Journal of Science Education

ISSN 0124-5481

An Empirical Study on Chinese Primary School Students' Learning Interest in Science Writing

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ARTICLEINFO

Keywords:
primary students;
science writing;
learning interest

ABSTRACT

The research takes a survey on a sample of 1051 students in grade four to six from Nanjing's six primary schools to investigate the current situation of Nanjing's primary school students' learning interest in science writing. The differences of primary school students' learning interest in science writing are analyzed from the prospective of school, gender, grade, parental occupation and self-sensation in some subjects. And a regression model is built to establish the predictive ability of students' self-sensation in some subjects to their learning interest in science writing. The study shows: School, gender and parental occupations do not significantly affect students' learning interest in science writing; Students who have experienced science writing in class tend to have a strong interest in science writing; Students of grade five are the most interest in science writing, while students of grade four are significantly lower than them but slightly lower than students of grade six with little difference; A significant difference is in the students' self-sensation in some subjects to their learning interest in science writing, and students' self-sensation in Chinese and Science can predict their learning interest in science writing.

1. Introduction

Language is the Interdisciplinary key concept, and it is a key skill that almost do not depend on students' congenital conditions but can be well trained afterwards. Viewing science learning from a linguistic perspective is because academic circles are highly focus on key competences recently: Although different interpretation in key competence by many international organizations, countries, or regions, they all pay great attention to develop the abilities of languages, communications and depth thinking (EU,2013;UNESCO,2014;OECD,2016). In education, the use of language is mostly reflect on reading and writing except directly verbal communication in class. Besides, compared to reading, writing can be more authentic and direct access to students' knowledge and thoughts.

Applied writing activities on science learning area is called science writing. Science writing is a tool to foster students' scientific literacy (Yore & Treagust, 2006), it refers to activities that learners interpret, organize, review, reflect or link scientific concepts through text. Science writing can be used for self-concept construction and communication with others (Galbraith, 1999; McDermott & Hand, 2010), and has the significance of explaining and proving scientific concepts, disseminating scientific ideas (Jidesjö et al. 2009). With the deep research in science writing, the connotation and extension of science writing are also expanding, and their writing topics, types, purpose, audience and method of text production are becoming more pluralistic and flexible.

These years, some researchers such as Prain &Hand(Prain &Hand,1996)Hand, Lawrence &Yore(Lawrence &Yore ,1999), Hodson D. & Hodson J. (Hodson D. & Hodson J. ,1998) input most of their energy to science writing, successively presented five major models of science writing, Know-What-Learn models, science writing heuristic models, etc. They put these models into real class to get fully usage and promotion, proving that science writing is a powerful tool for science learning and an excellent medium connecting teachers' teaching and students' learning. It has advantages of teaching, evaluation and learning at the same time (Chinn & Hilgers,2000;Yaman,2017).Using science writing to conduct effective science learning involves the cultivate of students' critical thinking abilities(Hand&Prain,2002) and language organization abilities. Certain strategic knowledge, conceptual knowledge and explanatory knowledge are needed at the same time. Then combined and integrated these abilities and knowledge effectively (Yang& Chin, 2006; Su& Lo, 2007). Otherwise, students are likely to lose interest in science writing because of lacking certain conditions, thus losing the lasting power of science writing. Moreover, some other researches

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Accepted 2 October 2021, Available online 31 December 2021

enhance their learning interest in science writing even if they knew the importance of science writing in science learning (Mason & Boscolo, 2000).International science education emphasizes on interest teaching, and science education is not merely a way to disseminate science knowledge, it transfers more interest and attitude towards science learning to students. Therefore, students' learning interest in science writing should be considered when conducting science writing activities.

In addition, interest had always been considered to be an important aspect of both learning and achievement during about a century. Research has been conducted based in both philosophical and psychological perspectives. In the early twentieth century, Dewey discussed interest as a motive that engaged children toward an occupation and the gaining of experience by utilizing of a philosophical and pedagogical approach (White, 1977). Subsequently, Atkinson (Atkinson,1957) first defined interest value(incentive value) in view of psychological perspective. He believed that the relationship of incentive value to motive could be helpful to predict achievement. Later, based on the predecessor's research, Krapp et al. (Krapp et al. ,1992) proposed three constructs of interest: personal interest (disposition), situational interest (interestingness of contextual factors) and interest as a psychological state (combination of actualized personal interest and situational interest).

In the education setting, interest is generally subdivided into particular subjects or specific areas. Necessary tools should be provided or developed to measure and understand students learning interest in these particular subjects or specific areas, and then modify or develop pedagogical approaches or contexts to optimize student learning in these subjects or areas.

To successfully and rapidly measure students' learning interest in science writing, valid and reliable instrument should be put into utilized. There already had some developed interest scales in science education, however, even measuring interest in such fixed range, some assess general interest, some assess interest in other small directions, seldom accurately measure students' learning interest in science writing(Chin,2009; Lamb et al.,2012; Oh, et al.,2013;). Thankfully, A Scale named School Students' Learning Interest in Science Writing (Huang &Wen, 2009) was found, which excellent match the purpose of this research. But Huang &Wen only made a preliminary research on the influence of different learning stages, gender and subject performance on learning interest in science writing, no further research followed.

Therefore, this research enlarged collecting some background information of the participants, and investigated students' self-sensation in some subjects to deeply analyze the differences in students' interest in science writing.

2. Literature review

2.1 Science reading

"Science writing" is a writing activity that breaks through discipline restrictions, and belongs to "writing across the curriculum ", it gradually gained attention from 1980s. Later, writing to learn emphasizes students to achieve or gain learning and cognitive strategies, such as questioning, thinking, recording, knowledge presentation, exploring and integrating the results of learning by means of writing, and is wildly applied to learning in various fields of language, literature, sociology, and natural science (Keys, 1999). Tchudi(Tchudi, 1984), one of the first scholars to discuss the concept of science writing, pointed out that the main teaching and evaluation of science writing should not be the language itself, but the content of science subject. It also confirms that science writing is merely a kind of teaching assistant means or ways in science teaching.

In the research development stage of science, science educators have been abstracted and summarized from previous experiences to put forward a series of teaching models in writing. Osborne &Wittrock(Osborne &Wittrock ,1983)put forward the Generative Learning Model, laying a solid theoretical foundation for science writing. Two other science writing models: Explanatory Model and Scaffolding Model were raised after that model. Prain &Hand (Prain &Hand,1996) developed five major models of science writing, including topics, writing types, writing purpose, audience and method of text production. This was a relatively systematic model to be put forward early. Then, Hand, Prain &Vance (Hand, Prain &Vance, 1999) developed this model into "Writing in Science Wheel". Besides, Keys, Hand &Prain (Keys, Hand &Prain, 1999) proposed Science Writing Heuristic, which also called SWH. With the direct use of these mature models, developing the series of science writing activities is becoming much convenient and feasible. Science writing appeared in Chinese Taiwan at this period.

In addition, science educators eagerly need abundant evidence to support the development of science writing, and explore the applicable conditions of science writing in different models thoroughly, knowing their relationship and influence in the aspect of learning interest, attitude and conceptual change. For example, Mason& Boscolo (Mason& Boscolo, 2000) focused on scientific discourse in primary school students in order to their science learning; Akkus, Gunel &Hand(Akkus, Gunel &Hand,2007) using mixed method study to compare the relationship level in students' grades and teachers' achievements between Science Writing Heuristic and traditional teaching practice. Chin (Chin,2013) discussed whether science students who participate in a science writing course for the public can change their "attitude towards science writing" or "index ability perception in science writing". These empirical research not only enriches the practical significance of science writing, but also promotes the further development of theory.

The study of science writing in mainland China begins later, Zhang H. Y. & Zhang H.D. (Zhang H. Y. & Zhang H.D.) published Science writing: A science education field that should be urgent paid attention to, Cai&Chen(Cai&Chen,2010) wrote Science writing in science education, which had introduced science writing into Chinese science education researchers. In addition, with the great attention to interact with international education, many Chinese teachers now adopted aims and ways of science education which is pointed to scientific inquiry and inquiry teaching. As a way of science learning, science writing has been proved to be conducive to the cultivation of students' science literacy (Yore& Treagust, 2006). The latest curriculum standard of compulsory education in primary school science(The PRC Ministry of Education,2017) also consider highly of science literacy, trying to localization international science education, and some goals and cases suited for mainland China were added.

2.2 Learning interest

Science writing has certain help to science learning, but science writing is no easy for any students because of its specific requirements for students' knowledge reserve and related abilities. A great deal evidence has showed that keeping certain learning interest has a positive impact on their learning outcomes. However, many students lack science learning interest from an early age (Hidi & Harackiewicz, 2000;Schmidt et al., 2001),especially in science class. Hayes(Hayes,2000) found students who lack of confidence or interest may hinder their motivation of constant writing when discussing writing in the perspective of motivation and emotion. Therefore, in order to let students accept writing as the main form of science learning, learning interest should be considered in designing textbooks, curriculum content and assignment assessment.

Interest refers to the student's evaluation of how interesting and how useful the task is (Wigfield and Eccles 2000). Krapp (Krapp et al., 1992) have conceptualized interest from three different perspectives: personal or individual interest as disposition, interestingness of contextual or environmental features, and interest as a psychological state. Other researchers got similar classifications (Hidi&Baird,1986; Hidi & Anderson,1992). Individual interest refers to a relatively fixed psychological orientation that point to a certain object, activity or knowledge domain, its significant feature is immanence. Situational interest refers to a person's present interest in the environment and is considered to result from contextual

factors such as tasks, activities, tools, materials, or content of texts that make a particular domain interesting (Krapp et al. 1992). The psychological state of an individual is impacted by both actualized individual interest and situational interest (Schunk et al. 2007). Normally, these two interests are considered to interact with and relate to each other. A person's situational interest in a certain domain is considered to interact with and relate to the individual personal interest. These two factors interact to determine a person's psychological state to be interested in a certain domain. Particular features of environments generate the psychological state of interestingness in a particular domain to an individual (Krapp et al. 1992). Thus, Through long-term training, situational interest can also become the basis of individual interest. That is to say, situational interest may develop into a relatively durable individual interest under certain conditions. Since then, classification of interest is based on these categories.

3 Research Methodology

3.1 General background of research

This study takes science education of Nanjing primary schools as the overall background of the research, to analyze the differences in students' interest in science writing. Research procedures are scale test, data analysis and processing, conclusion and discovery, sequentially.

First, the aim of this research is to (1) Analyze questionnaire to understand the current situation of learning interest in science writing in grade four to six from Nanjing's six primary schools; (2) Established a regression model to get the predictive validity of students' self-sensation in some subjects to their learning interest in science writing. To achieve this aim, three research questions were raised: a. What is the reliability and validity of the instrument School Students' Learning Interest in Science Writing? Whether it can adapt science teaching environment in Nanjing? b. What are the significant differences in primary school students' learning interest in science writing in Nanjing? c. What is the predictive ability of students' self-sensation in some subjects to their learning interest in science writing?

3.2 The participants

The participants are some students in grade four to six from Nanjing's six primary schools. Schools are numbered 1-6 and are classified into two categories (old school and new school). Cluster random sampling was used to test these students. A total of 1550 scales were issued, 1533 were recovered, the recovery rate was 98.9%; After eliminating the invalid scales (Filling in all the same answer, having the phenomenon of omission or multiple filling, etc.), 1051 effective scales were obtained, and the effective rate was 68.56%. Results were statistically analyzed using SPSS 24.0.

3. 3 Instrument

Quantitative data were collected by questionnaire in this research. Using an instrument called School Students'Learning Interest in Science Writing. It was developed by Hsiao-Ju Huang and Meichun Lydia Wen to measure students' learning interest in science writing, In order to know students learning interest and willingness in science writing when teaching by science writing. This scale were developed by using five major models of science writing (Prain &Hand,1996) as basic structure, and combining factors in affecting learning interest(Darst &Pangrazi,1999; Palmer,2009).The total questions are 26, and six dimensions were contained(see Table 1).

Table1 The definition, item number, item quantity of the subscale

Subscales' name	Definition	item number and item quantity
Topics	Students' interest in choosing science writing topics (such as key concepts, factual understandings, linking themes, apply concepts, etc.).	Item 1,7,13,19 Total 4
Types	Students' interest in the types of science writing (such as reports, concept maps, posters, diagrams, etc.).	Item 2,8,14,20,25 Total 5
Purpose	Students' interest in choosing science writing purpose (such as review, clarify, demonstrate, explore, design, persuade, apply, interpret, etc.).	Item 3,9,15,21 Total 4
Audience	Students' interest in choosing science writing audience (such as peers, younger students, parents, teachers, consumers, governments, etc.).	Item 4,10,16,22 Total 4
Method of text production	Students' interest in method of text production (such as individuals, pen, groups, computer, redrafting, etc.).	Item 5,11,17,23 Total 4
Overall experience	A comprehensive assessment of students' interest in science writing activities.	Item 6,12,18,24,26 Total 5

Using 5-point rating- Likert scale to measure students' interest in science writing by the degree of approval to some main points of view. Students were required to provide descriptive answers for each of the 26 items in the 6 dimensions. Answers were scored along a scale of 1 to 5 points, from (1) Completely Disagree, (2) Partial Disagree, (3) Neutral, (4) Partial Agree (5) Completely Agree.

First, the diction of words needed analyzing according to the sequence of items. Since this scale has been well used in Chinese Taiwan and its language had been carefully reviewed by professional scholars, so there is no need to make any changes in items themselves, just revise some words(elder, network and so on)that do not conform to the context of mainland China.

In order to enable the research to be carried out in an accurate and in-depth manner, some items for understanding the basic information of the participants were added, including school, gender, grade, ages, parental occupations, writing experience in class and students' self-sensation in some subjects. Thus, the final edition of scale was formed.

Reliability testing was carried for the scale results. Nunnally (1978) recommended that alpha values should be at least 0.7, while DeVellis proposed a minimum acceptable alpha value from 0.65 to 0.70 (alpha values of 0.70–0.80 would be considered good, while 0.80–0.90 would be very good). The Cronbach's alpha values among each individual subscales were from 0.684 to 0.822, which would be considered good in general. Overall structural reliability assessment for this scale gave a Cronbach's alpha value of 0.946, which would be considered very good. Structural effectiveness was investigated via coefficient testing. The correlation coefficient between scale and subscales were from 0.848 to 0.901, and among each individual subscales were from 0.715 to 0.752. Thus, this scale had good structural validity. Contents effectiveness analysis showed that the score for each item was significantly correlated to the total score. Therefore, this scale had good content validity.

4 Results

4.1 Descriptive statistical analysis of participants' background

Part 1 of the questionnaire was student's personal basic information, its revised results were followed: 509(48.4%) were in old school, 542(51.6%) were in new school; 556(52.9%) were boys, 495(47.1%) were girls; Grade four to six were 467(44.4%),334(31.8%),250(23.8%), respectively; 627(59.7%) were experienced science writing in class, 339(32.3%) were not, and 85 were unfilled; The specific situation of self-sensation in some

subjects referred to Table 2.

Table 2 The specific situation of self-sensation in some subjects (N=1051)

	self-sensation in some subjects		
	Chinese	**Mathematics**	**Science**
Unfilled	0(0)	0.4(4)	0.8(8)
Excellent	42.4(446)	54.7(575)	44.9(472)
Good	43.7(459)	35(368)	43.8(460)
Medium or below	13.9(146)	9.9(104)	10.6(111)

Combined with the actual situation and based on National standard of occupational classification (http://ms.nvq.net.cn/nvqdbApp/htm/fenlei/ecGzs_Dl-6531.html), parental occupations were divided into 7 categories: The head of state organs, party group organizations, and enterprises; Professional technical personnel; Clerks and relevant personnel; Business and service personnel; Private operators; Operators of production and transportation equipment; No career or no constant career. These occupations were numbered 1-7, respectively (0 meant unfilled.). Results showed that parental occupations were mostly focused on category 2(Father occupied 24.26% and mother occupied 21.14%.)and full-time Mommy is common among students(15.94%).

4.2 Overall situation analysis of learning interest in science writing

The average and standard deviation of the scale and subscales were respectively analyzed. Results showed that whether it is the scale or the subscales, the primary school students in Nanjing have a positive bias in learning interest in science writing(M=4.149,S.D.=0.709). Among each subscales, "Types" has highest score(M=4.322,S.D.=0.780) while Overall experience has lowest score(M=3.924,SD=0.934).

4.3 Analysis of differences in learning interest in scientific writing

Difference analysis emphatically discussed students' learning interest in science writing under different variables, independent sample t test, variance analysis and chi square test were mainly used.

By SPSS, schools, genders were compared by means of independent samples t-tests. Result showed that there have no significant difference in schools (t=0.73,p>0.05) or genders (t=0.72,p>0.05).

Variance analysis were carried out to analyze the difference between parental occupations and learning interest in science writing. Results showed that there is no significant difference between father's occupations and students' learning interest in science writing(F=2.02,p>0.05). Since the significant value in Levene's Test for Equality of Variances of mother's occupations was lower than 0.05, so the report forms derived by SPSS invalid. In other words, parental occupations had no significant differences in students' learning interest in science writing.

In the aspect of science writing in class, using independent samples t-tests to analyze after eliminating the missing value. It was found that students who have science writing experience in class were significantly highly interested in science writing than those haven't. All subscales (expect Types) had similar results like this (see Table 3).

Table 3 Independent samples t-tests for science writing in class (N=966)

	M(S.D.)		t value
science writing in class	**Have experienced(N=627)**	**Haven't experienced (N=339)**	
Scale	4.22(0.66)	4.01(0.76)	4.45***
Topics	4.30(0.68)	4.08(0.80)	4.25***
Types	4.37(0.73)	4.24(0.86)	2.37
Purpose	4.21(0.77)	4.05(0.85)	2.95***
Audience	4.14(0.79)	3.94(0.90)	3.55***
Method of text production	4.28(0.75)	4.07(0.85)	3.77***
Overall experience	4.05(0.88)	3.68(0.98)	5.81***

***p<.001.

Table 4 variance analysis among different grades (N=1051)

	Source	**SS**	**MS**	**F**	**ηp2**
Scale	Grade	3.81	1.91	3.81*	0.007
	Error	523.43	0.50		
Topics	Grade	6.34	3.17	6.04**	0.011
	Error	550.19	0.53		
Types	Grade	2.37	1.18	1.95	0.004
	Error	636.84	0.61		

Purpose	Grade	3.38	1.69	2.61	0.005
	Error	678.51	0.65		
Audience	Grade	2.46	1.23	1.77	0.003
	Error	729.92	0.70		
Method of text production	Grade	8.93	4.46	7.17***	0.013
	Error	652.93	0.62		
Overall experience	Grade	2.77	1.38	1.59	0.003
	Error	912.49	0.87		

*p<.05, **p<.01, ***p<.001.

As shown in Table 4, students of different grades had significant differences in learning interest in science writing (F=3.81，p＜0.05，ηp2=0.007). In subscales, only Topics (F=6.04，p＜0.01,ηp2=0.011) and Method of text production (F=7. 17，p＜0.001，ηp2=0.013) had significant differences in learning interest in science writing. Scheffe post hoc comparison provides further evidence that grade four(M=4.09，SD=0.69) was significant lower than grade five(M=4.23，SD=0.72), but similar to grade six(M=4.15，SD=0.71); Grade five was no difference to grade six too. Two subscales had the same results. However, in view of the overall condition of the average score in different grades was that grade four lower than grade six and much lower than grade five, it can be concluded that students of grade five are the most interest in science writing, while students of grade four were significantly lower than them but slightly lower than students of grade six with little difference.

In addition, setting up two groups: high-scores group and low-scores group (high-scores was those at the top 27% of the participants, while low-scores was those at the least 27% of the participants) first and then considering the difference in students' self-sensation in some subjects. Chi square test was used to explore the relationship between interest in science writing and students' self-sensation in some subjects. The results were summarized in Table 5.

Table 5 Percentage distribution and chi square test for each groups students' self-sensation in some subjects (N=576)

Unit: %

Subjects	Grades	Groups		Pearson chi square / Fisher's exact probability test	Phi
		High-scores group	Low-scores group		
Chinese	**Excellent**	55.10(163)	32.50(91)	32.86***	0.24***
	Good	34.10(101)	45.00(126)		
	Medium or below	10.80(32)	22.50(63)		
Mathematics	**Excellent**	61.80(183)	44.60(125)	17.90***	0.18***
	Good	28.40(84)	41.40(116)		
	Medium or below	9.10(27)	13.60(38)		
Science	**Excellent**	62.80(186)	28.60(80)	74.74***	0.36***
	Good	30.40(90)	49.60(139)		
	Medium or below	6.10(18)	20.00(56)		

***p<.001, Missing values are very few, so they are not eliminated in data processing.

According to the results in table 5, there was a significant difference in the distribution of two groups students' self-sensation in some subjects (p＜0.001). Besides, the highest Phi correlation was between two groups and students' self-sensation in Science, followed by Chinese and the least is Mathematics (0.36>0.24>0.18). This meant a significant difference is in the students' self-sensation in some subjects to their learning interest in science writing, and relatively, Science > Chinese > Mathematics.

4.4. Trend prediction of learning interest in science writing

In this study, the forward condition method of Logistic regression analysis was used to study the impact of two groups students' self-sensation in some subjects. The final result was organized in Table 6.

Table 6 Individual parameters of students' self-sensation in some subjects to their learning interest in science writing(N=576)

Variable name	self-sensation in Chinese	self-sensation in Science	Constant
B	-0.285	-0.901	2.684
SE	0.138	0.145	0.367
Wald	4.282*	38.453***	53.512***
Df	1	1	1
Exp(B)	0.752	0.406	14.651
χ2	75.147***		
Hosmer-Lemeshow value	7.652(p≥0.05)		

Logistic regression model		Log(p/1-p)=-0.085cg-0.901sg+2.684
Correlation strength	Cox-Snell R2	0.122
	Nagelkerke R2	0.163

*p＜.05, , ***p＜.001.

It can be found in Table 6: Self-sensation in Chinese and Science entered the final regression model. Its overall regression model x 2=75.147, which exhibited difference at the 0.001 significance level; The Goodness of fit in this regression model was great(H.L.=7.652, p ⩾ 0.05). As for correlation strength, low relevant relationships between independent variable and dependent variable, and the two variable can explain 12.2% and 16.3% of the total variance of the dependent variable(Cox-Snell R2=0.122, Nagelkerke R2=0.163). That is to say, although self-sensation in Chinese and Science influences students' learning interest in science writing, it was not a decisive factor but only to make a certain prediction. (Detail information can be seen in Table 7.)

Table 7 Logistic regression for individual parameters of students' self-sensation in some subjects to their learning interest in science writing(N=576)

		Predictive value		Measurement trueness
		High-scores group	Low-scores group	
Actual value	High-scores group	186	110	62.80
	Low-scores group	80	200	71.40
Total prediction accuracy				67.00

In Table 7, 296 participants who was in high-scores group were classified according to the logistic regression model, 186 were classified into high groups (correct classification), 110 were classified to low groups (wrong classification), the correct rate was 62.80%; The 280 participants who was in low-scores group had similar classification results through the same logistic regression model. The total prediction accuracy was 67.00%, which belonged to moderate prediction, and the regression model was relatively reasonable.

5. Findings

Quantitative research method was used in this research. Having assessment and preliminary prediction of primary school learning interest in science writing based on the relevance information of the scale. Research has found that although overall learning interest in science writing is positive, many factors have various effects on students' learning interest in science. In order to promote student learning of the sciences, teachers must encourage students to develop the mindset, habit, curiosity, interest, and creativity of a scientist to focus their learning upon the process of inquiry (NRC, 1996), so as to improve their scientific literacy.

Combining science writing and science reading together is a good idea. Recent research demonstrates that since they have the need for writing, students will try to read relevant materials with a clear purpose and direction, and writing will not be an arduous task if students can apply the internalized information of reading to the written output. Reading and writing are often intertwined together and mutually reinforcing in practice(Graham &Hebert, 2010; Miller & McCardle, 2011). Therefore, teachers may wish to guide students to accumulate writing material or inspiration through reading, and then try to make science writing through the guidance of certain writing strategies, which may probably be a reliable way to improve students' learning interest in writing.

It is only to be noted that science writing is a learning activity across language and science, which cannot weaken or replace the original scientific inquiry, but it can drive students to engage in science writing by science inquiry. The charm of science teaching lies both in the intuitive experience brought to students by hands-on experiments, and the ability to organize reading and writing activities to enhance students' thinking ability. It also means that there is no fixed standard method for science teaching, and the improvement of science literacy requires continuous training of students' comprehensive ability, such as problem solving ability, communication ability and logical judging ability.

In conclusion, science writing is a feasible way to improve science literacy, and its effective facilitation requires students' learning interest.

6. Conclusion

Generally speaking, qualitative interview, classroom observation or video analysis should be taken to achieve students' learning interest, but these are too complicated and time-consuming for busy teachers and inexperienced pre-service teachers. However, this research successfully introduces Chinese Taiwan's Scale of School Students' Learning Interest in Science Writing into mainland China, analyzes the differences in learning interest in science writing from many perspectives, and can have a preliminary prediction on students' learning interest in science writing. This really meet the needs of learning interest assessment of science writing in mainland China, which is a progress compared with original research.

Having the way to quickly access learning interest in science writing, it is naturally to put relevant requirements to teachers and education researchers. For primary school teachers, more measures can be taken to enrich students learning interest in science writing, such as designing suitable writing topics to motivate their writing desires; Diversifying types of writing to avoid too much writing tasks suppressing students' learning interest; Providing more opportunities for students' communicating each other to promote the persistence of learning interest in science writing. Besides, education researchers can continue to develop the instrumentality and characterization of the scale, combine several scales together or added other research methods to maximize the advantages of scales.

In the future, it is hopefully that other techniques can be used to realize students' learning interest in a specific science writing or possible mechanism of changing students' learning interest in science writing can be found.

Acknowledge

The authors gratefully acknowledge the support provided by National Science Foundation of China (72074031).

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