

RESEARCH ARTICLE

The sustainable practice of education fairness in China: The influence of college students' perceptions of senior teachers' support on students' well-being

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ABSTRACT

The Chinese Ministry of Education implemented a policy to recruit silver-aged (retired) teachers to participate in the construction of higher education in the western region to promote the practice of educational equity. However, for policy stakeholders, it is still unclear whether they will perceive the actual effect of the policy implementation. Therefore, under the framework of the socio-ecological model (S-EM) and self-determination theory (SDT), this study explored the relationship between college students' perceptions of silver-aged teachers' support, school belonging, two types of learning motivation and students' well-being. Purposive sampling was adopted in this study. College students who participated in the "Program for Supporting Senior Teachers in Colleges and Universities in the West" were recruited to fill out the online questionnaires, and a total of 532 questionnaires were returned. The results of structural equation model analysis showed that when the students perceived the support of senior teachers, it was helpful for them to form their sense of belonging to the school. When the sense of belonging to the school became stronger, their learning motivation was also promoted. When students were motivated to learn, they also had higher levels of well-being. From this point of view, the plan to support the western colleges and universities with silver-aged (retired) teachers is conducive to the sustainable development of education.

Keywords: Chinese educational policy; school belonging; sustainable development; socio-ecological model; silver-aged teachers; learning motivation; self-determination theory

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1. Introduction

The construction of higher education in remote cities and regions is equally important as in urban areas, and is conducive to the practice of educational equity. The education development in the eastern region of China is generally better than that in the western region. How to effectively mobilize resources to improve the education level in the western region is an important policy under the guidelines of the Chinese government. The Ministry of Education released the “Implementation Plan for Silver-Aged Teachers in Colleges and Universities to Support the Western Regions,” which aims to “promote the connection between the colleges and universities in the eastern region and these in the western region, make full use of the superior resources of silver-aged teachers in colleges and universities, and mobilize outstanding silver-aged teachers in colleges and universities to continue to devote their enthusiasm to education and to promote the construction of ‘double first-class’ colleges and universities in the western region, alleviate the contradictions of insufficient teaching staff and unreasonable structure in the western region, improve the development level of higher education in the western region, and promote the revitalization and development of higher education in the western region.^[1]” In addition, the report of the 20th National Congress of the Communist Party of China proposed “promoting education fairness and running an education that satisfies the people,” which was a further deepening of the “promoting education fairness” proposed in the report of the 19th National Congress of the Communist Party of China. Therefore, the practice of educational fairness is an important policy in China.

The promulgation and implementation of policy related to silver-aged teachers provides new opportunities to alleviate the teacher shortage problem in aided schools in rural and other disadvantaged areas^[2]. Relying on silver-aged teachers with senior teaching and scientific research experience to help the development of the western region is a sustainable application of educational human resources. Meanwhile, it also realizes the sustainable development of education. It can not only impart the knowledge accumulated over the years to students, but can also improve the quality of students' learning, and lead the professional development of young teachers in the region. Therefore, this issue had its value and significance for the sustainable development of education.

In the educational field, promoting learning outcomes requires a proper social environment. Conceptually, the school can be regarded as an independent social body with an independent community operation mechanism which leads to a social process of interaction between people and their environment^[3]. The socio-ecological model (S-EM) can explain the gradual adaptation of people to changes in their actual living and growth environments^[4]. Besides, under different levels of the S-EM framework, positive interactions with teachers and a sense of belonging to the school have the potential to improve students' experiences of well-being^[5]. Therefore, the S-EM framework helps to understand the influence of school (society) on students.

Since students spend a great deal of time with teachers at school, teacher support is significant for students' academic development, including not only learning outcomes, but also emotional outcomes^[6]. Teacher support refers to teachers who promote mutual respect, care, encouragement, friendliness, fairness, and autonomous development. When students feel connected to the teacher, they will feel the support of the teacher^[7]. Teacher support is also a rather subjective dimension of teaching quality^[8]. Based on past research, teacher support is not uncommon for students. The teaching support behavior of silver-aged teachers essentially strengthens the social relationship with students^[9]. However, when silver-aged teachers from other regions come to teach in colleges and universities in the western region, they do not know how to help local students or whether students can feel their support. The effect of this policy remains unknown. Therefore, teacher support was the independent variable of the study to find out if this policy worked or not.

The basic psychological need for belonging in a school environment is a key determinant of a student's overall functioning in school and in life ^[10]. Because students spend the majority of their time in school, it is critical to feel part of an educational community ^[11]. On the other hand, if students do not develop a sense of belonging to school, they may feel rejected, unsupported, helpless, and fatigued ^[12]. Previous research supports the benefits of school belonging to academic and psychosocial outcomes ^[7]. It is meaningful to explore whether the implementation of the Western Plan will affect the sense of belonging of college students to the school. Therefore, this study took school belonging as another research variable.

Learning motivation is one of the important variables to measure students' learning situation. Two-dimensional intrinsic and extrinsic motivation types have been widely studied, and the differences between them provide important implications for development and educational practice ^[13]. Self-determination theory (SDT) is a broad framework for understanding the factors that promote or undermine intrinsic motivation, extrinsic motivation, and mental health, all of which are directly relevant to educational settings ^[14]. According to SDT, people are naturally motivated to turn uninteresting but important activities into regulatory internalization. This internalization occurs through two different processes, and results in qualitatively different ways of self-regulation, as well as the social context in which internalization processes and regulation take place ^[15]. When people's basic psychological needs are satisfied, individuals may be autonomously motivated and this can lead to more positive outcomes ^[16]. Another key component of SDT is the proposition that all human beings have three basic psychological needs, namely ones' fulfillment for self-motivation, health and learning ^[17]. Therefore, taking SDT as one of the theoretical bases of the model of this study was more helpful for thoroughly explaining the research results.

Learning motivation is considered to be an important factor in education and an influencing factor on students studying in college. Motivation refers to the force that guides students to fulfill their academic responsibilities and better learning process ^[18]. Learning motivation is defined as the expectation of academic success through setting goals and future ambitions ^[7]. Learning can serve many different purposes for students, and students can be motivated to learn in two ways: intrinsic motivation and extrinsic motivation ^[19]. Activities spurred by play, exploration, and curiosity embody behaviors that are intrinsically motivated because they do not depend on external stimuli or pressure, but instead provide their own satisfaction and pleasure. Reward and punishment-driven behavior is a form of extrinsic motivation that is often experienced as controlled and involuntary ^[14].

More important than grades is students' psychological growth and health ^[14]. Therefore, well-being is considered an important educational outcome. Adolescents' subjective well-being (SWB) is related to various schooling experiences, especially their perceptions of teacher support ^[20]. In fact, attending college comes with unique demands and stressors that may make students more vulnerable to psychological distress ^[21], such as once the potential lifelong consequences of college-age psychological distress cause downsides of life, students who experience mental health issues while coping with academic stress will face struggles to succeed academically ^[21].

In summary, according to the past research, students' sense of belonging, learning motivation and emotional outcomes all need to be paid attention to. When silver-aged teachers from eastern China go to the western region to assist in the construction of higher education, it is unknown whether they can meet the needs of college students; thus, this issue is worthy of further exploration. One of the main goals of social science research is to explain and predict specific behaviors of individuals, groups or organizations in an efficient manner in the context of identifying specific concepts and events ^[22]. The evaluation of policy effects should

therefore be based on the perspective of the parties involved (i.e., the students). Accordingly, under the framework of S-EM and SDT, this study explored the relationship between students' perceived silver-aged teacher support, school belonging, their two types of learning motivation and their well-being.

2. Research model and hypothesis

2.1. Research model

A solid model is constructed based on a theory derived from the literature, knowledge in the field, or one's educated guesses from which a causal relationship between variables in the theory is specified [23]. S-EM not only works as a theory-based framework for understanding the multifaceted and interactive influences of individual and environmental factors [24], but also helps to understand the outcomes of student (individual) and school (environment) interactions. Additionally, SDT outlines intrinsic and various extrinsic sources of motivation while explaining the dynamics of human needs in a social context [25]. It also takes into account the inherent tendency of human beings to pursue happiness and growth against their social and cultural background. If their psychological needs are not met, it may be detrimental to their happiness and growth [26]. The application of SDT in education focuses on promoting the satisfaction of the basic psychological needs of students and teachers [14]. Therefore, under the framework of S-EM and SDT, based on the social support-cognition-motivation-well-being model, this study explored the relationship between students' (individual) perceptions of silver-aged teacher support (environmental needs), school belonging (environmental needs), two types of learning motivation (psychological needs) and well-being. The relationship between all variables is shown in **Figure 1**.

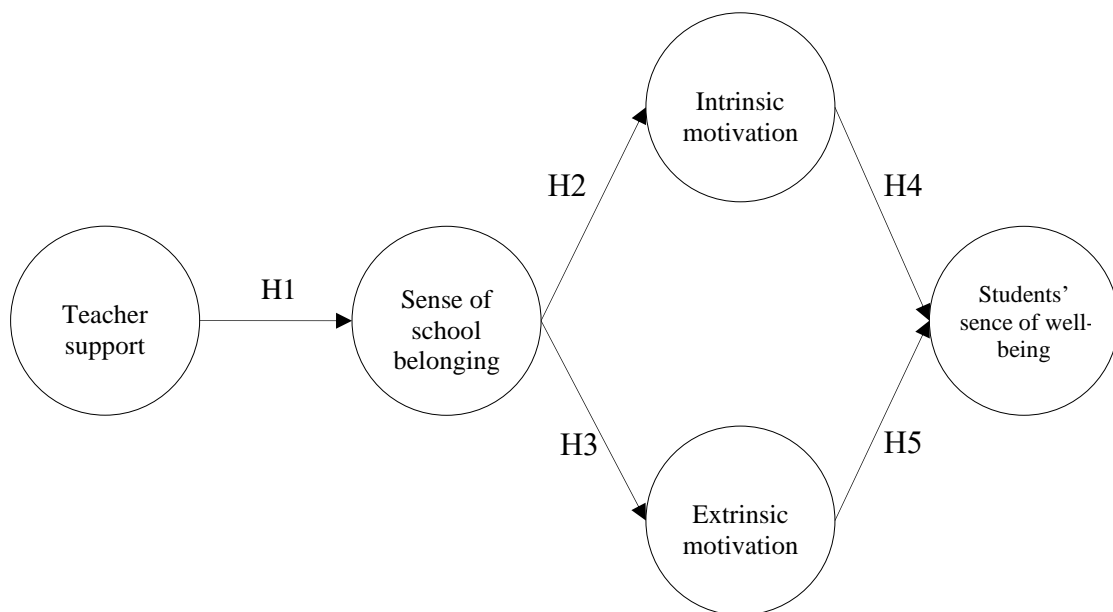


Figure 1. Research model.

2.2. The relationship between teacher support and school belonging

Benevolent care for students is the unique advantage and charm of silver-aged teachers [27]. While considering the time students spend at school and the interactions that take place there, all matters about school characteristics, teacher-student relationships, and student-to-student relationships are thought to influence their feelings of belonging [28]. In other words, students' sense of belonging to school depends on teachers,

classmates and parents, and is derived from positive interpersonal relationships based on care and support, which contribute to their sense of community ^[29]. Teacher support is believed to enhance teacher-student relationships ^[6]. Teachers also have the power to influence children's sense of belonging and peer relationships in the classroom ^[30]. In addition, research indicates that teacher support is one of the strongest predictors of school belonging ^[7]. When students receive support from teachers, they feel a greater sense of belonging to the school ^[31]. Silver-aged teachers directly participate in the practice of imparting knowledge, cultivating moral character, and improving students' abilities through their own teaching behaviors and scientific research behaviors, and transform the rich knowledge and experience accumulated by individuals into actual teaching results ^[27]. Summarizing the above literature, when students feel the attention, care and help from teachers, they will perceive the support from teachers. This sense of support may increase students' sense of school belonging, making them think they are a part of the school community. The specific assumption is hypothesized as follows:

H1: Teacher support has a positive impact on school belonging.

2.3. The relationship between school belonging and learning motivation

SDT is a broad framework for understanding factors that promote or undermine intrinsic motivation, autonomous extrinsic motivation, and mental health. All of these are considered to be directly related to the educational environment ^[14]. School is a productive environment where students can develop a sense of belonging ^[32]. School belonging is often defined as a sense of connection to the school community and is thought to contribute to academic motivation ^[33]. Researchers have paid great attention to the influence of school belonging on academic and non-academic outcomes, and it has been suggested that school belonging is positively related to various educational outcomes ^[28]. In addition, many theoretical perspectives describe the mechanisms by which a sense of belonging supports both short- and long-term academic success ^[34]. A sense of belonging is therefore important because it encompasses a sense of being valued, included, and accepted in college ^[35]. In addition, previous studies have shown that college students with a stronger sense of school belonging tend to have higher motivation and higher achievement. Based on the above literature, when students feel a strong sense of school belonging, their motivation in learning will be higher. The specific assumptions are hypothesized as follows:

H2: School belonging has a positive impact on intrinsic learning motivation.

H3: School belonging has a positive impact on extrinsic learning motivation.

2.4. The relationship between learning motivation and students' well-being

SDT is a widely used theoretical approach to the study of human motivation, development, and well-being. This theory focuses on different types of motivation that have been shown to predict a variety of adaptive and maladaptive cognitive, affective, and behavioral outcomes ^[36]. SDT proposes that intrinsic motivation is typical of positive integrative tendencies in people's minds, while extrinsic motivation is usually the opposite of intrinsic motivation, as it involves behavior for reasons other than intrinsic gratification ^[14]. Students who perceive themselves as having a sense of autonomy, competence, and relevance will experience high-quality motivation in learning activities, and hence motivation is equated to the satisfaction of students' psychological needs ^[37]. Studies have confirmed that both intrinsic and extrinsic learning motivation have a positive impact on students' well-being ^[18,38]. Additionally, numerous studies have shown that intrinsic motivation can promote more positive outcomes in youth ^[31]. According to the literature reviews, when students have a higher level of learning motivation, they feel a better sense of well-being. The hypotheses are as follows:

H4: Intrinsic learning motivation has a positive impact on students' well-being.

H5: Extrinsic learning motivation has a positive impact on students' well-being.

3. Research design

3.1. Procedure

This study adopted the purposive sampling method and used China's Wenjunxing platform to distribute online questionnaires. The questionnaire collection period was from January 15 to February 20, 2023. The target students of the questionnaire distribution were those who participated in the "Project of Supporting the Silver-Aged Teachers to the Western Colleges and Universities," which meant that these students had attended courses taught by silver-aged teachers. The number of returned questionnaires was 532.

3.2. Participants

There were 532 responses received in this study, from which a total of 23 questionnaires with incomplete answers or which were answered too quickly were deleted. There were thus 509 effective questionnaires, giving an effective recovery rate of 95.6%. Among them, 217 participants were male (42.6%), and 292 were female (57.4%); 447 (87.8%) were from rural areas and 62 (12.2%) from urban areas; 141 participants were second-year students (27.7%), 207 were third-year students (40.7%), and 161 were fourth-year students (31.6%). The average number of courses taught by senior teachers that they had attended was 3.07 (standard deviation: 1.36). The mean age of the participants was 21.31 years, with a standard deviation of 1.37 years.

3.3. Measurement

The measurement of this study was composed of four constructs, namely teacher support, sense of belonging to school, learning motivation, and student well-being. After the measurement was initially completed, three PhDs with expertise in educational psychology conducted an expert content validity review to confirm the completeness of the measurement variables, the comprehensibility of the text, and the correctness of the expression, and the measurement was finalized based on the opinions of experts. In addition, this study adopted a 5-point Likert scale as the basis for answering, with 1 representing *strongly disagree*, 2 representing *disagree*, 3 representing *neutral*, 4 representing *agree*, and 5 representing *strongly agree*.

3.3.1. Teacher support

To ascertain the extent to which college students perceive support from silver-aged teachers, this study confirmed the concept of teacher support from past literature and developed a scale of teacher support, with a total of eight items. Example items are: "If I need help, the teacher will help me immediately" and "My teacher always encourages me." Since this scale measures students' perceptions of being supported and helped by silver-aged teachers, a higher total score meant a higher level of individual perceived teacher support.

3.3.2 School belonging

In order to confirm the level of feelings of college students about being accepted by the school, this study extended Encina and Berger's School Belonging Scale to a total of nine items^[11]. Example items are: "I am happy to be a part of the school" and "I feel that I have a strong relationship with the school." Since this scale measured whether students had a good sense of belonging to the school they attended, the higher the total score, the higher degree of school belonging the individual perceived.

3.3.3. Learning motivation

In order to confirm the degree of internal and external learning motivation of college students themselves, this study adopted the Learning Motivation Scale compiled by Ye et al.^[38], with a total of 14 items. Examples of intrinsic learning motivation include: "Learning new things makes me feel satisfied and joyful" and

“Learning is for me to feel the feeling of self-transcendence.” Examples of extrinsic learning motivation are: “I study to be better prepared for my chosen career” and “I study because I want to have a better life in the future.” Since the scale measured whether students were motivated to perform learning tasks, a higher total score represented a higher degree of personal perceived learning motivation.

3.3.4. Students' sense of well-being

To confirm the level of well-being perceived by college students, this study adopted the students' well-being scale revised by Ye et al. [38], with a total of 10 items. Example items are: “Learning makes me more optimistic about my future development” and “Learning makes me feel more fulfilled about my own performance.” Since this scale measured students' level of well-being in their learning and life, the higher the total scores, the higher degree of learning well-being the students perceived.

4. Research results

Structural equation modeling (SEM) analysis is the statistical tool if researchers intend to explore the causal relationship between independent and dependent variables [39]. Structural equation modeling is also known as causal modeling, causal analysis, path analysis, or validation factor analysis among others. SEM allows answering questions involving multiple regression analysis of factors [40]. In recent years, SEM has become a popular analytical method to study the relationship between components [39]. SEM is a combination of two statistical methods, confirmatory factor analysis and path analysis [41]. Therefore, this study adopted SEM to verify the causal relationship among the variables.

The first step in SEM analysis is the specification of the model [40]. Before the model validation, this study carried out the evaluation of the measurement model, the reliability and validity analysis of the variables, the overall fitness analysis, and finally the model validation.

4.1. Analysis of measurement model

The Confirmatory Factor Analysis (CFA) process enables researchers to assess variables across multiple items, and scholars have begun to refer to measurement model validation as CFA [42], whereas CFA has been widely used to assess the adequacy of individual variables as indicators of the underlying variables they should measure [23]. The numerical standards and test results of this study are shown in **Table 1**. In this stage, the items of the teacher support construct were reduced from eight to six, those for sense of school belonging were reduced from nine to six, intrinsic learning motivation was reduced from seven to six, extrinsic learning motivation was reduced from seven to five, and students' sense of well-being was reduced from ten to seven.

Table 1. Analysis of measurement model.

Index	Critical value	Teacher support	Sense of school belonging	Intrinsic learning motivation	Extrinsic learning motivation	Students' sense of well-being
χ^2	---	30.9	21.5	44.1	16.8	32.5
df	---	9	9	9	5	14
χ^2/df	< 5	3.43	2.39	4.9	3.36	2.32
RMSEA	< .10	.07	.05	.09	.07	.05

Index	Critical value	Teacher support	Sense of school belonging	Intrinsic learning motivation	Extrinsic learning motivation	Students' sense of well-being
GFI	> .80	.98	.99	.97	.99	.98
AGFI	> .80	.93	.97	.93	.96	.97
FL	> .50	.86~.91	.75~.93	.84~.92	.81~.90	.85~.92

Note: χ^2 = chi-square, *df* = degree of freedom, RMSEA = root mean square error of approximation, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, FL = factor loading.

4.2. Reliability and validity analysis

Before constructing the model, we tested the reliability and validity of each variable (measurement model). The Cronbach's α and CR values of the variables in this study were both between .93 and .96, the FL value was between .86 and .90, and the AVE value was between .75 and .78, as shown in **Table 2**. Judging from the numerical results of Skewness and Kurtosis, the data in this study presented a normal distribution.

Table 2. Reliability and validity analysis.

Construct	Skewness	Kurtosis	α	CR	AVE	FL
	---	---	> .70	> .70	> .50	> .50
Teacher support	-.97	1.00	.96	.96	.79	.87
Sense of school belonging	-.89	.90	.94	.95	.75	.87
Intrinsic learning motivation	-.50	-.76	.96	.95	.78	.90
Extrinsic learning motivation	-.68	-.08	.93	.94	.75	.86
Students' sense of well-being	-.55	-.49	.96	.93	.75	.86

Note: α = Cronbach's alpha, CR = composite reliability, AVE = average variance extracted, FL = factor loading.

If discriminant validity is not confirmed, then conclusions about the relationship between the variables under study may be incorrect. Therefore, according to Fornell's criterion, if the AVE of each variable is greater than its correlation coefficient with other variables, it is considered to have discriminant validity^[43]. As shown in **Table 3**, the five variables in this study all had discriminant validity.

Table 3. Variable discriminant validity analysis.

Construct	M	SD	1	2	3	4	5
1. Teacher support	4.43	.61	(.93)				
2. Sense of school belonging	4.30	.69	.52	(.93)			
3. Intrinsic learning motivation	4.38	.61	.51	.66	(.95)		
4. Extrinsic learning motivation	4.38	.61	.48	.60	.85	(.93)	
5. Students' sense of well-being	4.34	.63	.47	.67	.84	.83	(.93)

Note: M = mean, SD = standard deviation. The value on the diagonal is the square root value of AVE, and the other values are the correlation coefficient values.

4.3. Model fit analysis

SEM usually confirms the suitability of the model through the goodness-of-fit index reported by the software program^[23]. The fitting index values of this study were $\chi^2 = 1673.6$, *df* = 400, $\chi^2/df = 4.18$, RMSEA = .80, GFI = .83, AGFI = .81, NFI = .91, NNFI = .92, CFI = .93, IFI = .93, RFI = .90, PNFI = .84, and PGFI = .72. The standards proposed in this study conformed to the χ^2/df value suggested by Hair et al. and Abedi et al. of less than 5, the RMSEA value of less than .1, GFI, AGFI, NFI, NNFI, CFI, and IFI and RFI equivalents

greater than .80, and PNFI and PGFI equivalents greater than .50^[44-45].

4.4. Research model validation analysis

The model validation results showed that teacher support had a positive impact on sense of school belonging ($\beta = .56^{***}$); sense of school belonging had a positive impact on intrinsic learning motivation ($\beta = .70^{***}$); sense of school belonging had a positive impact on extrinsic learning motivation ($\beta = .67^{***}$); intrinsic learning motivation had a positive impact on students' sense of well-being ($\beta = .54^{***}$); and extrinsic learning motivation had a positive impact on students' sense of well-being ($\beta = .50^{***}$). From the verification results, the five research hypotheses proposed in this study were all supported, as shown in **Figure 2**.

Figure 2 represents that the explanatory power of teacher support to school belonging was 31%, and f^2 was .45; the explanatory power of school belonging to intrinsic learning motivation was 49%, and f^2 was .96; the explanatory power of school belonging to external learning motivation was 45%, and f^2 was .82; the explanatory power of the two types of learning motivation to students' well-being was 79%, and f^2 was 3.76.

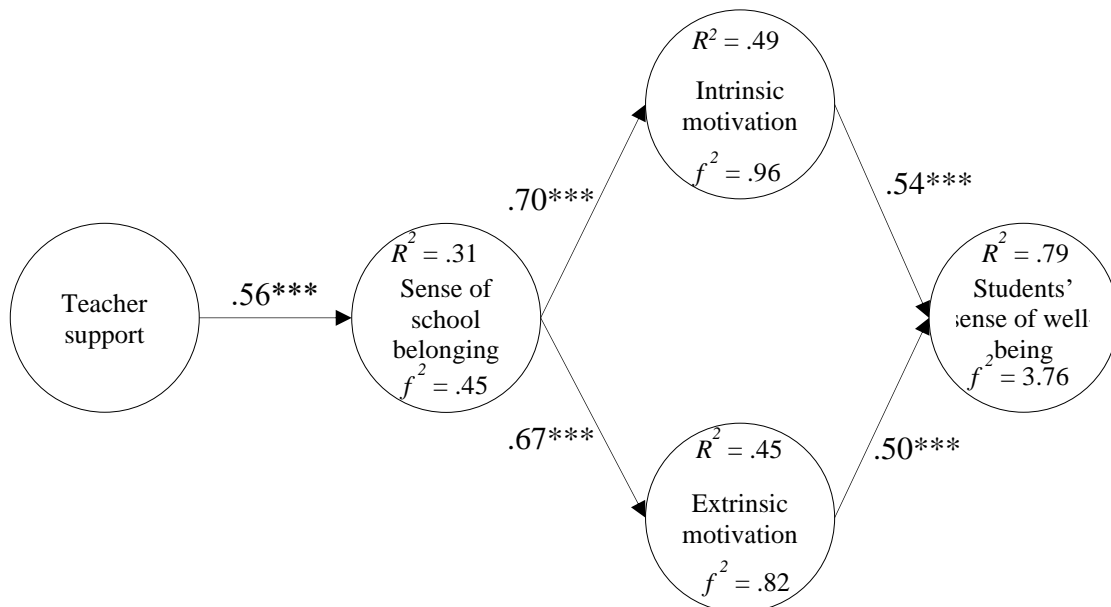


Figure 2. Research model validation.

5. Research discussion

This study aimed to understand the relationship between the support of silver-aged teachers perceived by college students and their sense of school belonging, their two types of learning motivation, and their well-being. In this study, five research hypotheses were proposed and the validity of paths in the model was confirmed by structural equation modeling. In addition, in the descriptive statistics, the mean value of teacher support was 4.43 ($SD = .61$), which means that students felt that senior teachers provide good support; the mean value of school belonging was 4.30 ($SD = .69$), which means that students felt a high level of school belonging; the mean values of the two dimensions of learning motivation were both 4.38 ($SD = .61$), which means that students had good intrinsic and extrinsic learning motivation; and the mean value of students' feeling of well-being was 4.34 ($SD = .63$), indicating that students felt a high degree of well-being in their campus life.

5.1. Teacher support has a positive impact on school belonging

The results of the study showed that teacher support had a positive impact on the sense of school

belonging, representing that H1 was supported. In other words, when college students in the western region felt more supported by silver-aged teachers, their sense of belonging to the school they attended was also stronger. The reason for this phenomenon was that when students felt cared for and supported by silver-aged teachers, their degree of identification and belonging to the school they attended was also higher. This is also consistent with the concept proposed by Lei et al. ^[6], that teacher support is believed to enhance the relationship between teachers and students. It also fits with Neri Tejada et al.'s notion that teachers have the ability to influence children's sense of belonging and peer relationships in the classroom ^[30]. In addition, the results of this study concurred Allen et al.'s finding that teacher support is one of the strongest predictors of school belonging ^[7]. As Froiland et al. stated, when students receive support from teachers, they will feel more of a sense of school belonging ^[31]. According to the explanation of China's Kimi AI, "teacher support is a key factor for students to establish a sense of belonging in school. It provides emotional care, academic help, social promotion, increased participation, maintenance of fairness, and the positive impact of serving as a role model actively promotes students to feel accepted and valued, thereby enhancing their identification and belonging to the school."

5.2. Sense of school belonging has a positive impact on learning motivation

The results of the study showed that the sense of school belonging had a positive impact on intrinsic and extrinsic learning motivation, representing support for H2 and H3. When college students in the western region had a stronger attachment to the school, their intrinsic and extrinsic learning motivation was also higher. The reason for this was that when students had a higher level of belonging to the school they attended, they also had a better source of motivation for learning tasks. This result was also consistent with what Cortina et al. said, and the sense of school belonging is considered to contribute to the generation of academic motivation ^[33]. Meanwhile, it was also consistent with Ahmadi et al. that the sense of school belonging is positively correlated with various educational outcomes ^[28], and Kirby and Thomas stated that the sense of belonging supports the mechanism of short-term and long-term academic success ^[34]. In addition, the analysis results of this study were consistent with the finding of Pedler et al. that college students with high levels of belonging tend to have higher motivation ^[35]. According to China's Kimi AI, "when students feel that they are part of the school community and feel accepted and valued, they are more likely to actively participate in learning activities and show higher enthusiasm and motivation for learning. This sense of belonging provides a kind of psychological support that makes students more willing to accept challenges, explore new knowledge, and work hard to achieve academic goals."

5.3. Learning motivation has a positive impact on students' well-being

The results of the study showed that intrinsic and extrinsic learning motivation had a positive impact on students' well-being, representing support for H4 and H5. In other words, when college students in the western region had a higher level of motivation for learning, it was easier for them to experience well-being. The reason for this was that when students are more motivated to participate in learning tasks, their sense of well-being in their learning life will be stronger. The results of this study were also in line with Froiland et al.'s research showing that intrinsic motivation can promote positive outcomes in youth ^[31]. Although SDT states that different motivation types co-occur to varying degrees and lead to different outcomes ^[46], Ye et al.'s research confirms that both intrinsic and extrinsic learning motivation have a positive impact on students' well-being ^[38]. The results of this study were consistent with those of Ye et al. According to China's Kimi AI, "learning motivation has a positive impact on students' well-being, which means that when students have intrinsic drive and interest in learning, they are more likely to experience satisfaction and a sense of accomplishment, thus improving overall life satisfaction and emotional state. This positive attitude towards learning helps students remain resilient in the face of challenges and promotes mental health and personal growth."

6. Conclusions and recommendations

6.1. Conclusions

The goal of sustainable development of higher education is to promote high-quality education and the effective application of educational resources. However, this study explored the feasibility of silver-aged teachers in colleges and universities helping to practice educational equity. Under the framework of S-EM and SDT, the variables of sustainable education development policy effects are conceptualized extensively. Under the theoretical framework, it focuses on the main factors such as cognition and emotion that may affect the implementation results. The study results showed that: 1. Teacher support has a positive impact on school belonging; 2. School belonging has a positive impact on the two types of learning motivation; and 3. The two types of learning motivation have a positive impact on students' well-being. When students perceive the support of senior (silver-aged) teachers, it helps them establish a sense of belonging to the school. When their sense of school belonging is stronger, it also triggers and promotes their learning motivation better. When students are motivated to learn, they in turn have higher levels of well-being. Based on these conclusions, when students gain a sense of school belonging, positive outcomes are delivered in the academic environment. Therefore, this study recommends that schools and teachers should actively create a supportive learning environment and enhance students' sense of school belonging by prompting teacher-student interaction and providing personalized guidance. Meanwhile, schools and teachers should cultivate students' different types of learning motivation to promote the creation and maintenance of students' well-being.

6.2. Contributions

Whether the implementation of the policy is effective should be explored from the perspective of the parties involved (stakeholders). However, this study explored its effectiveness from the perspective of one of the participants (students) of the Western Project. A sense of belonging is very important to any student group. A low sense of belonging among college students is an ongoing challenge in the higher education sector ^[47]. It was found in this study that silver-aged teachers participating in the Western Project indeed provided the support needed by college students. The effects of this program were recognized by the students concerned. This also means that silver-aged teachers are important and effective educational human resources, and this type of project is also a sustainable re-use of resources. Therefore, education authorities in countries (regions) around the world can refer to China to implement similar policies. This is the practical contribution of this study.

Furthermore, on the basis of two theoretical frameworks, S-EM and SDT, this study proposed a learning motivation-driven model, proved that the research model has a good degree of adaptation, and also confirmed the interpretability of this framework. Thus, this model can help explain the cognition-motivation-outcome relationship in the learning field, which is the theoretical contribution of this study. In sum, the research model based on integration theory is more helpful in thoroughly explaining study questions or phenomena according to the research needs. In addition, in recent years, how to effectively promote students' well-being has been of particular interest in positive psychology. This study adopted the social support-cognition-motivation-well-being model to help understand how students' well-being was generated in the school setting.

6.3. Limitations and suggestions for future research

This study had some limitations. First of all, it was a cross-sectional study, and the time point of the study was during the development period of this project. Therefore, the long-term effects of the program are still unknown. Moreover, this study was mainly conducted from the perspective of educational psychology, and so it is impossible to understand the impact of this program on students' academic achievement or employment.

Therefore, follow-up research can continue to track and expand research variables to more fully explore the effectiveness of this project. Second, even though this study intended to explore the effect of policy implementation from the perspective of stakeholders, in fact, the implementation effect of the silver-aged teacher policy was only discussed from the perspective of students. It is still unknown what silver-aged teachers think and why they responded to the call to take part in the project. Therefore, follow-up research can be conducted from the perspective of teachers to fill this research gap. In addition, when faced with students from different regional cultures, different types of institutions, and different levels, it is not clear how silver-aged teachers themselves should make adjustments. In the future, students can also be interviewed to understand their specific needs. Besides, the report of the 20th National Congress of the Communist Party of China is China's contemporary policy guidelines. This report mentions the expectations for education development such as education power, talent power, science and technology power, and cultural power. China's education development in the next few years will also be linked with the core topics in the report of the 20th National Congress of the Communist Party of China. Although the Western Project as the background of this study has been implemented for several years, it still follows the core concepts in this report. Therefore, it is suggested that future research on China's education can be based on the content of the 20th National Congress of the Communist Party of China, including teacher training, teacher morality, moral cultivation, and education digitalization, which can be closer to China's latest education development focus. This will help the world to understand the current situation of education in China.

Promoting high-quality education and mental health and well-being is one of the sustainable development goals of the United Nations. Scholars and organizations around the world are committed to researching this issue, so as to understand the programs (methods), promoting and inhibiting factors for improving the quality of education. This study also falls within this scope. Therefore, in follow-up research, it would be inspiring and encouraging to explore the impact of different contexts on the goal of high-quality education under the concept of promoting sustainable development goals.

Conflict of interest

The authors declare that the study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Author contributions

All authors contributed to the article and approved the submitted version.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

This study was approved by the Ethics Committee of Hainan Vocational University of Science and Technology (HKD-2023-01). Meanwhile, the participants provided an electronic version of their informed consent statement.

Artificial intelligence usage scope statement

One of the authors had a dialogue with generative artificial intelligence (Kimi AI) based on the research analysis results, and wrote with reference to its opinions to support the research results in one paragraph each

of the Discussion section.

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