Optimizing Cognitive Style: A Direction to Improve College Students' Learning Interest

Li Fang, Gertrude Corpuz

Abstract: Enhancing the individual learning interest of college students has received extensive attention from teachers, and the individual cognitive style of the student plays a very important role. This paper mainly optimized the status quo and trend of college students' cognitive style by studying, and optimized the cognitive style of college students and improved their learning interest by teachers according to the differences. The sample used in this article included 219 second-year undergraduate students from different majors from Hebei University of Engineering. Through a questionnaire survey, a difference scale was established for analysis. According to the characteristics of students' cognitive style, guide teachers to establish 5 types of optimization projects, so as to achieve the purpose of helping students improve their interest in learning through the intervention of instructors. The overall research results show that through the adjustment of students' cognitive styles, students with FI and FD should be intervened in education respectively, and students with different cognitive styles should be optimized to increase their interest in learning. This research is beneficial to the improvement of teaching quality which has also strengthened the learning methods of students, providing reference for the realization of education and teaching optimization in the future.

Keywords: cognitive style, field Independence and field dependence, enhance learning interest, optimize cognitive style

Ⅰ.Introduction

In recent years, college students have different performances in learning based on cognitive differences, which are mainly manifested in cognitive level, cognitive style and prior knowledge.In the past, teachers' efforts to improve students' interest in learning by changing classroom teaching patterns have not been sustainable.On the one hand, teachers began to focus on the transformation of improving students' individual cognition, so as to change the cognitive style of students and enhance their interest in learning.On the other hand, students also hoped that teachers can help optimize their own cognitive styles to change their learning styles and increased their interest in learning.Moreover, the differences in cognitive styles provided help to enhance their interest in learning.Early research included individual differences that defined cognitive style as the preferred way of organizing and processing information and experience (Lee, C, Cheng, Y., 2005).According to the different degrees of dependence on the external environment and field in the individual's cognitive processing, the individual is divided into two types of cognition, FI and FD, but Witkin believed that the cognitive style is difficult to change.This view had limitations.Because the cognitive style of college students is not constant, the questionnaire also reflects the students' desire to change their existing cognitive styleIn various studies of individual differences, there was no significant correlation between cognitive style and prior ability (Chang, 2015).Therefore, this article only studies the relationship between individual differences and cognitive style.In terms of priority abilities , the different learning patterns shown by domain-independent and domain-dependent learners also echo their characteristics (Chen, SY, Liu, X., 2008), reflecting the individual's ability to process information, solve problems, and make decisions.The stable, characteristic cognitive preferences of the students(Cotton, 2011); educators have always been interested in the possibility of using cognition and learning styles to predict educational outcomes or optimize the teaching of individual learners.However, before attempting to use styles in education, cognitive styles need to be evaluated(A, David ACook2008).

It is assumed that optimizing cognitive style has a significant effect on enhancing the learning interest of college students.In order to prove the hypothesis, when the research is based on the two cognitive styles, it is necessary to consider both the limitation of cognitive teaching inconsistency and the differences of different majors.By investigating the differences in cognitive styles of students of different majors, and comparing the differences in learning between domain-independent and domain-dependent students, the direction of cognitive style optimization is clarified, the influence of cognitive style on learning interest is explored, and the optimization of different cognitive styles is carried out to provide students' learning interest.

Ⅱ.Methodology

This paper conducted research by means of questionnaire survey.The sample came from a questionnaire survey on the current learning situation (2021) of 219 second-year undergraduates from School of Architecture and Art of Hebei University of Engineering.We obtained the degree of interest in learning by students scoring 1-10 grades of their current learning interests.Taking into account the impact of the sample's own professional differences on learning interests, the differences in learning interests in different majors were analyzed, and the inter-subject effects were tested through descriptive analysis, and conclusions were drawn.The questionnaire design referred to Michael Kirton's survey of cognitive styles, and classified them based on the learning styles of FD and FI individuals; 42.03% of the students' learning styles tended to be FD, and 91 cases in the case; 57.97% of the students' learning styles tended to be FI, There were 128 cases.According to the proportion of different students, the instructor made a detailed division of the methods of optimizing the cognitive style of FD and FI students, and established five groups of projects according to the different characteristics of students, and students with different cognitive styles chose according to their own wishes.Considering that students' choices were easily affected by external interference and other factors, we arranged students to make individual choices to ensure the authenticity of the data.Through the results of the difference analysis, we intervene in the cognitive style of the interviewed students to meet their needs.We observed students' learning effectiveness and changes in learning interest.After the test, students scored the level of guidance and described the results according to the ordinal variables as four results: completely possible, comparable, unlikely, and completely impossible.By observing the FD And FI students' feedback after the test to draw conclusions.

Ⅲ.Results

According to Table 1 and Table 2, it can be seen that the F value of learning interest in different majors is 1.677, which does not reach a significant level at the 0.05 level (P<0.05), so there is no significant difference in learning interest in different majors.

Table I Descriptive analysis of differences in learning interests in different majors

Professional	Average value	Standard deviation	Number of cases
Architecture 2001	7.7742	2.01179	31
Architecture 2002	8.0313	1.99167	32
Town and Country Planning 2001	7.5556	1.57708	27
Town and Country Planning 2002	8.0385	1.73161	26
Environmental design 2001	7.7083	2.72635	24
Environmental design 2002	7.1923	2.05950	26
Environmental design 2003	6.4828	2.81096	29
landscape garden design2001	7.9167	2.16527	24
Total	7.5845	2.18962	219

Table2 Between-subjects effect test (F test)

source	Type III sum of squares	Degree of freedom	Mean square	F	Significance (P)
Revised model	55.099[a]	7	7.871	1.677	0.116
Intercept	12477.578	1	12477.578	2659.127	0.000
Professional	55.099	7	7.871	1.677	0.116
Error	990.088	211	4.692		
Total	13643.000	219			
Revised total	1045.187	218			

According to Table 3 and Table 4, it can be seen that the t value of learning interest in different cognitive styles is -2.159, reaching a significant level at the 0.05 level, so learning interest has significant differences in different cognitive styles, and field-dependent students have lower scores than those independent students in the field.

table 3 Analysis of Differences in Learning Interests in Different Cognitive Styles (T Test) Group Statistics

	CS	Number of cases	average value	standard deviation	Standard error average
Learning interest	FD	91	7.2088	2.17826	0.22834
	FI	128	7.8516	2.16664	0.19151

table 4 Independent sample test

		Levine Variance Equivalence Test		Mean equality t test						
		F	Significance	t	Degree of freedom	Sig(Double tail)	average value Difference	Standard error difference	Difference 95% confidence interval	
									Lower limit	Upper limit
Learning interest	Assumed equal variance	0.000	0.991	-2.159	217	0.032	-0.64277	0.29775	-1.22962	-0.05592
	Does not assume equal variances			-2.157	193.346	0.032	-0.64277	0.29802	-1.23056	-0.05499

The instructor optimizes the cognitive style for different students, and establishes five sets of projects according to the students' different dispositions (Table 5 and Table 6) 53.80% of the FD on the students choosing to try item 1, and 39.80% of the FI students also chose this project, accounting for 45.70% of the total, indicating that students with different cognitive styles hope that the instructor should pay attention to their actual situation and arrange assignments that suit the students according to the differences in cognitive styles.FI students with an average score of 85.08 are more inclined to study together with similar learners, share learning results, and increase their interest in learning.This shows that students with different cognitive styles have an experience-oriented attitude towards the style they are not good at.

table 5 The relationship between learning items and the distribution of students with different cognitive styles

Item Description	Cognitive style		
	FD	FI	Total
1.Instructed by the teacher, assign homework that meets my actual situation to enhance my interest in learning	53.80%	39.80%	45.70%
2Change the teaching method (reverse the classroom, etc.) so that every student can participate in the teaching process	6.60%	7.00%	6.80%
3Help gradually establish an environment for independent learning and guide the discovery of points of interest in learning	35.20%	31.30%	32.90%
4Arrange learners with similar learning styles to team up to complete learning tasks together	3.30%	17.20%	11.40%
5The current learning interest is high and does not require the help of the instructor, complete independently	1.10%	4.70%	3.20%
Total	100.00%	100.00%	100.00%

Table 6 Differences in different cognitive styles, learning interests and academic performance

	Academic performance			
	DF		DI	
	average value	standard deviation	average value	standard deviation
1.Instructed by the teacher, assign homework that meets my actual situation to enhance my interest in learning	81.94	3.62	83.07	4.22
2Change the teaching method (reverse the classroom, etc.) so that every student can participate in the teaching process	79.87	2.42	82.01	1.83

3Help gradually establish an environment for independent learning and guide the discovery of points of interest in learning	82.64	2.91	83.91	2.90
4Arrange learners with similar learning styles to team up to complete learning tasks together	81.21	0.44	85.08	3.01
5The current learning interest is high and does not require the help of the instructor, complete independently	84.42	.	83.46	2.73

The students evaluated the selected intervention items and divided the evaluation results into four levels.From Table 7 and Table 8, it can be seen that 96.60% of the field-dependent students and 91.40% of the field-independent students are assisted by teachers.They have a positive view of enhancing learning interest.Among them, the average of the field-dependent students' academic performance is 81.93By comparing the performance of students with different learning styles, it is found that the average academic performance of independent students in the same evaluation level is higher than that of field-dependent students4.40% of the field-dependent students and 8.60% of the field-independent students believed that the teacher's intervention did not increase their interest in learning, and individual field-independent students with higher academic performance believed that the teacher's intervention was not helpful in improving their learning.

Table 7 Evaluation results of whether students and teachers with different learning styles can promote learning interest

Evaluation level	Cognitive style		
	FD	FI	Total
absolutely okay	34.10%	32.00%	32.90%
More ok	61.50%	59.40%	60.30%
Not too possible	4.40%	5.50%	5.00%
Totally impossible		3.10%	1.80%
Total	100.00%	100.00%	100.00%

Table 8 Differences in learning interest and academic performance under different cognitive levels and teacher guidance

Evaluation level	Academic performance			
	FD		FI	
	average value	standard deviation	average value	standard deviation
absolutely okay	81.92677	3.529695	84.2835	3.67589
More ok	82.29107	2.960538	83.26747	3.490685
Not too possible	79.7375	5.396612	82.74714	2.899297
Totally impossible	—	—	84.4275	2.91868

Ⅳ.Discussion

In the process of self-study, students with independent fields also hope to get help from instructors.In particular, students with different cognitive styles have a preference for teacher guidance and the formation of interest groups.The difference in their preferences may reflect the optimize ability of students' cognitive styles.For example, the results show that students with different cognitive styles are more inclined to try cognitive styles that they are not good at One possible explanation is that they hope to try to change the original cognitive style to solve the current learning difficulties.Another explanation is that students are eager to try different cognitive styles to develop their potential in learning, so as to stimulate their broader learning interests, and the intervention of instructors is that they try different cognitive styles to inspire their ideas to solve the problem.Generally speaking, the results are in line with the hypothesis.The framework of the learner's learning reference in the previous study is divided into external and internal.The external is guided by the entire environment (domain dependent), and the internal can extract significant clues (domain independent) (David A Cook), MD, 2005), this article explores more references to help students obtain information.This article believes that, regardless of whether it is to guide or provide internal clues, students' interest in learning is the basic starting point, and optimization on the basis of cognitive style should be carried out to significantly enhance learning interest.

Ⅴ.Conclusion

Regardless of whether they are field-independent or field-dependent students, their cognitive style is suitable for themselves and at the same time steadily accepting the information they need, but it does not mean that the learners are in a state of being able to control the reception of information.They may only accept the information within their ability.The information required by the teacher may not have an effect on the students.The instructor needs to help the students establish a way to optimize their cognitive style to stimulate students' interest in learning, and at the same time to establish mutual trust with the teacher relation.This research provides a reference for teachers to optimize education and teaching methods.At the same time, innovations are also made in teaching methods.Traditional optimized education and teaching methods focus on teachers' teaching skills and ignore the impact on students' persistence.This study pays more attention to the individual students, starting from optimizing the individual cognitive style of students, and constantly expanding the research in the fields of students' cognition and learning.

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