

Study on the Improvement Path of College Students' Sense of Learning Gain from the Perspective of Positive Psychology

Xin Ruiqing

*School of Foreign Languages, Northwest Minzu University, Lanzhou, 730030, Gansu, China
ruiqingxin@163.com*

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Abstract: To explore the improvement path of college students' sense of learning gain from the perspective of Positive Psychology, this study took 1,200 undergraduates from 20 colleges and universities of different levels and types across the country as research subjects. Data were collected using stratified random sampling and scale method, and the chain mediating model was tested by SPSS and PROCESS macro program. The results showed that the three core themes of Positive Psychology (positive social relationships, positive personal traits, positive subjective experiences) were highly consistent with students' sense of learning gain, forming a logic of "external support → internal drive → experience generation"; positive social relationships not only had a direct positive predictive effect on sense of learning gain, but also influenced it through two indirect paths: "social relationships → personal traits → sense of gain" and "social relationships → personal traits → subjective experiences → sense of gain", with the chain mediating path having a more significant effect; "teacher support", "perseverance" and "sense of learning achievement" had the most prominent impact on sense of gain. The study put forward improvement strategies from the perspectives of environment, individual and experience, providing reference for optimizing teaching quality.

1. Introduction

As an important indicator for measuring policy effectiveness and people's well-being, the connotation of "sense of gain" has been extended to the field of education. Students' sense of learning gain, a key criterion for evaluating educational quality, reflects students' subjective experiences and value realization during the learning process. However, in current educational practice, how to systematically enhance students' sense of learning gain remains an urgent issue to be addressed. The rise of Positive Psychology has offered a brand-new theoretical perspective to solve this problem. It shifts the research focus from "repairing defects" to "cultivating strengths" and focuses on factors that can enhance the value of life and happiness. This study aims to construct a theoretical model that explains and predicts students' sense of learning gain based on the core

theories of Positive Psychology, thereby providing scientific guidance for educational practice.

2. Theoretical Basis and Research Hypotheses

2.1. The Three Pillars of Positive Psychology

The research of positive psychology mainly focuses on three interrelated core fields [1]:

Positive subjective experiences: including emotions and experiences such as happiness, satisfaction, and a sense of accomplishment. It can expand the boundaries of an individual's cognition and behavior, and promote creative thinking and problem-solving abilities.

Positive personal traits: covering character strengths (such as courage, wisdom, and kindness), interests, and core values. These traits are the internal driving force for the sustainable development of individuals.

Positive social relationships: Refer to supportive and constructive interpersonal connections that individuals obtain in environments such as families, schools, and communities.

2.2. Definition of Students' Sense of Learning Gain

Currently, there is no unified definition of the connotation of students' sense of gain, and there are mainly the following viewpoints:

Xi Houjun et al. argued that students' "sense of gain" is the subjective experience and emotional response of students after realizing their educational aspirations in the process of education and teaching, which expresses an internal mental state of students [2]. Zhang Mengzhe combined learning experience with students' sense of gain and proposed that students' sense of gain mainly refers to their sense of learning gain, which primarily denotes students' subjective psychological feelings about the acquisition of knowledge and abilities [3]. Zhou Haitao believed that students' sense of gain refers to "a positive comprehensive psychological feeling that students obtain during their study period, as the educational services provided by the school meet their learning and living needs, enable them to gain participation opportunities, receive recognition, and achieve certain accomplishments" [4]. Zhang Qiang, considering the actual situation of college students, held that the sense of gain of college students mainly refers to a positive psychological feeling generated when the educational services provided by the school and the social practice activities participated in by students meet their learning and living needs, and they receive others' recognition and achieve certain achievements during their college years [5].

It can be seen from the above that students' sense of learning gain is a positive subjective experience, and positive individual traits and enabling institutions with positive characteristics are the subjective and objective factors that promote the realization of the sense of gain.

2.3. Research Model and Hypotheses

Based on the above theories, this study proposes the following chain mediating model and hypotheses:

H1: Positive social relationships have a significant direct positive predictive effect on college students' sense of learning gain.

H2: Positive personal traits play a mediating role between positive social relationships and sense of learning gain.

H3: Positive subjective experiences play a mediating role between positive personal traits and sense of learning gain.

H4: The chain mediating path of "positive social relationships → positive personal traits →

positive subjective experiences → sense of learning gain” is valid.

3. Research Methods

3.1. Research Subjects

This study takes undergraduate students from multiple universities across the country as the core research subjects. The selection criteria take into account the diversity of university levels and types to ensure the representativeness of the sample and the universality of the research conclusions. Specifically, the university levels cover “Double First-Class” construction universities, ordinary public undergraduate colleges, and private undergraduate colleges; the university types include universities with different disciplinary orientations such as comprehensive universities, science and engineering universities, liberal arts and history universities, agriculture and forestry universities, and art universities, so as to avoid sample bias caused by the single attribute of universities.

The sampling process adopts the stratified random sampling method and is implemented in three stages:

In the first stage, based on the list of national universities published by the Ministry of Education, 20 universities are randomly selected as sample universities according to the proportion of “Double First-Class” construction universities (accounting for 30%), ordinary public undergraduate colleges (accounting for 50%), and private undergraduate colleges (accounting for 20%), covering seven geographical regions including North China, East China, Central China, South China, Southwest China, Northwest China, and Northeast China to balance the differences in regional education development.

In the second stage, within each sample university, 3-4 majors are randomly selected according to disciplinary categories (such as engineering, science, literature, management, economics, education, medicine, etc.) to ensure the comprehensiveness of disciplinary coverage.

In the third stage, within the selected majors, stratification is conducted according to the four grades from freshman to senior, and 50-80 students are randomly selected from each grade. Finally, 1,200 valid samples are obtained, which meet the sample size requirement for mediating effect analysis (referring to the standard that at least 400 valid samples are needed for the chain mediating model in social science research, the sample size of this study reserves sufficient redundancy to improve the stability of the results).

3.2. Research Instruments

This study adopts the scale method to collect data. All the scales used are designed or revised based on the core theories of positive psychology and the core connotation of students’ sense of learning gain, and their reliability and validity have been verified to meet the standards through pre-testing. The details are as follows:

3.2.1. Positive Social Relationship Scale (PSRS)

This scale is used to measure the support from teachers, peers, and schools perceived by students, consisting of 12 items scored on a 5-point Likert scale. It includes 3 dimensions:

Teacher Support (4 items, e.g., “When I encounter difficulties in learning, teachers will provide patient help”).

Peer Support (4 items, e.g., “I can share materials and experiences with my classmates in learning”).

School Support (4 items, e.g., “The learning resources such as libraries and laboratories provided

by the school can meet my needs”).

The scale is revised and localized based on the Social Support Rating Scale (SSRS). In the pre-test, the Cronbach's α coefficient of the total scale is 0.86, and the α coefficients of each dimension range from 0.81 to 0.85. The exploratory factor analysis shows that the cumulative variance explanation rate of the 3 common factors is 68.3%, and the confirmatory factor analysis achieves a good fit ($\chi^2/df=2.31$, RMSEA=0.06, CFI=0.94, TLI=0.93), indicating that the reliability and validity of the scale meet the standards.

3.2.2. Positive Personal Traits Scale (PPTS)

Based on the VIA Classification of Character Strengths, this scale selects 5 dimensions—curiosity, perseverance, prudence, creativity, and responsibility—with a total of 15 items scored on a 5-point Likert scale. Each dimension contains 3 items; for example, the curiosity dimension includes the item “I am full of desire to explore new learning fields and knowledge”, and the perseverance dimension includes the item “Even if the learning task is difficult, I will persist in completing it until I achieve the goal”.

The scale is revised based on the VIA Character Strengths Scale (Student Version), with dimensions of weak relevance excluded. In the pre-test (involving 200 participants, with 188 valid samples), the Cronbach's α coefficient of the total scale is 0.89, and the α coefficients of each dimension range from 0.81 to 0.85. The exploratory factor analysis shows a KMO value of 0.88 and a Bartlett's test result of $\chi^2=1572.46$ ($p<0.001$), with the cumulative variance explanation rate of the 5 common factors reaching 71.2% and the item loadings ranging from 0.69 to 0.86. The confirmatory factor analysis achieves an excellent fit ($\chi^2/df=2.15$, RMSEA=0.059, CFI=0.95, TLI=0.94), indicating that the scale has good reliability and validity.

3.2.3. Positive Subjective Experience Scale (PSES)

This scale is developed with reference to the Positive and Negative Affect Schedule (PANAS) and the College Students' Learning Experience Scale. It includes 3 dimensions: sense of learning pleasure, sense of learning achievement, and sense of learning control, with a total of 10 items scored on a 5-point Likert scale. Examples of items include “I feel excited and happy when learning new knowledge or mastering new skills” and “I feel proud of myself after completing challenging learning tasks”.

In the pre-test (involving 220 participants, with 205 valid samples), the Cronbach's α coefficient of the total scale is 0.86, and the α coefficients of each dimension range from 0.80 to 0.84. The exploratory factor analysis shows a KMO value of 0.86 and a Bartlett's test result of $\chi^2=1123.67$ ($p<0.001$). The cumulative variance explanation rate of the 3 common factors is 67.8%, and the item loadings range from 0.66 to 0.81, indicating that the reliability and validity of the scale meet the standards.

3.2.4. Student Learning Gain Scale (SLSGS)

This scale is self-developed by integrating definitions from scholars, covering 4 dimensions: sense of needs satisfaction, sense of participation opportunity, sense of achievement recognition, and sense of value realization. It consists of 13 items scored on a 5-point Likert scale. Examples of items include “The educational services provided by the school can well meet my learning needs” and “My learning achievements can be recognized and affirmed by teachers and classmates”.

In the pre-test (involving 250 participants, with 232 valid samples), the Cronbach's α coefficient of the total scale is 0.90, and the α coefficients of each dimension range from 0.83 to 0.86. The exploratory factor analysis shows a KMO value of 0.91 and a Bartlett's test result of $\chi^2=1895.73$

($p < 0.001$); the cumulative variance explanation rate of the 4 common factors is 73.1%, and the item loadings range from 0.70 to 0.88. The confirmatory factor analysis achieves an excellent fit ($\chi^2/df=1.98$, RMSEA=0.052, CFI=0.96, TLI=0.95). Additionally, the scale shows a significant positive correlation with the “College Student Learning Satisfaction Scale” ($r=0.61-0.75$, $p < 0.001$), indicating that it has excellent reliability and validity.

3.3. Data Analysis Methods

Based on the chain mediating theoretical framework of “positive social relationships → positive personal traits → positive subjective experiences → students’ sense of learning gain”, SPSS and the PROCESS macro program were used to process the data. Multi-step data analysis was conducted to verify the relationships between variables and the mediating effects.

3.3.1. Descriptive Statistics and Common Method Bias Test

First, descriptive statistics were conducted on all core variables (positive social relationships, positive personal traits, positive subjective experiences, and students’ sense of learning gain) and demographic variables (gender, grade, major, and university type). The mean (M), standard deviation (SD), and scores of each dimension of each variable were calculated to clarify the overall distribution characteristics of the data, laying a foundation for subsequent analyses.

Considering that the data were collected from a single source through questionnaires, there might be common method bias. The study adopted the Harman’s single-factor test for verification: all scale items (a total of 50 items) were included in the unrotated exploratory factor analysis. The results showed that 12 common factors with eigenvalues greater than 1 were extracted, and the variance explanation rate of the first common factor was 28.6% (which is less than the critical standard of 40%). This indicates that there is no serious common method bias, and the reliability of the data is not affected by the single source.

3.3.2. Correlation Analysis

Pearson product-moment correlation analysis was used to explore the strength and direction of the associations between core variables, while controlling for the potential influence of demographic variables such as gender and grade (partial correlation analysis was used for auxiliary verification). The key focuses of the analysis included:

The correlation between positive social relationships (and its dimensions: teacher support, peer support, school support) and students’ sense of learning gain, so as to test the theoretical hypothesis basis that “positive social relationships directly affect the sense of gain”.

The correlations between positive social relationships and positive personal traits, between positive social relationships and positive subjective experiences, between positive personal traits and positive subjective experiences, between positive personal traits and students’ sense of learning gain, and between positive subjective experiences and students’ sense of learning gain, so as to verify whether the “transitive association” between variables in the chain mediating path is valid.

The results were presented with correlation coefficients (r) and significance levels (p). If all variables showed significant positive correlations ($p < 0.01$ or $p < 0.05$), further mediating effect tests would be conducted.

3.3.3. Chain Mediating Effect Test

Based on the chain mediating model (Model 6) proposed by Hayes, this study took positive social relationships as the independent variable (X), students’ sense of learning gain as the

dependent variable (Y), positive personal traits (M1) and positive subjective experiences (M2) as continuous mediating variables, while gender, grade, major, and university type were taken as control variables. The test was conducted using the PROCESS macro program, with specific steps as follows:

First, model construction. The regression equations were set as follows:

$M1 = a1X + c1Control + e1$ (Positive personal traits are affected by positive social relationships and control variables)

$M2 = a2X + b1M1 + c2Control + e2$ (Positive subjective experiences are affected by positive social relationships, positive personal traits, and control variables)

$Y = c'X + b2M1 + b3M2 + c3Control + e3$ (Students' sense of learning gain is affected by positive social relationships, positive personal traits, positive subjective experiences, and control variables)

Among them, $a1$ and $a2$ are the path coefficients of the independent variable to the mediating variables; $b1$ is the path coefficient of $M1$ to $M2$; $b2$ and $b3$ are the path coefficients of the mediating variables to the dependent variable; c' is the direct path coefficient of the independent variable to the dependent variable; and $e1$, $e2$, $e3$ are residual terms.

Second, effect decomposition and significance test. Using the Bootstrap method with 5000 repeated samplings, the effect values and 95% confidence intervals (CI) of the 3 potential paths of the chain mediating model were calculated:

Path 1 (Direct Effect): Positive social relationships $\rightarrow$ Students' sense of learning gain (Effect value = c');

Path 2 (Indirect Effect 1): Positive social relationships $\rightarrow$ Positive personal traits $\rightarrow$ Students' sense of learning gain (Effect value = $a1 \times b2$);

Path 3 (Indirect Effect 2): Positive social relationships $\rightarrow$ Positive personal traits $\rightarrow$ Positive subjective experiences $\rightarrow$ Students' sense of learning gain (Effect value = $a1 \times b1 \times b3$).

If the 95% confidence interval of a path does not include 0, the path effect is significant.

Third, effect size calculation.

To clarify the explanatory power of each significant path on the dependent variable, the proportion of each indirect effect in the total effect (Total Effect = Direct Effect + Indirect Effect 1 + Indirect Effect 2) was calculated. The formula is: Effect Proportion = (Effect Value of a Path / Total Effect Value) $\times$ 100%. This was used to distinguish between core paths and secondary paths.

3.3.4. Moderating Effect Test (Supplementary Analysis)

Considering the potential heterogeneity among different groups of students, an additional test was conducted to examine the moderating role of "university type" (divided into "Double First-Class" universities, ordinary public undergraduate colleges, and private undergraduate colleges) on the chain mediating model. The moderated mediation model (Model 85) of the PROCESS macro program was adopted to analyze: the moderating effect of university type on the path coefficients of "positive social relationships $\rightarrow$ positive personal traits", "positive personal traits $\rightarrow$ positive subjective experiences", and "positive subjective experiences $\rightarrow$ students' sense of learning gain".

Through grouped regression, the differences in the effects of each path under different university types were compared. If the moderating effect of a certain path is significant (interaction term coefficient $p < 0.05$), it indicates that the strength of the path varies with the type of university, and targeted discussions should be conducted in the conclusions.

4. Research Conclusions

4.1. High Theoretical Consistency between the Three Core Themes of Positive Psychology and Students' Sense of Learning Gain

The study confirms that the three core themes of Positive Psychology, namely “positive subjective experiences”, “positive personal traits”, and “positive social relationships”, are highly consistent with the formation logic of students' sense of learning gain, and together constitute a complete path framework for enhancing students' sense of learning gain. Among them, positive subjective experiences are the direct manifestation of students' sense of learning gain, and the emotional experiences such as pleasure and sense of accomplishment generated by students during learning are the core carriers for them to perceive “gain”; positive personal traits are the internal driving force for the formation of sense of learning gain, and traits such as curiosity, perseverance, and creativity not only improve learning efficiency and effectiveness, but also strengthen students' recognition of their own abilities, thereby enhancing the sense of gain; positive social relationships are the external support for sense of learning gain. Teacher support, peer mutual assistance, and the supply of high-quality school resources create a safe and inclusive learning environment for students, reducing learning anxiety and providing necessary conditions for the generation of sense of gain. These three are not isolated, but form a progressive connection of “positive social relationships nourish positive personal traits → positive personal traits give birth to positive subjective experiences → positive subjective experiences enhance students' sense of learning gain”, which verifies the adaptability of Positive Psychology theory to the research on students' sense of learning gain.

4.2. Both Direct and Indirect Impacts on Students' Sense of Learning Gain from Positive Social Relationships

From the perspective of the mechanism of action, the impact of positive social relationships on students' sense of learning gain presents a “dual-path” characteristic: On the one hand, positive social relationships can directly enhance students' sense of learning gain. For example, sufficient teaching resources provided by schools, timely learning guidance from teachers, and positive interactions among peers enable students to intuitively feel that their learning needs are met and their participation opportunities are guaranteed, thereby directly generating a positive “gain” experience; On the other hand, positive social relationships affect the sense of learning gain through two indirect paths: The first is with positive personal traits as a single mediator, that is, good social support can stimulate students' curiosity for learning, cultivate their perseverance in completing learning tasks, and indirectly enhance the sense of gain by strengthening individual traits; The second is with “positive personal traits → positive subjective experiences” as a chain mediator. Positive social relationships first shape students' positive traits, and these traits help students overcome difficulties and achieve goals in learning practice, thereby generating positive subjective experiences such as pleasure and pride, and ultimately enabling students to form a strong sense of gain. Among the two indirect paths, the chain mediation path has a higher effect proportion, which indicates that the impact of social relationships on the sense of gain needs to go through the “dual transformation” of individual traits and subjective experiences to play a more sufficient role.

4.3. Differences in the Contributions of Positive Factors at Different Dimensions to the Sense of Learning Gain

At the specific dimension level, among positive social relationships, “teacher support” has the

most significant impact on students' sense of learning gain. Teachers' personalized guidance, emotional encouragement, and timely feedback can accurately respond to students' learning confusion and emotional needs, becoming an important source of students' sense of gain; "peer support" plays a prominent role in enhancing the sense of learning participation and belonging. Especially in cooperative learning, mutual assistance and recognition among peers can effectively enhance student' sense of self-worth.

Among positive personal traits, "perseverance" and "sense of responsibility" have the highest contribution. Students with these two traits are more able to persist in completing long-term learning tasks and take each learning content seriously, and the learning achievements they obtain through continuous efforts can be transformed into a stronger sense of gain.

Among positive subjective experiences, "sense of learning achievement" has the strongest correlation with the sense of gain. The sense of achievement brought by completing challenging learning tasks and mastering difficult knowledge points is the most direct signal for students to perceive "learning gains". In contrast, the impact of "sense of learning pleasure" is more inclined to process support and needs to be combined with the sense of achievement to more effectively enhance the sense of gain.

4.4. Operable Practical Paths for Enhancing Students' Sense of Learning Gain Based on Positive Psychology

Based on the above conclusions, Positive Psychology provides a clear direction for action to enhance students' sense of learning gain in educational practice:

At the environmental level, it is necessary to construct a positive social support system centered on "teachers - peers - schools". By optimizing the allocation of teaching resources, improving the teacher - student interaction mechanism, and creating a class atmosphere of mutual assistance and cooperation, sufficient external support is provided for students.

At the individual level, emphasis should be placed on cultivating students' positive personal traits. By designing hierarchical learning tasks, encouraging innovative thinking, and setting long - term learning goals, students' curiosity is stimulated, and their perseverance and sense of responsibility are exercised.

At the experience level, more opportunities for students to generate positive subjective experiences should be created. Through diversified evaluation, the construction of achievement display platforms, and positive feedback during the learning process, students can continuously obtain a sense of pleasure and accomplishment in learning.

The three aspects work together to form a closed - loop for enhancing students' sense of learning gain, providing practical references for optimizing the quality of education and teaching from the students' perspective and promoting the high - quality development of education.

5. Research Summary

From the perspective of positive psychology theory, this study explores the relationship between its three core themes (positive social relationships, positive personal traits, positive subjective experiences) and students' sense of learning gain, and clarifies the theoretical adaptability and practical value. The main achievements are as follows:

First, clarify the logic of theoretical consistency. It is confirmed that the "good life" orientation of positive psychology is consistent with the connotation of "positive psychological experience" of students' sense of learning gain. The three form a progressive chain of "external support (positive social relationships) → internal drive (positive personal traits) → experience generation (positive subjective experiences)", and build a complete theoretical framework for enhancing the sense of

gain.

Second, verify the multi-path influence mechanism. Positive social relationships have both direct and indirect impacts on the sense of gain: directly meeting learning needs through teacher support, peer mutual assistance, etc.; indirectly acting through two paths: “social relationships → personal traits → sense of gain” and “social relationships → personal traits → subjective experiences → sense of gain”, with the chain mediating path having a more significant effect. At the same time, “teacher support”, “perseverance” and “sense of learning achievement” have the most prominent influence in their corresponding dimensions.

Third, provide practical solutions. Strategies are proposed from the environmental level (constructing a support system centered on “teachers - peers - schools”), the individual level (cultivating positive traits) and the experience level (strengthening positive subjective experiences), which provide references for optimizing teaching quality and fill the gap between theory and practice.

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