimensions of learning (Viholainen et al., 2023; Masaki, 2021). Recent studies indicate that reward strategies aligned with teachers' motivational orientations are more effective than those focused merely on frequency of use (Fourie & Dreyer, 2022; Kalogeropoulos et al., 2024). However, research has also revealed a gap between teachers' declarative knowledge of rewards and their procedural implementation in classrooms, a phenomenon described as pedagogical fragmentation (Saks et al., 2021).

Although teachers often articulate clear conceptual knowledge about rewards, their classroom practices frequently reveal inconsistencies. Many deliver rewards in ways that contradict their stated beliefs about effective reinforcement. This conceptual–practical gap points to underlying psychological factors that remain insufficiently examined in previous research.

Self-Determination Theory clarifies how intrinsic and extrinsic motivational drivers influence teachers' decisions in planning, delivering, and modifying reward strategies in the classroom. According to Ahn, Chiu, and Patrick (2021), teachers' autonomous motivation supports teaching practices that address students' psychological needs for autonomy, competence, and relatedness. Using SDT in this way provides a coherent basis for understanding how teachers' motivational orientations moderate their classroom use of rewards.

Positioning motivational orientation as a moderating factor strengthens the conceptual bridge between teachers' knowledge of reward mechanisms and their actual instructional choices. This perspective is necessary to understand why teachers with similar knowledge may implement rewards in markedly different ways.

Building on this framework, the present study explores how teachers' motivational orientations are reflected in their conceptualizations, understanding, and classroom implementation of reward practices in mathematics instruction. A qualitative approach is employed to capture the diversity of experiences and contextual complexity surrounding classroom reward practices, since prior quantitative studies tend to reduce pedagogical phenomena into isolated variables (Saldaña & Omasta, 2021). The study focuses on junior high school mathematics teachers in South Sulawesi, thereby providing contextually grounded insights into Indonesian mathematics education. Accordingly, this study is guided by two research questions: (1) how do mathematics teachers with intrinsic versus extrinsic motivational orientations differ in their conceptualizations of reward mechanisms, and (2) how are differences in teachers' motivational orientations reflected in their understanding and implementation of reward practices in mathematics classrooms?

## METHOD

This study employed a qualitative exploratory case study design to investigate how teachers' motivational orientations shape their conceptualizations, understanding, and classroom implementation of reward practices in mathematics instruction. A case study approach was chosen because it enables an in-depth exploration of complex pedagogical processes situated within authentic school contexts (Rashid et al., 2019; Yin, 2017). The study was grounded in a constructivist–interpretivist paradigm, which views meaning as socially constructed through interaction and experience (Lincoln & Guba, 2016). This paradigm aligns with the goal of examining how teachers interpret and use rewards beyond their function as behavioral reinforcement tools.

The study involved 114 junior high school mathematics teachers from urban, suburban, and rural regions across South Sulawesi Province. Purposive maximum variation sampling (Patton, 2015) was used to ensure representation across gender, school location, and teaching experience. From this pool, a subsample of 14 teachers was selected for classroom observations based on three criteria: (1) motivational orientation profile, (2) school type, and (3) geographical distribution. The subsample consisted of five urban, five suburban, and four rural teachers. Although this approach increased contextual diversity, potential sampling bias remains because participation depended on voluntary willingness and institutional approval.

Four instruments were developed using a Construct-Centered Design (CCD) approach:

1. Motivational Orientation Questionnaire, consisting of 20 Likert-type items (10 intrinsic, 10 extrinsic) adapted from the Work Task Motivation Scale for Teachers (Fernet et al., 2008).
2. Conceptual Knowledge Test, comprising seven open-ended items measuring declarative and conceptual understanding of reward strategies.
3. Contextual Implementation Vignettes, eight classroom scenarios eliciting teachers' intended actions and reasoning.
4. Classroom Observation Protocol, consisting of 12 indicators across timing, type of reward, communication, and social aspects.

All instruments were validated by experts and piloted for clarity. Instruments were designed as a sequential continuum linking teachers' psychological orientations to their observable instructional practices. The preregistered materials are accessible via OSF (https://doi.org/10.17605/OSF.IO/UX8T7).

Data collection proceeded in three stages for all participants, with an additional stage for the observation subsample:

1. Motivational Orientation Questionnaire to identify dominant motivational profiles.

2. Conceptual Knowledge Test to assess declarative and conceptual understanding.
3. Contextual Implementation Vignettes to examine decision-making and rationales.
4. Classroom observations for the 14 selected teachers, conducted twice using the structured protocol and supported by narrative field notes to capture contextual nuances.

Data were analyzed thematically using Braun and Clarke's (2021) six-phase framework: familiarization, initial coding, theme generation, theme review, theme definition, and reporting. Trustworthiness was strengthened through member checking, inter-rater reliability checks among researchers, and maintaining a detailed audit trail of analytic decisions. The analysis produced three themes: process orientation, outcome orientation, and social awareness.

Ethical approval was obtained from the relevant institutional review board. Informed consent was collected from all participants, and confidentiality was ensured through anonymized data handling.

## RESULT AND DISCUSSION

Data from 114 teachers' conceptual knowledge tests, implementation vignettes, and classroom observations of 14 focal teachers were analyzed to address the two research questions regarding how motivational orientation shapes teachers' conceptualizations and implementation of reward practices in mathematics learning.

### Profile of Motivational Orientations

There are 114 teachers, 58 (51 percent) were predominantly intrinsically oriented, 56 (49 percent) were extrinsically oriented, and 23 teachers (20 percent) demonstrated mixed motivational profiles. Observation data indicated that intrinsically oriented teachers used rewards more frequently, averaging 12 instances per session, compared to eight instances among extrinsically oriented teachers. However, individual variation was substantial, ranging from four to 18 reward

instances across classrooms. These patterns suggest that motivational orientation influences tendencies in reward use but does not operate as a rigid categorical distinction.

**Differences in Conceptualizations of Reward Mechanisms**

*Conceptual Knowledge Findings*

Clear conceptual distinctions were observed between groups. Intrinsically oriented teachers defined rewards as tools for strengthening internal motivation, autonomy, and strategy development. Extrinsically oriented teachers viewed rewards primarily as behavioral management mechanisms designed to secure compliance and maintain classroom order. Although nearly all teachers (89 percent) recognized both material and immaterial reward categories, intrinsically oriented teachers emphasized instructional and pedagogical effects, while extrinsically oriented teachers emphasized physical attributes or tangible outcomes. These patterns indicate that motivational orientation shapes how teachers interpret the purpose and function of rewards in mathematics learning.

*Understanding and Implementation Across Scenarios*

Analysis of vignette responses highlighted distinct tendencies. In Case 1 (students exerting strong effort despite errors), 89 percent of intrinsically oriented teachers indicated they would offer specific praise focused on strategy use, compared to 71 percent of extrinsically oriented teachers who preferred assigning bonus points as formal recognition. In Case 3 (students showing improved scores), 84 percent of intrinsically oriented teachers emphasized acknowledging the strategies underlying the improvement, while 79 percent of extrinsically oriented teachers prioritized outcome-based recognition. The sharpest inconsistencies appeared in Case 7 involving social dynamics, where 76 percent of intrinsically oriented teachers considered delaying rewards to protect group harmony, while 68 percent of extrinsically oriented teachers opted to deliver immediate rewards to motivate other students. These mixed responses in socially complex scenarios

suggest that contextual pressures can temporarily override teachers' dominant motivational orientations.

*Classroom Practice Findings*

Classroom observations revealed partial alignment between teachers' conceptual orientations and their enacted practices. Intrinsically oriented teachers delivered immediate rewards in 78 percent of observed instances, typically accompanied by descriptive feedback averaging 3.2 explanatory words per reward. For example, one teacher stated, "The way you organized your diagram shows clear analytical thinking." Extrinsically oriented teachers delivered most rewards at the end of the lesson (71 percent) and provided more general praise with an average of 1.1 descriptive words, such as, "Good job, your score is high." Nonetheless, inconsistencies were observed. Some intrinsically oriented teachers shifted toward outcome-based rewards under time pressure or curricular demands. Conversely, several extrinsically oriented teachers occasionally praised effort when students demonstrated perseverance. These findings indicate that orientation interacts with situational constraints rather than determining behavior in a fixed manner.

These shifts in practice, such as intrinsically oriented teachers using outcome-based rewards under time pressure, highlight that a teacher's motivational orientation is not the sole determinant of their classroom actions

**Cross-Domain Themes**

*Theme 1: Process-Oriented vs. Outcome-Oriented*

Intrinsic teachers exhibited a developmental orientation centered on learning processes, while extrinsic teachers displayed a regulatory orientation emphasizing outcomes and efficiency. These patterns aligned consistently across conceptual, scenario-based, and observational data, although occasional cross-orientation behaviors emerged in response to classroom demands.

*Theme 2: Social Awareness vs. Individual Focus*

Intrinsic teachers demonstrated heightened social awareness, adjusting reward delivery to manage peer dynamics or maintain classroom cohesion.

However, this sensitivity was less consistently enacted during observations, where immediate classroom management needs often took precedence. Extrinsic teachers tended to focus more on individual performance and rarely modified reward practices based on social considerations.

*Theme 3: Reflective vs. Transactional Communication*

Communication patterns represented the clearest distinction. Intrinsically oriented teachers integrated reflective dialogue into reward delivery, prompting students to identify strategies or reasoning behind their work. Extrinsically oriented teachers employed shorter, transactional comments tied to results or observable outputs.

**Explaining Inconsistencies in Motivational Profiles**

The presence of 23 teachers (20 percent) with mixed motivational profiles suggests that orientation should be understood as a spectrum rather than a strict dichotomy. Several factors contributed to inconsistencies across conceptual, procedural, and practical domains. Institutional pressures, particularly the emphasis on grades and measurable outcomes, prompted teachers to adopt outcome-based or controlling reward practices even when their conceptual understanding aligned with intrinsic approaches. Curricular pacing and time constraints further influenced teachers' decisions, as did classroom management challenges requiring immediate behavioral responses. Student characteristics, such as effort, temperament, or learning challenges, also shaped teachers' choices. These contextual influences demonstrate that reward practices emerge from the interaction between personal motivational drivers and environmental demands.

**Table 1. Differences in Teachers' Reward Practices by Motivational Orientation**

| Domain | Intrinsically Oriented Teachers | Extrinsically Oriented Teachers | Key Evidence (n = 114) | Notes on Inconsistencies |
|---|---|---|---|---|
| Conceptual Knowledge | Rewards foster internal motivation, autonomy, and learning processes. | Rewards regulate behavior and ensure compliance. | 72 percent intrinsic, 64 percent extrinsic aligned. | Fifteen intrinsic teachers also mentioned compliance. |
| Reward Emphasis | Emphasis on pedagogical impact and strategy development. | Emphasis on tangible outcomes or measurable results. | 89 percent identified both categories. | Differences lie in emphasis, not recognition. |
| Implementation Understanding | Process-based judgments focusing on effort and strategies. | Outcome-based judgments tied to performance. | Clear contrasts in Case 1 and Case 3. | Social-dynamics scenarios produced highest mixed responses. |
| Classroom Practices | Immediate, descriptive, reflective rewards. | End-of-session, general, or tangible rewards. | 78 percent vs. 71 percent timing pattern. | Shifts due to time pressure and evaluation demands. |
| Communication Style | Reflective dialogue explaining the basis of reward. | Brief, transactional comments tied to results. | Clear differentiation between groups. | Variation within intrinsic group was high. |
| Overall Pattern | Developmental orientation supporting autonomy and competence. | Regulatory orientation prioritizing compliance and efficiency. | Patterns consistent across domains. | Twenty percent showed mixed profiles due to contextual constraints. |

This study reveals fundamental differences in how mathematics teachers with distinct motivational orientations understand and implement reward strategies. Motivational orientation emerges as a mediating factor that determines the extent to which teachers' conceptual knowledge is transformed into concrete pedagogical practice. Broadly, intrinsically oriented teachers consistently interpret rewards as tools to strengthen the learning process and foster student autonomy, while

extrinsically oriented teachers tend to view them as behavioral management instruments designed to secure compliance and academic achievement.

With respect to student autonomy, the findings indicate that rewards function differently depending on teachers' orientations. Intrinsically oriented teachers employed rewards to support students' self-regulation and cultivate responsibility for their own learning. In contrast, extrinsically oriented teachers often utilized rewards as external control mechanisms, thereby constraining students' autonomy. This pattern aligns with the distinction drawn by Reeve and Cheon (2021) and Pittman et al. (1980) between informational rewards, which promote autonomy, and controlling rewards, which undermine intrinsic motivation.

Differences were also evident in how rewards contributed to students' competence development. Intrinsically oriented teachers frequently provided specific and descriptive feedback, enabling students to identify strategies or skills that required reinforcement. In this way, rewards served as learning tools that deepened both procedural and conceptual understanding in mathematics. Conversely, extrinsically oriented teachers relied on more generic forms of praise, rendering rewards less informative and more outcome-oriented. These qualitative differences in communication echo Fong et al. (2019), who found that specific, instructionally rich feedback is more effective in sustaining intrinsic motivation than evaluative, general feedback.

The most pronounced divergence emerged in the relational dimension of classroom practice. Intrinsically oriented teachers demonstrated heightened sensitivity to social dynamics, carefully considering how rewards might shape classroom interactions and, in some cases, delaying recognition to prevent unhealthy competition. They frequently integrated rewards into group activities, fostering solidarity and collective reflection. By contrast, extrinsically oriented teachers tended to distribute rewards on an individual basis, often without attending to broader social consequences. Such practices risk cultivating competitive atmospheres that undermine collaboration. These findings reinforce the importance

of what Patall and Zambrano (2019) describe as "social-contextual sensitivity," whereby effective teachers account for social dimensions in every pedagogical interaction.

In the Indonesian educational context, these findings carry particular significance. The prevailing emphasis on examination outcomes continues to drive teachers toward result-oriented practices, even when they conceptually recognize the importance of rewarding learning processes. Cultural expectations that prioritize compliance and uniformity further entrench this orientation. Teachers attempting to implement process-oriented rewards often encounter resistance from parents or school administrators who demand tangible evidence in the form of grades.

Accordingly, both the *Pendidikan Profesi Guru* (PPG) program and in-service training should integrate motivational orientation as a critical component of pedagogical competence development (Hapsari et al., 2020). Strategies such as classroom simulations, video analysis, and reflective practice can help teachers recognize the motivational impact of their reward practices. Rahma et al. (2022) found that teachers' intrinsic motivation to engage in PPG is shaped by their perceptions of the teaching profession, underscoring the need to foster developmental orientations within training programs.

Similarly, the implementation of the *Kurikulum Merdeka*, with its emphasis on differentiation and student agency, can be reinforced by reward practices that support autonomy, competence, and social relatedness. Recent evidence from Yafie et al. (2024) indicates that the *Kurikulum Merdeka* significantly improves teacher performance by promoting adaptive instructional practices, which resonate with the developmental orientation observed in this study. Palangda et al. (2023) further emphasizes that the transformation of Indonesian education through the "Merdeka Belajar" framework and the *Profil Pelajar Pancasila* requires approaches that holistically foster both character and competence.

The practical implications of these findings highlight the need for more targeted professional development strategies. Assessments of teachers' motivational orientations should be incorporated into training programs, rather than focusing exclusively on content knowledge. Mentoring initiatives could also be structured to pair teachers with strong developmental orientations as role models for their peers. Training sessions that emphasize pedagogical communication skills—particularly in delivering specific and reflective feedback—may enable teachers to internalize more effective reward practices, consistent with Cheon et al.'s (2020) argument for combining structure with autonomy support in learning environments.

Nevertheless, this study has limitations. The classroom observation sample was confined to teachers in South Sulawesi, so caution is warranted in generalizing findings to other geographical and cultural contexts where institutional supports may differ. Moreover, the binary categorization of intrinsic–extrinsic orientations oversimplifies the complexity of teacher motivation, as approximately 20% of teachers in this study exhibited mixed profiles. This suggests that motivational orientation is better understood as a spectrum rather than a discrete dichotomy. Finally, the limited observation period may not have fully captured variations across topics, classroom conditions, or academic terms. Future longitudinal studies could provide a more comprehensive account of both consistency and adaptability in teachers' reward practices.

Overall, these findings underscore that rewards in mathematics education should not be understood merely as technical strategies, but rather as pedagogical practices shaped by teachers' motivational orientations. Whether rewards serve as instruments of student empowerment or tools of behavioral regulation depends on these orientations, making them a critical factor in improving the quality of mathematics teaching and learning in Indonesia.

## CONCLUSION

This study confirms that teachers' motivational orientation functions as a key moderating factor determining how conceptual knowledge of rewards is transformed into concrete pedagogical practice. Intrinsically oriented teachers tend to adopt a *developmental* approach, integrating rewards within the learning process to foster student autonomy and growth. In contrast, extrinsically oriented teachers more frequently employ a *regulatory* approach, emphasizing behavioral control, standardization, and performance outcomes.

Although these general patterns are consistent, the findings also reveal variations and inconsistencies. Some teachers exhibited mixed characteristics, indicating that motivational orientation is not a rigid binary category but rather a spectrum shaped by contextual factors such as school evaluation pressures and institutional expectations. This underscores that rewards in mathematics education should not be viewed merely as technical instruments but as pedagogical practices deeply rooted in teachers' motivational orientations.

The practical implications are clear. The Ministry of Education should revise teacher competency standards to include indicators of motivational orientation and require teacher education institutions (LPTK) to integrate motivational orientation modules into the PPG curriculum. School leaders are encouraged to assess teachers' motivational orientations as a basis for planning more targeted professional development programs. Practitioners can also use the instruments developed in this study for self-assessment and adopt SDT-based reward strategies that have been shown to effectively support students' autonomy, competence, and social relatedness in mathematics learning.

In addition, three directions for future research are recommended. First, the development and testing of SDT-based interventions designed to shift teachers' orientations from *regulatory* to *developmental* through 12–16 week programs with longitudinal follow-up. Second, cross-cultural studies comparing motivational orientation patterns among teachers in collectivist and individualist contexts. Third, multilevel investigations integrating teacher-level, school-level, and policy-level

factors to better understand how reward practices are shaped within mathematics classrooms.

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