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An Examination of the Effects of Intrinsic and Extrinsic Motivation on Student Engagement and Academic Success

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Abstract. Students' learning is highly influenced by their motivation, which serves as the primary driver of their behavior. Motivations are classified as either internally or externally oriented, and existing literature emphasizes the significance of each type of motivation. Intrinsic and extrinsic motives are frequently used in many social fields, such as economics, psychology, sociology, etc. This study will mainly concentrate on the motivations in educational fields, and meanwhile draw on psychological theories, to examine the influences of different motivations on students' performances. The paper will use the method of literature review and some cases to investigate the effects of motivations on students. Through a series of comparisons and analyses, the author concludes that both intrinsic and extrinsic motivations are valuable in fostering learning, and the most effective approach involves understanding how to influence each motivation and employ it as appropriate. This paper aims to provide insights in teaching to improve students' motivation.

Keywords: Intrinsic, extrinsic, motivation, learning

1. Introduction

Intrinsic and extrinsic motives are frequently examined in the disciplines of economics, psychology, and sociology, in both theoretical and practical frameworks. Intrinsic motivation seems uncompelling in realistic economic or working conditions, since it fails to adequately explain an individual's action when there are no external rewards [1]. The relationship between the frequently discussed issue of climate change and the free market reveals that mitigation measures have not been extensively implemented, as the free market lacks inherent incentives to transition to renewable energy, primarily due to the pervasive irresponsibility toward carbon emissions [2]. On the other hand, progress in any field is unlikely to succeed without a single sip of passion. Engagement in an activity characterized by the "inherent satisfaction of the activity" is referred to as intrinsic motivation [3]. Controversial admirers have spent decades discussing whether talent or affiliation serves as a more significant determinant of academic and job success. But no one dares to courageously diminish intrinsic motivation's place in the game. Extrinsic incentives, otherwise, is a more prevalent route to effort investment and success. There are also many more extrinsic factors. Based on Bates' ideas, which serves as the main backup and reference, this essay will focus on extrinsicism from normative influence and external reward explanations since they are universal attributes in the school environment. Peer influence becomes more prominent during adolescence as

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competitive tendencies increase, whereas parental reward systems frequently drive academic performance in childhood.

2. Theoretical foundations of intrinsic motivation

Intrinsic motivation primarily concerns the intrapersonal self. Richard deCharms's theory of personal causation directly addresses intrinsic motivation by emphasizing internal sources of behavior while minimizing the role of external determinants. The theory posits that individuals possess an innate drive to act as the originators of their own behavior, rather than as "pawns" controlled by external forces [4]. In this view, behavior is guided by a sense of personal causation and internal responsibility. Similarly, the more prevalent self-determination theory (SDT) expands on this idea by specifying the psychological conditions under which intrinsic motivation takes place. This theory provides a framework for psychological conditions that drive intrinsic motivation: competence, relatedness, and autonomy [5].

Competence focuses on the desire to master a skill or achieve a specific performance. When individuals have succeeded in the field, which boosts their self-efficacy, it motivates them to continue regardless of any rewards or feedback. Initially, learning mathematics can be a struggle for students, and incompetence in the field predicts low motivation and inhibits the desire to practice math questions or engage with math class efforts. Conversely, if a student is competent in math and can understand the lesson well, they become more motivated to do math. Relatedness highlights that comfortable interactions and a supportive environment foster internal motivation [6]. Although this factor appears to be related to sociocultural factors that drive the shift toward extrinsic motivation, it is worth noting that the environment can also facilitate self-driven actions.

Rodriguez and Tamis-LeMonda's longitudinal study implied a strong positive correlation between the learning environment and children's literacy ability and vocabulary skills. Although not explicitly emphasizing the environment-motivation connection, this provides insights into the importance of relatedness. Lastly, autonomy involves the need for individuals to have their own rights and choices. Recognition of personal favoritism and divergence from others' opinions helps individuals become more intrinsically motivated and less likely to be influenced by normative social pressures [6].

America is an individualistic-oriented nation, while China is a collectivist-oriented nation. Americans tend to be more self-oriented and prioritize personal goals, while the Chinese focus on cohesiveness and harmony. The difference shapes how people make decisions and act in the two nations: Americans are more reward-oriented, while Chinese people are more inclined to avoid social punishments. In conclusion, both deCharms' personal causation theory and Self-Determination Theory highlight the importance of internal characteristics such as competence, relatedness, and autonomy in driving intrinsic motivation. Different environments and backgrounds either boost or hinder intrinsic motivation, providing insights into viewing intrinsic and external motivation as the crossroads of two distinct routes.

3. Mechanisms and theories of extrinsic motivation

Extrinsic motivation is driven by the pursuit of earning rewards or avoiding punishment. Punishment avoidance can be explained through normative social influence, which is the pressure exerted by a group on an individual to conform and gain acceptance. However, normative influence does not involve internationalization or accepting the group norm at heart. This predicts the

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uncertainty and short-term aspect of this extrinsic motivation-driven approach—students may only temporarily conform to a group and pay attention to their learning.

Asch's line of conformity experiment is one that shows how commonly conformity takes place. The experiment shows a 37% average conformity rate in incorrect group consensus among all participants in an easy and intuitive task of selecting two lines of identical length [7]. Conformity also has its foundation in the social cognitive theory proposed by Bandura. The core aspect of the theory is reciprocal determinism, which is the idea that cognitive processes, behavior, and environment are interrelated and interact with each other [8]. A student that has high self-efficacy in biology (cognitive process) is more likely to participate actively in biology classes, such as answering questions and facilitating group work (behavior), which in turn increases peers' attitude and behavior in biology class. Thus, reciprocal determinism demonstrated a cut above the normative social influence explanation since it emphasized mutual and positive influence rather than one that is pressured by conformity and group belonging.

Another theory that is worth delving into is the overjustification hypothesis. The hypothesis shows a preference for extrinsic motivation by stating that "the delivery of some extrinsic reward will decrease an individual's intrinsic motivation to engage in the behavior" [9]. Individuals want to rationalize their decisions, thus shifting them toward reward-driven instead of passion-driven, since it is a more persuasive explanation of action. Students (especially at a higher age) would argue that they learn for good grades and for a better future, rather than learn for the love of the subject. The negative aspect of this hypothesis is that reward-based learning impedes thorough understanding and the retention of knowledge [10]. Acquiring knowledge prior to the examination and subsequently abandoning it as soon as vacation begins is a prevalent phenomenon in extrinsically motivated learning. Overjustification is also an underestimated predictor of job satisfaction; individuals may express dissatisfaction with their work despite its engaging nature, as they attribute their actions to monetary earnings [11]. Ultimately, extrinsic motivation in the school environment is driven by external regulations, including punishments and rewards [12]. Thus, extrinsic motivation may produce immediate compliance in educational settings but remains limited in its ability to support long-term motivation and deep cognitive involvement.

4. Empirical studies on motivation and learning outcomes

4.1. Classroom engagement

Both intrinsic and extrinsic motivations reflect students' learning progress and the level of attention paid during class. Sun and Hsieh's experiment measured the effect of the interactive response system (IRS) on motivations as well as engagement and attention in high school students using a quasi-experiment. The study highlights the distinct roles of intrinsic and extrinsic motivation: while intrinsic motivation encourages students to be more proactive in the classroom and to acquire deeper knowledge, extrinsic motivation is beneficial in situations where interest is not the primary factor driving learning. 6 classes of a total of 118 valid samples are divided into 3 groups: one control group and two experimental groups. The instructor implemented the same instructional activity across all three groups. Students in the control group were assessed using traditional teaching methods, while one experimental group was evaluated through a standard IRS. The second experimental group was assessed using a gamified IRS approach. Statistical analysis revealed a significant difference in the intrinsic motivation component of the post-test results and no significant difference in the extrinsic aspect [13]. This suggests that all variations in post-experiment outcomes related to attention and performance are associated with heightened intrinsic motivation facilitated

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by the use of IRS. The primary engagement scores for the three groups were 70.73, 75.56, and 84.45, demonstrating a significant disparity among all three groups [13]. A similar trend exists for attention paid in all three groups. The results indicated a positive correlation of intrinsic motivation with engagement and attention. This study provides valuable insight into the relationship between intrinsic motivation and performance. However, it does not examine this relationship directly, as the independent variable is the use of an IRS.

4.2. Subject-specific learning context

Another study investigated intrinsic motivation in the mathematics classroom. As background, the study informs that students are either math lovers or "math anxious" students [14]. This study employed methodological triangulation by integrating classroom observations and teacher interviews to achieve a comprehensive understanding of students' performance as a construct variable. Qualitative data indicate that intrinsic motivation plays a crucial role in learning mathematics. A key argument that this experiment suggests is that internal motivation could be simulated, as the teacher in the experiment argues, using computer models that allow each step of the math question to be carefully explained [14].

4.3. Grade-oriented rewards

While it is certain that intrinsic motivation can affect learning, attention, and performance, it is also shaped by extrinsic motivation, which operates through either punishment and rewards. Horne et al. delve into the pursuit of good grades (rewards) and how it influences learning and actual in-class performance. This study used a mixed method design with the integration of qualitative and quantitative data to gain deeper knowledge about the relationship. The two aims are to investigate the factors influencing grade-focused interactions and to learn whether grade presentation influences students' behavior [15]. As a result, the researchers found that participants were more career-oriented rather than intrinsic or interest-driven. Moreover, a considerable portion of career aspiration codes were specified for obtaining good grades. 72% of students consider grades as more important than learning itself, and the majority of participants agreed that getting an A is more important than taking challenging but useful courses. Thus, this experiment showed that grade is an important and never omittable predictor of learning. Indeed, focusing on grades is shown to lead to more attention and time spent reviewing, as well as greater seriousness, which in turn leads to higher grades [15]. This study offers valuable insights into the role of grades in learning; however, cross-cultural differences must be considered. For example, East Asian populations tend to place greater emphasis on grades than Western populations, which constitutes a limitation of the study.

4.4. Peer influence

Another study on extrinsic motivation focuses on peer pressure (or avoidance of social punishment). In the literature review, the author borrowed from the Coleman report which "highlighted the importance of peers for the performance of students, arguing that peers are more important than schools as determinants of student outcomes" [16]. Although numerous studies have theoretically argued that peer pressure may undermine academic performance, alternative perspectives should not be overlooked. This study highlights a gender-related factor, indicating that facilitation effects are stronger among same-gender peers [16]. Also, a higher proportion of girls is beneficial for girls' learning, but has the opposite effect for boys. The results indicate that a more equal distribution of

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female and male students may influence the manipulation of extrinsic motivation in educational settings. Thus, this study shows that learning is amplified with peers present to the extent that competition is healthy and not overly stressful [16].

5. Discussion

From the previously discussed definition aspect, intrinsic motivation involves internal satisfaction, and the focus is surrounding the activity itself [17]. For example, the inherent motivation for learning may stem from the student's passion for the subject. On the other hand, extrinsic motivation emphasizes the outcome or reward associated with the process and may also be driven by the desire to avoid punishment. Whether people focus more on gaining rewards or avoiding punishment is dependent on situational or personal factors. A theory to predict the behavior is known as the approach-inhibition theory. The theory suggests that individuals with more power are more concerned with rewards and are more likely to initiate approaching actions, whereas those with less power tend to consider social consequences more and are more likely to inhibit action [18]. The learning environment does not consider status or hierarchy; thus, power in this case indicates self-efficacy.

The discussion demonstrates an inventive approach to extrinsic motivation and explores its potential for positive application in student development. Another difference between intrinsic and extrinsic motivation is in terms of data and testing methods. Both motivations require a construct of definitions, because there is no explicit method for testing motivation. However, compared with intrinsic motivation, extrinsic motivation is more defined and categorized. In other words, when considering extrinsic motivation, people can refer to it in relation to sociocultural and cognitive factors. For intrinsic motivation, researchers are less certain about what exactly to construct since it is more based on internal thinking. Moreover, a limitation of assessing intrinsic motivation is that data are often collected through self-report measures. Students may report a strong interest in a subject, while such responses can be influenced by multiple confounding variables, including instructional quality, classroom dynamics, and individual academic performance.

Third, the two motivations contrast in their application to a learning scenario. From the earlier paragraph of data analysis and interpretation, we can derive insights into the motivations' outcomes. Intrinsic motivation leads to self-propagated learning, which predicts more stable performance and grades. However, as students grow older and learning becomes more challenging, they may experience a period of loss in intrinsic motivation. This is when extrinsic motivation place its importance. On the other hand, extrinsic motivation, driven by rewards and peer influence, is less stable, but it is arguably crucial in learning. Sustained learning over many years is unlikely to occur without some form of self-reward or influence from peers within the same learning environment. In the same way, learning and good performance cannot last without a particle of personal motivation and encouragement, and genuine interest in the subject.

Finally, from a theoretical perspective, Self-Determination Theory accounts for both intrinsic and extrinsic motivation through a unified but differentiated framework. Intrinsic motivation is strongly associated with the satisfaction of autonomy, competence, and relatedness, while extrinsic motivation may likewise be shaped by factors such as academic achievement and relationships with family and peers. Despite its root in external motivation, the inclusion of competence and relatedness within intrinsic motivation underscores that internal motivational states are also influenced by external social and contextual conditions. This illustrates the interconnectedness of the two motivations, which also suggests that learning is more effective when both are effectively combined.

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6. Conclusion

This study aimed to investigate the role of two different types of motivation in how students learn, and the findings indicated that intrinsic and extrinsic motivations work in different ways. The analysis revealed that intrinsic motivation is more stable, while extrinsic motivation is used in short-term goal enrichment, which supports the initial hypothesis that each motivation is crucial in terms of learning and one cannot rely on either single one. This research contributes to the existing body of knowledge by providing supporting evidence and an explanatory route to understanding the motivations. The finding further extends the previous theory by linking the two motivations together. This study holds high significance in the fields of education and developmental psychology, as it reveals the driving factor behind students' learning. However, this study is limited by its testing method, which heavily relies on self-reported results that reveal uncertainties, and this may affect the generalizability of the findings. In the future, the author will delve into different methods of testing motivations by reviewing more previous studies and establishing a greater number of literature reviews. Overall, this study provides new insights into how the educational framework can be structured to engage students' interests in learning, from both the educators' and students' perspectives. By shedding light on motivations in learning, this research paves the way for future generations to learn with their best will.

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