

# Investigating The Long-Term Effects Of Small-Scale Pedagogical Interventions On Student Motivation And Engagement Tracking Small-Scale Pedagogical Motivation

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## Abstract:

*Social determination theory was used to analyse small-scale educational interventions for student motivation. SDT holds that people have psychological needs for autonomy, competence, and relatedness. These demands are essential for intrinsic motivation and good functioning. The study examines how these pedagogical initiatives affect students' long-term motivation and engagement, prompting examination of SDT principles including autonomy, competence, and relatedness. They also noted that student expectations shape their university career. Studies increasingly emphasise the instructional role in student motivation and engagement. Multisource, three-wave data with two-month delays from varied students show that small-scale pedagogy motivates and engages pupils. We studied mediation impact in Amos using Bootstrap. Qualification and gender are controls. Student expectations can mediate learning mechanisms during instructional practises and motivate and engage students. These data suggest unique instructional pedagogical strategies are needed to motivate and engage students. Effective teaching methods can raise academic standards by motivating and engaging pupils. The study can improve teaching by using online resources, simulations, virtual laboratories, and interactive platforms. Teachers and schools can create an environment where kids are motivated, engaged, and academically ready.*

**Keywords:** Motivation, Engagement, Pedagogical Interventions, Student Expectations.

## 1 Introduction

Research on small-scale pedagogical interventions on student motivation and engagement in education has surged over the past decade. Increasingly, basic social-psychological research has been applied to the development of pedagogical interventions in educational settings with goal of improving student motivation and engagement (Wilson, 2011). A related study conducted by Smith and Johnson (2015) found that small-scale pedagogical interventions, such as incorporating interactive learning activities and providing personalized feedback,

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significantly increased student motivation and engagement. These findings support the growing body of research emphasizing the importance of targeted interventions in improving educational outcomes. Students' motivation and engagement can be significantly enhanced using small-scale pedagogical interventions (Buttazzoni, 2022). In Lira & Costa (2023), pedagogical interventions are deliberate measures educators take to enhance student learning. Studies show that small-scale pedagogical interventions can be implemented at multiple levels, including individual, group, and whole-class settings. Students' engagement, understanding, and overall academic performance can be improved by a variety of teaching strategies, techniques, motivational approaches, and approaches to improve their motivation and engagement. Boost motivation and engagement among students, address their unique learning requirements, encourage critical thinking, and ensure a pleasant and inclusive learning environment. Pedagogical interventions can create an inclusive learning environment by incorporating diverse perspectives and experiences into the curriculum. This can be achieved through the use of inclusive teaching materials, promoting open and respectful classroom discussions, and providing opportunities for students to collaborate and learn from one another. Additionally, educators can implement strategies to address individual learning needs and foster a sense of belonging and acceptance among students. To foster a sense of belonging and acceptance among students, educators can create a supportive classroom environment by encouraging open and respectful communication, promoting peer collaboration and teamwork, and recognizing and valuing each student's unique perspectives and contributions. Additionally, implementing inclusive teaching practices and incorporating diverse perspectives and experiences into the curriculum can help students feel seen, heard, and valued.

Consequently, teachers must support the long-term effects of small-scale pedagogical interventions on students' motivation and engagement (Lira & Costa, 2023). In education, pedagogical interventions have recently become valuable strategies and methods for teachers, whereas students' motivation and engagement have been enhanced. However, there are a limited number of teacher learning development programs that have been subjected to rigorous empirical testing and are related to pedagogical approaches, and independent students' motivation and engagement. More importantly pedagogical intervention programme to increase student motivation and engagement is essential for practical and theoretical reasons. Furthermore, it is essential to intervene in public university students because small-scale pedagogical interventions have appeared to develop the students' motivation and engagement. Research consistently shows that motivated students are more likely to engage in their studies, set goals, and persist in facing challenges. Motivated and engaged students tend to have higher self-confidence and self-efficacy, which are crucial for their overall success in university and beyond. However, the current limitations of teacher learning development programs are evident, as there is a lack of rigorous empirical testing and a focus on pedagogical approaches that directly impact students' motivation and engagement. To truly enhance student motivation and engagement, it is crucial for these programs to prioritize practical and theoretical interventions that address the specific needs of individual students and promote a supportive learning environment. Some specific practical interventions for enhancing student motivation and engagement could include implementing project-based learning activities that connect classroom content to real-world applications, providing regular and timely feedback on student progress, and fostering a sense of autonomy and ownership in the learning process by giving students choices and opportunities for self-directed learning. Additionally, creating a positive and inclusive classroom culture where students feel valued and supported can also contribute to increased motivation and engagement.

Furthermore, some programmes are intended towards student motivational engagement investigation concerning small-scale pedagogical intervention strategies (Azimi et al., 2020). Hence, recent calls have appeared for evaluation studies focusing more on small-scale pedagogical approaches (Buttazzoni, 2022) to enhance student motivation and

engagement. According to Buttazzoni (2022), considers lasting impact of small-scale pedagogical methods such as multimedia, electronic boards, and presentations. Moreover, in education research, knowing a more significant impact on university students' motivation and engagement in learning is essential. As a response to these calls, study's optimized to inspect small-scale pedagogical interventions long-term effects on student motivation and engagement. Hence, three small-scale pedagogical interventions, like various techniques such as multimedia presentations, real-world examples, and gamification, make the learning experience more enjoyable and relatable for students. Additionally, we will discuss the importance of student motivation and engagement in promoting academic success and overall well-being. However, despite importance of student motivation and engagement, there remains a significant gap in studies that have rigorously evaluated long-term effects of small-scale pedagogical interventions on these factors. Yet, gap highlights need for further research to better understand which specific interventions are most effective in promoting student motivation and engagement, and ultimately improving academic success and overall well-being. One potential limitation of current studies on small-scale pedagogical interventions is lack of standardized measurement tools to assess student motivation and engagement. This makes it difficult to compare results across different studies and draw definitive conclusions about the effectiveness of specific interventions. Additionally, many of the existing studies have focused on short-term effects, failing to capture the long-term impact of these interventions on students' motivation and engagement. Therefore, future research should aim to develop reliable and valid measurement tools and conduct longitudinal studies to address these limitations. One potential research question that could be explored in future studies is: How do different small-scale pedagogical interventions impact student motivation and engagement in the long term? This research question would allow for a comprehensive examination of the lasting effects of various techniques such as multimedia presentations, real-world examples, and gamification on students' motivation and engagement, providing valuable insights for educators and policymakers. By addressing the gap in existing studies and conducting rigorous research, we can gain a better understanding of which specific small-scale pedagogical interventions are most effective in promoting long-term student motivation and engagement (Mynard and Shelton-Strong, 2022). This knowledge will not only provide valuable insights for educators and policymakers but also contribute to the overall improvement of academic success and well-being among students. The existing studies have made a valuable contribution by highlighting the need for further research in understanding the effectiveness of small-scale pedagogical interventions on student motivation and engagement. However, they also point out the limitations, such as the lack of standardized measurement tools and focus on short-term effects. Future research should address these gaps to provide educators and policymakers with a better understanding of which interventions are most effective in promoting long-term student motivation and engagement. By conducting more comprehensive and rigorous research that addresses the limitations of existing studies, we can gain a clearer understanding of the long-term impact of small-scale pedagogical interventions on student motivation and engagement. This knowledge will ultimately help educators and policymakers make informed decisions about which specific interventions to implement for the improvement of academic success and overall well-being among students.

Ultimately, this research paper seeks to provide valuable insights and recommendations for educators to effectively engage and motivate their students, ultimately leading to improved learning outcomes and student satisfaction. An outline of the remaining sections of research as below: While Section 3 covers research methods and variables used; Section 2 gives theoretical underpinnings of construct. Section-4 offers the findings after discussing the empirical research, and Section 5 explores ramifications. Finally, Section 6

brings the study to a close by discussing the study's limitations and identifying potential future areas.

## **2 Literature Review:**

### **2.1 Research on Student Motivation and engagement**

Research has indicated that university pupils mainly engage in writing assignments and other investigating tasks (Zheng&Xu, 2023). Students in this sector have their own intrinsic as well extrinsic motives. Research discovered direct relationship between students' high levels of autonomous writing motivation and quality of their narrative and informational texts. In contrast, students more motivated to write specifically would have been more chance of producing good narrative writings. Students' capacity to cultivate a wide range of cognitive abilities may be directly proportional to their self-directed motivation for writing (Zheng and Xu, 2023). According to Yu et al. (2023), motivation represent what pushes writers to employ procedural, lexical, and syntactic information in working memory. To enhance student motivation and engagement, highlighting vital role frolicked in adopting successful language attainment. Instead of adopting writing tactics various pedagogical methods approaches have continuously positive impacts on students' motivation and engagement. Wilby (2022) also promises clear and thorough writing, with careful planning, translation, and revision. On the other hand, the student's engagement is also considered necessary for reasons such as excellent writing consequences. For universities to achieve educational and pedagogical objectives, the involvement of students is crucial. Some pedagogical methods that have been shown to enhance student motivation and engagement include project-based learning, collaborative learning, and incorporating technology into the classroom. These methods provide students with opportunities to actively participate in their learning, work together with their peers, and use technology tools that make the learning experience more interactive and engaging.

If pedagogical interventions are implemented on smaller scale, students' overall performance and learning experience may improve. According to Mynard and Shelton-Strong (2022), increasing student involvement is one of primary goals of university students' outcomes to ensure best possible result from pedagogical interventions. Engagement, as defined by Mynard and Shelton-Strong (2022), is " time and effort that students utilize, that empirically linked to desired outcomes, as well what universities do to encourage students to take part in such activities" (p. 2). In other words, the level of engagement those students have in their university writing directly affects the university's goals and students' timespenton research. On the practical level, academic researcher is often discovering motivation's impact on university student engagement. Some examples of pedagogical interventions that can be implemented to enhance student motivation and engagement include flipped classrooms, problem-based learning, and gamification. Flipped classrooms involve students watching pre-recorded lectures or completing readings before class, allowing for more interactive and engaging in-class activities. Problem-based learning involves presenting students with real-world problems and guiding them through the process of finding solutions, fostering critical thinking and collaboration. Gamification incorporates game elements into the learning process, such as rewards, leaderboards, and challenges, to make it more enjoyable and motivating for students. However, implementing flipped classrooms in university settings may pose challenges such as ensuring students come prepared for in-class activities, addressing technological barriers that some students may face, and managing the logistics of creating and sharing pre-recorded lectures or readings. Additionally, instructors may need to adapt their teaching methods and assessment strategies to effectively integrate flipped classrooms into the curriculum and ensure that learning objectives are met. Ensuring student preparation for in-class activities can be challenging, as it requires students to take responsibility for completing assigned readings or watching pre-recorded lectures before coming to class. Instructors may need to implement

strategies such as regular reminders, quizzes, or incentives to motivate students to come prepared. Additionally, providing support and resources for students who may face technological barriers or difficulties accessing the required materials can help address these challenges.

## **2.2 Research on small-scale pedagogical interventions**

Pedagogical practices (Guay et al., 2020) concepts that determine how students taught learning process during recent past. Under agenda of pedagogical practices extensive research which underlines student motivation and engagement. Guay et al. (2020) further more in-depth topic comprehension and fosters analytical and problem-solving abilities. Incorporating discussions, group activities, multimedia presentations, examples practically and gasification into educational process enhance interactive learning and engaging educator professionalism. Eau et al. (2019) assert that university education policies should prioritize pedagogical practices to enhance educational development. So, Pedagogy and pedagogic practices are foremost actions within HE setting, and consequently necessity to be considered for university strategic primacy. Virtanen and Tynjälä (2022) in similar fashion to Eau et al. (2019), characterize university pedagogic practices to engage students from personalized learning. To foster pedagogic practices using interesting texts that increase students' intrinsic value and perceived learning. Also, in studies on university students many studies inclusively create dynamic and learning environment for students' diverse needs. Thus, in line with previous research university pedagogic practices seem to have impact on academic outcome and increased student motivation. Hence, in class room, university pedagogic practices fostering collaboration and facilitate social and emotional development. Most researcher of pedagogic practices have focused on influence on students learning development, even education revolutionize preparing students. However, it is important to note that the effectiveness of small-scale pedagogical interventions may vary depending on various factors such as the context, student population, and implementation fidelity. Further research is needed to examine the long-term effects of such interventions and to determine the specific pedagogical practices that are most effective in promoting student motivation and engagement. Additionally, it is crucial to consider the potential limitations and challenges of implementing these interventions in real-world educational settings. Some potential limitations and challenges of implementing these pedagogical interventions in real-world educational settings include resistance from educators who are accustomed to traditional teaching methods, lack of resources or funding to support the implementation of new practices, and the need for extensive training and professional development for educators to effectively incorporate these interventions into their teaching. Additionally, there may be logistical challenges in coordinating schedules and ensuring that all students have equal access to the interventions. One potential solution for overcoming resistance from educators is to provide comprehensive training and professional development opportunities. By offering workshops, seminars, and ongoing support, educators can gain the necessary knowledge and skills to effectively incorporate new pedagogical practices into their teaching. Additionally, creating a supportive and collaborative environment where educators can share their experiences and learn from one another can help to alleviate concerns and build confidence in implementing these interventions.

## **2.3 Research on Mediating effect Student expectations**

Despite potential of social determination theory (Haw & King, 2023) to characterize students' expectations, have been limited empirical investigations on this subject. Haw & King (2023) also argues that teacher positive support emphasizes significant role in student motivation and engagement. A related study by Johnson et al. (2024) found that students' expectations were positively influenced by teacher positive support, leading to increased motivation and

engagement. This suggests that understanding and addressing student expectations can be a valuable pedagogical intervention for enhancing student outcomes. Engaged students generally exhibit higher levels of attentiveness, curiosity, and receptiveness to helpful teacher interventions, albeit with a reduced emphasis on academic rigor. Recent research has instead focused on topics such as expectations of traditional academic students, the long-term impacts of small educational interventions (Hlazunova & Chen, 2021), and student motivation and engagement (Putarek et al., 2019).

Previous studies have demonstrated that pedagogical interventions can enhance students' expectations across all academic disciplines. Moreover, effective application of student motivation and engagement, as shown by Azimi et al. (2020) and Putarek et al. (2019), can significantly improve both students' expectations and their academic performance. Students' motivation and engagement levels are directly tied to their learning and retention abilities. The study conducted by Johnson et al. (2024) builds upon previous research that has shown the positive influence of teacher positive support on students' expectations, motivation, and engagement. This further supports the notion that addressing and understanding student expectations can be a valuable pedagogical intervention for enhancing student outcomes and improving their learning and retention abilities. When students are interested in material and have high expectations, they are more likely to ask questions, delve deeper into issues, and seek further knowledge. Consequently, educators implement pedagogical techniques that encourage independent student motivation. Also, students' expectation also play crucial role, as their practices mediated effect on these factors. Teaching methods like pedagogical practices also influence pupils' engagement, but also on engagement.

## **2.4 Hypothesis Development:**

### **2.4.1 Pedagogical practices and Student motivation and engagement**

Empirical studies (Massaad & Chaker, 2020; Luo et al., 2021) indicate pedagogical practices are positively relationships to students motivation and engagement. Many students would describe pedagogical practices strategies as gorgeous; often explain with words like engagement, motivation, drive, achievement, route, and assembly. Through active involvement, educators exhibit a discernible attentiveness to students' academic experiences, prioritize their individual learning needs, and establish precise and positive objectives (Koçoglu et al., 2022). Teachers communicate better and provide meaningful feedback to students pedagogical practice learning and attached challenges (Guay et al., 2020). Teachers that cheer student engagement, and revise process for effective pedagogical practices, that might foster an environment conducive, to knock students motivation and engagement aspects. Some specific pedagogical practices that have been found to enhance student motivation and engagement include project-based learning, collaborative group work, and incorporating real-world examples and applications into lessons. These practices provide students with opportunities to actively participate in their learning, work together with their peers, and see the relevance and practicality of the concepts being taught.

Recently, pedagogical practices significantly focused on evidence-based students' active learning and meet individual students teaching needs (Bundsgaard et al., 2019). Building upon previous research, it is evident that pedagogical practices play a crucial role in enhancing student motivation and engagement. The incorporation of project-based learning, collaborative group work, and real-world examples into lessons has been found to actively involve students in their learning, foster peer interaction, and demonstrate the practicality of the concepts being taught. This further emphasizes the importance of evidence-based practices that cater to individual student needs. In simpler term, create supportive environment by emphasizing cooperation, involvement, and autonomy. Autonomous motivation and engagement consider key element, which enables university to amended pedagogical practices skills. Research

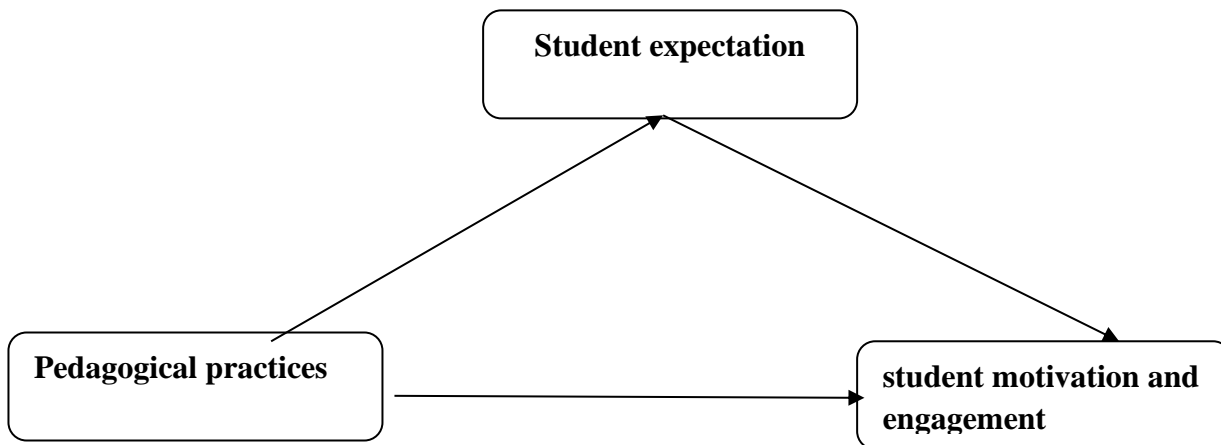
studies, like Koçoglu et al. (2022) and Guay et al. (2020), highlight the significance of using teaching methods that can spark students' motivation and participation. Examples of such pedagogical practices process contain combine informative lectures with interactive and collaborative learning activities. Overall, incorporating better pedagogical practices can foster motivation, collaboration, critical thinking, engagement and personalization, making it a potent tool in education.

## **H.1: Pedagogical practices has positive impact on students motivation and engagement**

### **2.4.2 Student expectation as mediator**

Students who are extremely involved in the academic process have a tendency to have higher expectations and are more likely to continue being engaged in their studies. According to SDT (Haw & King, 2023) proposition, students who are engaged in their learning and motivated to succeed show a greater interest in innovative teaching approaches. A lack of motivation, on the other hand, might result in a loss of interest in learning as well as a lack of excitement for methods of instruction that are more personalized. As a consequence of this, it is absolutely necessary for educators and policymakers to have thorough knowledge of significance of student motivation and engagement. Students' motivation and engagement are influenced by social interaction, so it is essential for educators and policymakers to have knowledge and awareness in this area (Poots& Cassidy, 2020). Additionally, students' expectations can influence how teachers approach their pedagogy. If students have high expectations, they anticipate teachers to adopt more student-centered pedagogical practices, whereas low expectations might lead to more traditional teaching methods. Therefore, creating an interactive learning environment is crucial to promoting student motivation and engagement, which ultimately leads to better academic outcomes. Student-centered pedagogical practices have the potential to enhance student motivation and engagement by empowering students to take ownership of their learning. When students are actively involved in the decision-making process and have the opportunity to explore their interests and perspectives, they are more likely to be motivated to succeed and actively engage in their studies. This approach also fosters a sense of autonomy and independence, which can have long-term positive effects on students' academic outcomes. However, it is important to acknowledge that implementing student-centered pedagogical practices requires significant time and resources from educators. This can be a challenge in schools with limited funding or large class sizes, where individualized attention may be difficult to provide. Therefore, while student-centered approaches have the potential to enhance motivation and engagement, it is essential to consider the practical limitations and ensure that adequate support and resources are in place for effective implementation. Technology plays a pivotal role in facilitating student ownership of learning. With the help of digital tools and platforms, students can access a wealth of resources, collaborate with peers, and engage in self-paced learning. Technology also provides opportunities for personalized feedback and assessment, allowing students to track their progress and make informed decisions about their learning journey. By leveraging technology, educators can create a more dynamic and interactive learning environment that empowers students to take ownership of their education. Technology can support personalized feedback and assessment by providing instant feedback to students, allowing them to understand their strengths and weaknesses in real-time. Online platforms and tools can generate automated assessments that adapt to each student's level of understanding, providing tailored feedback and recommendations for improvement. Additionally, technology can facilitate self-assessment and reflection through the use of digital portfolios and online discussions, enabling students to actively monitor their progress and set goals for their learning journey.

**H2: Student expectation environment has mediating impact on Pedagogical practices and student motivation and engagement**



**Figure 1: The conceptual framework**

**3.1 Research Methodology:**

Effective Research Methodology plays a crucial role in exploring the effectiveness of student-centered pedagogical practices and the integration of technology in education. By employing rigorous research methodologies, such as experimental studies, surveys, and case studies, educators and researchers can gather empirical evidence on the impact of student-centered approaches and technology on student motivation, engagement, and academic outcomes. This research can inform the development of evidence-based practices and guide policymakers and educational institutions in implementing effective strategies for creating student-centered and technologically-enhanced learning environments.

**3.1 Research Design**

For an empirical study on the effectiveness of student-centered pedagogical practices, a mixed-methods approach could be employed. This would involve collecting both quantitative data, such as standardized test scores and attendance rates, as well as qualitative data through interviews or surveys to gather students' perspectives on their motivation and engagement. By combining these methods, researchers can gain a comprehensive understanding of the impact of student-centered approaches on academic outcomes and student experiences. What aspects of student-centered approaches do you find most motivating and engaging? How do you feel technology has enhanced your learning experience? In what ways do you believe student-centered approaches have positively impacted your academic outcomes? How do you perceive the role of personalized feedback and assessment in your learning journey?

**3.2 Control variable**

The analysis included two control variables: age (male, female) and qualification (Diploma, Higher secondary school, graduate, PhD, Master). Consistent with prior studies (Guay et al., 2020; Zheng&Xu, 2023).

**3.3 Data collections and Sampling Procedures:**

The target population consisted of Beijing and Shanghai: Tsinghua University, Fudan University students. Thus, Tsinghua University, Peking University and Fudan University are three of the most prestigious and well-known universities in China. These university mostly



conducted research in students welfare in area of pedagogy, teacher education significance etc.). Choosing these universities will offer broader applicability to other academic institutions. We visited three public sector universities in Beijing and Shanghai: Tsinghua University, Fudan University, and Peking University of China. Because all university students can provide a comprehensive sample representation, all studies consider including them in the sample for the current study. After receiving their assent, we randomly sampled some of the student participants and then distributed copies of our survey questionnaires to them. Questionnaire was thoughtfully designed to assess several key aspects of interest, such as pedagogical practices, university student motivation and engagement, and student expectations. Out of 265 samples, we received 201 usable responses, a 75.85% success rate. Multisource, three-wave longitudinal data with 2-month lags utilized. Multiple sources of three-wave data reduce concerns about technique bias and social desirability (Podsakoff, Mackenzie, & Podsakoff, 2012).

Variable	Frequency	%
<b>Gender- Female</b>	73	36.32
<b>Male</b>	128	63.68
<b>Qualification - Ph.D</b>	34	16.92
<b>Master's</b>	35	17.41
<b>Graduate</b>	71	35.32
<b>Higher Secondary School</b>	29	14.43
<b>Diploma</b>	32	15.92

**Table 1: Demographics variables**

### 3.4 Measurement items

Questionnaire was utilized to obtain information from study participants. The selection of this instrument was appropriate since it made it possible to collect a substantial amount of data from a respondent in a more expedient manner and at a reduced cost. There were two parts to the questionnaire, with the first one concentrating on the background data that the respondents provided. The research hypothesis developed for the study was discussed in detail in the second section. Pedagogical practices had eight measurement items, two from each subconstruct of evaluation, management, learning, and counselling). University student motivation and engagement also have eight measurement items, four from motivation and four from engagement scales for university students (Martin, 2012). The mediator, Student expectation, comprised six measurement items; the measurement items were adapted from Hornstra et al. (2018) and were modified to suit the study's purpose. Four Doctoral students evaluated the validity of the content to ensure that it was accurate and reliable. Before it was approved as a final instrument for the study, the research instrument was modified based on the feedback obtained from those individuals.

### 4. Results

We ensure discriminant and convergent validity proved to be check more thoroughly using confirmatory factor analysis, often known as CFA. We generated and analyzed various measurement models to determine which model best fits the data. The expected four-factor model was initially constructed, and the fit indices revealed that the data fit the model well ( $\chi^2$ , RMSEA, GFI,  $\chi^2/df$ , CFI). Nonetheless, the various items of the concerned factors had a very low loading, so we excluded that item in accordance (Armstrong et al., 2012). Two stages of analysis were used to test the measurement model. In first phase, we conducted CFA-AMOS 25.0 and Maximum Likelihood Estimation, as described by Ludtke

et al. (2021). Because of this, we were able to determine how each measurement's burden would be distributed over each component. Using a structural regression model, the recommended conceptual model was put through its paces in the second round of testing. In these tests, the model's appropriateness was evaluated using a number of different fit measures. These fit measures included the  $\chi^2/df$ , (GFI), (CFI), and (RMSEA).

Statistics on the measurement model fit are shown in Table-1. Indicating a solid evaluation value for proposed model, the chi-square ( $\chi^2/df=1.074$ ) that smaller than frequently advised figure of 3, according to Byrne (2010).

Ludtke et al. (2021) indicates the GFI and CFI values are close to 0.90, a standard threshold for assessing how well two variables correlate. Indicating a good model fit, the RMSEA is 0.08 (Kline, 2010). The statistics are generally acceptable, according to the results of Table 1 (Figure 2).

To verify the validity of the three constructs proposed by (Sackett, 2012), we calculated each variable's standardized factor loadings and Cronbach's alpha (such as, pedagogical practices, student motivation and engagement, and students' expectation) were tested. According to Sackett (2012), all factor loadings for reflected indicators exceeded the specified threshold of 0.50, ranging from 0.58 to 0.94. Evidence of validity was established for all constructs through convergent validity (Sackett, 2012). Ensuring that all item factor loadings exceeded 0.50. Additionally, the coefficient demonstrated internal consistency accuracy by exceeding the minimum threshold of 0.70.

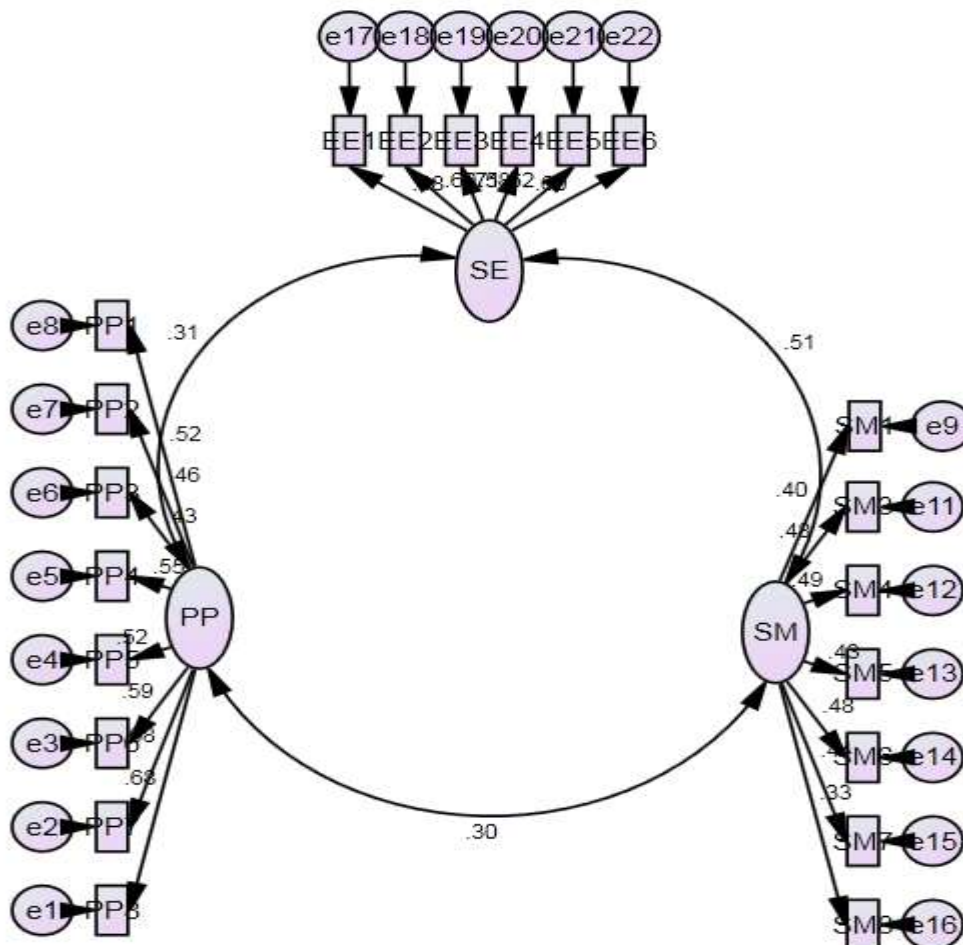


Figure 1 Confirmatory Model

	<b>Cmin/Df</b>	<b>TLI</b>	<b>CFI</b>	<b>SRMR</b>	<b>RMSEA</b>
<b>One factor (PP)</b>	1.188	.982	.987	.043	.031
<b>One factor (SM)</b>	1.276	.932	.952	.0512	.037
<b>One factor (SE)</b>	2.005	.939	.972	.0397	.071
<b>Two factor (PP, SM combined)</b>	1.230	.937	.946	.0538	.034
<b>Three factor (PP,SM, Mediator)</b>	1.197	.938	.945	.0568	.031
<b>Alternative model</b>	1.074	.977	.019	.0547	.980

**Table 2: One factor, Two factor model, and Three factor model**

<b>Construct</b>	<b>Items</b>	<b>Cronbach alpha</b>	<b>Factor Loading</b>	<b>AVE</b>	<b>CR</b>
<b>Pedagogical practices</b>	PP-1	.782	0.523	0.742809918	.783
	PP-2	.781	0.461		
	PP-3	.784	0.433		
	PP-4	.780	0.547		
	PP-5	.782	0.519		
	PP-6	.781	0.598		
	PP-7	.773	0.679		
	PP-8	.778	0.68		
<b>Student motivation and engagement</b>	SM-1	.780	.392	0.648293881	0.623
	SM-2	.788	.258		
	SM-3	.781	.458		
	SM-4	.779	.521		
	SM-5	.783	.447		
	SM-6	.782	.484		
	SM-7	.786	.402		
	SM-8	.786	.344		
<b>Students' expectations</b>	EE1	0.782	.604	.603	.773
	EE2	0.783	.596		
	EE3	0.779	.539		
	EE4	0.776	.669		
	EE5	0.778	.579		
	EE6	0.779	.567		

**Table 2 Indices of Measurement Model**

Table 2 also observes connection between hidden variable and average variance extracted (AVE). So, connection highlighted for each variable in table. The diagonal elements show square root of AVE, while off-diagonal elements show structure correlations (Dixon & Johnston, 2019) To determine AVE, the researchers first examined convergent validity of components, followed by discriminant validity of constructs. Table 2 shows AVE 0.603 to 0.742 that exceeds threshold of 0.50 (Dixon & Johnston, 2019) for convergent validity. Dixon and Johnston (2019) defined discriminant validity as AVE square root for constructs that being larger than specific correlations.

	<b>1</b>	<b>2</b>	<b>3</b>
<b>1.Pedagogical practices</b>	(.742 )		
<b>2.Student motivation and engagement</b>	.303	(.648 )	

<b>3.Student Expectation</b>	.305	.507	(.603 )
<b>Mean</b>	3.0361	3.3178	3.5680
<b>Standard deviation</b>	.76925	.65764	.88049

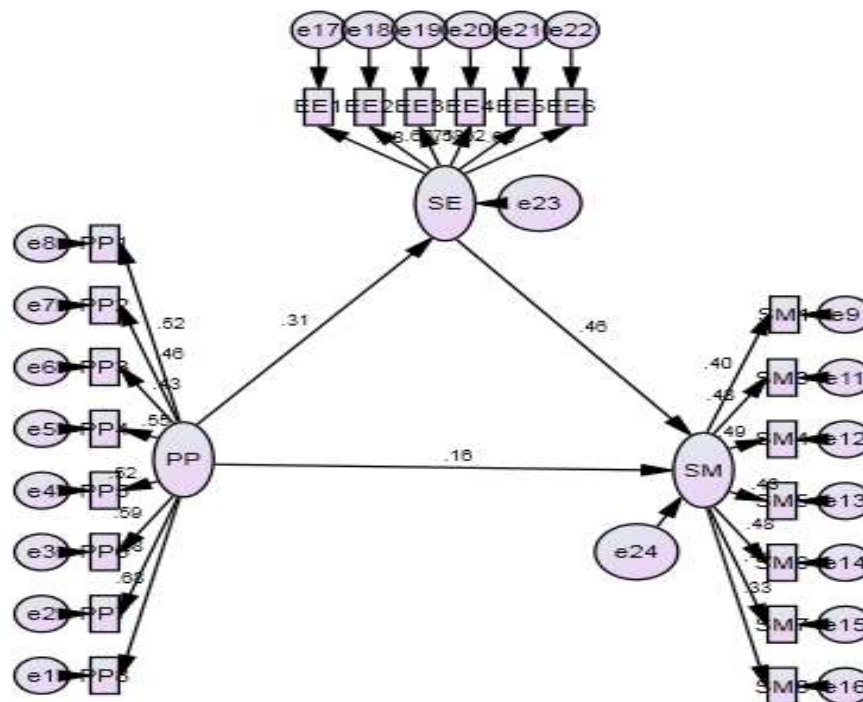
**Table 3: Convergent and discriminant validity**

**4.1 Structural model**

A model (Figure 3) was utilized to examine the proposed connections. The study found that the first hypothesis, which suggests that pedagogical practices and student motivation and engagement interact harmoniously (.141, significant), is supported. Additionally, there is a relationship between students' motivation and engagement and their level of engagement. The second hypothesis is that students' expectations, when mediated by pedagogical practices, significantly impact their motivation and engagement (.126).

**4.2 Mediating Effect Results:**

Through our utilization of the Bootstrap method in Amos, we have confidently identified that pedagogical practices directly impact students' motivation and engagement (b=.076, 95% CI: 0.059, 0.518). Our findings, as presented in Table 4, also reveal that the indirect impact is significant (b= .418, 95% CI: 0.238, 0.708) and that the total effect is significant (b=0.161, 95% CI: 0.083, 0.503). The findings support idea, that student expectations partially mediate the relationship concerning educational practices and student motivation and involvement. Student expectations significantly influence teaching effectiveness methods and motivation and engagement.



**Figure 3 Mediation effect**

PP-SM-SE	b	SE	95% bias-corrected interval	
Direct effects	.076	.050	.059	.518
Total indirect effects	..418***	0.135	0.238	0.708
Total effect	0.161***	0.053	0.083	0.503

**Table 4 Mediation Effect result**

## 5. Discussion

The study at hand represents a significant leap forward in our understanding of pedagogical practices within university settings. By meticulously examining the effectiveness of these practices, the study not only fills a critical gap in existing research but also makes a substantial contribution to the broader field of education. In an educational context characterized by universities' ongoing efforts to improve instructional methods and optimize learning outcomes, the present study's emphasis on assessing the influence of pedagogical practices is particularly notable. Previous scholarly investigations have delved into diverse facets of pedagogy and education. However, this particular study adopts holistic methodology by conducting empirical research to examine the efficacy of various pedagogical approaches. The study also explores the consequences of these approaches on student engagement, comprehension, and overall academic performance. The report provides educators, administrators, and lawmakers with vital resources to enhance pedagogical three basic techniques learning. The research offers useful evidence-based teaching tips. The findings may improve student learning by influencing instructional design, curriculum development, and teaching methods. The study's careful methodology and evaluation of varied teaching methods make it unique. The study's exact experimental protocols, systematic data collection, and thorough analysis assure dependability and validity.. The meticulousness of methodology employed serves to bolster trustworthiness of the findings and emphasizes the importance of the study's contribution to advancement of knowledge in field of education. Study's exploration of effectiveness of pedagogical practices in universities marks a pivotal moment in educational research. Its findings have potential to reshape way we approach teaching and learning at the university level, providing a solid foundation for evidence-based decision-making and ultimately improving the quality of education for students. As such, this study stands as a landmark contribution that will undoubtedly influence educational practices and policies for years to come. Our research differs from previous studies as we provide preliminary evidence supporting the effectiveness of pedagogical practices in universities. Although all effects were significant at  $p < .05$ , few studies have focused on how university teachers use these practices to influence students' motivation and engagement. To address this gap, we investigated the situation in three Chinese universities to explain how likely pedagogical practices are to affect students' education effectiveness. Previous empirical results confirm these relationships (Simonova&Kuzovenkova, 2022; Mudehwe-Gonhovi et al., 2018). We found that students' expectations mediate the relationship between pedagogical practices and students' motivation and engagement, as shown in Hypothesis 2. Students who perceive excellent pedagogical practices as essential are more likely to engage and be motivated because they learn from others. This research aligns with previous studies like (Lüdtke et al., 2021). Ultimately, we offer critical insight into how students can benefit from pedagogical practices by using their motivation and engagement, with the partial mediation effect of students' expectations.

Certainly, understanding concept of mediation of students' expectations and its implications for practical interventions in educational settings is crucial. In this case, it's about

how students' expectations mediate or influence small-scale pedagogical interventions on student motivation and engagement. Students' expectations play significant role in shaping pedagogical practices and engagement of students. These expectations can encompass academic performance, social interactions, and personal growth. They might influence factors like motivation, engagement, and effort put into learning. To uncover mediation process, researchers might explore factors such as self-efficacy, mindset, or locus of control. These psychological constructs can act as bridges between students' expectations and their academic achievements. For example, students with high self-efficacy might be more likely to persist in the face of challenges, thus leading to better outcomes. By addressing students' expectation mediating factors, educational institutions equip students with skills and mindsets that extend beyond academics. As proven to improve instructional effectiveness and increase student motivation and engagement. Our data suggests that proof is crucial. Moreover, elucidating mediation process between students' expectations and their educational outcomes provides valuable insights for designing effective interventions. Educators and policymakers allows beyond surface-level observations and target underlying factors that can truly drive positive change in students' learning experiences and achievements.

Finally, highlights the importance of pedagogical practices in influencing student motivation and engagement, which in turn play critical role in shaping learning experiences and academic outcomes. By employing effective teaching methods and strategies that cater to students' interests and needs, educators can create an environment that fosters intrinsic motivation and active engagement. This positive learning environment most likely result in improved learning outcomes, as motivated and engaged students are more likely to grasp and retain the material being taught. In essence, the conclusion underscores the interconnectedness of pedagogy, motivation, and learning outcomes, and emphasizes the potential benefits of aligning these elements in educational settings.

#### **Practical Implication of study:**

Additionally, researchers will delve into prospective avenues for future research and identify areas that could benefit from further investigation, proposing strategies for further studies to expand upon their discoveries. Finally, the researchers analyze wider ramifications for domain of education and society at large, deliberating on potential contributions of results towards enhancing our comprehension of educational methodologies and their potential for enhancement. The researchers will additionally emphasize any potential ramifications for policy formulation and decision-making within educational institutions. Furthermore, the researchers engage in comprehensive examination of significance in relation to other interconnected disciplines, such as psychology and sociology. Additionally, explore potential benefits of multidisciplinary collaboration in advancing our comprehension of educational methodologies. Researchers study's ramifications offer significant perspectives for educators, politicians, and researchers, so fostering progress of educational methodologies and ultimately yielding societal advantages. Study's analysis has some implications, like educators would profound comprehension of potential effects specific on students learning via teaching methods and approaches. The findings utilized policymakers through informed decisions on development of curricula. Moreover, scholars enhance understanding that impact educational methodologies specific to pedagogical practices. Interdisciplinary collaboration across sectors can produce unique methods of pedagogical practices that accomplish learners and improve educational outcomes. Through the integration of knowledge from several disciplines such as education, psychology, and sociology, researchers can acquire holistic comprehension of intricate dynamics that occur among students, teachers, and educational setting. The collaboration across multiple disciplines can facilitate identification of teaching practices effective in accommodating individual learning styles, fostering inclusivity, and promoting student engagement. Furthermore, the incorporation of psychological and sociological

viewpoints might provide insight into the fundamental social mechanisms and psychological obstacles that could impede academic achievement, hence facilitating the creation of focused interventions and support structures. Through comprehensive methodology employed provide potential to facilitate profound pedagogical strategies and foster societal progress on broader scale. Research can offer educators significant perspectives on efficacy of diverse educational strategies in augmenting student motivation and engagement. Educators possess the ability to customize their instructional methods by integrating practices. The research findings may emphasize need for educators to adopt more personalized learning approaches. They should recognize the diverse learning styles and paces of individual students and adjust their teaching methods accordingly.

#### **Limitation and future direction:**

Results show significant consequences for enhancing efficacy of teaching techniques. Firstly, the research provides insight into the factors that influence student motivation and engagement over an extended period, which can help teachers and policymakers sustain student interest in learning. Secondly, examining the outcomes of various pedagogical interventions can identify approaches that effectively enhance student motivation and engagement. These moments of realization utilized plans for future interventions. Additionally, researchers should focus on long-term effects of ways to evaluate lasting benefits and influence on students' educational experiences. Educators also use this data to select interventions that will have positive, long-lasting effects on students. Fourthly, the research may also reveal interventions that are beneficial for specific groups of students based on age, grade level, learning styles, or cultural background. This comprehension can facilitate the adaptation of interventions to cater to the needs of diverse student demographics. Fifthly, the findings contribute to the development of evidence-based teacher professional development programs. Policymakers utilize research findings to enrich educational policies and superior engage and motivate students. Lastly, the research can incur effective interventions to enhance overall educational outcomes and serve as a stepping stone for further investigations into influence of various intervention and factors on student motivation & engagement.

The present study indicates long-term effects of small-scale pedagogical interventions on student motivation and engagement in Chinese universities. However, limitations include being limited to universities in three Chinese universities, and donot included private and public universities.

In addition to the aforementioned consequences, one possible direction for further investigation in field of pedagogical practices research, concentrate on other significant study areas, such as information and communication technology or technology. Current study measured influence of pedagogical construct, and students' motivation and engagement but need to consider artificial intelligence construct in the Chinese universities. Furthermore, the present study did not describe new tactics of Chabot's in education for predicting influence on pedagogical approaches. The researcher also examine construct through confirmatory factors analyses, that indicates to use Smart-PLS to predict three pedagogical approaches impacting motivation and engagement of students. Moreover, collaboration between educators and neuroscientists could yield a deeper understanding of the cognitive processes underlying effective learning. This interdisciplinary approach could lead to innovative teaching methods grounded in neuroscience.

## **5.2 Conclusions**

This study introduces the SDT framework, which explores how meaningful elements combine in pedagogical practices to impact student motivation and engagement. By creating a positive learning environment and supporting educators and educational institutions, student outcomes

can be improved, resulting in better overall learning experiences. Findings significantly suggest educators, policymakers, & researchers, to recognize interventions that positively impact student motivation and engagement and can mediate relationships with students' expectations.

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