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The Quality of Teacher-Student Interaction and University Students' Self-Efficacy

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ABSTRACT

As a core variable influencing university students' learning engagement, academic achievement and mental health, the development of self-efficacy is closely linked to the quality of teacher-student interaction in the classroom. Drawing on social cognitive theory, this paper systematically analyses the connotations and dimensions of the quality of teacher-student interaction, and explores four core pathways through which it influences university students' self-efficacy: verbal persuasion, vicarious experience, direct experience of success, and emotional arousal. Building on this, the paper further distinguishes the differential effects of four interaction types—supportive, challenging, egalitarian, and feedback-oriented interactions—on self-efficacy, and proposes teaching strategies to enhance the quality of interaction in order to strengthen students' self-efficacy. Research indicates that high-quality teacher-student interaction not only directly enhances students' self-efficacy but also produces lasting effects through mechanisms such as establishing a safe psychological learning environment, providing precise demonstrations of learning strategies, and promoting positive shifts in students' attributional styles. This paper provides a theoretical basis for promoting students' psychological development through the optimisation of teacher-student interaction in higher education practice.

KEYWORDS

Quality of teacher-student interaction; Self-efficacy; University students; Social cognitive theory; Classroom teaching

1. INTRODUCTION

Self-efficacy refers to an individual's belief in their ability to organise and execute specific actions to achieve desired outcomes [1]. In the context of higher education, self-efficacy has a profound impact on university students' academic performance, persistence in learning, career choices, and even mental health. A wealth of empirical research indicates that students with higher self-efficacy demonstrate greater perseverance when facing difficulties, adopt more effective learning strategies, and achieve better academic results [2]. However, phenomena such as academic burnout and learned helplessness, which are prevalent among university students today, precisely reflect a lack of self-efficacy. At the same time, teacher-student interaction, as a core component of classroom teaching, plays a fundamental role in the development of university students. Unlike in primary and secondary education, teacher-student interaction in higher education is often more complex: factors such as large class sizes, limited contact time between teachers and students, and the heavy research pressures on lecturers may all affect the quality of interaction. Yet it is precisely because of these constraints that high-quality teacher-student interaction becomes particularly valuable. Numerous studies indicate that the quality of teacher-student interaction not only influences students' academic performance but also profoundly affects their self-perception, learning motivation and psychological adjustment [3]. So, through what mechanisms does the quality of teacher-student interaction influence university

students' self-efficacy? How do different interaction patterns produce varying effects? How can we enhance students' self-efficacy by optimising the design of these interactions? This paper will conduct a systematic theoretical analysis of these questions from the perspective of social cognitive theory, with the aim of providing a theoretical framework for university teachers' teaching practice and related empirical research.

2. THEORETICAL ELABORATION OF CORE CONCEPTS

2.1. Self-Efficacy: Sources, Mechanisms and Educational Implications

The concept of self-efficacy was first systematically proposed by Bandura in his social cognitive theory. Unlike self-esteem or self-confidence, self-efficacy is a task-specific, context-dependent judgement rather than a general self-evaluation. Bandura noted that self-efficacy primarily derives from four sources of information: direct experiences of success, vicarious experiences, verbal persuasion, and physiological and emotional states [4].

Direct experiences of success are the most powerful source of efficacy information. When students successfully complete a challenging task, their belief in their own abilities is substantially enhanced. However, the impact of successful experiences on self-efficacy depends on the difficulty of the task, the effort expended, and the attribution of success to the situation. Vicarious experiences refer to efficacy beliefs generated by observing the success of others similar to oneself. When students see a peer overcoming difficulties to complete a task, they infer that 'if they can do it, so can I'. Verbal persuasion encompasses encouraging and persuasive feedback from teachers, peers or others; whilst its effect is limited when acting alone, it proves highly effective when combined with other sources of self-efficacy information. Physiological and emotional states refer to emotional reactions experienced by individuals in task situations, such as anxiety, stress or excitement, which are interpreted as signals of either inadequate ability or sufficient preparedness.

In higher education contexts, self-efficacy plays a multifaceted moderating role in students' learning behaviours. Students with high self-efficacy tend to set higher learning goals, invest more effort, persevere longer in the face of setbacks, and employ more advanced cognitive strategies [5]. Conversely, students with low self-efficacy are prone to avoiding challenges, giving up easily, and experiencing academic anxiety. Therefore, enhancing university students' self-efficacy is not only a means of improving academic performance but also an end in itself for promoting students' positive psychological development.

2.2. Quality of Teacher-Student Interaction: Dimensions and Measurement

The quality of teacher-student interaction is a multidimensional concept, defined by different researchers from various perspectives. Synthesising existing research, we can summarise the quality of teacher-student interaction in higher education institutions into the following core dimensions.

Firstly, the emotional support dimension. This dimension focuses on the respect, care, understanding and acceptance demonstrated by teachers in their interactions with students. In interactions characterised by high levels of emotional support, students feel valued and understood, and experience a strong sense of psychological safety; whereas in interactions with low levels of emotional support, students may feel neglected or judged, leading to a defensive mindset [6]. Secondly, there is the dimension of instructional support. This dimension involves the cognitive guidance, demonstration of strategies and cognitive scaffolding provided by teachers during interactions. In interactions with high levels of instructional support, teachers are able to adjust the difficulty of their questions according to students' level of understanding, provide appropriate prompts when students encounter difficulties, and guide students to reflect on their own thought processes. The quality of pedagogical support directly influences the learning gains students derive

from the interaction. Next is the autonomy support dimension. This dimension focuses on whether teachers respect students' autonomous choices, encourage them to express independent views, and allow them to voice opinions differing from the teacher's during interactions. Autonomy support helps satisfy students' need for autonomy, thereby enhancing intrinsic motivation and self-efficacy [7]. Finally, there is the dimension of feedback quality. Feedback in teacher-student interactions encompasses not only judgements on the correctness of students' answers, but also evaluations of their thought processes, suggestions for improvement, and emotional responses. High-quality feedback is specific, timely and constructive, and focuses on students' efforts and strategies rather than fixed abilities. It should be noted that the aforementioned dimensions are not mutually exclusive. A high-quality teacher-student interaction often simultaneously exhibits high levels of emotional support, instructional support, autonomy support and feedback quality. However, different teachers may place varying emphasis on these dimensions in different contexts.

3. MECHANISMS THROUGH WHICH THE QUALITY OF TEACHER-STUDENT INTERACTION INFLUENCES UNIVERSITY STUDENTS' SELF-EFFICACY

3.1. Verbal Persuasion Mechanism: The Efficacy-Enhancing Function of Teachers' Discourse

Bandura points out that whilst verbal persuasion has limited effect on its own, persuasion from an authoritative or credible source can significantly influence an individual's self-efficacy. In the classroom context, teachers are undoubtedly persuasive sources possessing high levels of authority and professional credibility. When teachers express trust in students' abilities (e.g., 'You have the ability to meet this challenge'), affirm students' efforts (e.g., 'I've noticed you've put a great deal of effort into this problem'), or express expectations of students' future success (e.g., 'I believe you will perform even better in subsequent tasks'), such statements directly enhance students' belief in their own capabilities [8]. However, not all teacher remarks have a positive impact on self-efficacy. Ineffective or negative verbal persuasion—such as vague praise ('You're so clever'), insincere encouragement ('You can definitely do it' when the student is clearly lacking in ability), or critical remarks ('Why did you get it wrong again?')—not only fails to enhance self-efficacy but may actually be counterproductive. Effective verbal feedback should possess the following characteristics: it should be specific to particular behaviours and strategies, based on genuine evidence of performance, and aligned with the student's actual ability level. For example, "I noticed you applied the analytical framework we discussed last week in this presentation; that was a very good attempt" is more effective at enhancing students' self-efficacy than simply saying "Well done". Furthermore, teachers' language indirectly influences self-efficacy by shaping students' attributional styles. When teachers attribute students' success to effort, strategies and continuous learning (controllable factors) rather than talent or luck (uncontrollable factors), students are more likely to perceive their success as replicable, thereby forming a more robust belief in their efficacy [9].

3.2. The Mechanism of Vicarious Experience: The Transmission of Efficacy Through Observational Learning

Teacher-student interaction encompasses not only direct dialogue between teachers and students, but also the indirect experiences students gain by observing teachers' interactions with their peers. Vicarious experience is the second major source of self-efficacy. When a student observes a teacher giving positive feedback to another student, or sees a peer successfully complete a task under the teacher's guidance, the observing student will also experience a certain degree of enhanced efficacy—provided they perceive similarities between themselves and the observed student.

In teacher-student interactions, teachers can utilise the vicarious experience mechanism to enhance students' self-efficacy in the following ways. Firstly, teachers can invite students who have made progress in previous learning to share their experiences, providing other students with examples that demonstrate 'ordinary people can succeed too'. Secondly, when interacting with individual students, teachers can consciously make the interaction visible to the whole class (such as through 'aquarium discussions'), allowing more students to observe and benefit from the process [10]. Furthermore, teachers can demonstrate coping strategies for dealing with difficulties through exemplary dialogue—for instance, by personally demonstrating how to analyse a tricky problem, how to try different approaches, and how to learn from failure; these demonstrations provide models for students' observational learning. It is worth noting that the impact of vicarious experiences on students' self-efficacy depends on observers' perceptions of the similarity between themselves and the model. If the model presented by the teacher is too exceptional (such as a student who always performs flawlessly), other students may conclude, "I am not like him; his success holds no relevance for me." Therefore, effective vicarious experiences should showcase diverse models, including students of average ability, those who have experienced failure but ultimately succeeded, and students with different learning styles.

3.3. The Mechanism of Direct Success Experiences: Validation of Competence in Interactive Tasks

Direct success experiences are the most powerful source of self-efficacy. How does the quality of teacher-student interaction create direct success experiences for students? This depends on the design of the interactive tasks and the teacher's scaffolding support. In a high-quality teacher-student interaction, the teacher is able to accurately assess the student's current level of competence (i.e., what Vygotsky termed the 'actual level of development') and, on this basis, propose challenges that are slightly above that level (i.e., entering the 'zone of proximal development') . Through the student's efforts and the teacher's timely assistance, this challenging task is completed, and the student gains a direct experience of success [11].

Unlike unstructured independent learning, tasks within teacher-student interactions typically feature clear objectives, appropriate levels of difficulty, and immediate teacher feedback. These characteristics make it easier for students to experience the causal relationship that 'effort leads to success' during the interaction, thereby fostering positive beliefs in their efficacy. For example, during teacher-student Q&A sessions, teachers can break down questions, offer hints, or adjust the difficulty level to enable students who might otherwise have failed to arrive at the correct answer. This 'guided success' enhances students' sense of efficacy more effectively than independent success, as it simultaneously conveys the message that 'support is available when needed'. However, teachers must also take care to avoid over-helping. If students perceive that success stems entirely from the teacher's assistance rather than their own efforts, the positive impact of this experience on self-efficacy will be significantly diminished. The ideal scaffolding should be 'dynamic and phased': the support provided by the teacher gradually diminishes as the student's abilities improve, enabling the student to ultimately experience the sense of achievement that comes from completing a task independently [12].

3.4. Emotional Arousal Mechanisms: Emotional Regulation within the Interaction Context

The quality of teacher-student interaction directly influences students' physiological and emotional states within the classroom context. Low-quality interactions—such as harsh criticism from the teacher, impatient responses, or public humiliation—can trigger anxiety, tension, embarrassment, or even fear in students. These negative emotional reactions are interpreted by the individual as a signal that 'I cannot cope with this situation', thereby reducing self-efficacy. Conversely, high-quality interactions—such as understanding, encouragement, respect and patience from the teacher—create

a safe and relaxed psychological atmosphere, maintaining students' emotional state at a level of arousal conducive to performance [13].

The role of the emotional arousal mechanism is particularly evident in high-pressure situations such as examinations, public speaking and classroom responses. A student who has established a relationship of trust with their teacher is more likely, when called upon to answer a question in class, to interpret mild nervousness as a 'sign of readiness' rather than a 'sign of inadequacy'. This difference in emotional interpretation directly influences the student's performance in responding, and this performance in turn reinforces or undermines their self-efficacy, creating a self-reinforcing cycle.

Teachers can utilise the emotional arousal mechanism to enhance students' self-efficacy in the following ways: establishing clear classroom norms for psychological safety (e.g., "All thoughtfully considered answers are valuable, even if incomplete"); normalising students' expressions of anxiety (e.g., "I understand that many of you feel nervous about this task; that is normal"); maintaining a non-judgmental attitude during interactions; and providing immediate support when students experience emotional distress [14].

4. THE DIFFERENTIATED EFFECTS OF DIFFERENT TEACHER-STUDENT INTERACTION MODELS ON SELF-EFFICACY

4.1. Supportive Interaction: Fostering Self-Efficacy Based on Trust

Supportive interaction refers to teachers demonstrating a high degree of respect, empathy and acceptance in their interactions with students. Typical characteristics of this interaction model include: teachers listening patiently to students' expressions, showing understanding of students' difficulties, focusing criticism on the issue rather than the individual, and taking a proactive interest in students' academic and personal circumstances. The impact of supportive interaction on self-efficacy is realised primarily through three pathways: firstly, it reduces students' psychological defences, making them more willing to reveal their gaps in understanding and thereby receive more targeted assistance; secondly, it enhances students' sense of belonging and feeling of being valued, an emotional experience that forms a crucial foundation for intrinsic motivation; thirdly, it leads students to view teachers as resources to turn to rather than as judges, making them more willing to seek support rather than avoid challenges [15]. However, excessive supportive interaction may also have adverse effects. When a teacher's support manifests as overprotection (such as consistently solving problems for students or offering equal praise for all answers), students may fail to obtain authentic information about their efficacy, leading to an inflated sense of self-efficacy. Should they encounter failure in an independent task, this inflated sense of efficacy will rapidly collapse. Therefore, supportive interaction must be balanced with challenging interaction.

4.2. Challenging Interactions: Breaking Through to Efficacy Under Moderate Pressure

Challenging interactions refer to situations where teachers set task requirements that exceed students' current ability levels but are achievable through effort. This interaction model is realised through high expectations, probing questions, and the assignment of extension tasks. The role of challenging interactions in enhancing self-efficacy lies in the fact that they provide students with an opportunity to demonstrate their capabilities. When students successfully meet the teacher's challenge, they gain not only a sense of accomplishment but also a renewed understanding of their own potential—this experience of realising 'I can actually achieve this much' is key to a significant boost in self-efficacy [16].

However, challenging interactions carry significant risks. If the challenge is too difficult and the teacher provides insufficient scaffolding, students will repeatedly experience failure, which will severely damage their self-efficacy. Therefore, challenging interactions must be combined with carefully designed scaffolding. Teachers need to dynamically adjust the intensity of the challenge based on students' immediate feedback, ensuring that students remain in a state of 'supported challenge' rather than 'overwhelming challenge'. In this sense, challenging interactions and supportive interactions are not opposites, but complementary.

4.3. Equal Interaction: Autonomy and Efficacy in a Dialogue

Equal interaction refers to the establishment of a non-hierarchical dialogue between teachers and students. In this model, teachers do not assume an authoritative stance but participate in discussions as 'co-explorers'; students are not only permitted to question the teacher but are also encouraged to put forward differing perspectives. The core value of egalitarian interaction lies in fulfilling students' need for autonomy. Self-determination theory posits that autonomy, competence and relatedness are three fundamental psychological needs, and the fulfilment of autonomy is a key precursor to intrinsic motivation and self-efficacy [17]. In egalitarian interaction, students experience that: their views are worthy of serious consideration; they can influence the direction of the discussion; and their relationship with the teacher is one of collaboration rather than subordination. These experiences translate directly into a belief in their own capabilities—for a person capable of engaging in equal dialogue with an authority figure must necessarily be competent. Of course, egalitarian interaction does not imply that teachers abandon their professional judgement. Teachers can still demonstrate expert thinking within an equal dialogue, but the manner in which they do so is through asking, 'This is how I see it; what do you think?' rather than stating, 'This is the answer'.

4.4. Feedback-based Interaction: Calibrating Efficacy through Information Loops

Feedback-based interaction refers to a model of teacher-student interaction centred on high-quality formative feedback. In this interaction, feedback is not a one-off evaluation, but a continuous information loop: student performance – teacher feedback – student improvement – further teacher feedback. High-quality feedback possesses the following characteristics: it is specific (identifying what was done, how well it was done, and how to improve); timely (provided whilst the student has not yet forgotten the task context); balanced (highlighting both strengths and areas for improvement); and attributed to effort and strategy rather than fixed ability.

The unique contribution of feedback-based interaction to self-efficacy lies in its ability to help students calibrate their perception of their own abilities. Many students' low self-efficacy stems not from a lack of ability, but from a lack of accurate self-perception—they either underestimate or overestimate themselves. High-quality feedback provides students with authentic, actionable information regarding their efficacy: when a student reads "Your argument is well-structured, but the evidence requires further verification", they receive a precise assessment of their strengths and weaknesses, which is far more effective than a vague "not bad" [18].

5. STRATEGIES TO ENHANCE THE QUALITY OF TEACHER-STUDENT INTERACTION AND BOOST UNIVERSITY STUDENTS' SELF-EFFICACY

5.1. Building Trust and Creating a Psychologically Safe Interaction Environment

The quality of teacher-student interaction depends first and foremost on the psychological environment in which it takes place. If students feel judged, belittled or ignored, even the most sophisticated teaching design will struggle to be effective. Therefore, teachers should consciously

work to build a relationship of trust with their students. Specific strategies include: demonstrating care for students at the start of the term through self-introductions and interest surveys; avoiding humiliating or demeaning language during classroom interactions; offering encouragement rather than impatience to students who struggle to express themselves; and setting aside open office hours outside of class to provide genuine assistance to students.

Establishing a psychologically safe environment also requires teachers to manage their non-verbal behaviour effectively. Research indicates that a teacher's eye contact, facial expressions, body language and tone of voice have a significant impact on students' emotional experiences. A frown, a sigh or an averted gaze may convey a stronger sense of judgement than words alone [19]. Consequently, teachers should maintain an open posture during interactions, engage in eye contact at eye level with students, and use a gentle yet firm tone of voice.

5.2. Carefully Designing Interactive Tasks to Create Attainable Experiences of Success

As mentioned earlier, direct experiences of success are the most powerful source of self-efficacy. Teachers should design interactive tasks to ensure that students can achieve frequent and authentic experiences of success. This requires teachers to accurately assess students' ability levels and, on this basis, design tiered and progressive interactive tasks. A practical framework is the 'three-tier approach': dividing interactive tasks into a foundational level (ensuring all students can complete them), an extension level (which most students can achieve with effort), and a challenge level (designed for students with extra capacity). During classroom interactions, teachers can flexibly select tasks from different levels to probe further based on students' responses. Furthermore, teachers should document students' progress during interactions and provide regular feedback on their development. For example, midway through the term, a teacher might say to a student in a one-to-one conversation: "At the start of the term, you could only identify one aspect when explaining this concept; now you are able to analyse it from three perspectives. This is a significant improvement." Such feedback based on longitudinal comparison effectively enhances self-efficacy, as it emphasises growth rather than horizontal comparison with peers.

5.3. Demonstrating Positive Attribution to Guide Students in Constructing Healthy Beliefs in Their Own Capabilities

The way students attribute outcomes during interactions directly influences the stability of their self-efficacy. When faced with failure, students who attribute the cause to 'I'm not clever enough' (a fixed, uncontrollable internal factor) will feel powerless to change the situation, leading to a sharp decline in self-efficacy; whereas those who attribute it to 'I need more practice' or 'I need to adjust my strategy' (variable, controllable factors) will maintain their sense of efficacy and continue to strive.

Teachers can guide students towards developing positive attribution habits through verbal modelling. When students perform well during interactions, teachers might say: "It seems you've prepared thoroughly for this problem" (emphasising effort) or "You've adopted a very creative approach" (emphasising strategy), rather than "You're so clever" (emphasising innate ability). When students perform poorly, teachers might say: "That approach didn't work; let's try another one" (emphasising the malleability of strategies) or "This concept does indeed require more time to digest; that's perfectly normal" (normalising the difficulty). Through consistent linguistic modelling, students gradually internalise this attribution style, developing a more resilient sense of self-efficacy [20].

5.4. Building a Feedback Community to Promote Peer and Self-Assessment

Although teacher-student interaction is important, the impact of feedback from the teacher alone is limited. Incorporating peer assessment and self-assessment into the interactive system can create

synergies that further strengthen self-efficacy. The advantage of peer assessment lies in the fact that language between peers is easier to understand, evaluation criteria are closer to the learner's perspective, and the frequency and volume of feedback far exceed what a teacher can provide. Self-assessment, in turn, encourages students to internalise external standards as tools for self-monitoring.

Teachers can design structured peer-assessment tools, such as rubrics containing specific criteria, to guide students in evaluating their peers' performance across dimensions such as 'clarity of argument', 'sufficiency of evidence' and 'fluency of expression'. During the self-assessment phase, students might be asked: 'What did I do well in this interaction?' and 'What is one area I could improve next time? Through such exercises, students gradually shift from relying on external evaluation to internal self-monitoring, and the source of their self-efficacy expands from 'the teacher says I can' to 'I also believe I can'.

6. CONCLUSION

There is a close and complex relationship between the quality of teacher-student interaction and university students' self-efficacy. From the perspective of social cognitive theory, high-quality teacher-student interaction comprehensively influences students' efficacy beliefs through four pathways: verbal persuasion, vicarious experience, direct experience of success, and emotional arousal. The four modes of interaction—supportive, challenging, egalitarian and feedback-oriented—each have their own focus and serve the development of students' efficacy at different levels. Effective teaching practice should integrate these interaction modes, making systematic efforts in areas such as building trusting relationships, designing achievable tasks, modelling positive attributions and constructing a feedback community. It should be noted that the influence of teacher-student interaction on self-efficacy is not unidirectional. Students with higher self-efficacy often seek teacher-student interaction more proactively, thereby gaining more opportunities to enhance their efficacy and creating a virtuous cycle; conversely, students with low self-efficacy may avoid interaction, missing out on developmental opportunities. Therefore, when designing interactions, teachers should pay particular attention to those students with lower self-efficacy and lower levels of engagement, proactively creating safe and accessible experiences of success for them.

Future research could further explore differences in the relationship between the quality of teacher-student interaction and self-efficacy across different disciplines, year groups and course types, as well as how to systematically enhance university teachers' interactive skills through professional development. At a time when higher education is increasingly focused on the quality of student development, optimising teacher-student interaction is not merely a technical issue of teaching reform, but a fundamental pathway to promoting students' mental well-being and lifelong growth.

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