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The Pygmalion Effect in Education: A Review of Research Evolution and Future Directions

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Abstract: ***The Pygmalion Effect has become a core topic in the fields of educational psychology and school leadership since Rosenthal and Jacobson's pioneering research. This article aims to conduct a systematic integration and review of the research results based on core literature, clarifying the theoretical origin, mechanism of action, influencing dimensions, boundary conditions and educational intervention strategies of this effect. The review reveals that teacher expectations influence students' academic achievements and psychological motivation through multiple mediating variables such as teacher-student interaction, students' self-concept and self-efficacy. However, this effect is not unconditional and its strength and direction are significantly regulated by individual student factors (such as autonomy), classroom environment (such as ability grouping), teacher beliefs (such as growth mindset) and different analytical levels (such as individual and class). It may even trigger the "reverse Pygmalion Effect" or the "Golemb Effect". Effective educational practices should combine high expectations with high support, and through teacher reflective training, classroom environment optimization and differentiated teaching to transform the expectancy effect into a positive educational force. This paper finally summarizes the limitations of existing research and indicates the direction for future research.***

Keywords: Pygmalion Effect, Teacher expectations, Boundary conditions, Educational intervention, Literature review.

1. Introduction

The Pygmalion Effect, which also known as the "Self-Realization Prediction", was initially proposed by sociologist Merton. Later, Rosenthal and Jacobson introduced it into the field of educational research through the "Oak Tree School" experiment, which confirmed that teachers' expectations can significantly affect students' intellectual development (Chang, 2011; Gündüzalp & Özan, 2019; Iqbal & Ali, 2021). This discovery caused continuous ripples and in-depth discussions in the field of education. Although numerous studies have repeatedly confirmed the positive effect of positive expectations, the educational reality is far from being a linear model of "expectation equals realization". Chang's case study (2011) sharply pointed out that in the field of education, it was not always the case that "what you expect is what you get", which revealed the conditional and complexity of this effect. Moreover, the research perspective of researchers is expanding from traditional teacher-student interaction to the relationship between school administrators and teachers (Gündüzalp & Özan, 2019). That indicates that the Pygmalion Effect is a multi-level phenomenon throughout the entire educational system, operating the student level (namely individual level), the classroom level and the school level (e.g., administrator expectations towards teachers).

Therefore, this review aims to comprehensively and dialectically understand the Pygmalion Effect by integrating existing research. It will trace the theoretical basis of this effect and the controversies it has sparked, starting from its pioneering studies, clarify the mechanism of expectation transmission, explore its boundary conditions and potential flaws, and formulate intervention strategies. Finally, this review will critically assess the current limitations and propose suggestions for future research.

2. Methodology

The methodology used in this study is the systematic literature review method (Nightingale, 2009) and the purpose of this method is to comprehensively summarize the evidence related to a specific issue. Firstly, this study clearly defines the core issue that this review aims to explore, namely "the theoretical origin, mechanism, influencing factors, boundary conditions, and educational intervention strategies of the Pygmalion Effect". Secondly, this study has formulated an appropriate literature search strategy, aiming to cover representative empirical studies and key intervention studies in different contexts. This approach ensures both historical depth and contemporary relevance. Meanwhile, where claims rely on one or two specific studies, cautious language is used. This paper mainly conducts searches in academic databases (CNKI and Google Scholar) and screening and including relevant literature. Then, data extraction and analysis were carried out, systematically extracting relevant information from each included literature and conducting secondary analysis. Finally, the extracted data were organized and analyzed to draw conclusions and discuss their significance, limitations, and implications for future research.

3. Foundation, Verification and Controversy of Theory: From the Laboratory to the Classroom

The Pygmalion Effect was rooted in the Merton's theory of "self-fulfilling prophecy" wherein an initially incorrect situational definition could trigger new behaviors, thereby turning the incorrect concept into reality (Good et al., 2018). Before entering the field of education, Rosenthal and Fode (1963) had already accumulated empirical evidence for the expectancy effect in the laboratory environment. In this research, the experimentalists who were guided to believe that they were feeding smarter mice actually achieved better performance of the mice in the maze task, which initially proved that researchers' expectations could unintentionally influence the research subjects. Based on this theoretical framework, Rosenthal and Jacobson (1968) conducted a landmark educational psychology experiment "Pygmalion in the Classroom". They conducted a test of general ability (TOGA) on a primary school, and then randomly selected

some students and informed the teachers that these students had a huge potential for intellectual explosion. The research results showed that these students who were randomly designated as potential students achieved more significant gains in subsequent IQ tests compared with the students of control group. Therefore, the researchers concluded that the high expectation signals received by teachers, through their daily interactions, were subtly conveyed to the students, thereby stimulating better performance from the students (Gündüzalp & Özan, 2019).

However, this study immediately sparked a huge academic controversy upon its publication and recorded by Good et al.: in 1968, Thorndike (1968) raised serious doubts about the data of the study, arguing that the credibility and effectiveness of the test tool were questionable, and the conclusion might just be a coincidence of luck. While in 1969, Snow criticized the complex and chaotic design of the study and pointed out a key flaw, namely that teachers even couldn't accurately remember the list of potential students, which made the mechanism of expectation transmission an unsolved "black box". Despite these methodological flaws, Good et al. (2018) emphasized that the research topic had profound social significance. As Snow pointed out: "Teacher expectations is a powerful phenomenon, and if it can be understood, it will bring many positive values to educational area."

4. The two-stage Transmission Mechanism of the Pygmalion Effect

In response to early criticisms, subsequent research shifted focus to elucidating the specific behavior pathways of expectation transmission (Kuklinski & Weinstein, 2001) and revealed a two-stage transmission mechanism.

First, teacher expectations lead to differential interactions with students (e.g., in questioning, wait time, feedback, and opportunities). The series of observational studies by Brophy and Good (2018) were exemplary in this stage. They developed the "Brophy-Good Binary Interaction System", which was the first to conduct detailed coding and analysis of classroom teacher-student interactions. They discovered that teachers would have systematic differences in interaction with students, consider to be high-achievers and low-achievers. For high-achieving students, teachers tended to pose more challenging questions, give more waiting time when students answer incorrectly, provide clues or rephrase the questions (the "stay" strategy), and offer more positive and academic-related feedback. On the other hand, for low-achieving students, teachers are more likely to ask simple questions, quickly provide the answers when students make mistakes, or turn to other students (the "give-up" strategy). Brophy and Good said that these differentiated interaction patterns created a richer and more supportive cognitive environment for high-achieving students, while inadvertently limiting and undermining the academic participation and thinking development opportunities of low-achieving students.

Second, these behavioral differences then influence students' self-system, such as their self-concept and self-efficacy (Friedrich et al., 2015; Jahan & Mehrafzoon, 2019; Wang & Lin, 2014), which in turn affects their academic engagement and achievement. For example, Friedrich et al. (2015) provided crucial empirical support for the viewpoint that "the behavioral differences of teachers ultimately needed to be influenced by students' internal psychological processes to affect their performance". Their multi-level mediation model indicated that the influence of teachers' expectations on students' math scores was partly achieved through the mediating variable of students' math self-concept, namely teachers' high expectations would enhance students' belief in their own math abilities, and this enhanced self-concept would subsequently translate into better academic performance. Jahan and Mehrafzoon's (2019) intervention study also found that when teacher education is grounded in the "Pygmalion effect," it effectively fosters greater self-efficacy and learning motivation among students. Meanwhile Wang and Lin (2014) emphasized from a humanistic perspective that teachers' positive expectations and emotional support could boost students' self-confidence, which was the key to stimulating their intrinsic motivation for foreign language learning. Therefore, this mechanism is moderated by factors such as student autonomy, classroom grouping practices, teacher growth mindset, and assessment design.

5. Field Expansion: the Pygmalion Effect in School Management

Research on the Pygmalion Effect has expanded beyond the classroom to the school level. Gündüzalp and Özan's (2019) empirical study used a mixed research method, demonstrating the effect at a different analytical level, and provided direct evidence: the expectations of school administrators towards teachers could significantly predict teachers' perceptions and views of their own profession and career. Based on the qualitative research data, the bidirectional mechanism of the expected effect had been vividly revealed: when managers had high expectations, the vast majority of teachers reported positive feelings and behavioral intentions. This indicates that when managers have high expectations, they can create a positive cycle, namely an optimistic psychological atmosphere, and stimulate the intrinsic motivation and professional loyalty of teachers. On the contrary, when managers have low expectations, it will have a significant negative impact. At the same time, it means that these teachers were experiencing the Golem Effect (Collins et al., 2009; Leung & Sy, 2018), namely low expectations leaded to low performance.

6. Boundary Conditions and the Reverse Pygmalion Effect

The Pygmalion Effect is not an unconditional law. Its efficacy is constrained by a series of factors and may even fail or have the opposite effect under certain conditions (Babad, 1977). Chang's case study (2011) provided us with a crucial perspective to examine the boundaries of this effect. In this study, the teacher had extremely high positive expectations for the college students, believing that they should have a high degree of autonomy in online learning. However, the midterm exam results were in sharp contrast to the teacher's optimistic expectations. This case clearly showed that only the teacher's positive expectations were not sufficient to guarantee students'

success. When expectations deviated from the students' reality and there was a lack of corresponding support systems, it may give rise to the "reverse Pygmalion Effect".

The key boundary conditions of the Pygmalion Effect as studied by numerous researchers can be systematically grouped as follows. The first point is learner factors. Most students generally lack clear learning goals and good time management skills, and they stick to traditional learning habits, unwilling to use new online learning resources. If students lack the necessary autonomous learning ability and the willingness to adapt to new learning methods, the high expectations of the teachers lose their foundation. The second point is teacher factors. Wang and Lin (2014) pointed that the growth mindset and reflective practice moderate how expectations translate into behaviors, and the "appropriate expectations" aligned to the Zero Point Deviation Value (ZPD) are more effective. As Amini's (2016) point, the differentiation is important, arguing that teachers should set different and personalized high expectations for different students. Because when the teaching requirements conflict with students' learning habits, technical access conditions, and psychological comfort zone, even the highest expectations cannot be transformed into positive learning outcomes. The third point is classroom factors, which also named assessment factors. When the teaching requirements conflict with students' learning habits, technical access conditions, and psychological comfort zone, even the highest expectations cannot be transformed into positive learning outcomes. Also, the ability grouping can amplify expectancy tracking; assessment designs that signal low challenge depress motivation, for example, the teacher clearly informed students before the exam that some content came from the online learning center (Chang, 2011). This was originally a way to reduce difficulty and encourage learning. However, this move was interpreted by some students as "the test lacking challenge", which instead weakened their learning motivation. The fourth point is analysis level factors. The Pygmalion Effect was significant at the individual level of students but not at the overall class level (Friedrich et al.,2015). That means the influence of teacher expectations is highly individualized and cannot simply be generalized from the individual level to the group level. The last point is context and culture factors. The communication norms and authority structures may moderate effect strength (Shair-Rosenfield et al., 2021), so there is a need for conducting more education-specific cross-cultural studies, particularly in East Asian contexts.

7. Evidence-based Educational Interventions

Translating theory into practice requires systematic strategies targeting teacher beliefs and classroom structures (Cobos-Sanchiz et al., 2022; Qi et al., 2021; Weinstein, 2018) and they all pointed to a series of systematic strategies ranging from teachers' internal beliefs to the external classroom environment. Among them, how to enhance teachers' reflective practice and awareness was the core contribution of Amini's research (2016). The main three strategies which he proposed are: delaying contact with student files, namely teachers should avoid forming "preconceptions" before interacting with students; continuous self-reflection, namely teachers need to constantly examine their interactions with students, groupings, questioning patterns, etc., to check if there are implicit differentiated expectations; establishing a "high expectation" and "new start" culture, namely teachers should convey the belief that "I believe you can all succeed" to all students and provide a "reset" opportunity for each new learning task.

In terms of the implementation of strategies, teachers should optimize the classroom environment and interaction structure, adopt various flexible grouping methods such as heterogeneous grouping and random grouping, and create equal participation opportunities through projects like "peer tutoring". When implementing differentiated teaching and assessment, teachers should apply differentiated teaching methods such as inquiry-based learning and diverse teaching materials to meet the needs of students with different learning styles. At the same time, the assessment methods should be diversified and based on clear success criteria, rather than based on a general impression of the students. Finally, in the process of conducting systematic teacher expectation intervention training, the empirical research by Jahan and Mehrafzoon (2019) showed that through systematic training, teachers' concepts and behaviors could be positively changed, and this will in turn improved students' self-efficacy and academic engagement. That directly proved the plasticity of the teacher factor.

8. Current Limitations and Future Directions of Research on the Pygmalion Effect

Through the integrated analysis, several limitations still exist in the current research field. Firstly, there are methodological limitations. The pioneering research has significant methodological flaws, although subsequent studies have continuously improved, the issue of how to measure teachers' expectations and their transmission process without interference remains a challenge. Secondly, the cultural universality is insufficient. The existing empirical research is mostly conducted in the West (such as the United States, Germany and Canada) or in specific cultural contexts (such as Iran and Turkey), and different cultures may have differences in their interpretations of authority, expectations, and communication methods (Shair-Rosenfield et al., 2021), which limits the universality and applicability of the conclusions. Thirdly, the relative has a shortage of student perspectives. The existing research mostly focuses on the perspectives of teachers or researchers, and qualitative research on how students specifically perceive, interpret, and respond to the differentiated expectations of teachers and their inner experiences and struggles is still insufficient. Fourthly, there is a lack of long-term effect verification. Most studies, especially intervention studies, only focus on short-term effects, and there is a lack of tracking research evidence for the long-term stability of changes in teachers' expectations and their lasting impact on students' development. Finally, cross-disciplinary comparative studies are scarce. The knowledge structures and ability requirements of different disciplines are different (Liao, 2025), and the formation and effects of teachers' expectations may therefore vary, but there is currently a lack of targeted comparative studies.

Furthermore, basing on these various constraints, this paper will propose some future research directions. Firstly, there

will be an emphasis on deepening the exploration of mechanisms. Future research should employ more refined measurement tools (such as video analysis, physiological indicators) and longitudinal designs (Wright & Markon, 2016) to further reveal the immediate process of teacher expectation transmission and the dynamic mechanism of students' psychological internalization. Secondly, cross-cultural comparative studies will be conducted. In China and other East Asian cultural contexts, conducting empirical research to examine how cultural factors (such as collectivism and power distance) regulate the intensity and manifestation of the Pygmalion Effect is extremely urgent. Thirdly, the student perspective will be introduced and deepened. Future research should more frequently adopt qualitative interviews, log methods, etc., to deeply explore students' perception of teacher expectations and their coping strategies, making the research picture more complete. Then, the attention will be paid to new educational environment. With the popularization of online education and blended learning (Getenet et al., 2024), how teachers can effectively convey positive expectations without face-to-face communication will become a new research topic. Finally, the cross-disciplinary comparisons will be conducted. Future research can compare the special manifestations and intervention strategies of the Pygmalion Effect in different fields such as natural sciences, arts, sports, etc (Liao, 2025).

9. Conclusion

This article reviews the evolution of research on the "Pygmalion Effect" in the field of education, covering the entire process from the basic theories to the in-depth understanding of its mechanisms and influencing factors. This study demonstrates that teachers' expectations have a conspicuous impact on education, but this influence is extremely complex. It is constrained by various boundary conditions such as students, environment, teachers, and analytical abilities, and is not a simple causal relationship. Therefore, elevating the "Pygmalion Effect" from an unconscious psychological suggestion to a conscious and morally-acceptable educational art is an opportunity and challenge that contemporary educators and researchers are jointly facing. Therefore, cultivating teachers' "growth mindset" and "reflective wisdom" is a key direction for future educational research and practice. This not only optimizes the educational environment but also transforms teachers' positive expectations into a genuine driving force for the growth of each student.

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