

Gender Differences and Suggestions on Self-regulated Learning Ability of Primary School Students under the Background of “Internet+ Education”: An Empirical Study

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ABSTRACT

With the development of information technology, the popularization of "Internet+ education" has become a general trend. This new educational model which is characterized by the student-centered requires students to cultivate their self-regulated learning ability. The primary school stage is the critical and optimal period for cultivating the self-regulated learning ability of students. Self-regulated learning ability is an important factor to affect the academic performance of students. Many studies have shown that girls perform better academically than boys. In order to reduce this gender difference, this paper investigated the gender difference of primary school students' self-regulated learning ability. The primary school students were investigated by questionnaire. In summary, there is a gender difference in the self-regulated learning ability of primary school students, where girls are higher than boys. Finally, this paper puts forward corresponding countermeasures to guide the primary school students to cultivate their self-regulated learning ability.

KEYWORDS

Internet+ education; Primary school students; Self-regulated learning ability; Gender difference

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1 Introduction

In the 1990s, people first proposed the concept of informatization, which promoted the development of online education. "Internet+ Education" can maximize the utilization of educational resources, time and space, and flexibly meet the needs of learners.^[1] In terms of educational resources, the Internet, due to its technological advantages, can quickly absorb a large amount of knowledge and information in a short period of time, providing learners with a huge information base. In terms of educational time, learners can flexibly arrange their time according to their own needs. In terms of educational space, learners can enjoy high-quality educational resources without leaving their homes. However, the "Internet+ education" has built a student-centered education philosophy, so self-regulated learning is an inevitable problem. Faced with the rapid development of online education, it is urgent and necessary to understand the current situation and behavioral characteristics of students' self-regulated learning, while accurately choosing the main factors that contribute to the effectiveness of students' self-regulated learning. Because this is not only a bottleneck problem that teachers require solving though carrying out online education, but also an important guarantee for improving the quality of online education.^[2] However, self-regulated learning ability is an important factor that affects the learning performance of learners.^[3] These studies indicate the academic

performance of girls is generally superior to that of boys. For instance, "Among boys, difficulties with emergent literacy were associated with aggressive misbehavior and fewer prosocial interactions, while neither of these relationships was observed for girls."^[4] In long-term foreign language teaching, it has been found that female students demonstrate higher strength than male students in both test scores and classroom performances.^[5] There are gender differences in self-regulated learning ability of students, leading to female students outperforming male students in academic performance. The study of this difference plays an important role in identifying ways to improve self-regulated learning ability of students, reducing gender differences between men and women, and improving self-regulated academic achievement of students.

2 The Structure of Self-regulated Learning Ability

Constructivists question the objectivity and certainty of knowledge, emphasizing the initiative and situational nature of knowledge. This school pays attention to the active role of learners. Students actively adjust their learning strategies based on their own learning situation. At the same time, German psychologist J. Kuhl and American psychologist L. Corona proposed the will theory of autonomous learning. This theory believes that students' autonomous learning is actually a process of will control, emphasizing the learner as the main body and the executor of behavioral activities.^[6] According to Little, self-regulated ability is primarily concerned with the psychological and relational issues of learners in terms of learning process, content, critical thinking, decision-making, and selflessness.^[7] In other words, learners can independently determine their learning objectives, materials, content, and methods during the learning process. In the article "On Self-monitoring of Students' Learning", students are required to continuously obtain changes in various elements of learning activities, think scientifically about learning, and provide timely feedback in autonomous learning. The results of each student's feedback will affect their next step in learning.^[8] Zimmer's perspective is that autonomous learners can assess the effectiveness of their learning strategies and adjust their learning tasks based on feedback, such as determining the appropriateness of a particular learning strategy.^[9] To achieve optimal results and optimize their learning, Associate Professor Pang Guowei of East China Normal University recommends that individuals begin with a well-adapted learning system through self-regulated learning. Therefore, the more self-regulated learning level is, the more efficient it becomes and the better its learning outcomes.^[10]

Generally speaking, self-regulated learning allows learners to have autonomy in selecting their own learning tasks, establish clear learning objectives, and maintain a positive learning attitude. Self-regulated learning ability is divided into several aspects through cognitive strategies, metacognitive strategies, and resource management strategies: 1) learners' learning attitude is positive. 2) Learners can independently develop their own learning plans. 3) Learners can learn new skills through reflection. 4) Learners can monitor their learning progress. 5) Learners can evaluate their learning outcomes. However, previous research on self-regulated learning mainly focused on middle school students and college students, with only limited findings on primary school students. The primary school stage is the key and optimal period for cultivating self-regulated learning ability. The formation of good self-regulated learning ability at this stage will have a profound impact on the future development of learners. At the same time, few previous researches on autonomous learning have taken "Internet+ education" as the research background. However, with the continuous development of the network today, "Internet+ education" is an unavoidable problem for us.

3 Material and Method

(1) Subjects

This survey attempts to reveal the gender differences in self-regulated learning ability of primary school students under the "Internet+ education background". The respondents are from different primary schools, with grades ranging from one to six. The questionnaire is randomly distributed. The survey comprises 219 students, with a gender ratio of approximately 4:5, which is quite equal.

(2) Experimental apparatus

The questionnaire is employed in this study, referencing categorization of learning methods and domestic surveys on students' self-regulated learning. Focusing on the background of "Internet+ education" in China, the survey of primary school students' self-regulated learning ability is carried out from the following five aspects: 1) learners' learning attitude is positive. 2) Learners can independently develop their own learning plans. 3) Learners can learn new skills through reflection. 4) Learners can monitor their learning progress. 5) Learners can evaluate their learning outcomes. The content of the survey includes: learning attitude (4 questions), resource utilization (4 questions), self-monitoring (3 questions), self-planning (3 questions), self-evaluation (2 questions), self-reflection (2 questions), analytical reasoning (1 question), and academic help seeking (1 question). The scale is rated in a Likert five-point format, with scores ranging from 1-5 points for answers that are from "total disarray" to "complete agreement". The higher the score on the questionnaire, the stronger the students' self-regulated learning ability is.

(3) Data collection and analysis

A total of 211 valid responses are obtained from all 245 survey questionnaires, with only 34 being classified as invalid. The author used SPSS statistical software to input data and perform data statistics, mainly using statistical t-descriptive tests and analysis of variance.

4 Results

(1) Comparison of overall self-regulated learning abilities

According to the data, boys have an average score of 3.459 while girls have a score of 3.882. The P-value of the t-test is less than 0.01, indicating a significant difference. This shows that there are differences in the overall self-regulated learning ability of male and female pupils in the context of "Internet+ education". In contrast to male students in primary school, the average of female pupils is higher. The lack of self-directed learning skills in male students in primary school necessitates the intervention of teachers and parents.

Table 1. Status of gender difference in self-regulated learning ability

	gender	Mean	Std. Deviation	Std. Error Mean	t	p
Analytical reasoning	Male	3.47	1.253	.129	-2.374	0.018
	Female	3.85	1.031	.095		
Academic help seeking	Male	3.55	1.146	.118	-1.466	0.144
	Female	3.77	1.054	.097		
Learning attitude	Male	3.75	0.772	.079	-2.095	0.037
	Female	3.97	0.738	.068		
Resource utilization	Male	3.43	1.019	.105	-3.716	< 0.001
	Female	3.91	0.814	.075		

Self - monitoring	Male	3.26	1.067	.109	-4.428	< 0.001
	Female	3.86	0.899	.083		
Self - planning	Male	3.24	1.062	.109	-3.978	< 0.001
	Female	3.80	.981	.091		
Self - evaluation	Male	3.40	1.150	.118	-3.302	0.001
	Female	3.88	0.921	.085		
Self - reflection	Male	3.57	1.074	.110	-3.361	< 0.001
	Female	4.03	.857	.079		

(2) Analysis of the significant disparity between male and female students in self - regulated learning ability

Learning attitude includes learning motivation, self - effort, self - efficacy, and studying mood. Learning attitude refers to whether an individual can actively engage in certain activities. Resource utilization refers to whether individuals can fully utilize the resources on the Internet to help themselves. Self - monitoring refers to the ability of individuals to adjust and control their behavior in accordance with their surrounding environment. Self - planning refers to the ability of individuals to set goals based on their own situation to promote future development. Self - evaluation is the process by which an individual evaluates their thoughts and actions. Self - reflection is the capability of individuals to contemplate their actions and move ahead with it. Analytical reasoning refers to the use of learning strategies by individuals to obtain correct answers. Academic help seeking refers to individuals seeking help from others when encountering learning problems. In the context of "Internet+ education", all eight scenarios involving the use of learning strategies in the learner's self - regulated learning. Seven of the eight aspects in the survey had T - test and P - values below 0.05, which suggests significant differences between male and female students in primary school. Each of the seven items will be examined separately, as shown below.

The problem in analytical reasoning is "when encountering difficult questions, I will carefully consider the knowledge points or context to come up with answers and will not directly search for answers on the Internet." This belongs to the use of elaboration strategies in cognitive strategies. Boys score lower than girls in this area and boys choose to seek answers online, while girls use methods of learning to connect knowledge and obtain answers. The problem with learning attitude is that "in today's online environment, it is necessary for students to learn independently." "When there are no tasks, they will also view learning information online." "When achieving goals, they will feel a sense of achievement." "There is no anxiety in the process of self - directed learning. These are part of effort management strategies in resource management strategies. Girls exhibit greater resilience in maintaining their learning willpower and self - motivation than boys. The problem in resource utilization is "using network resources for learning." "Being able to obtain the desired information online." This belongs to the resource management strategy in learning strategies. Compared to boys, girls are more flexible in using their surrounding environment and resources to improve themselves. The problem in self - monitoring is that "in the process of online learning, we will not be interrupted by games, advertisements, etc." "We will be able to complete homework in a timely manner." "When we find relevant explanations online for questions that we don't know, we will think carefully and not copy them." It falls under the monitoring strategy of metacognitive strategies. Compared to boys, girls are better at regulating their behavior and knowing what they want to do. The question in the aspect of self - planning is to 'develop a learning plan.' 'Reasonably allocate time for learning and entertainment.' 'Independently complete recorded classes for learning.' The planning strategy in metacognitive strategies is the subject of this part. Girls are more inclined to establish learning objectives, allocate time for learning, and contemplate on learning approaches than boys. The

question in self-evaluation is 'understand your learning situation and state your strengths and weaknesses. 'Your grades will be reviewed every two weeks.' This relates to the metacognitive strategy in learning strategies. Compared to boys, girls are able to evaluate their learning outcomes and adjust their learning strategies in a timely manner. The question in the aspect of self - reflection is "being able to analyze and modify criticism from teachers and parents." "Being able to purchase learning materials based on one's own learning situation." This is also a part of the mediation strategy in metacognitive strategies. The process of adjusting oneself to make progress after self - evaluation is known as self - reflection. Compared to boys, girls are more likely to gain experience from the results.

5 Discussion

The preliminary survey results show that there are certain differences in self - regulated learning abilities of male and female students. In analytical reasoning, learning attitude, resource utilization, self - examination, self - planning, self - evaluation, and self - reflection, girls are more proficient than boys. This indicates that girls' self - regulated learning ability is significantly higher than boys. Students have become the main focus in learning activities due to the development of "Internet+ Education." The cultivation of self - regulated learning ability provides a profound impact on students' future. During primary school, students are less susceptible to temptations and are more likely to develop the habit of self - regulated learning. However, there are significant gender differences in primary school students' self - regulated learning abilities. To address the issue of boys with low self - regulated learning abilities, it is essential to develop effective and well-rounded learning habits.

(1) The combination of information technology and teaching tasks

Combining information technology with preview tasks and utilizing online resources to cultivate students' learning attitudes. A complete learning process is divided into three parts that are pre reading, while reading, and post reading. Pre reading is one of the effective ways to help students develop their self - regulated learning ability. Pre reading can help students understand the basic content they will learn. The implementation of modern technology in pre reading not only can enhance teaching content, but also make the classroom more inclusive in light of the new media development. Students can benefit from these activities as they engage in learning and comprehend the use of network information technology. This not only cultivates students' positive learning attitude, but also makes them better at utilizing online resources.

(2) Study group supervised by the teacher

Construct a learning system using the Internet that focuses on group learning and teacher supervision. Primary school students find it difficult to get in touch with their classmates and teachers during holidays. The Internet enables individuals to engage in group learning with their classmates, exchange ideas among peers, generate diverse intellectual impulses, and develop their analytical thinking skills. Due to the lack of self - discipline among primary school students, teachers may use a random sampling method in group activities to monitor their learning and develop their self - regulated learning ability.

(3) Start planning and reflecting from trivial matters

Parents communicate with students to guide and cultivate their self-reflection and self - planning abilities. Parents are the ones who spend the longest time with their students during their break

time. It is important to encourage students to observe their daily lives drawing conclusions, as self - reflection and self - planning ability can be improved during small things. Parents ought to develop the habit of giving priority to students' plans and actions, regardless of whether they are in life or studying.

About the Author

Ruying Wang is undergraduate of Yibin College, and her research field is the impact of gender differences in self-regulated learning ability on primary school students under "internet+ education".

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