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Designing Motivation: Integrating Individual Beliefs and Environmental Factors in the Classroom

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Conceptual

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Abstract

Student motivation is essential for academic success and is influenced by personal beliefs and environmental factors. This paper explores these dual dimensions of motivation, emphasizing the importance of educators' roles in fostering motivation through intentional instructional design. It introduces key theories regarding individual beliefs, such as self-efficacy, mindset, and attribution theories, highlighting how these beliefs shape learners' engagement and learning outcomes. The article also examines environmental factors, including self-determination theory (SDT) and goal structures, and their impact on motivation. The MUSIC Model of Motivation (eMpower, Usefulness, Success, Interest, Care) is presented as a comprehensive framework synthesizing these insights and offering practical ideas for educators to enhance learner motivation in the classroom.

Keywords

student motivation, academic success, self-efficacy, self-determination theory

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Introduction

Motivation plays a critical role in academic success. It affects immediate educational outcomes such as grades and long-term goals like career success and lifelong learning (Lynch, 2006; Zimmerman et al., 1992). It drives students' engagement, persistence, and achievement. However, motivation is not an unchanging attribute but a dynamic interplay between individual beliefs and environmental elements. Alongside educator-created conditions, students' attitudes and experiences (Howard et al., 2021; Urdan & Schoenfelder, 2006) influence motivation. This dual nature of motivation offers both challenges and opportunities for educators. Motivation can be nurtured and developed, not an inherent trait students possess or lack (Urdan & Schoenfelder, 2006). Therefore, this paper aims to analyze individual beliefs and environmental factors contributing to academic motivation and advocate for comprehensive approaches to promote student engagement. It begins by defining academic motivation, then examines individual beliefs, followed by environmental factors that educators can influence. The MUSIC Model of Motivation (Jones, 2009, 2018) is presented as a practical framework for synthesizing these insights. Finally, teacher perceptions of student motivation and its alignment with the MUSIC Model are discussed.

Academic Motivation

Academic motivation involves students' needs, goals, and beliefs when they engage in academic tasks to learn, be recognized, or obtain rewards (Bembenutty et al., 2021). It is a dynamic, multifaceted construct shaped by individual and environmental factors. Students are neither motivated nor unmotivated; they experience varying degrees of motivation (Anderman & Anderman, 2021; Jones, 2018; Keller, 2010; Linnenbrink & Pintrich, 2002). Pintrich (2000) identified three components of academic motivation: expectancy (beliefs about ability), value (reasons and purposes), and affect (emotions like anxiety). Ryan and Deci (2017) highlighted three psychological needs—autonomy, competence, and relatedness—as drivers of motivation. Jones (2018) added that empowerment, usefulness, success, interest, and caring stimulate motivation. A unique perspective on academic motivation is that these factors are theorized and researched in the context of how the surrounding environment facilitates them rather than how much individuals possess them initially. Therefore, identifying and understanding different factors that drive academic motivation can reveal how and why students are motivated in academic settings, thus helping educators influence student motivation.

Components of Academic Motivation

Many studies have explored the interaction between academic motivation and the environment, including teacher behaviors (Meyer & Turner, 2006), and identified motivational classroom practices (Olivier et al., 2020). This section examines individual beliefs and environmental factors essential for shaping academic motivation.

Individual Beliefs

Understanding the factors that shape students' individual beliefs about their abilities and intelligence and the causes of success or failure is essential for fostering academic motivation

and performance. This section examines self-efficacy, mindset, and attribution theories to better understand students' motivational needs and how educators can respond to them.

Self-Efficacy

Self-efficacy, or belief in one's ability to succeed, influences choices, effort, persistence, and emotional responses (Bandura, 1997). In academic settings, self-efficacy is defined as a student's judgment of how well they will handle a situation based on their skills and the circumstances (Reeve, 2018). Bandura identified four primary sources of self-efficacy: mastery experience, social modeling, social persuasion, and physical and emotional states (Feist et al., 2013; Usher & Pajares, 2008). Mastery experience, the most influential source, strengthens self-efficacy, while repeated failures reduce it. Social modeling raises self-efficacy by observing peers' successes, and social persuasion, through feedback, can enhance or diminish it. Emotional states also affect self-efficacy, with positive states boosting it. Lent et al. (1991) validated these sources, and further studies (Sheu et al., 2018; Byars-Winston et al., 2017) confirmed the strong link between mastery experiences and self-efficacy.

Self-Efficacy and Academic Achievement. Self-efficacy significantly impacts academic achievement. A meta-analysis by Schneider and Preckel (2017) identified self-efficacy as the most influential student-related variable in higher education achievement, surpassing intelligence and prior performance. Studies consistently show that self-efficacy predicts course grades and GPA. For example, Hauck et al. (2020) found that it accounted for 36% of the variance in seminar grades, while Sucuoglu (2018) showed it explained 33% of GPA variance in Turkish students. These findings are supported across various disciplines, including physics and mathematics (Kalender et al., 2020; Grigg et al., 2018). Whether self-efficacy is as crucial as cognitive factors like intelligence in predicting academic outcomes arises. Lotz et al. (2018) and Steinmayr et al. (2019) found that while intelligence strongly predicts competence test results, self-efficacy is the strongest predictor of grades. Together, self-efficacy and intelligence account for significant variance in both test results and grades, highlighting self-efficacy's key role in academic success.

Malleability of Self-Efficacy. Self-efficacy is a strong predictor of academic achievement and a malleable construct that can be developed over time through interactions with the learning environment. Some studies suggest personality traits moderate self-efficacy, but research shows that teaching methods, mentoring, and feedback strongly influence it (Judge et al., 2007). Stajkovic et al. (2018) found that self-efficacy positively correlated with academic achievement, even when controlling for personality traits like conscientiousness and emotional stability. This result suggests that interventions to improve self-efficacy, such as mentorship and positive feedback, can lead to better academic outcomes. Han et al. (2021) further demonstrated that self-efficacy could develop over time, with students who initially had low self-efficacy showing significant improvement over a year, leading to better predicted GPA outcomes. Thus, enhancing self-efficacy through targeted interventions and supportive learning environments can yield lasting improvements in academic performance, regardless of individual personality traits.

Mindset Theory

Closely related to self-efficacy is mindset theory, developed by Dweck (2017), which examines how students' beliefs about their intelligence affect their academic success. While self-efficacy focuses on students' belief in their ability to succeed, mindset theory distinguishes between fixed and growth mindsets. Individuals with a fixed mindset believe intelligence is inborn and unchangeable, while those with a growth mindset believe it can be developed through effort (Dweck, 2017; Bernecker & Job, 2019). Students with a fixed mindset focus on proving their competence rather than learning, often avoiding challenges to protect their self-image (Aditomo, 2015; DeBacker et al., 2018). In contrast, students with a growth mindset are motivated to improve their skills and demonstrate resilience when faced with academic challenges (Aditomo, 2015; Blackwell et al., 2007; DeBacker et al., 2018).

Mindset and Mastery Experience. Mastery experience, one of Bandura's sources of self-efficacy, is crucial, but when limited, social persuasion becomes vital (Burnette et al., 2020). For example, university introductory courses can function as social persuasion by providing structured guidance, positive reinforcement, and feedback that helps students believe in their ability to succeed in the subject, assuming that students may lack mastery experiences in certain subjects. In these cases, students' mindsets significantly impact their learning experiences. Aditomo's (2015) study of Indonesian university students found that a growth mindset about academic ability positively predicted adopting learning goals and effort attribution. Therefore, without mastery experiences, fostering a growth mindset through social persuasion can be key to encouraging students to adopt positive learning goals and persist in their efforts.

Mindset Interventions. Mindset interventions designed to promote a growth mindset have been studied as a form of social persuasion. These can be delivered through face-to-face workshops or online sessions as a one-time event or across multiple sessions (Blackwell et al., 2007; Burgoyne et al., 2018; Buzzetto-Hollywood et al., 2019; Yeager et al., 2016). They typically communicate that the brain, like a muscle, can be strengthened through practice, often using a neuroscience perspective (Yeager et al., 2019). Studies with college students have shown that these interventions can enhance self-efficacy, promote a growth mindset, increase interest, and boost task persistence (Burgoyne et al., 2018; Burnette et al., 2020; Miller & Srougi, 2021). A growth mindset is also linked to deeper learning (Mangels et al., 2006).

Mindset interventions' impact on academic performance is mixed. Some studies found no significant improvements in course grades, task performance, or cognitive test results (Burgoyne et al., 2018; Burnette et al., 2020). Meta-analyses by Sisk et al. (2018) reveal that mindset interventions have a minimal effect on academic performance, with only a small correlation between growth mindset and achievement. However, they appear to be more effective for students from underrepresented or marginalized backgrounds, such as those at high academic risk or from low socioeconomic status (SES) families. Yeager et al. (2016) found greater benefits for students with below-median GPAs. Similarly, a national study with ninth-grade math students showed that at-risk students benefited more, mainly when peer norms supported the growth mindset message (Yeager et al., 2019; Burnette et al., 2020).

Further research by Miller and Srougi (2021) demonstrated that students who received mindset interventions performed better on cumulative final exams than their peers, although no significant differences were observed in in-class exams throughout the semester. The final exam was more challenging, requiring students to apply their knowledge and critical thinking skills. The study suggests that while mindset interventions may not immediately impact performance, they can enhance task persistence and motivation to tackle challenges, leading to better performance over time (Burgoyne et al., 2018; Burnette et al., 2020). Thus, while the direct link between mindset interventions and immediate performance improvements may be weak, the long-term benefits of fostering a growth mindset are evident, particularly in building resilience and a belief in the ability to learn.

Teachers' Mindset. Teachers' mindsets also play a crucial role in shaping students' mindsets. Gutshall (2016) found that teachers' beliefs significantly influenced their students' mindsets, mediated by students' perceptions of those beliefs. Farrington (2013) identified four key student beliefs: belonging in an academic community, growth through effort, confidence in success, and valuing the work. Teachers can communicate these beliefs through praise, feedback, and grading practices. Teachers must hold and express a growth mindset, as it directly impacts students' academic outcomes.

Attribution Theory

While self-efficacy and mindset theory highlight how students' beliefs drive their behavior, attribution theory brings a new layer to understanding motivation. It explores how students interpret the causes of their successes and failures, directly influencing their motivation (Weiner, 1985). It categorizes the causes of academic outcomes along three dimensions: locus of control (internal/external), stability (stable/unstable), and controllability (controllable/uncontrollable) (Weiner, 2000). When students attribute success or failure to internal, stable, and uncontrollable factors like ability, they may stop putting in effort, often developing learned helplessness (Aksoy-Pekacar et al., 2020). They may also see hard work as evidence of low ability (Dweck, 2000). Attributing failure to external factors leads students to blame others, evoking emotions like anger, guilt, or shame (Kirschner & Hendrick, 2020). Conversely, attributing failure to controllable factors, such as effort or strategy, increases motivation.

Performance Predictions. Some scholars suggest that compared to high performers, poor performers are more likely to overestimate their ability or prediction of success for academic tasks because of the optimism bias, but they are also less confident in their predictions (Callender et al., 2016; Hamann et al., 2020; Miller & Geraci, 2011). Meanwhile, high performers tend to underestimate their performance but are confident in their predictions (Hamann et al., 2020). The gap between the high and low performers' predictions could be explained by "the unskilled and unaware effect," which postulates that one needs the metacognitive ability to reach accurate conclusions about one's ability, and overestimation is likely to happen when students do not know how to assess themselves (Kruger & Dunning, 1999) effectively. When low performers experience failure due to overestimation, what they attribute their failures to is important. Depending on their perceived reasons for failure, they

can encourage or discourage themselves from putting in more effort (Hamann et al., 2020). Attribution theory (Weiner) and related research shed light on this issue.

Attribution Retraining. Attribution retraining (AR) interventions aim to improve academic success for students with limited prior achievement (Hamm et al., 2017) or those who are new to environments like universities (Dryden et al., 2021). AR typically involves three stages: causal search, attribution induction, and consolidation (Perry & Hamm, 2017). In the causal search stage, students identify and rate the causes of past failures. In the attribution induction stage, they watch a video about shifting attributions for failure from uncontrollable to controllable causes. The consolidation stage encourages deep processing of AR through group discussion or writing.

Empirical evidence suggests that AR positively impacts motivation and performance (Perry & Hamm, 2017). Dryden et al. (2021) found that first-generation students with low academic control beliefs who received AR outperformed their non-AR peers by one letter grade (B vs. C-) in an online psychology course and were less likely to drop out. The researchers suggested that AR decreased attributions to uncontrollable causes and increased academic control beliefs. Similarly, Hamm et al. (2017) compared AR and stress-reduction (SR) treatment with 806 first-year students. Low cognitive elaborators who received AR outperformed their SR peers by one letter grade, showing AR's effectiveness in improving performance.

Environmental Factors

Environmental factors such as teaching styles, classroom goals, and learning climate significantly influence motivation, interacting with students' beliefs to impact learning behaviors. Theories such as self-determination and achievement goal theory explain how the environment affects motivation and how educators can design practices that enhance it.

Self-Determination Theory

One prominent framework for understanding motivation is Self-Determination Theory (SDT), especially its Basic Psychological Need Theory (BPNT). BPNT identifies three core psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2017). Autonomy involves controlling one's actions; competence refers to feeling effective, and relatedness pertains to feelings of belonging and connection. Satisfying these needs is essential for enhancing student motivation and well-being (Domen et al., 2020; Reeve, 2018). In contrast, the frustration of these needs leads to passivity and disengagement (Vansteenkiste et al., 2020). A meta-analysis by Cerasoli et al. (2016) found that autonomy, competence, and relatedness collectively predict student performance, with autonomy accounting for 28%, competence for 37%, and relatedness for 25%. Furthermore, research by Carmona-Halty et al. (2019) shows that satisfying these psychological needs boosts psychological capital, which leads to improved academic performance.

Autonomy Support. Teachers can significantly enhance student motivation by supporting their need for autonomy (Stroet et al., 2013). Autonomy-supportive teaching involves giving students choices, acknowledging their perspectives, using non-controlling language, and explaining the rationale behind tasks (Reeve, 2018; Reeve & Cheon, 2016).

Research consistently shows that autonomy-supportive teaching is associated with greater student engagement and conceptual learning, particularly when students feel they have control over their learning (Jang, 2008; Ulstad et al., 2019). Autonomy-supportive teaching has increased student motivation and learning outcomes (Su & Reeve, 2011).

Competence Support. Equally important is the need for competence, which can be supported by providing structure, clear expectations, and constructive feedback (Deci & Ryan, 2000). Structure helps students gain control over their learning by clarifying goals and offering guidance (Jang et al., 2010). Guay et al. (2017) found that structure enhances autonomous motivation and competence when teachers use differentiated instruction. However, the structure must not feel controlling, as this can lead to controlled motivation instead (Domen et al., 2020). Effective structure involves setting clear goals, providing how-to instructions, and offering feedback highlighting strengths and improvement areas (Forsythe & Johnson, 2017). Research also shows that autonomy support and structure are complementary, working together to promote student engagement and emotional well-being (Hospel & Galand, 2016).

Relatedness Support. The need for relatedness can be met through warmth and involvement, achieved by building strong relationships and being attentive to students' needs (Ayllon et al., 2019). Teacher behaviors such as individualized communication, task-related support, and promoting teamwork are closely linked to higher psychological needs satisfaction and better academic outcomes (Ayllon et al., 2019; Sparks et al., 2015). Ayllon et al. (2019) found that students who viewed their teachers as dependable and supportive achieved higher grades. Satisfying the three core psychological needs—autonomy, competence, and relatedness—fosters students' natural learning inclination. The extent to which these needs are met depends largely on whether teachers adopt a need-supportive or controlling teaching style, which can greatly impact student motivation (Han & Yin, 2016).

Controlling Teaching. While need-supportive teaching fosters motivation, controlling teaching behaviors can hinder it. Controlling teaching can take external forms, such as pressure and intimidation, or internal forms, such as invoking guilt or shame (Bartholomew et al., 2018). Prolonged exposure to controlling teaching leads to student disengagement and frustration. Jang et al. (2016) found that controlling teaching at the start of a semester predicted disengagement by its end, with students experiencing need frustration. Studies involving middle school students have also linked controlling behaviors to decreased motivation, increased fear of failure, and avoidance of challenges (Bartholomew et al., 2018). Therefore, teachers must be mindful of how their behavior influences student motivation and learning.

Achievement Goal Theory

Achievement goal theory explains how individuals' perceptions of achievement influence their motivation, focusing on goal orientations toward task performance and engagement (Pintrich, 2000). These orientations are typically divided into two main types: mastery and performance. Mastery orientation emphasizes understanding and mastering the content, while performance orientation focuses on performing better than others (Friedel et al., 2010). Researchers have developed models to categorize these orientations further. The 2 x 2 model splits mastery and performance orientations into approach and avoidance goals (Elliot,

1999; Elliot & McGregor, 2001). Mastery-approach goals aim at understanding and mastering tasks, while mastery-avoidance goals focus on avoiding failure. Performance-approach goals aim at outperforming others, and performance-avoidance goals focus on avoiding negative judgments. The trichotomous model, which excludes mastery-avoidance goals, has been found to fit better in some studies, suggesting that mastery-avoidance may not be a valid construct (Strunk et al., 2021).

Multiple Goal Perspectives. Although educators often prefer students to adopt mastery goals, students frequently adopt a mix of mastery and performance goals. A meta-analysis of 24 studies identified ten goal profiles, with the most common being a combination of all three orientations, which was consistently maladaptive when analyzed with learning outcomes (Wormington & Linnenbrink-Garcia, 2017). Profiles with high mastery goals and either low or moderate performance goals were associated with more adaptive outcomes. This indicates that while performance goals are often linked to extrinsic motivation, they are not inherently maladaptive, particularly when balanced with mastery goals (Fong et al., 2018; Lee et al., 2017).

Person-centered approaches have supported that students with multiple goal perspectives do not necessarily experience adverse effects. For example, a study of 136 university students in an anatomy course identified three profiles, all of which included mastery goals but varied in their performance goals. The study found no significant differences in achievement outcomes among the groups, suggesting that performance goals are neither beneficial nor detrimental when highly endorsed mastery goals (Lee et al., 2017). Another study with 768 community college students identified five goal orientation profiles, finding that students with high mastery and moderate performance goals achieved the best outcomes (Fong et al., 2018).

Classroom Goal Structure. The learning environment significantly influences Students' motivation, particularly the classroom goal structure and the instructional practices teachers use. Mastery goal structures, which encourage students to learn and master the content, are consistently associated with positive motivation-related factors, such as intrinsic motivation, self-efficacy, and engagement (Murayama & Elliot, 2009; Skaalvik et al., 2017; Won et al., 2020). In contrast, performance goal structures, which emphasize social comparison, are linked to negative outcomes like reduced intrinsic motivation and lower self-concept (Murayama & Elliot, 2009; Skaalvik et al., 2017).

The Matching Hypothesis. Achievement goal theory suggests that students adopt goal orientations that align with their learning environment (Meece et al., 2006). Research on this alignment has produced mixed results. Some studies support the matching hypothesis, which posits that students benefit when classroom goal structures match their personal orientations (Linnenbrink, 2005). For example, Skaalvik and Federici (2016) found that Norwegian students benefited from a classroom mastery goal structure, especially when combined with a low level of performance goal structure. In Taiwan, Lin et al. (2017) also found that students used cognitive and motivational regulation strategies when their personal goals aligned with the classroom structure. Bardach et al.'s (2020) meta-analysis of 68 studies showed that

personal and classroom goal orientations were closely linked, with the strongest association between performance-avoidance goals.

However, Hofverberg and Winberg (2020) found no significant evidence for the matching hypothesis in their study of Norwegian students. Despite this, they noted mastery goals positively impacted motivation and test performance, with the most adaptive pattern being high mastery and low-performance goals. Bardach et al. (2020) found that climate-focused items showed more substantial relationships with personal goals than teacher-focused ones, suggesting that students' reflections on classroom climate influence their goal adoption (Karabenick et al., 2007). Hofverberg and Winberg (2020) also used teacher-focused measures, which might explain their different findings. Similarly, Skaalvik and Federici (2016) relied on teacher-focused items. More research is needed to examine the matching hypothesis, as students' perceptions of classroom goal structures may differ from teachers' (Emery et al., 2018; Federici et al., 2015). Group work, for instance, may be seen by teachers as mastery-oriented but by students as performance-oriented, depending on the context. Despite mixed results, Hofverberg and Winberg (2020) maintained that classroom mastery-goal structures help students adapt their mastery goals.

The MUSIC Model of Academic Motivation

Motivation and engagement emphasize students' responsibility and self-regulation in acquiring new skills. However, student motivation is shaped by the interaction between individual and environmental factors. Further, teachers' perceptions of student motivation guide their behavior in the classroom, which influences the students' level of engagement. While teachers generally agree that student motivation is essential, they do not always effectively incorporate established motivational principles and strategies in their classrooms despite their years of experience (Wiesman, 2016). Therefore, I argue that designing learning environments that foster student motivation and engagement falls under teachers' control and responsibility. The challenge is that while many motivational theories exist, no grand theory currently unifies them. Therefore, a framework of relevant principles is essential for meeting students' needs. The MUSIC Model of Motivation synthesizes various motivation studies and theories into one cohesive model. The developer of the model, Jones (2009; 2018), organized more than 20 theories of motivation into five categories: empowerment, usefulness, success, interest, and caring. These components, validated as correlated but distinct (Jones & Wilkins, 2013), are supported by research-based practices to help teachers apply motivational strategies systematically in their instruction (Jones, 2020; Li & Jones, 2019).

Empowerment

Empowerment refers to students' perceived control over learning, aligning with autonomy in SDT (Ryan & Deci, 2020). Students enjoy learning more when they feel they have some control over class activities (Jones, 2009; 2018; Jones et al., 2016). Experiencing autonomy increases motivation, engagement, and performance (Cerasoli et al., 2016). Classroom strategies to enhance empowerment include offering choices, using learner-directed approaches like problem-based learning, and avoiding controlling language (Jones, 2018).

Usefulness

Usefulness refers to students' perception of how relevant materials or activities are to their short-term and long-term goals (Jones, 2009; Jones, 2018; Jones et al., 2016). It aligns with expectancy-value theory, which posits that motivation depends on the expectation of achieving a desired outcome and how much the individual values that outcome (Deckers, 2018; Eccles & Wigfield, 2002; 2020). Students who see coursework as useful for their future are more likely to be motivated. Goal-setting theories, which emphasize the importance of specific goals, are also relevant (Locke & Latham, 2002). Teachers can enhance the sense of usefulness by connecting coursework to its goals. When students perceive coursework as useless, their engagement motivation may decline (Pintrich, 2003).

Success

The third component, success, tackles self-perception related to competence. It is derived from various theories including, but not limited to, self-efficacy theory (Bandura, 1997), SDT's need for competence (Ryan & Deci, 2017), growth mindset (Dweck, 2017), and expectancy-value theory (Eccles & Wigfield, 2002; Eccles & Wigfield, 2020). Jointly, they posit that students who believe they can succeed are more likely to focus and put effort into the coursework. It should be noted that self-perception regarding competence cannot be nurtured when tasks are too difficult or too easy. Hattie's (2009) meta-analysis of educational achievement demonstrated that when challenging yet achievable goals are established and presented clearly to students, they positively impact student motivation. Therefore, teachers should strive to match task difficulty and student ability, clearly explain the expectations, create a supportive environment, and provide actionable feedback (Jones, 2018).

Interest

Interest refers to whether students find course materials or activities engaging, which includes individual and situational interest. Individual interest is a relatively stable state fueled by curiosity, while situational interest is temporary, triggered by specific task features (Hidi & Renninger, 2006). Individual interest aligns with intrinsic motivation (Ryan & Deci, 2017). Both types of interest lead to positive learning outcomes by increasing concentration on the task (Schunk et al., 2008). While intrinsic motivation may be challenging to foster, teachers can capture attention through gamification, reducing distractions, presenting surprising information, involving students in discussions, and showing enthusiasm (Jones, 2018).

Caring

The final component of the MUSIC Model of Motivation is caring. When students have a trusting and caring relationship with teachers, they recognize that their teachers care about their learning, which increases their attention to learning. This aligns with SDT's need for relatedness (Ryan & Deci, 2017). Studies show that caring relationships enhance intrinsic motivation, resilience, cognitive engagement, and self-efficacy (Jones, 2009; Jones, 2018). Caring can be divided into academic caring, which focuses on student learning, and personal caring, which emphasizes caring for students as persons (Jones, 2010; Johnson et al., 1983).

Teachers can enhance perceptions of caring by being approachable, supportive, and respectful and by valuing student success (Jones, 2018).

Empirical Studies of the MUSIC Model of Motivation

The MUSIC Model of Motivation includes a 26-item inventory (Jones, 2021) that measures students' perceptions of the five components in a course, rated on a 6-point scale. It has been validated across various student groups, including online, medical, and veterinary students (Jones & Skaggs, 2016; Gladman et al., 2020; Jones et al., 2019). The inventory has also been translated and validated in over ten languages, including Chinese and Spanish (Jones et al., 2017). The inventory serves three primary purposes: comparing subgroups' perceptions of the same course (Lee et al., 2017; Scala et al., 2018; Tu & Jones, 2017), assessing students' perceptions of new learning approaches (Chittum et al., 2019; Dockter et al., 2017), and examining the relationship between perceptions and engagement (Chittum et al., 2019; Jones & Carter, 2019).

Comparing Subgroups

The MUSIC Inventory has been used to investigate subgroup differences in the same course. For example, Scala et al. (2018) compared engineering and business students in a cross-listed analytics course. They found that usefulness predicted engineering students' scores, while interest predicted business students' scores, with engineering students scoring higher on the caring component. Tu and Jones (2017) compared students in a neuroscience laboratory course, dividing them into groups overseen by professors or teaching assistants (TAs). They found that as the number of TAs increased, students' motivation perceptions decreased, likely due to insufficient TA training. Lee et al. (2017) examined gender, ethnicity, and race differences in a summer bridge engineering program, finding that success and caring were significant for underrepresented students.

Assessing New Teaching Approaches

When new approaches such as active, learner-centered, or collaborative learning are introduced, students often prefer familiar, teacher-centered methods (Doyle, 2008). The MUSIC Inventory has systematically assessed students' perceptions of these changes. For instance, Mora et al. (2017) examined the introduction of problem-based learning and found that the facilitator's approach influenced students' perceptions of empowerment and caring. Chittum et al. (2017) used the inventory to assess team-based learning in an undergraduate biology course, where students showed high motivation levels. They analyzed the empowerment and interest components to evaluate the effectiveness of the instructional practices and course structure. The MUSIC Inventory has also been applied in asynchronous online learning environments. Docker et al. (2017) used it to study a self-paced online chemistry course, focusing on the caring component. Surprisingly, despite limited direct interaction with instructors, students rated the caring component highly due to "light touch" interventions, such as progress updates, reminders, and offers of support.

Motivation and Engagement

Studies have linked the MUSIC Inventory to student engagement. Chittum et al. (2019) found that higher MUSIC scores were associated with greater cognitive engagement and effort, particularly among students majoring in psychology. Jones and Carter (2019) reported that empowerment and usefulness predicted both behavioral and cognitive engagement in learning. These findings suggest that teachers can enhance student engagement by intentionally targeting specific components of the MUSIC Model.

Limitations

The MUSIC Model of Motivation (Jones, 2009, 2018) and its inventory offer valuable insights into student motivation, though it is not without limitations. While many studies have been conducted in collaboration with the model's founder, expanding research to include a broader range of researchers would further enhance its validity. Additionally, exploring its application in diverse online and face-to-face learning environments presents an exciting opportunity to deepen our understanding of how the model can support student motivation across varied contexts.

Connection to Individual and Environmental Factors

Table 1 summarizes the relationships between the MUSIC Model components and the individual and environmental factors discussed. Each component of the MUSIC Model is deeply interconnected with individual beliefs and environmental factors. This dual connection emphasizes the importance of a holistic approach to student motivation, where educators design learning environments that address both personal and contextual elements to foster motivation and engagement.

Table 1

MUSIC Model Components Related to Individual and Environmental Factors

MUSIC Model Component	Connection to Individual Factors	Connection to Environmental Factors
Empowerment	Self-efficacy: Students with high self-efficacy feel more empowered to take control of their learning.	Autonomy-supportive teaching practices: Offering choices in learning activities and encouraging student input.
Usefulness	Goal orientation and mindset: Students are motivated when they see the relevance of their learning to their future goals.	Classroom goal structure: Teachers can increase the material's perceived usefulness by relating it to students' personal and academic goals.
Success	Self-efficacy, attribution theory, the need for competence: Belief in one's ability to succeed and attributing success to effort increases motivation.	Classroom goal structure, Competence supportive teaching: A structured, supportive environment fosters a sense of competence.
Interest	Intrinsic motivation and mindset: Students with a growth mindset and intrinsic motivation are likelier to engage deeply with interesting material.	Autonomy-supportive teaching: Teachers can enhance interest by incorporating hands-on activities, real-world applications, and varied teaching methods.
Caring	The need for relatedness: Students who feel cared for are more engaged and motivated.	Relatedness-supportive teaching: Strong teacher-student relationships fulfill students' psychological need for relatedness, increasing motivation.

Teacher Perceptions and Responsibility in Student Motivation

The components of motivation discussed in the previous sections are linked to positive learning experiences and outcomes, making it essential to understand what drives teachers' use of motivational strategies. Laurermann and Karabenick (2013) developed the Teacher Responsibility Scale (TRS), which measures teachers' perceived responsibility in four domains: student achievement, student motivation, relationships with students, and their teaching. Studies using the TRS consistently show that teachers score lowest on personal responsibility for student motivation (Daniels et al., 2016, 2017, 2018; Eren, 2017). Many educators believe they have little influence on student motivation, viewing it largely determined by students' innate traits (Daniels et al., 2018). Teachers who hold this belief are less likely to try motivational strategies (Turner, 2010). In contrast, those who recognize their ability to affect student motivation are more likely to adopt strategies that enhance engagement and learning (Reeve & Cheon, 2016; Wang et al., 2017). Thus, it is crucial for educators to see motivation as something that can be nurtured.

Despite their importance, teacher perceptions are not always accurate, which can lead to ineffective strategies. Ulstad et al. (2019) compared teacher and student perceptions of motivation in physical education (PE) classes using the organismic integration theory of Self-Determination Theory (SDT). They found that teachers' and students' ratings aligned only for autonomous motivation. Teachers often misinterpreted behaviors such as not participating in class as a lack of motivation, potentially leading to ineffective strategies.

Teachers' and students' views on the causes of amotivation often differ. Schwan (2021) studied middle school teachers and students and found that teachers attributed amotivation to external factors like home or social issues, while students pointed to a lack of relevance and future utility as the main reasons. Similarly, Miller et al. (2017) examined how high school math teachers rated student achievement and effort. They found that teachers with higher self-efficacy rated remedial students more positively regarding improvement, while those with lower self-efficacy were more critical. This suggests that teachers' perceptions and self-efficacy influence their views on student potential, particularly in struggling students.

Moreover, teachers' perceptions of their students' motivation are crucial in shaping the learning environment (Berger et al., 2018; Liu et al., 2020). Hornstra et al. (2018) explored this in Dutch secondary schools, finding that teachers with higher expectations used more autonomy-supportive teaching styles, leading to students perceiving greater autonomy. Teachers' perceptions of student competence and motivation significantly impact their instructional approach. A path-analysis study conducted by Liu et al. (2020) in Singapore found that teachers' perceptions of student motivation directly influenced their use of autonomy-supportive strategies. Teachers who believed their students were intrinsically motivated were more likely to provide meaningful rationales, offer instrumental help, and try to understand their students better. These findings highlight the importance of teachers' perceptions in shaping their teaching methods and student learning experience.

In sum, misperceptions about student motivation and biases in interpreting behaviors can result in missed opportunities to boost motivation. To address this issue, educators can turn to the

MUSIC Model of Academic Motivation (Jones, 2018), a comprehensive framework designed to help teachers integrate motivational strategies into their instructional practices. By understanding and applying the MUSIC Model, teachers can adjust their perceptions and adopt strategies that foster student engagement and enhance motivation.

Conclusion

Student motivation is not stable and is not achieved by simply encouraging them. Motivating students involves creating an environment that nurtures motivation (Kember et al., 2010), and teachers play a crucial role in this process (Anderman et al., 2011). By recognizing student motivation as part of their professional responsibility and utilizing frameworks like the MUSIC Model of Motivation, educators can design learning experiences that support and enhance student motivation. This approach benefits students and leads to more meaningful and successful learning experiences.

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