

# Effect of Environmental Factors on Learning Quality Among Adult College Students: The Mediation Role of Learning Motivation

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Received: May 8, 2023

Accepted: June 2, 2023

Online Published: August 10, 2023

doi:10.20849/jed.v7i3.1366

URL: <https://doi.org/10.20849/jed.v7i3.1366>

## Abstract

In order to explore the impact of school environment and working organization environment on the learning quality of adult college students, 629 students from two adult colleges were randomly selected as participants in this study. The questionnaires of school environment, work organization environment, learning motivation and learning quality questionnaires were filled out by participants online. Statistical analyses were conducted on SPSS26.0 and PROCESS3.5. Results showed that school environment and work environment both positively predicted the learning quality of adult college students; learning motivation of adult college students played a partial mediation role between school environment, work environment and learning quality. Based on the findings, educators and enterprises should work together to create positive learning environments that inspires students' learning motivation and improve their learning quality.

**Keywords:** adult college students, school environment, working organization environment, learning motivation, learning quality

## 1. Introduction

With China's rapid development, the education sector has ceased to be elite and has become mass education, and continuing education is gradually becoming an integral part of the education system. By 2021, there were 8326521 adult college students in China. The fourth Global Report on Adult Learning and Education, edited by the UNESCO Institute for Lifelong Learning, calls on countries around the world to improve the promotion of adult education and learning and further improve the quality of education. However, the quality for adult learning and education was not improved across the all fields of learning. Therefore, in adult higher education, it is necessary to understand how to provide high level education services to improve the learning quality of learners.

Learning quality is an important indicator of students' knowledge acquisition and is influenced by both external factors (e.g., school environment, work organization environment, social-cultural environment) (Chen et al., 2021; Xia et al., 2019) and internal factors (e.g., the influence of self-efficacy, personality traits, individual needs, learning motivation) (Li & Zhang, 2001; Ou & Sun, 2020; Sun, 2018; Yang & Jin, 2020). Gravani (2015) identified personality, interactivity, emotionality, formality as four dimensions that influenced adult learning in the context of distance education. A recent study suggested that adult students' learning depended on the interaction between personality and environment (Sun & Lin, 2022). Students' own attributes had an important effect on learning quality, but educational environment could also drive the development of individuals. Generally, educational environment refers to all factors that influence students' development in schools, including classroom instruction, extracurricular activities, different facilities, and school climate (Tong, 2020). For example, it was found that basic teaching skills, teaching level and goals perceived by university students influenced the degree of learning quality (Lu, 2013). According to Lv (2016), factors influencing university students' high-quality learning include two main dimensions: students' perceptions of the leaning context and students' preconceived notions of learning, with the perception of the learning context having a greater impact on the quality of learning. However, most of these studies were carried out among college students. According to the ecosystem theory perspective, in the process of individual continuing learning, not only the school

environment will have an impact on adult learners continuing education, but also their work environment will have an impact (Sun, 2015). Work environment here refers to the collection of factors and forces that influence the daily operation of work and have a significant role in work performance (Tian, 2021). New institutional theory suggests that the system of guidelines and norms at work can constrain members' behavior and influence individuals' beliefs and goals, which in turn affects the quality of learning (Zhao & Cai, 2018). Previous studies have found that working environment factors such as transformational leadership, procedural fairness and colleague relationship have significant effects on rural teachers' learning quality (Zhao & Liu, 2018).

Learning motivation is the kind of motivation generated by people during learning. It is a psychological state that is resulted from learning, maintained for learning, and helps individuals achieve certain learning goals (Wang & Liang, 2015). The Self-Determination Theory of motivation points out that environment can enhance individual's internal motivation and promote the internalization of external motivation by satisfying three basic psychological needs of autonomous support, competent support, and relational support (Zhang, 2019). Due to the diversity of the environment in which adult learners live, their thoughts and behaviors are also inevitably influenced and conditioned by teaching and management practices.

In summary, this study mainly explores the relationship between school and working organization environment and adult college students' learning quality, as well as the mediating role of learning motivation. Accordingly, we proposed four hypotheses:

**H1:** School environment can significantly positively predict adult college students' learning quality;

**H2:** The working environment can significantly positively predict the learning quality of adult college students.

**H3:** Learning motivation of adult college students plays a mediating role between school environment and learning quality;

**H4:** Learning motivation of adult college students mediates the relationship between working environment and learning quality.

## 2. Methods

### 2.1 Participants

In this study, 650 students from an adult college were randomly selected by the convenience sampling method. Finally, 629 questionnaires were obtained, with a valid recovery rate of 96.76%. Among participants, 311 were male (49.40%) and 318 were female (50.60%). The distribution of other demographic variables was shown in Table 1.

Table 1. Demographics of adult college students

Variables		Number (percent)
marital status	Single (single, widowed, divorced)	212(33.70%)
	Married	417(66.30%)
age	18-35	392(62.30%)
	36-45	197(31.30%)
	46-60	33(5.20%)
	Over 60	7(1.10%)
education background	junior college education	301(47.90%)
	undergraduate course	328(52.10%)
working condition	Not in work (including layoff, resignation and retirement)	58(9.20%)
	be on the job	571(90.80%)
profession	Personnel of government organs and public institutions	112(17.80%)
	Enterprise employee	290(46.10%)
	Private owner	39(6.20%)

	other	188(29.90%)
	Below 3500	75(11.90%)
income level	3501-5500	220(35%)
	5501-7500	144(22.90%)
	7500	190(30.20%)

## 2.2 Measurements

### 2.2.1 Questionnaire for Adult College Students' Motivation to Study

The Education Participation Scale (EPS), developed by Professor Boucher in Canada, is a 5-point scale with 6 dimensions, cognitive interest, career progression, social stimulation, community service, external expectations, and social contact (Cui & Wang, 2001). The higher the score, the higher the intensity of motivation, and the lower the score, the weaker the motivation. Considering the applicability of the original scale, this study eliminated some questions and the community service dimension based on the results of exploratory factor analysis from the previous study (Chen, 2013), and the final adult learner engagement motivation questionnaire consisted of 21 questions, including the career progression and cognitive interest dimensions, the social expectation dimension, and the social contact dimension, with the sub-dimensions and the total scale Cronbach's  $\alpha$  were 0.954, 0.924, 0.806 and 0.964, respectively, with construct validity of  $\chi^2/df = 5.487$ ,  $GFI = 0.858$ ,  $CFI = 0.926$ ,  $TLI = 0.916$ ,  $RMSEA = 0.085$ .

### 2.2.2 Questionnaire on Quality of Learning for Adult College Students

Learning Quality Assessment Questionnaire for Vocational School Students, developed by Tang (2021), investigates the characteristics of adult college students by a total of 7 questions from two levels: learning process quality and learning outcome quality. The items were scored on a 5-point scale, with higher scores indicating better quality of learning for adult college students. In this study, Cronbach's  $\alpha$  was 0.965, and the validation factors indicated that the structural validity of this learning quality questionnaire was  $\chi^2/df = 5.09$ ,  $GFI = 0.974$ ,  $CFI = 0.991$ ,  $TLI = 0.983$ ,  $RMSEA = 0.081$ .

### 2.2.3 School Environment Questionnaire for Adult College Students

The School Environment Scale (Feng, 2015) was used and revised considering the actual situation of school environment in adult colleges and universities. Particularly, there are 3 dimensions, overall environment, interpersonal relationship, and class. A 5-point scale, with higher scores representing better performance on this dimension, was used for the graded environment. The Cronbach's  $\alpha$  of the subscales and the total scale were 0.943, 0.891, 0.966, and 0.972, respectively. Validation factor analysis showed that the structural validity of the school questionnaire was  $\chi^2/df = 6.502$ ,  $GFI = 0.881$ ,  $CFI = 0.960$ ,  $TLI = 0.951$ ,  $RMSEA = 0.094$ .

### 2.2.4 Questionnaire on the Working Environment for Adult College Students

This study used the internal organizational environment questionnaire revised by Zhang (2020) with 14 questions under 4 dimensions (company encouragement, resource adequacy, work stress, and trust and cooperation). It is a 5-point scale, with higher scores indicating a better work environment and vice versa. The Cronbach's  $\alpha$  of the subscales and the total scale were 0.953, 0.902, 0.709 and 0.942, respectively. Validation factor analysis showed that the structural validity of the questionnaire was  $\chi^2/df = 5.83$ ,  $GFI = 0.908$ ,  $CFI = 0.949$ ,  $TLI = 0.951$ ,  $RMSEA = 0.084$ .

## 2.3 Data Analyses

SPSS 26.0 and PROCESS 3.5 macro programs were used to process the data, and statistical analyses included common method deviation test, descriptive statistical analysis of each variable, correlation analysis, and mediating effect test.

## 3. Study Results

### 3.1 Common Method Deviation Test

Because each variable in this study was collected using self-reported measures of adult college students, there may be common method bias. To avoid this effect, an unrotated exploratory factor analysis was conducted on all variables of the study using Harman's one-way test (Podsakoff et al., 2003). The results showed that the number of all factors with eigenvalues greater than 1 was 9 and the variance explained by the first factor was 39.27%, which was less than the 40% threshold, indicating that there was no serious common method bias in this study.

### 3.2 Descriptive Statistics and Correlation Analysis

Since school environment, work organization environment, learning motivation, and learning quality were continuous variable zero, Pearson product-difference correlation analysis was used for the correlation among the variables. Results were shown in Table 2. The correlation analysis showed that there were significant positive correlations between school environment, work environment, adult learners' motivation and learning quality.

Table 2. Descriptive statistics and correlation analysis of each variable

	1	2	3	4
1.school environment	—			
2.work environment	0.72**	—		
3.learning motivation	0.79**	0.13**	—	
4.learning quality	0.17**	0.65**	0.21**	—
<i>M±SD</i>	104.26±16.69	54.37±10.91	48.64±15.79	54.37±10.91

Note: \*\* $p < 0.01$ , \*\*\* $p < 0.001$  (two-tailed test); The same as below.

#### 3.2.1 Prediction of School Environment on the Quality of Learning of Adult College Students

Using stratified linear regression, two sub-dimensions of school environment, class environment and peer relationships, were significant predictors of learning quality after controlling for gender, marital status, occupation, employment status, and income level of adult college students (Table 3).

Table 3. Predictions of classroom environment and peer relationships on the quality of learning of adult college students

	<i>R</i>	<i>R</i> <sup>2</sup>	<i>F</i>	$\beta$	<i>t</i>
gender				0.014	0.330
marital status				0.021	0.481
work status	0.104	0.011	1.135	0.035	0.796
profession				-0.039	-0.912
income level				0.059	1.358
class environment	0.664	0.441	69.948***	0.659	21.854***
peer relation	0.706	0.499	77.186***	0.428	8.481***

#### 3.2.2 Prediction of Working Environment on Learning Quality of Adult College Students

By hierarchical linear regression, after controlling the gender, marital status, occupation, employment status and income level of adult college students, the internal environment of work organization has a significant predictive effect on learning quality (Table 4).

Table 4. Predictive effect of work organization environment on learning quality of adult college students

	<i>R</i>	<i>R</i> <sup>2</sup>	<i>F</i>	$\beta$	<i>t</i>
gender				0.003	0.096
marital status				0.011	0.350
work status	0.094	0.009	1.099	0.005	0.144
profession				-0.024	-0.731
income level				-0.037	-1.117
Work organization environment	0.646	0.418	74.400***	0.649	20.906***

### 3.2.3 The Influence of School Environment on Learning Quality of Adult Learners: The Mediating Role of Learning Motivation

Model 4 in Process was used to test the mediating effect. Learning quality was taken as the dependent variable, school environment as the independent variable, and learning motivation as the mediating variable. Regression analysis and mediating effect test were conducted at 95% confidence interval. The results showed that when learning motivation was taken as the outcome variable, school environment could positively predict learning motivation ( $\beta=0.165$ ,  $p < 0.001$ ). When learning quality was used as the outcome variable, both school environment and learning motivation could positively predict learning quality ( $\beta=0.778$ ,  $p < 0.001$ ;  $\beta=0.083$ ,  $p < 0.001$ ) (Table 5)

Table 5. The relationship between school environment, learning motivation and learning quality

Regression equation		Overall model fit			Significance of regression coefficient	
Outcome	Predictor	R	R <sup>2</sup>	F	$\beta$	t
learning motivation	school environment	0.165	0.027	17.523	0.165	4.186***
learning quality	learning motivation	0.795	0.633	538.790	0.083	3.367***
	school environment				0.778	31.651***

The mediating effect showed that the learning motivation of adult college students plays a partial mediating role between school environment and learning quality, with the total effect value of 0.233, the indirect effect value of 0.004 and the direct effect value of 0.229. Specifically, the Bootstrap 95% confidence interval of the mediation path did not contain 0, indicating that the mediation effect reached a significant level (Table 6).

Table 6. Analysis of the mediating effect: The mediating effect of learning motivation between school environment and learning quality

	effect size	Lower CI	Upper CI	effect size
indirect effect	0.004	0.001	0.008	1.72%
direct effect	0.229	0.214	0.243	98.28%
total effect	0.233	0.218	0.247	

### 3.2.4 The Influence of Work Environment on Learning Quality of Adult Learners: The Mediating Role of Learning Motivation

Model 4 in Process was used to test the mediating effect. Learning quality was taken as the dependent variable, working environment as the independent variable, and learning motivation as the mediating variable. Regression analysis and mediating effect test were carried out in the 95% confidence interval. The results showed that when learning motivation was taken as the outcome variable, working environment could positively predict learning motivation ( $\beta=0.132$ ,  $p < 0.001$ ). When learning quality was used as the outcome variable, both working environment and learning motivation could positively predict learning quality ( $\beta=0.633$ ,  $p < 0.001$ ;  $\beta=0.128$ ,  $p < 0.001$ ) (Table 7).

Table 7. The relationship between working environment, learning motivation and learning quality

Regression equation		Overall model fit			Significance of regression coefficient	
Outcome	Predictor	R	R <sup>2</sup>	F	$\beta$	t
learning motivation	work environment	0.132	0.017	11.073	0.132	3.328***
learning quality	learning motivation	0.669	0.438	244.023	0.128	4.220***
	work environment				0.633	20.940***

The mediating effect showed that the learning motivation of adult college students plays a partial mediating role between the working environment and learning quality, with the total effect value of 0.360, the indirect effect value of 0.009 and the direct effect value of 0.351. Specifically, the Bootstrap 95% confidence interval of the mediation path did not contain "0", indicating that the mediation effect reached a significant level (Table 8).

Table 8. The mediating role of learning motivation in the relationship between work environment and learning quality

	effect size	Lower CI	Upper CI	effect size
indirect effect	0.009	0.002	0.019	2.58%
direct effect	0.351	0.318	0.384	97.42%
total effect	0.360	0.327	0.394	

#### 4. Discussion

This study used the mediation model to investigate the influence of school environment and work environment on the learning quality of adult college students and the mediating mechanism of learning motivation. Results showed that both school environment and work organization environment significantly and positively predicted the learning quality of adult learners, and learning motivation played a partial mediating role in this process.

##### 4.1 The Influence of School Environment on Learning Quality of Adult Learners

The results of this study showed that school environment can significantly positively predict the learning quality of adult learners, and a good learning environment is conducive to the improvement of learning quality, which is consistent with previous research results. Students' learning outcomes are not only affected by students' personality characteristics, but also affected by the school environment where students live. Among these three, the most critical one is school environment (Lin, 2021; Zhao et al., 2021). School environment plays a very important role in the development of adult college students' social behavior, as school is the main place for individual learning. A more caring and challenging classroom environment can effectively improve students' sense of self-efficacy, thus improving students' learning quality to some extent (Fast et al., 2010).

##### 4.2 The Influence of the Work Environment on the Learning Quality of Adult Learners

The results of this study showed that the working environment can significantly positively predict the learning quality of adult learners, and a good working environment can help improve the learning quality of learners, which is consistent with the results of previous studies (Zhao & Cai, 2018). At the same time, it also verified the viewpoint of ecosystem theory and new institution theory, as reasonable institution in work environment can restrict individual behavior, affect individual beliefs and goals, and then affect the quality of learning. Therefore, the more positive the company's attitude towards the continuing education of adult learners, the more beneficial it is for learners to acquire knowledge.

##### 4.3 The Mediating Role of Learning Motivation in School and Working Environment and Learning Quality

This study found that learning motivation can partially mediate the relationship between school environment and learning quality of adult learners. The level of learning motivation is enhanced with the improvement of learning environment (Zhao et al., 2021). School can be further divided into two levels. The first one is the school in general; the second one is the class level. And strong learning motivation is to secure higher learning quality (Wang & Liang, 2015). Therefore, a good school environment is conducive to the generation of individual learning motivation, so that learners have greater interest in learning, more focused on learning, and thus improve the quality of learning.

This study also revealed that learning motivation can partly mediate the relationship between working environment and learning quality of adult learners. This result supported self-determination theory of motivation (Zhang, 2019). Environmental factors can improve individuals' motivation level through relational support and competency support. This finding suggested that companies maintaining a positive attitude towards students' continuing education, moderate work pressure, and high trust among team members can stimulate students' learning motivation and thus improve the quality of learning.

Through this study, it is found that the learning motivation of adult college students was related to school and working environment. What they most want to acquire is frontier knowledge related to work and new knowledge,

which brings new challenges and thinking to educators. School should provide platforms for students with access to new knowledge and new technology. This study also has some limitations. First, a cross-sectional design can not determine the causal relationship between variables. In the future, a longitudinal study design should be adopted to measure the causal relationship and dynamic changes among the variables. Second, all questionnaires in the study were finished by adult college students themselves. Future research can gather data by multiple data collection methods, such as interview.

## 5. Conclusion

The school and working environment can significantly positively predict the learning quality of adult college students; and learning motivation of adult college students plays a mediating role between school and working environment and learning quality.

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