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Fostering Student Autonomy and Self-Regulation: Insights from Cognitivist and Constructivist Perspectives

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ABSTRACT

The educational landscape is continuously evolving, prompting ongoing discussions among educators and psychologists about effective knowledge acquisition methods. Cognitivism and Constructivism are two educational theories that play a significant role in understanding learning dimensions. Although these theories have been widely studied, their practical use in classroom settings to support student autonomy and self-regulation has been explored less thoroughly. This study explores the application of cognitivist and constructivist approaches in the teaching-learning process and their implications for independent learning. The study identifies crucial elements of self-regulation, such as goal-setting, self-monitoring, and reflection. It further explores their implications for instructional methods by examining empirical research and theoretical frameworks. Using a qualitative research method, this study utilized purposive sampling to collect data from a total of 20 participants from Pakistan, Oman, and China, selected from among university students, ensuring diversity in background, gender, education level, and majors. The thematic analysis produced key themes including individual differences in memorization and goal-setting, study habits, support mechanisms, and effectiveness of teaching methods. The discussion highlights the significance of cognitivist and constructivist approaches in developing and promoting student autonomy and

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self-regulation in the learning process, offering valuable knowledge to the broader study of enhancing student engagement and performance, ultimately contributing to the UN's SDG4, that is, to improve quality education for all.

Keywords: Autonomy; Self-regulation; Motivation; Learner Engagement; Information Retention

1. Introduction

The nature of learning and knowledge acquisition has been a long-standing topic of debate among educators and psychologists. The two most well-known theories influencing contemporary educational methods are Cognitivism and Constructivism. Both theories seek to explain how students absorb knowledge and acquire new skills, but they differ greatly in how they define the responsibilities of the teacher and the student. Cognitivism, rooted in the Information Processing Model, highlights the importance of structured classroom environments that promote learning through teacher guidance [1,2]. In contrast, Constructivism—which draws its inspiration from the ideas of philosophers such as Jean Piaget and Lev Vygotsky—promotes a learner-centered methodology in which learners actively construct their own understanding through experience and social interaction [3–5].

These paradigms offer opposing yet complementary viewpoints on student autonomy and self-regulation. Cognitivism emphasizes internal mental processes like attention, memory, and problem-solving and focuses on creating mental models and cognitive methods [2]. Meanwhile, Constructivism places the learner at the center, emphasizing exploration, cooperation, and the personalization of learning experiences [4,5]. This research aims to investigate how these educational theories affect students' autonomy and self-regulation, two essential elements of both academic achievement and lifelong learning. This study aims to provide an overview of how these theories enable students to take control of their education and develop self-regulatory learning habits. The study aligns with Sustainable Development Goal (SDG) 4, the United Nation's goal of providing quality education to all irrespective of their background, gender, age distribution, capabilities, and other relevant aspects.

The study clarifies the implications of these frameworks for modern education, especially regarding the design learning spaces that encourage participation, accountability, and the development of metacognition [6]. Through this investigation, teachers and researchers may gain a better understanding of how to improve student learning outcomes by striking a balance between structure and freedom, as well as guidance and independence.

Research Objectives

- RO1: To examine effective strategies that enhance the retention of information in long-term memory
- RO2: To investigate the underlying factors that contribute to student motivation in learning environments

2. Literature Review

In educational psychology, Cognitivism and Constructivism form the foundation of student-centered learning. Studies assert that understanding theories such as Constructivism and Cognitivism is essential for educators to create engaging and effective learning experiences for learners of all kinds, and that a well-rounded application of these theories can enhance student motivation, engagement, and overall learning outcomes in multimedia and technology-enhanced learning environments [7–9]. For example, Son et al. [10] highlight the importance of balancing intrinsic, extraneous, and germane cognitive loads to optimize student engagement and information retention. However, some researchers caution that excessive emphasis on cognitive load without considering learners' prior knowledge or emotional states may reduce instructional effectiveness [11], indicating the need for alternative methods.

Stapleton and Stefaniak [12] explore Jerome Bruner's influence on instructional design and conclude that understanding how students construct knowledge is essential for designing effective learning environments, and that there is a need for instructional strategies that encourage active problem-solving and exploration, ultimately leading to improved educational outcomes. Similarly, Chand [13] explores the works of Piaget, Vygotsky, and Bruner and asserts that learners build on their existing knowledge through new experiences, with teachers serving as guides rather than traditional instructors. Szabó and Csépes [14] also support constructivist approaches in enhancing language teaching and learning out-

comes through collaborative learning, problem-solving tasks, and the integration of real-world situations into language education similar to the introduction of generative grammar by Noam Chomsky. However, few studies examine how these strategies fare in digital-first or AI-supported classrooms, which now represent a significant shift in educational delivery[15].

Researchers suggest using a variety of teaching methods—from Behaviorism to Social Constructivism—to support different learning styles and help students understand the content better[16]. They also highlight the importance of Constructivism as a common foundation for natural learning processes and as a strong theoretical base for special education[17]. Empirical research also supports the effectiveness of inquiry-based constructivist learning models or cloud-based constructivist learning models over traditional instruction materials in promoting students' analytical skills, creativity, and application of innovative educational solutions[18,19].

Technology has also significantly enhanced interactive learning experiences through tools like AI and gamification by facilitating collaboration, critical thinking, and personalized learning, emphasizing the need for educators to integrate various educational tools thoughtfully to promote deeper understanding and engagement among students[20–22]. However, over-reliance on technology may lead to cognitive overload, digital fatigue, or superficial learning[23], revealing a gap in literature assessing long-term effects of tech-enhanced environments.

Motivation theories also play a crucial role in learning. The self-determination theory postulates that satisfying students' basic psychological needs results in the improvement of their autonomous motivation which, in turn, produces well-being and achievement[24–26]. Recent studies explore how motivation, emotions, and metacognition interact to shape learning outcomes[6]. Similarly, Kilinc and Buyuk[27] investigate the effect of intrinsic motivation on participant engagement and an effective social presence within online discussions. Other studies suggest that engagement plays a crucial role in enhancing productivity and overall performance across both educational and professional settings[28,29].

Studies also investigate the motivational factors influencing short-term and long-term learners in web-based educational systems. The researchers identify key motivational elements, including intrinsic and extrinsic factors, and how they impact learners' engagement and performance suggesting that tailored motivational strategies can significantly improve learning outcomes by addressing the specific needs of diverse learners in web-based education systems[30,31]. Similarly, research also explores the implications of gamification in boosting intrinsic motivation in diverse learning environments[32,33] though some argue that it may lose effectiveness over time[34], again showing inconsistencies in findings. Urhahne and Wijnia[35] also indicate that motivation constructs related to situation, self, goal, action, outcome, and consequences impact academic achievement significantly.

Finally, cognitive load continues to be a central theme in various studies. Sisakhti et al.[36] assert that it remains a leading factor in the interaction between working memory and long-term memory. However, Skulmowski and Xu[37] assert the importance of maintaining a balanced cognitive load by considering both positive and negative effects of design factors.

Theory Underpinning

This study is grounded in Cognitivism and Constructivism, which provide a comprehensive theoretical framework for applying their principles to boost student autonomy and self-regulation[12]. Cognitivism focuses on how knowledge is constructed through mental processes and emphasizes the role of cognitive load in the interaction between working and long-term memory[36]. Constructivist approaches, on the other hand, highlight the significance of active learning in enhancing teaching and learning outcomes through collaborative learning, problem-solving tasks, and integration of real-world situations into education[14].

By integrating these theories, the current study explores how thoughtfully designed instructional strategies can optimize both memory retention and motivation, leading to student self-regulation towards autonomous learning. While existing research focuses heavily on the theoretical benefits of constructivist and cognitive frameworks, few studies provide insights into how these can be practically applied and balanced in modern, tech-driven educational settings, particularly regarding long-term memory enhancement and sustained student motivation.

3. Methodology

A qualitative research design was used to investigate how constructivist and cognitivist teaching methods can be applied to develop autonomy and self-regulation in university students. This approach facilitates an understanding of personal experiences and perspectives that might not be conveyed fully using quantitative methodologies.

3.1. Sampling and Participants

A total of 20 individuals participated in the study, representing China, Pakistan, and Oman. Participants were purposively selected from among university students, ensuring diversity in background, gender, education level, and majors. The research employed a qualitative method, using open-ended online questionnaires. **Table 1** is a visual representation of the demographic details of the participants.

3.2. Research Instruments

Several techniques were used in the interview design and analysis stages to guarantee the precision and dependability of the data gathered. In order to ensure high content validity grounded in recognized theoretical frameworks, a semi-structured interview methodology was first developed based on an extensive review of the literature pertaining to cognitivism, constructivism and learning motivation. Second, two student representatives participated in a pilot study of the procedure to enhance the questions' relevance and clarity. Third, the interview questions were examined by two specialists in educational psychology to make sure they were conceptually coherent and used proper terminology. A total of 12 main items were used to gather responses. Some questions were reinforced with sub-questions to elicit further details from the respondents regarding the research topic.

Table 1. Participants' Demographic Profiles.

Participants	Gender	Education Level	University Major
p1	Female	Undergraduate	Architecture
p2	Male	Undergraduate	Architecture
p3	Female	Undergraduate	Architecture
p4	Female	Masters	Instructional Technology
p5	Female	Undergraduate	Medicine
p6	Male	Masters	Public Administration
p7	Female	Masters	Public Administration
p8	Female	Masters	Education Management
p9	Male	Masters	Business Administration
p10	Female	Masters	Business Administration
p11	Female	Masters	Energy System Engineering
p12	Female	Undergraduate	Islamic Art & Architecture
p13	Male	Masters	Finance
p14	Male	Masters	Thermal Energy Engineering
p15	Female	Undergraduate	Aerospace Engineering
p16	Male	Masters	Computational Sciences & Engineering
p17	Female	Masters	Education Management
p18	Female	Undergraduate	Economics
p19	Male	Undergraduate	Music
p20	Female	Undergraduate	Software Engineering

3.2.1. Research Objective 1

1. How long does it take you to memorize facts and important information?

    1.1 What do you think is the cause behind this?

2. How much influence do you think teaching practices have on information retention?

    2.1 What strategies should the teachers employ to make sure students develop long-term memory effectively?

3. Have you ever tried to teach what you learned to others?

    3.1 How do you feel the process helped you deepen your own memory reserves?

4. Do you follow any habits or routines (diet, sleep, study schedule etc.) that allow you to retain information better?

5. In your opinion, what is the most effective way you

have experienced to enhance long-term memory?

6. Based on your experience, what advice would you give students who seek to enhance information retention?

3.2.2. Research Objective 2

1. What is your university major?

    1.1   What factors helped you in deciding it?

2. Are you motivated by rewards, recognition, a sense of achievement, or something else? Please explain with examples.

3. How do you maintain motivation during challenging or tedious tasks?

4. In your opinion, what is the most important thing that keeps students motivated to perform at their best?

    4.1   Why do you say so?

5. Do friends and family play any role in student motivation?

    5.1   Why do you say so?

    5.2   How much is this support effective?

6. What do you think the teachers should do to make sure students are motivated to learn?

3.3. Data Collection Methods

Research items were incorporated into online questionnaires designed using Google Forms. Links were generated for the questionnaires which were shared with the participants through WhatsApp and WeChat, ensuring and facilitating easy access. The questionnaires were designed in both English and Chinese, keeping in mind the diverse ethnic and educational backgrounds of the participants. This allowed the participants to convey their experiences and perspectives clearly and effectively.

3.4. Data Analysis

The data were analyzed using thematic analysis to identify common patterns and ideas shared by the participants following the steps suggested by Braun and Clarke[38], which included familiarization with the data, generating initial codes, identifying and reviewing themes, and writing up the results. The analysis was done manually at first and later supported by NVivo 12 software to help organize and check the coding.

3.5. Confidentiality and Ethical Considerations

The entire research process was carried out with high integrity and ethical standards. Respondents were informed about the nature of the research through a note in the questionnaire which promised privacy and confidentiality of their data. No unauthorized individual was given access to this data, and it was accessed and used strictly by the members of this research group only.

4. Results

A thematic analysis was conducted based on the responses collected from university students regarding long-term memory and motivation. The results have highlighted several key aspects including 1) Individual Differences in Memorization and Learning, 2) Healthy Lifestyle and Study Habits, 3) Motivation and Learning, 4) Self-Regulation and Goal-Setting, 5) Emotional and Social Support, 6) Role of Teaching Practices, and 7) Strategies to Enhance Motivation and Memory Retention.

4.1. Individual Differences in Memorization and Learning

The analysis shows that individuals have varying memory abilities, with some students needing only minutes to memorize, while others may take days to accomplish the same task. It further highlights the various challenges each respondent faces in memorization. Respondent 20 shared, "*I am pretty quick in memorizing facts because I try to engage more than one sense in learning (speaking the information out loud allows me to use visual, verbal, and auditory learning), also I try to incorporate kinesthetic learning by writing down what I want to memorize*", indicating that consolidating information through multiple senses is the way towards quick learning and memorization. Respondent 9, who claimed they take about 5 minutes to memorize information, based the process on factors like duration of rest, mental capacity, stress levels, etc. Conversely, Respondent 2 noted, "*It takes me a lot of time to memorise something because I think that my mind is not capable of consuming the facts and important information that rapidly*", supported by Respondents 1, 4, and 5. This underscores that the brain's information processing capacity is a major factor in determining the ease and

quickness of information retention. For other respondents (Respondents 7, 17 and 18), the time it takes to memorize varies from person to person due to varying levels of focus, distractions, amount and complexity of information, and interest levels are among the challenges they face while retaining information and knowledge. Respondents 8, 10 and 19 assert that their brains are wired such that they take around 3 days to process information; others think memorization time depends on the type of information/concepts they need to learn. In a nutshell, the rate of acquiring knowledge and its retention varies from person to person with no two people sharing the same reasons or challenges. However, strategies can be devised according to individual capabilities and needs, which will provide a viable framework for long-term memory retention.

4.2. Healthy Lifestyle and Study Habits

Many university students have emphasized devising and maintaining a structured study schedule to ensure long-term memory retention alongside developing healthy lifestyle practices. While some students struggle to connect a healthy lifestyle with their study routine, others have managed to develop habits and routines that help enhance memorization and information retention. "*I prioritize habits and routines to optimize information retention. A balanced diet, regular exercise, and 7–8 hours of sleep ensure physical well-being. Dedicated study time, breaks, and consistency maintain momentum. By incorporating these habits, I've noticed significant improvements in information retention and cognitive function*", noted Respondent 6, indicating factors that help optimize learning and retention. Respondents 13 and 16 reinforced these aspects, emphasizing sleep, short breaks during study, having a balanced diet, and breaking information into manageable chunks for better memorization and retention. This underscores that maintaining a healthy balance between study and leisure is crucial in enhancing learning and knowledge retention. Some respondents also highlighted summarizing, and active reviewing as major factors in the learning process: "*I'll take notes. Write down key points as you learn or encounter new information. For example, when reading a professional book, you will record important concepts, ideas and cases in a notebook for future*

review. In this way, when the information is needed, it can be quickly consulted, and the understanding and memory of the information can be deepened in the process of recording", Respondent 8 noted. Conversely, Respondents 3, 4, 5, 12 and 15 do not follow a study routine; however, they acknowledged the importance of following a specified schedule and routine for better learning. Thus, a blend of healthy lifestyle habits and mental stimulants like active recall, spaced repetition and information chunking create a viable framework for knowledge acquisition and memory build-up.

4.3. Motivation and Learning

Both intrinsic and extrinsic motivation play a key role in knowledge acquisition among university students. They view it as a driving force behind their learning journey. It provides the required impetus and momentum for them to push through their day-to-day learning regimen with determination and consistency. Intrinsic and extrinsic motivation often go hand-in-hand when it comes to knowledge acquisition and the drive to learn, as is the case with Respondent 6: "*I'm motivated by a sense of achievement and personal growth. Seeing tangible results from my efforts and overcoming challenges drives me forward. Additionally, recognition and constructive feedback from others reinforce my momentum and inspire continuous improvement*", reinforced by Respondents 2, 7, 11, 14 and 18. This denotes the significance of motivation as a noteworthy driver towards better learning. Many respondents feel that interest in their subject area, a sense of accomplishment, satisfaction and personal growth are major factors that motivate them towards persistent hard work and continuous efforts; however, a significant number of them view external rewards and encouragement as potent stimuli and motivators: Respondent 10 noted, "*My motivation comes from where I get a sense of accomplishment and encouragement from the outside world. I think this is very important. If it is very difficult for me to learn a new thing and no one encourages me, I will feel very depressed and give up soon. But if I can get encouragement, I will work harder*". To sum up, an amalgamation of inner drivers and external incentives is a major factor in mapping the students' learning regime and encouraging them towards betterment and consistent effort.

4.4. Self-Regulation and Goal-Setting

This study analyses how students perceive themselves as autonomous self-regulators, especially during challenging and tedious tasks, with their goals and purpose always in view. Student autonomy is ingrained in self-motivation and self-regulation making them disciplined and conscientious learners capable of governing their learning process without external supervision. Respondent 5 said, "*I think about the goals that are important for me and would make me happy. Achieving those goals is my biggest motivation and whenever I'm equipped with challenging tasks and think of giving up, I tell myself the reason why I'm doing this and it helps me maintain my motivation*", supported by Respondents 3 and 9. This emphasizes the importance of personal goal setting and a "keeping the eye on the prize" philosophy which provides learners enough internal drive to practice self-regulation even in the absence of an external motivator. This approach of self-motivation is directly related to learning and independent knowledge acquisition and is most likely to drive students towards better and long-term information retention. Respondent 20 endorsed the significance of self-driven learning, "*In my opinion, a sense of purpose and relevance is the most important thing that keeps students motivated to do their best. When students understand why they are learning something and how it relates to their goals and interests, they are more likely to be engaged and motivated*". This also highlights the connotation of goal setting as the highest motivator and influencer for autonomy, engagement and self-regulation: the clearer the purpose, the higher the motivation and the higher the information retention over long periods. "*Clear purpose and relevance drive student motivation. When learning connects to passions and future goals, it sparks intrinsic motivation and fuels enthusiasm*", according to Respondent 6, supported by Respondents 3, 8, and 19, and the same enthusiasm fosters deeper engagement and long-lasting memory retention information and knowledge for extended periods, contributing further to the principle of autonomy and self-regulation.

4.5. Emotional and Social Support

Learners highly value support from family and friends for motivation and self-regulation. The expectations of loved ones often serve as powerful drivers of knowledge acquisition and academic success. Respondent 5 emphasized the impact of social support, "*Humans tend to depend on each other. We care what our closest people think about us. It is really effective. If your family or friends encourage you, you become extremely motivated, hoping to prove them right*". This illustrates the implications of a supportive home environment and friend circle as critical factors in sustaining student motivation and drive to continue improving their knowledge acquisition and retention skills. Respondent 4 noted the importance of a helpful environment, "*Supportive relationships can provide encouragement, accountability, and emotional support. When friends and family show interest in a student's goals, celebrate their achievements, and offer assistance during tough times, it boosts the student's morale and determination to succeed*". In short, friends and family significantly influence student motivation by providing emotional support, encouragement, and accountability. Their support is highly effective since learners can draw confidence and strength from them, providing a maximum boost in motivation and resilience, that helps learners stay focused and driven during challenging times.

4.6. Role of Teaching Practices

Teaching style constitutes a critical component in the learning process, especially for developing interest in learning and facilitating long-term retention of concepts and ideas. As deliverers of information and knowledge, teachers play the greatest role in student motivation and long-term information retention. The activities employed in the classroom affect the learning process considerably since they are directly related to student autonomy and self-regulatory practices that they may adopt. Respondent 9 believes that "*teaching practice has a significant impact on information retention. Teaching practice can create a relatively good environment, and if students memorize in such a favorable environment, the time required for memorization will be relatively less and the duration of information retention will be relatively longer*". Learners endorse an active approach to classroom teaching with more focus on activity-based learning reinforced with projects and hands-on learning opportunities alongside discussions and a problem-solving mindset. This will ensure engaged learning and maximum information retention, as Respondent 1 shared, "*Teaching practices are a fundamental aspect in retaining information. I have experienced both*

effective and ineffective teaching methods throughout academic life. Teachers with more active approach are more likely to make students retain information". Respondents believe that traditional methods of teaching do not help in information retention since they are unengaging and passive. Students do not feel excited to learn which results in disengagement and inattention; acquisition and retention are nearly impossible in such learning environments. On the contrary, modern teaching strategies expedite the process of memorization and easy retrieval of information. activities and teaching practices that raise student interest and engage them effectively are more likely to make them feel motivated and excited to learn since they facilitate the encoding, storage and retrieval of information, thereby helping students form long-term memories. In the words of Respondent 7, teachers can "*make students feel valued and respected, and encourage collaboration and open communication*" and provide "*opportunities for choice and autonomy*" so that learners can stay engaged and are motivated to do better.

4.7. Strategies to Enhance Motivation and Memory Retention

Independent and self-regulated learners tend to develop effective learning strategies and procedures that stimulate them effectively and maximize memory retention simultaneously. However, learners need to be conscious of the "not one size fits all" adage; since individuals have different mental capabilities and processes, their knowledge acquisition and retention methods also differ greatly. Respondent 15 shared their preferred strategies and tips in this regard: "*Teachers often use a generalized method for the delivery of information in the class that is acceptable to everyone. Therefore, every student should analyze their own mental abilities and find the best method that they can adopt to retain more information. Teachers and family can assist the student in the process but the main responsibility lies with the student himself*". This view asserts the necessity of self-regulation and independent learning and establishes self-realization as the cornerstone for effective learning and recall. This intrinsic motivator will drive learners towards creating effective study routines and habits, making them more reliant on self-regulation rather than external dynamics. Respondent 6 noted, "*Consistency and organization are key - establish a regular study routine and utilize tools like flashcards and concept maps. Review*

regularly and reflect on your learning". Additionally, building understanding, making connections, using active learning techniques, practicing recall and retrieval, pre-class and post-class reviewing, reducing screen time, using memory devices, and teaching others (ZPD)—a critical component of constructivism—are among other strategies learners find effective in enhancing motivation and memory. Building healthy routines and making necessary lifestyle changes also have long-lasting effects on the learning process.

5. Discussion

RO1: To examine effective strategies that enhance the retention of information in long-term memory.

This study shows that student engagement is crucial for enhancing long-term memory. If the learners are fully engaged in lessons, they are more likely to retain information for longer periods. Existing research supports these findings, highlighting the importance of fostering active learning and critical thinking in improving student engagement and understanding[39]. These skills can be developed through incorporation of interactive, self-reflective and project-based learning activities in educational institutions. Understanding cognitive load can help instructors enhance teaching methods and learning outcomes enabling them to design lessons that minimize unnecessary burden on students and promote effective skill acquisition[10]. This, in turn, will lead to student autonomy and self-regulation practices that enhance long-term memory retention. Learners are more likely to develop autonomous learning strategies and routines if they are confident in their skill acquisition[40]; if their basic psychological needs of competence and autonomy are satisfied, it improves their autonomous motivation which, in turn, produces well-being and achievement[24,41]. Educators can use principles of cognitivism—thought-provoking questions, demonstrations, recitation, mnemonics and memory aids, concept mapping, hands-on problems, etc.—and constructivism—debates and peer discussions, interpretations, role-play, projects, inquiry-based activities, seminars, flipped classroom, etc.—to design lessons and classroom activities that augment student engagement, skill-building, and long-term information retention and, in turn, autonomous and self-regulated learning[42].

RO2: To investigate the underlying factors that con-

tribute to student motivation in learning environments.

This research establishes intrinsic and extrinsic drivers as strong motivators. Mainly, an innate interest in a subject area, a sense of achievement, and implications of personal growth motivate the learners to develop self-regulatory practices and routines to learn effectively[43]. Extrinsic drivers like family expectations, acknowledgement, recognition and rewards also play a major role in student motivation to learn and perform admirably[44]. Because of these stimulants that operate on all areas of self-regulated learning—metacognitive, cognitive-motivational and emotional—students develop autonomous and self-regulated learning strategies that help them achieve their goals and meet the targets they set for themselves[45]. These findings are also supported by motivational theories that stipulate that intrinsic and extrinsic motivational factors are fundamentally different, and that human motivation is driven by the fulfillment of three basic psychological needs: autonomy, competence and relatedness[46,47]. If learners feel that they have some freedom over their learning and have acquired effective relevant skills, their motivation to learn will increase; consequently, they will be more inclined towards developing self-regulatory habits and practices[48]. This is the very essence of cognitivist and constructivist approaches that seek to give learners independence over their learning.

Recommendations

Based on the findings and discussion, it is evident that student engagement is critical in fostering effective learning, long-term memory retention, and consequently, student autonomy and self-regulation. It is, therefore, recommended that instructors acquaint themselves with effective teaching practices that target skill acquisition and information retention, and design dynamic learning environments through project-based learning, peer teaching, and reflective practices[49]. This can be achieved by implementing various instructional strategies that align with constructivist theory, such as collaborative learning, problem-solving tasks, and the integration of real-world contexts into language education[14].

Learners, too, have the responsibility to use the available resources effectively and focus on skill acquisition instead of rote memorization. They can make effective use of classroom activities and teacher feedback to practice Cognitivist approaches of self-reflection and subsequent goal-setting, leading to self-regulation and autonomous learning habits[50].

Conclusions

The present study highlights the significance of cognitivist and constructivist approaches in developing student autonomy and self-regulation through motivation and information retention. The findings show that students learn more effectively when granted autonomy in their education and are engaged through interactive teaching and problem-based inquiry[51]. This, in turn, increases their motivation levels and encourages them to practice autonomous learning. Consequently, they develop self-regulatory habits and routines that support their learning and knowledge acquisition. This process underlines the importance of implementing interactive teaching practices in educational institutions to facilitate student autonomy and self-regulation. Findings from expert opinion research by Rasli et al. proves that flexible learning allows students to be more autonomous in developing their creative thinking and innovation skills in their learning process[51].

Limitations and Future Research

The study has some limitations that must be highlighted. The research is based on a limited sample of university students in China, Pakistan and Oman, which may not represent the full diversity of educational systems, cultural values, and learning styles. This geographical limitation affects the generalizability of the findings[52], especially in contexts with different pedagogical approaches or technological infrastructures. Additionally, the data gathered is self-reported which means that some responses might not be completely accurate or consistent, adding bias to the results. The absence of observational or longitudinal data also limits the ability to assess how motivation and self-regulation develop over time.

Future studies can focus on increasing the sample size and including a more diverse population, particularly from underrepresented contexts in Africa, Southeast Asia, or Latin America, to improve the generalizability of the findings.

Including students from vocational, online-only, or non-traditional education settings could also broaden the study's applicability. Additionally, future research can adopt a mixed-method approach to strengthen the validity and reliability of the findings and provide more robust conclusions in addition to combining interviews with classroom observations or digital learning analytics. Future studies can also explore the long-term impact of specific instructional methods by using longitudinal designs that track changes in student autonomy and learning outcomes over time.

Author Contributions

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Conflicts of Interest

The authors declare no conflict of interest.

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