ISSN: 2278-4012, Volume:13, Issue:4, December 2024

An Analysis of Empirical Research on Learning Engagement Intervention Abroad: Insights and Implications for Chinese Education

Ting Yin[1], Tianli Wu[2], Lin Xiong[3]

[1,2,3] Guangdong Polytechnic Normal University

Abstract:

Learning engagement intervention strategies are instrumental in enhancing teaching quality by actively participating in students' learning processes. This systematic literature review examines 39 empirical studies on learning engagement interventions, assessing their effectiveness and implications for Chinese education, and provides tangible evidence and practical insights into the efficacy of these interventions. Statistical analysis indicates a yearly increase in empirical studies on learning engagement, primarily published in education, psychology, and computer science journals. The focus is predominantly on college students, with growing attention to middle and primary school students. The findings reveal that despite valuable insights from foreign research, the application of interventions is not entirely satisfactory. Challenges identified include insufficient synergy, under-utilization of technical support, unidirectional intervention patterns, lack of personalized and differentiated interventions, and limited research on combined interventions. When conducting empirical research on learning engagement intervention strategies, Chinese scholars should consider the synergistic effects of intervention strategies, bidirectional linearity of interventions, multidimensional stakeholders involvement, personalized intervention, and the implementation of multiple rounds of iterative interventions.

Keywords: learning engagement, intervention strategy, systematic literature review

(Received: 20 September 2024; Revised: 07 October 2024; Accepted: 27 November 2024; Published: 31 December 2024)

Research Background

The enhancement of educational quality stands as a universal concern for governments and educators worldwide. Student engagement is considered as a key factor in evaluating students' learning performance and educational quality. Learning engagement refers to a complex educational construct, which is characterized by students' active behavioral engagement, their emotional and cognitive engagement in learning activities, and their social interactive engagement within educational contexts.

In recent years, a significant emphasis on student engagement has been placed by foreign research, leading to researchers endeavor to investigate and affirm the approaches to improve student engagement in learning. These include peer-assisted learning (Molinillo, 2018), flipped classrooms (Chen, 2019), personalized learning pathways (Leenknecht, 2020), teacher support perceptions (Erika, 2023). These interventions collectively aim to enhance educational outcomes and quality, refining instructional approaches and learning environments to boost student engagement.

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

While these strategies have demonstrated efficacy within their respective cultural and educational contexts, their adaptability to diverse groups presents challenges. This paper, therefore, attempts to systematically review empirical studies on international learning engagement interventions to assess their efficacy across varying educational settings. Through meticulous analysis, the study seeks to distill valuable insights and inspiration for the enhancement of domestic educational practices.

Core Concepts

2.1 Learning Engagement

The concept of academic engagement dates back to the 1930s when educational philosopher Taylor (1932) first defined it as the time and effort students invest in the learning process. This definition laid the foundation for subsequent research. Building upon Taylor's work, Pace (1982) further refined the concept, emphasizing that academic engagement should encompass not only the investment of time and effort but also the level of concentration students exhibit during the learning process, thus expanding the dimensions of academic engagement to include both quality and quantity.

Over time, the concept of academic engagement has become increasingly diverse, leading to a variety of research perspectives. Scholars have explained academic engagement differently based on their research contexts and needs. For instance, Fredricks (2004), from the perspective of learning activities, defined academic engagement as the commitment and investment students have in their learning activities. Bond et al. (2020), on the other hand, described academic engagement as the degree of energy and effort students put into the learning process, which can be observed and measured through indicators such as behavior, cognition, and affect, and is influenced by internal and external factors such as teacher-student relationships, peer relationships, learning activities, and the learning environment.

Among the many conceptual frameworks, the three-dimensional framework of academic engagement proposed by Fredricks (2004) and others is widely cited. This framework includes the dimensions of behavioral engagement, cognitive engagement, and emotional engagement. Subsequently, Fredricks (2006) expanded this framework by adding social engagement as the fourth dimension. This framework provides a more comprehensive perspective for understanding and measuring academic engagement.

In modern educational practice, academic engagement is closely related to students' academic performance and has a significant impact on the development of cognitive skills. However, effectively enhancing academic engagement in educational practice remains a challenge for educators and researchers. This requires a deep understanding of the extensive nature of academic engagement and the exploration and implementation of effective strategies to promote student engagement across all dimensions.

2.2 Learning Engagement Intervention

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

In the domain of English language education, the concept of "intervention" is rich and multifaceted. It extends beyond the mere involvement or participation to include a more assertive form of engagement, where intervention is used to prevent or correct certain behaviors, with the ultimate goal of enhancing the situation. Interventions are recognized as instructional tools or strategies designed to stimulate and convey relevant knowledge, creating opportunities for learners and providing feedback in post-learning activities (Sals & Cannon-Bowers, 2001).

The effectiveness of educational interventions has been a subject of extensive research. Scholars like Mikan et al. (2019) have demonstrated that well-crafted educational interventions can significantly improve skills in evidence-based practice among professionals, suggesting that similar strategies could be effective in language education settings.

Intervention strategies in education are diverse and may encompass personalized teaching plans, motivation enhancement, and optimization of the learning environment, all of these aimed at improving students' learning efficiency and academic performance. Recent studies, such as those by Azevedo (2023), have shown that interventions can take innovative forms, including community-based approaches to enhance student engagement.

Moreover, the impact of intervention strategies on learners' emotional engagement has been analyzed within the framework of emotional engagement, as seen in the work of Ashwin et al. (2020). This underscores the importance of considering the emotional aspect of learning in the design of educational interventions.

The concept of intervention in language education is not limited to direct teaching but also involves creating supportive environments and systemic changes. Effective interventions must consider the characteristics, needs, and context of the target group, as well as the feasibility, effectiveness, and sustainability of the intervention measures.

The design and implementation of these strategies should adhere to ethical principles, respecting individual rights and dignity, and ensuring fairness and transparency in the intervention process. With the advancements in technology, modern educational interventions are increasingly integrating data analysis and artificial intelligence to enhance precision and efficiency.

In summary, intervention strategies in English language education are a complex approach to enhancing learning outcomes. They require a comprehensive understanding of the learners' needs and a strategic use of resources and technologies to foster an environment conducive to learning and growth.

Research Design

3.1 Research Method

This study adopts a systematic literature review method to conduct research. Systematic literature review method is a clear and systematic approach to literature review. Bu Caili (2012) and Hu Xiaoling (2024) pointed out that systematic literature review is aimed at solving research problems, comprehensively collecting relevant research results on a certain issue through clear

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

strategies that can be replicated, and screening and analyzing all literature according to the inclusion criteria. Rudnicka (2012) and so on mentioned that the method of systematic literature review can accurately grasp the research status and development trends of the research topic, which can solve specific research problems. The advantages of systematic literature review over traditional literature review methods are reflected in rigor and transparency, including clear research questions, comprehensive search strategies, clear literature standards, high-quality evaluation methods, comprehensive data analysis, and reliable research results (Chalmers, 2002).

3.2 Research Question

To explore the characteristics of research in this domain, such as the evolution of publication trends and the focus of research subjects, as well as the efficacy of various intervention strategies in improving cognitive engagement and academic performance among students, this study will analyze the following research questions grounded in a comprehensive review of international literature: (1) What are the defining traits of empirical research abroad on learning engagement interventions, including trends in publication and research subjects; (2) What strategies have been implemented by foreign scholars to enhance student engagement, and how effective have these strategies proven to be?

3.2.1 Sample Acquisition

Literature Retrieval Strategy

In order to effectively obtain high-quality empirical research literature on foreign learning engagement in the past decade, this study conducted targeted searches using keywords such as “Intervention strategy” for “Learning engagement”, “Intervention to engagement”, “Learning intervention for Learning engagement”, and “Methods for increasing learning engagement” in literature databases such as ELSEVIER, Science Direct and Web of Science. The literature period was limited to January 1st, 2013 to January 1st, 2024. Finally, a total of 601 articles were obtained.

Literature Screening Criteria

In order to ensure the validity of the retrieved literature and the accuracy and reliability of the literature analysis results, this article uses the following criteria to screen the retrieved literature.

Table: 1

Inclusion/Exclusion Criteria for Literature

Serial number	Inclusion criteria	Exclusion criteria
One	English paper	Non English papers
Two	Empirical research	Non empirical research
Three	Full text available	Full text not available
Four	The research subject is students	The research subjects are teacher input and parent input
Five	The research topic focuses	The research topic focus on others

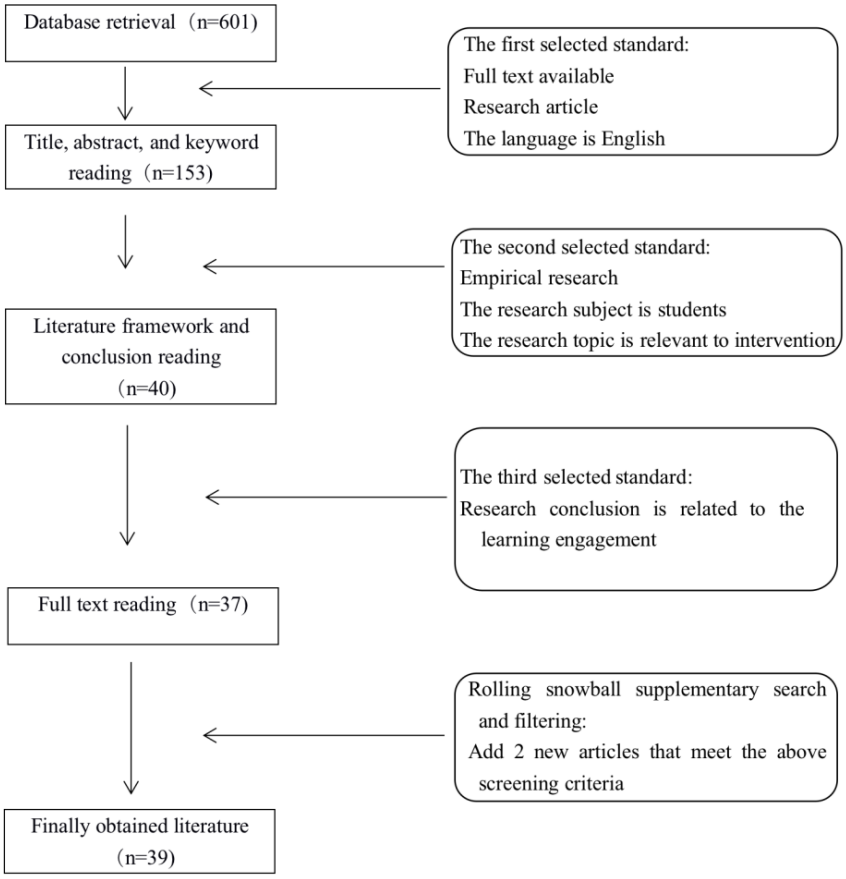
ISSN: 2278-4012, Volume:13, Issue:4, December 2024

on intervention strategies and methods for learning engagement	(making learning engagement intervention strategies a non research focus)

3.2.2 Literature Screening Process

This study adopts content analysis method to analyze the 39 final-selected literature from dimensions such as author, year, research topic, disciplinary background, research object, and research content. According to the requirements of the research question and systematic literature review, the literature underwent three rounds of screening. One is the basic information of the paper, including empirical research and English papers. The second is access to the full text, the relevant research topic of learning engagement, and the research subjects being students from different stages. The third is the situation of intervention, including the research conclusion that is related to learning engagement and research design.

Figure 1



Literature Screening Process

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

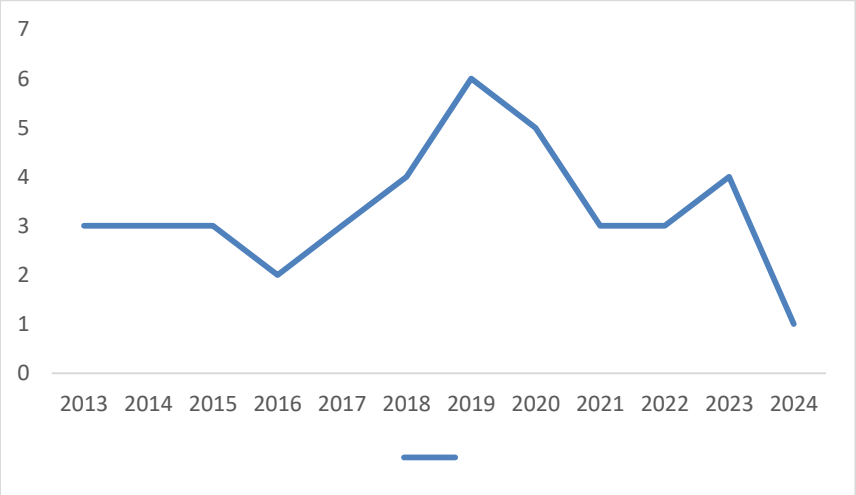
Research Status of Learning Engagement Intervention Strategies Based on Quantitative Analysis

To answer the research question, this chapter will conclude three points, the first two points address research question 1, while the third point responds to research question 2.

4.1 Publication and Citation Status of Literature

In recent years, research on intervention strategies for learning engagement has shown an overall increasing trend year by year, indicating that the research receives an increasing attention from foreign researchers. The trend can be roughly divided into four stages. The first stage is the slow development stage before 2016, the second stage is from 2016 to 2019, showing a rapid upward trend, the third stage is the slow growth phase from 2019 to 2022, and the fourth stage shows signs of recovery from 2023 to 2024, as shown in Figure 2. Among them, Herrmann (2013) and so on use cooperative learning to intervene in student learning engagement, which has the highest citation rate (412 times). It can be observed that articles with high citation rates mainly focus on how to enhance learning engagement, which is a hot topic in foreign research on intervention strategies for learning engagement. It should be noted that literature with more than 20 citations was published between 2016 and 2020, which may be due to recent publications not having enough time to obtain more citations.

Figure: 2



Number of Publications on Empirical Research Abroad from 2013 to 2024

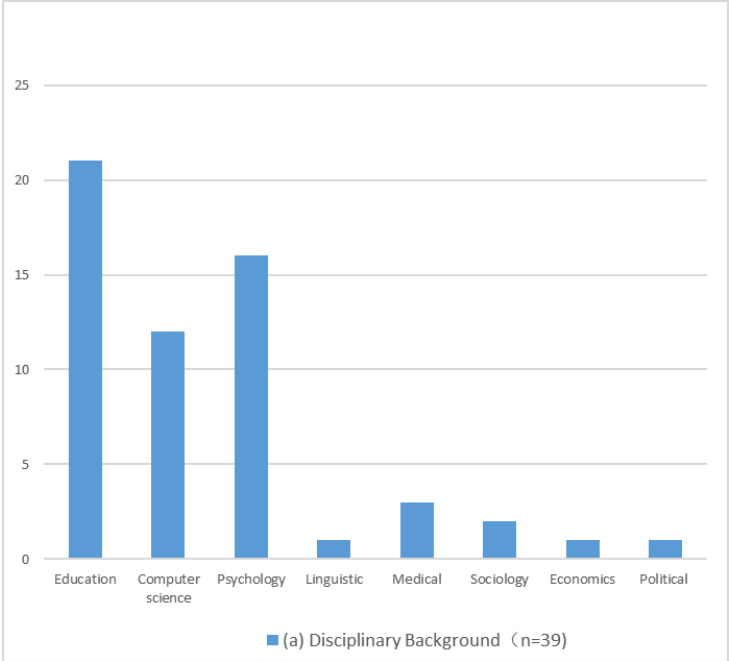
4.2 The Characteristics of Disciplinary Background and Research Object

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

This study systematically examined the disciplinary background and research subjects on learning engagement intervention strategies. The analysis indicates a broad interdisciplinary interest in learning engagement interventions over the past decade, with a significant concentration of research in the domains of education, psychology, and computer science(see Figure 3a).

The empirical research focuses predominantly on college students, constituting 48.7% of the sample (n=19), followed by high school (15.3%, n=6), middle school (17.9%, n=7), and primary school students (10.2%, n=4), with a small percentage (0.76%, n=3) addressing other subjects(see Figure 3b). This distribution suggests a notable emphasis on higher education, with comparatively less attention given to younger student populations. The potential rationale behind this pattern may involve the added complexities of obtaining necessary permissions from teachers or parents for experimental research with primary and secondary school students, thereby escalating the challenges associated with conducting such empirical studies.

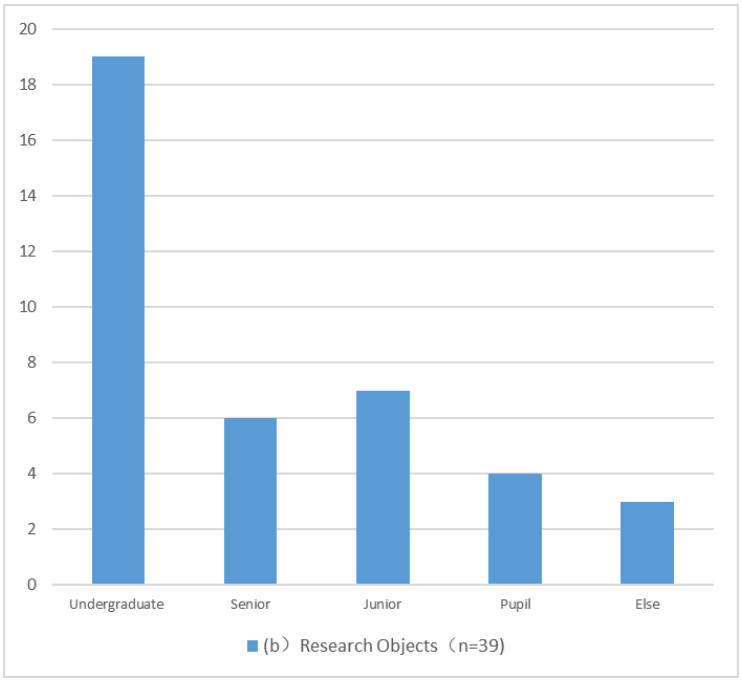
Figure: 3a



Disciplinary Background

Figure: 3b

ISSN: 2278-4012, Volume:13, Issue:4, December 2024



Research Objects

4.3 The Categorization of Intervention Strategies

The empirical literature analysis has identified a plethora of strategies for learning engagement intervention, which are categorized into seven distinct categories: technical support, learning environment, teaching diagnosis, teaching methods, teacher self-improvement, student meta-cognitive monitoring, and social support. This taxonomy is derived from the intervention strategy library by Tian Hao and Wu Fati (2022), which includes visualization, diagnostic prompts, social support, learning content, suggestion guidance, and teacher-student conversation.

Table: 2

Intervention Strategies for Learning Engagement

Intervention methods	Intervention type	Intervention example	Intervention subject	Representative literature
Individual intervention	Technical support	Mobile learning (iPad and applications)	Teacher	Albogami, 2020
		Using an automated content feedback system (essay critiquing system 2.0, ecs2.0)	Teacher	Cynthia Lee, 2018
		A new ocw (online collaboration) tool called	Teacher	Ming Liu, 2018

	cooperpad Using social networking tools to communicate, organize, interact, share information, and collaborate(such as blogs, social networks, file storage and sharin)	Teacher	Sebastian Molinillo , 2018
Learning environment	The networked tutoring environment of Virtual Tutee System (VTS).	Teacher	Seung Won Park, 2014
Teaching diagnosis	Teachers use the classroom assessment scoring system to provide feedback on student performance	Teacher	Sarah e. Mckellar , 2020
	Formative evaluation	Teacher	Cynthia Lee, 2020
Teacher's teaching methods	Learning community tutoring	Teacher (community teacher); student	Giselle Bonet, 2016
	Design of different blended learning environments	Teacher	Lisa r. Halverson , 2019
	Instructional methods: Cooperative learning	Teacher	Kim j Herrmann , 2013
	Teaching activities	Teacher (intervene by game)	Biyun Huang, 2019 ; Meng Tan, 2016 ; Arturo Rojas-López, 2019
	Teaching methods: Just in time teaching (jitt) and plenty of time teaching (pott), as well as the use of electronic feedback	Teacher	Jerry Chih-Yuan Sun, 2014;

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

	devices; Teachers provide immediate feedback on students' social skills development		Karen Milligan, 2015
	Teacher support behaviors (emotional, self-esteem, online support)	Teacher	Moyi Jia, 2024
Teacher self-Improvement	Teacher counseling intervention (through online seminars, workshops, and guided video reviews)	Teacher	Sigrun k. Ertesvåg, 2022
Meta-Cognition	Personalized (aslan) **meta-cognitive feedback support** learning analysis report	Student (learning analysis report, meta-Cognition)	Fatma Gizem Karaoglan Yilmaz, 2022
	Positive psychological resources for students include self-efficacy, hope, optimism, resilience, and psychological capital (self-efficacy, hope, optimism, and resilience, and psychological capital)	Student	Ji Won You, 2016
	Student self-monitoring behavior intervention (self-monitoring: Including session length, interval length, goal setting, feedback, and reinforcement)	Student	Allison Bruhn, 2022
Visualization	Design videos together by combining interviews, focus groups, and establishing youth counseling groups.	Student group	Sinead Pembroke, 2021
Social support	The storytelling tool ' yellow' s trials and tribulations' is used to	School	R. Azevedo, 2023

		convey content, which combines srl strategy and school engagement.		
		Financial assistance	School	Angela Boatman, 2016
		Perceived support from teachers and peers	Teacher; Companion	Lin Luan, 2020
Combination intervention	Technical support+ Teaching activities	The method of game application in online discussions	Teacher	Lu Ding, 2017
	Meta-Cognition+ Social support	Smarts intervention measures include school training for students, self-monitoring and feedback from students, and handling.	School; Student	Shannon r. Holmes, 2020

Teaching methods are the most frequently utilized, with six instances, encompassing strategies such as learning community counseling (Bonet, 2016), the design of blended learning environments (Halverson, 2019), and game-based instruction (Huang, 2019). These methods have been effective in enhancing students participation and academic performance. Technical support, the second most common category with four instances, includes real-time feedback systems like ECS2.0 (Lee, 2018), which facilitate rapid identification and resolution of academic issues. Social networking tools have also been instrumental in improving interactive learning and students collaboration (Molinillo, 2018). Meta-cognitive strategy and social support, each employed three times, focus on bolstering self-regulation and providing engaging learning experiences. Meta-cognitive feedback and learning analysis reports have been shown to improve learning efficiency (Yilmaz, 2022), while storytelling and social engagement strategies have successfully increased student involvement (Azevedo, 2023).

The universal applicability of learning engagement intervention strategies across diverse cultural and educational settings is not yet fully established and warrants further investigation. The efficacy of certain strategies, like story-based social support (Azevedo, 2023), has been noted to fluctuate significantly across different school cultures. This variability underscores the importance of a tailored approach to the adaptation of intervention strategies, ensuring they are sensitive to the unique characteristics of each educational context.

Moreover, interventions aimed at enhancing meta-cognitive and self-monitoring skills (Bruhn, 2022) have demonstrated potential in boosting students' self-efficacy and learning strategies. However, the manner in which these interventions can be effectively integrated with the diverse learning styles and individual needs of students to yield the most favorable outcomes remains a subject of ongoing research. This highlights the need for a personalized strategy that not only

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

addresses the commonalities in learning engagement but also accommodates the unique requirements of each learner, thereby optimizing the overall effectiveness of the intervention.

In the face of this challenge, it is necessary for us to conduct an in-depth analysis of various learning engagement intervention strategies to ensure that our educational practices can meet the needs of different students. The next chapter will explore the appropriateness of these strategies and evaluate their effectiveness and feasibility in specific contexts.

Appropriateness Analysis of Learning Engagement Intervention Strategies

The analysis of the appropriateness of learning engagement intervention strategies extends beyond a mere assessment of their efficacy. It encompasses a holistic review that takes into account the intrinsic qualities of education, the diverse needs of learners, and the diversity of the teaching environment. Such strategies are designed to enhance the learners' engagement by strategically intervening in their learning processes.

Upon meticulous examination of the thirty-nine empirical studies on learning engagement interventions from the past decade, a pattern of inadequate implementation has been observed. This is particularly evident in the singular focus on intervention subjects, an underwhelming presence of technical support in interventions, a linear progression of intervention steps that lacks flexibility, a deficiency in personalized approaches, and a general lack of impact from individualized interventions.

5.1 One-Dimensional Intervention Subject

Based on the analysis of the literature, it can be seen that intervention strategies are mostly designed and implemented by a single subject, such as teachers (21 articles), students (3 articles), schools (4 articles), parents (1 article), peers (1 article), etc. The intervention strategies under one subject include designing teaching plans, incentive measures by teachers who are in charge of a class, and optimizing learning environments in school. These strategies excel in unified resource allocation and the swift adaptation to the immediate needs of specific student cohorts. The centralized nature of such interventions allows for a direct and often efficient response to educational challenges within a contained environment.

However, learning engagement is a multidimensional concept that involves learners' psychological state, learning environment, social and cultural background, and other aspects. Therefore, intervention strategies just involved fewer stakeholders may overlook these complex factors. Intervention strategies that involve different stakeholders, mean the joint participation of different stakeholders such as families, schools, communities, and policymakers, can comprehensively consider the needs and backgrounds of learners and provide more comprehensive support, approved by Tian(2022), who mentioned that learning intervention is a systematic process that requires the participation of multiple stakeholders.

In summary, a multidimensional subject of learning engagement intervention strategy may include: teachers providing personalized learning guidance and feedback, schools providing abundant learning resources and a good learning environment, families providing emotional

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

support and learning space for learners, communities providing supplementary educational resources and social practice opportunities, and policymakers formulating policies that are conducive to the comprehensive development of learners. For example, interventions from school typically focus not only on a single aspect of learning, but also provide comprehensive support including financial assistance (Boatman, 2016), social support (Azevedo, 2023), and perceived teacher and peer support (Luan, 2020). This multidimensional support helps create an educational environment that is conducive to the comprehensive development of students, it is possible to more effectively promote learners' active participation, improve learning outcomes, and provide learners with more comprehensive educational support. Also, it requires good communication and coordination mechanisms among all parties to ensure the effective implementation of intervention strategies.

5.2 Teacher Feedback Lacks Prominence in Technology-Supported Interventions

The application of technological support in the intervention process has the potential to revolutionize traditional education models, promising to provide students with highly customized learning experiences through intelligent algorithms and personalized learning paths. This strategy is expected to significantly enhance students' learning engagement and motivation. The diversification of resources such as online courses, video lectures (Pembroke, 2021), interactive simulations (Ding et al., 2017), and the advanced features of learning management systems (LMS) (Henrie, 2015) undoubtedly provide broad prospects for the modernization transformation of education.

However, the effectiveness of technological interventions is not that perfect in implementation, especially in terms of teacher feedback mechanisms, the potential of technological intervention has not been fully realized. Despite the powerful data collection and analysis tools provided by technology platforms, teachers still face challenges in providing technical guidance to students based on the requirements of the collected data and providing effective feedback to students based on the results of data analysis. Jiang and Esland (2022) revealed that teachers and students have a sense of unfamiliarity with technology, which not only reduces the acceptance and efficiency of technology tools but also weakens teachers' ability to provide timely and targeted feedback in the teaching process. To fully unleash the potential of technological intervention, it is necessary to attach importance to and invest in teachers' professional development and technical support services.

5.3 The Intervention Steps Exhibit a Unidirectional Linearity

According to Table 2, the intervention steps exhibit a one-way linear characteristic in multiple cases, which is mainly reflected in the fact that teachers, as the main intervention subjects, unilaterally provide teaching support and feedback to students through various means, and students rarely intervene in their learning process by their own thinking and cognition. For example, in the research of Lee (2018) and Liu (2018), teachers utilize technological support to impart knowledge or conduct assessments to students, such as automated content feedback systems and online collaboration tools. Molinillo's (2018) study demonstrated that teachers use social networking tools for sharing information and organizing teaching. In addition, Seung Won Park (2014) and Sarah E. McKellar (2019) implemented teacher-centered teaching diagnosis and feedback through the Virtual Tutee System and CLASS assessment system, respectively. Under

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

this intervention, instruct-based teaching becomes the main means of teaching in class, with a lack of opportunities for students to participate and express themselves in class, which means teachers act as knowledge transmitters, while students passively receive information. Over time, students may feel that learning is an external requirement rather than an internal drive, leading to a decrease in learning motivation and unsatisfactory learning outcomes.

The intervention strategy of the one-way linear pattern ignores the initiative and creativity of students as learning subjects. The most easily ignorant aspect of this intervention is the learning requirements of all students, who have different learning styles, interests, and needs. In addition, because of the lack of interaction and feedback in the classroom environment, students' critical thinking and problem-solving abilities are cultivated finitely. In order to improve teaching effectiveness, intervention strategies need to shift towards a more interactive and participatory direction.

5.4 Insufficient Research on Personalized Intervention Strategies

The paucity of research in personalized learning engagement intervention strategies underscores the imperative for comprehensive analysis and further empirical inquiry. Yilmaz (2022) explored the impact of personalized meta-cognitive feedback support based on learning analysis on students' online learning engagement through carefully designed experiments, which not only fills this research gap but also provides an empirical basis and a valuable case for the appropriateness of personalized intervention strategies. In this study, 68 first-year college students were randomly assigned to an experimental group and a control group. The experimental group received personalized meta-cognitive feedback, while the control group did not. The research results revealed significant improvements in multiple dimensions of learning engagement among the experimental group students.

The importance of this study lies in two points, one is demonstrating the positive effects of personalized intervention strategies, and the other is emphasizing the potential applicability of such strategies in different educational environments. With the strong evidence for the appropriateness of personalized intervention strategies provided, more academic attention and empirical research should be taken into account in the future to further explore the diversity, complexity, and applicability of personalized intervention strategies in different educational contexts, which means some key factors that need to be considered in the design and implementation of personalized intervention strategies, including students' needs, the characteristics of the learning environment, and teachers' professional development.

In summary, the suitability analysis of personalized meta-cognitive feedback support emphasizes its potential to enhance students' learning engagement, which points out the direction for future research, that is, more attention to the development, evaluation, and optimization of personalized intervention strategies is required.

5.5 The Shortfall of Combined Interventions

Individual intervention strategy refers to using only one intervention method in the educational process, rather than combining multiple methods to enhance learning engagement and effectiveness. By comparing the research results of individual intervention and combination

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

intervention, we can find that combination intervention shows a more significant effect in improving learning engagement. Although individual interventions may be effective in specific situations, they are often limited due to a lack of comprehensiveness. For example, in Lee's (2018) study, although technological support has improved the convenience of learning, it may not be sufficient to stimulate students' deep engagement and motivation. This limitation suggests that individual interventions may not fully utilize students' psychological resources, such as self-efficacy and meta-cognitive abilities.

In contrast, combination interventions can more comprehensively meet students' learning needs by integrating multiple strategies such as meta-cognitive support, social support, and personalized feedback. The SMARTS intervention mentioned in Holmes' (2020) study is a combination intervention case that combines meta-cognitive support and social support. This intervention not only includes school training for students but also involves student self-monitoring and feedback mechanisms, thereby promoting student self-management and participation in multiple dimensions.

Overall, although individual intervention strategies may have their advantages in certain situations, combined intervention strategies demonstrate greater potential and effectiveness in enhancing learning engagement due to their comprehensiveness and adaptability. Education researchers and practitioners should focus on the development and application of combination intervention strategies, while recognizing the challenges that may arise in implementing such strategies. Through more research and practice, we can better understand the working mechanism of combination intervention, optimize its design and implementation, and provide students with more effective and personalized learning support.

Research Conclusion and Implications

This study comprehensively reviewed the research progress in the field of learning engagement intervention strategies in foreign countries in the past decade through a systematic literature review method. After screening, this study included 39 representative English empirical literature and conducted in-depth statistical analysis on the research trends, disciplinary distribution, and research focus during this period. The analysis results indicate that the number of empirical studies on learning engagement intervention strategies has shown a significant increasing trend year by year, reflecting the research activity and importance in this field. These studies have mainly been published in journals in disciplines such as education, linguistics, psychology, and computer science, indicating that learning engagement intervention strategies are an interdisciplinary research field involving theories and practices from multiple disciplines. In terms of research subjects, this study reveals that college students are the main focus of research on learning engagement intervention strategies, followed by middle and elementary school students. This discovery emphasizes the special needs of students at different educational stages in academic and psychological development, as well as the importance of targeted intervention strategies. Furthermore, this study analyzed the diversity and effectiveness of intervention strategies, and identified key features of effective interventions. On this basis, this study provides five insights for Chinese scholars to conduct empirical research on learning

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

engagement intervention strategies, aiming to promote in-depth localization research and innovative practical applications.

6.1 The Necessity of Multidimensional Subject Intervention

Enhancing learning engagement necessitates a multidimensional approach that transcends the individual efforts of educators and involves collaboration among various stakeholders. This includes the active participation of students, educators, school administrators, parents, and societal elements.

As the subjects of the learning process, students are imperative in developing self-directed learning competencies. They must foster self-awareness and self-efficacy, which are pivotal for enhancing their engagement through autonomous monitoring and regulation of their learning activities. This self-actuated dimension is the foundation for the construction of a robust learning engagement ecosystem.

Educators play a critical role in facilitating an environment conducive to learning. They should employ effective instructional strategies and provide timely, formative feedback to motivate and guide students' active participation. The pedagogical interventions by teachers are instrumental in nurturing a classroom culture that values and expects active engagement from students.

Furthermore, school administrators are tasked with the provision of essential support and resources. This encompasses professional development for educators, the procurement of teaching facilities, and the supply of comprehensive learning materials. The administrative support is a keystone of learning engagement, as it ensures that the educational infrastructure is aligned with the needs of a dynamic and evolving learning process.

The involvement of parents and the broader community is equally significant. They contribute to the enrichment of the learning experience by engaging in family education initiatives and by offering social practice opportunities. This external support network extends the boundaries of the classroom, providing students with a more expansive and integrated learning experience.

In essence, the collective and coordinated efforts of these diverse stakeholders are vital in cultivating an ecosystem that bolsters student learning engagement. Each stakeholder brings unique contributions that, when harmonized, create a supportive and dynamic educational milieu. This multidimensional subject intervention is not merely an option but a necessity for a holistic and effective enhancement of learning engagement.

6.2 Enhancing Synergy in Teacher-Led Intervention Strategies

Teachers play a crucial role in increasing students' learning engagement. Firstly, teachers need to strengthen the synergy of intervention strategies, that is, to comprehensively use multiple teaching methods in the teaching process to adapt to the learning needs of different students. For example, teachers can stimulate students' thinking and interest through activities such as group discussions, role-playing, and problem-solving. At the same time, teachers should attach importance to students' feedback and adjust teaching strategies in a timely manner to meet students' learning needs. In addition, teachers should strengthen communication and exchange

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

with students, and establish a good teacher-student relationship, in order to enhance students' learning motivation and participation.

Secondly, when it comes to the synergy of human-machine collaboration, teachers can utilize educational technologies such as intelligent teaching systems and online learning platforms to assist in teaching and enhance students' learning engagement. For example, teachers can use intelligent teaching systems to analyze students' learning behavior and grades, in order to understand their learning situation and needs. Meanwhile, educators can enhance personalized learning by leveraging online platforms to curate tailored resources and activities that align with the diverse needs of their students. Furthermore, by integrating artificial intelligence, they can automate feedback and provide individualized tutoring, thereby optimizing both the efficiency and effectiveness of the learning process.

Finally, in order to avoid the bad effects caused by unfamiliarity with technical tools, teachers need to receive specialized training to enhance their ability to apply technological tools. The training content should include how to use technological tools to collect and analyze learning data, how to provide personalized feedback based on data, and how to combine technology with teaching practice to create an interactive and effective learning environment. Meanwhile, strengthening technical support services is key to ensuring that teachers can receive the necessary help and guidance in a timely manner.

Through these measures, teachers will be able to proficiently use technological measures to provide students with more accurate and effective learning feedback, thereby improving the effectiveness of learning engagement intervention strategies.

6.3 The Focus on Bidirectional Linear Intervention Strategies

The bidirectional linear intervention strategies not only require teachers to actively intervene in learning activities, but more importantly, encourage students to intervene in the learning process and activities themselves. This two-way interaction and participation are key to enhancing learning engagement and effectiveness.

For one thing, teachers play a crucial role in intervening in students learning process. They need to design and implement pedagogical activities and thought-provoking inquiries that compel students to engage in deep thinking and exploration. The role of the teacher extends beyond the mere transmission of knowledge; it should encompass the stimulation of students' innate curiosity, the direction of their problem identification, and the encouragement of autonomous problem-solving. For example, teachers can stimulate students' interest in exploration and learning motivation by posing challenging questions, setting exploratory tasks, or introducing real-world problem scenarios. Through such an intervention approach, educators can catalyze a more dynamic and self-directed learning experience for their students.

For another, the capacity for student self-intervention is an indispensable element of the educational experience. This concept encapsulates the initiative with which students engage in their educational journey, including the critical reflection and iterative refinement of their learning objectives, strategies, and progress. The propensity for self-intervention is a fundamental aspect of cultivating a student's capacity for lifelong learning. Educators can foster and enhance this self-intervention skill set among students by employing the following

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

pedagogical strategies. educators must facilitate the process of goal setting for students, ensuring that these objectives are both specific and quantifiable. This approach aids in delineating the trajectory and rationale of their educational pursuits. Secondly, it is essential to impart to students a repertoire of efficacious learning strategies. These may encompass skills such as time management, information organization, and the cultivation of critical thinking abilities, thereby empowering them to orchestrate and execute their learning activities with greater efficacy. Thirdly, creating opportunities for self-reflection is essential, allowing students to engage in the introspection of their learning processes. Through this reflection, they can discern their areas of proficiency and deficiency, and consequently adjust their study plans and methodologies to align with their self-identified needs. Lastly, affording students a measure of autonomy in the selection of learning content and pedagogical approaches, tailored to their individual interests and requirements, is crucial. This empowerment is instrumental in bolstering their intrinsic motivation to learn, thus fostering a more profound and enduring engagement with the educational material.

The implementation of bidirectional linear intervention strategies requires effective communication and interaction between teachers and students. Teachers need to listen to students' voices, understand their needs and confusion, and provide timely feedback and support. At the same time, teachers also need to create an open and inclusive learning environment, so that students feel that their viewpoints and ideas are respected and valued.

Through the intervention strategy of a bidirectional linear pattern, teachers and students can participate in the learning process together, forming a positive learning community. This kind of community can not only improve the effectiveness of learning, but also cultivate students' spirit of cooperation, critical thinking, and lifelong learning ability.

6.4 Crafting Tailored Intervention Strategies in Alignment with Diverse Learning Contexts and Learner Profiles

Designing personalized learning engagement intervention strategies is crucial for meeting the specific needs of each student, it can enhance students' learning motivation, making them feel valued and supported in their learning process.

In order to achieve personalized intervention, teachers need to understand the characteristics and needs of each student through observation, evaluation, and communication with them, which may include students' cognitive abilities, learning styles, interests, and motivation levels. Without this, teachers can not design differentiated teaching plans and activities to meet the learning needs of different students.

Personalized intervention strategies can include providing learning materials of different difficulty levels to cater to students with varying levels of ability, utilizing technological tools such as intelligent tutoring systems and online learning platforms to provide personalized learning resources and pathways for students, encouraging students to choose learning projects and topics based on their own interests, and providing students with the freedom to choose their learning methods, such as through visual, auditory, or hands-on learning.

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

Implementing personalized intervention strategies requires teachers to have flexibility and creativity, while also requiring schools to provide necessary resources and support. In addition, teachers need to work closely with students, parents, and other educators to jointly design and implement personalized learning plans.

6.5 Developing a Comprehensive Evaluation Framework for Iterative Intervention Enhancement

Effective learning engagement intervention strategies need to be monitored and improved through a scientific evaluation system. The evaluation system should be able to comprehensively and accurately reflect students' learning progress and the effectiveness of intervention strategies.

Firstly, teachers need to clarify the evaluation objectives and standards, including specific indicators and evaluation methods for learning outcomes. These indicators may include students' knowledge mastery, skill development, engagement, and motivation level. Evaluation methods can include observation, testing, self-evaluation, peer evaluation, and feedback.

Secondly, teachers need to regularly collect and analyze evaluation data to understand students' learning situations and the effectiveness of intervention strategies. These data can provide valuable information for teachers, helping them identify problems, and adjust teaching methods and strategies.

In addition, teachers need to establish a continuous improvement cycle, which involves iterative interventions based on evaluation results. This may include adjusting teaching plans and activities based on students' learning progress, improving teaching methods and learning materials based on student feedback and suggestions, and regularly discussing evaluation results and improvement measures with students, parents, and other educators. By establishing an effective evaluation system and a continuous improvement cycle, teachers can ensure that learning engagement intervention strategies are centered on students' needs and continuously improve teaching effectiveness.

Summary

The scholarly inquiry into the efficacy of intervention strategies designed to enhance learning engagement holds significant pedagogical value, particularly in fostering problem-solving ability, skill development, and overall capacity enhancement among students (Fredricks, 2019). This systematic review has endeavored to map the extant empirical research, thereby providing a foundation for Chinese academia to delve deeper into the nuanced mechanisms of learning engagement interventions.

It is imperative to acknowledge the methodological constraints encountered during the preliminary phases of this review, which have influenced the scope of the literature encompassed. The parameters for literature retrieval were confined to peer-reviewed journals, full-text availability, and empirical research, thereby inadvertently excluding non-empirical forms of scholarly communication such as conference abstracts, informal literature, and theoretical treatises. This exclusion may have introduced a bias towards empirical research, potentially overlooking valuable theoretical insights and broader trend analyses within the domain of learning engagement interventions.

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

Education transcends the mere transmission of knowledge, it is an intricate fabric interlaced with emotional, motivational, cognitive, and social dimensions. Intervention strategies that aspire to enhance learning engagement must transcend the conventional pedagogical paradigms, embracing a more humanistic, individualized, and adaptive approach to teaching and learning.

The overarching objective of educational endeavors is to foster the holistic development of students, encompassing cognitive and emotional dimensions, critical thinking, and a sense of social responsibility. Consequently, the conceptualization and execution of learning engagement interventions should be anchored in the ethos of comprehensive student growth, serving as both the point of departure and the ultimate aspiration. This necessitates that educational practitioners demonstrate a broad perspective, deep critical understanding, and the capacity for innovation, equipping them to navigate the dynamic landscape of educational demands and societal contexts.

The implementation of education should be envisioned as an ongoing journey of exploration and innovation. Educators are encouraged to engage in continuous reflection and critical evaluation of their instructional strategies, proactively pursuing avenues for enhancement and innovation. Such a proactive stance is essential to address emerging challenges and harness new opportunities within the educational sphere.

Through perpetual learning and professional development, educators are better positioned to provide effective guidance and inspiration to their students, empowering them to unlock their latent potential and achieve their aspirations. This study serves as a call to action for the educational community to embrace a more inclusive, reflective, and innovative approach to learning engagement interventions, with the ultimate aim of enriching the educational experience and outcomes for all learners.

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

References

Al-Bogami, B., & Elyas, T. (2020). Promoting middle school students' engagement through incorporating iPad apps in EFL/ESL classes. *SAGE Open*, *10*(2), 1-18.

Ashwin, T. S., & Guddeti, R. M. R. (2020). Impact of inquiry interventions on students in e-learning and classroom environments using affective computing framework. *User Modeling and User-Adapted Interaction*, *30*(5): 759-801.

Azevedo, R., Rosário, P., Núñez, J.c., Vallejo,G., Fuentes, S., & Magalhães, P. (2023). A school-based intervention on elementary students' school engagement. *Contemporary Educational Psychology*, *73*: 361-476.

Boatman, A., & Long, B. T. (2016). Does financial aid impact college student engagement? Evidence from the Gates Millennium Scholars Program. *Research in Higher Education*, *57*, 653-681.

Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology in higher education: A systematic evidence map. *International journal of educational technology in higher education*, *17*, 1-30.

Bonet, G., & Walters, B. R. (2016). High impact practices: Student engagement and retention. *Coll. Stud. J.*, 50: 224–235.

Bruhn A, Gilmour A, Rila A, et al. (2022). Treatment components and participant characteristics associated with outcomes in self-monitoring interventions. *Journal of Positive Behavior Interventions*, *24*(2): 156-168.

Bu, C., Cao, W. Y., Jin, Y., Guo, J. J., & Shen, X. J. (2021). Research on Principles, Theoretical Basis and Evaluation Tools of Instructional Video Design: A Systematic Review based on 72 Empirical Studies Abroad. *Modern Distance Education*, *02*, 35-44.

Chalmers, I., Hedges, L. V., & Cooper, H. (2002). A brief history of research synthesis. *Evaluation & the health professions*, 25(1), 12-37.

Chen, M. R. A., Hwang G. J., & Chang, Y. (2019). A reflective thinking promoting approach to enhancing graduate students flipped student engagement, participation behaviors, reflective thinking and project learning outcomes. *British Journal of Educational Technology*, *50*(5): 2288-2307.

Ding L, Kim C M, & Orey M. (2017). Studies of student engagement in gamified online discussions. *Computers & Education*, *115*: 126-142.

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

Erika, A. P., Amanda, V., Diane, J. L., & Jeanette, Z. (2024). Teacher support for students' psychological needs and student engagement: Differences across school levels based on a national teacher survey. *Teaching and Teacher Education*, *137*(5): 759-801.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of educational research*, *74*(1), 59-109.

Fredricks, J. A., Reschly, A. L., & Christenson, S. L. (2019). Interventions for student engagement: Overview and state of the field. *Handbook of student engagement interventions*, 1-11.

Halverson, L., & Charles, R. G. (2019). Learner engagement in blended learning environment in blended learning environments: A conceptual framework. *Online learning*, *23*(2): 145-178.

Herrmann, K. J. (2013). The impact of cooperative learning on student engagement: Results from an intervention. *Active learning in higher education*. *14*: 175-187.

Henrie, C. R., Bodily, R., Manwaring, K.C., & Graham, C.R. (2015). Exploring intensive longitudinal measures of student engagement in blended learning. *Int. Rev. Res. Open Distrib. Learn*, *16*(3): 131–155.

Holmes, S. R., Thompson, A. M., Herman, K. C., et al. (2020). Designing interventions for implementation in schools: A multi-method investigation of fidelity of a self-monitoring intervention. *School Psychology Review*, *50*(1): 42-51.

Hu, X. L., Wei, M. C., Yuan, M., & Zhang, H. (2024). A Systematic Literature Review in the Field of Education: Essence, Value and Realization. *e-Education Research*, *45*, 01.

Huang, B., Hew, K. F., & Lo, C. K. (2019). Investigating the effects of gamification enhanced flipped learning on undergraduate students' behavioral and cognitive engagement. *Interactive Learning Environments*, *27*(8): 1106-1126.

Jia, M., & Jiuqing, C. (2024). Effect of teacher social support on students' emotions and learning engagement: a US-Chinese classroom investigation. *Humanities and Social Sciences Communications*, *11*(1): 1-9.

Jiang, W., & Eslami, Z. R. (2022). Effects of computer-mediated collaborative writing on individual EFL writing performance. *Computer Assisted Language Learning*, *35*(9), 2701-2730.

Karaoglan Yilmaz, F. G., & Yilmaz, R. (2022). Learning analytics intervention improves students' engagement in online learning. Technology, *Knowledge and Learning*, *27*(2), 449-460.

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

Lee, C. (2020). A study of adolescent English learners' cognitive engagement in writing while using an automated content feedback system. *Computer Assisted Language Learning*, *33*(1-2), 26-57.

Lee, C. (2020). A Study of Adolescent English Learners Cognitive Engagement in Writing While Using an Automated Content Feedback System. *Computer Assisted Language Learning*, *33*(1-2): 26-57.

Leenknecht, M., Wijnia, L., & Köhlen, M. (2020). Formative assessment as practice: The role of students' motivation. *Assessment & Evaluation in Higher Education*, *46*(2): 236-255.

Liu, M., Liu, L., & Liu, L. (2018). Group awareness increases student engagement in online collaborative writing. *The Internet and Higher Education*, *38*: 1-8.

Luan, L., Hong, J. C., Cao, M., Dong, Y., & Hou, X. (2023). Exploring the role of online EFL learners' perceived social support in their learning engagement: A structural equation model. *Interactive Learning Environments*, *31*(3), 1703-1714.

McKellar, S. E., Cortina, K. S., & Ryan, A. M. (2020). Teaching practices and student engagement in early adolescence: A longitudinal study using the Classroom Assessment Scoring System. *Teaching and Teacher Education*, *89*, 102936.

Mickan, S., Hilder, J., Wenke, R., & Thomas, R. (2019). The impact of a small-group educational intervention for allied health professionals to enhance evidence-based practice: mixed methods evaluation. *BMC Medical Education*, *19*, 1-10.

Milligan, K., Phillips, M., & Morgan, A. S. (2016). Tailoring social competence interventions for children with learning disabilities. *Journal of Child and Family Studies*, *25*, 856-869.

Molinillo, S., Aguilar-Illescas, R., &Anaya-Sánchez, R. (2018) Exploring the impacts of interactions, social presence and emotional engagement on active collaborative learning in a social web-based environment. *Computers & Education*, *123*: 41-52.

Park, S. W., & Kim, C. M. (2014). Virtual Tutee System: a potential tool for enhancing academic reading engagement. *Educational Technology Research and Development*, *62*(1): 71-97.

Rojas-López, A., Rincón-Flores, E. G., & Mena, J. (2019) Engagement in the course of programming in higher education through the use of gamification. *Universal Access in the Information Society*, *18*(3): 583-597.

Rudnicka, A. R., & Owen, C. G. (2012). An introduction to systematic reviews and meta - analyses in health care. *Ophthalmic and Physiological Optics*, *32*(3), 174-183.

ISSN: 2278-4012, Volume:13, Issue:4, December 2024

Salas, E., & Cannon-Bowers, J. A. (2001). The science of training: A decade of progress. *Annual Review of Psychology*, *52*(1), 471–499.

Sigrun, K. E., Grete, S. V., & Marja, K. L. (2020). Enhancing upper secondary students' engagement and learning through the INTERACT online, video-based teacher coaching intervention: Protocol for a mixed-methods cluster randomized controlled trial and process evaluation. *International Journal of Educational Research*, *114*: 355.

Sinead, P., Edna, F. R., Betsy, S., Maria B., Carol, H., Declan, C., & Imelda C. (2020). Developing a video intervention to improve youth question-asking and provider education during paediatric diabetes clinic encounters: The Promoting Adolescents Communication and Engagement study. *Patient Education and Counseling*, *104*(9): 2170-2176.

Sun, J. C. Y., Martinez, B. S. H. (2014). Just-in-time or plenty-of-time teaching? Different electronic feedback devices and their effect on student engagement. *Journal of Educational Technology & Society*, *17*(2): 234-244.

Tan, M., & Hew, K. F. (2016) Incorporating meaningful gamification in a blended learning research methods class: Examining student learning, engagement, and affective outcomes. *Australasian Journal of Educational Technology*, *32*(5): 19-34.

Tian, H., & Wu, F. T. (2022). Learning Intervention from the Perspective of Complexity Science: Concept Explanation, Core Elements and Model Construction. *e-Education Research*, *33*(12).

You, J. W. (2016). The relationship among college students' psychological capital, learning empowerment, and engagement. *Learning and Individual Differences*, *49*, 17-24.