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*Lingke KONG, Zhenlong CHU, You LI*

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# A Study of Effects of E-Learning Based Exploratory Education on Students' Self-Efficacy and Interpersonal Relationship

Lingke KONG<sup>1</sup>, Zhenlong CHU<sup>2</sup>, You LI<sup>3</sup>

## Abstract

Under constant education reform to cultivate students with transferable skills, it is necessary to effectively release excessive competition for school admission and guide normal teaching and balanced development of five ways of life. By re-positioning book knowledge as footprints commonly accumulated by humans, it might be able to recover current rigid education. Students should not be restrained from formal education, but should positively cultivate learning autonomy aiming at living to successfully seek for goals and ideal. Taking a university in Fujian Province as the empirical object, total 214 students are preceded the 15-week e-learning based exploratory education experiment (3 hours per week for total 45 hours). The research results show that exploratory education would affect self-efficacy, exploratory education would affect interpersonal relationship, and self-efficacy reveals significantly positive effects on interpersonal relationship. According to the results to propose suggestions, it is expected to help students discuss, communicate, establish goals, solve problems, and generate trust in the interaction process in learning activities as well as connect specific experience in activities with life experience, transfer and generate meanings, encourage adventure and self-challenge, self-awareness, and finally discover innovative thinking and new potential to generate the natural development for learning and change.

*Keywords:* e-learning, exploratory education, self-efficacy, interpersonal relationship

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<sup>1</sup> College of Arts, Shandong Management University, Shandong, CHINA. E-mail: konglingke2020@outlook.com

<sup>2</sup> College of Arts, Shandong Management University, Shandong, CHINA. E-mail: chuzhenlong2020@outlook.com

<sup>3</sup> Suzhou Early Childhood Education College, Jiangsu, CHINA. E-mail: you776371@gmail.com (Corresponding author)

## Introduction

Education would determine talents, and talents would decide the future of the world. It is important to complete educational tasks by applying education concepts and thoughts to educational sites through benign educational policies in order to develop individual potential. Under the constant education reform, it is necessary to effectively release excessive competition for school admission and guide normal teaching and balanced development of five ways of life to cultivate students' transferable skills. The major difference between an educated person and an uneducated person lies in the openness of the experience world. Knowledge integration is an important experience process, and the integrated experience allows people re-participating in the real world. School admission is no longer the core problem at present and in the future; instead, it is the problem of all students acquiring knowledge. Knowledge is the collective or individual experience of humans under different time and space. By re-positioning book knowledge as the footprints accumulated by humans commonly experiencing the world, it might be able to recover the current rigid education. Teachers, in the exploratory education curricula, play the role of counselors, orally encourage students' thinking and active learning, guide students to view problems from different aspects, and allow students attempting thinking with personal experience and actual operation to induce the creativity. On the contrary, teachers, with authoritarian attitudes, arrange courses with fixed rhythm and model might affect the learning motivation of students who cannot keep up with others; students therefor might follow others, without thinking, and wait for teachers' answers. It is discovered that students, with thinking and actual operation experience in an activity of exploratory education curricula, might acquire perception and inspiration. The effectiveness of exploratory education curricula therefore is changeable and can be adjusted the maximal effectiveness output from curriculum design. Questionnaire survey or qualitative method is further matched to understand whether the effectiveness output of the curricula achieves the expected effect. It does not simply require learners' active thinking and reflection, but also needs teachers thinking and reflecting the effect after the teaching.

Integrative activities learning area aims to have learners experience, reflect, and practice learning in the exploratory education activities of "conflict, problem solving, teamwork, empathy, expression, understanding and being understood, and listening". Students should not be restrained from formal education, but should positively cultivate learning autonomy aiming at living to successfully seek for goals and ideal. Effects of e-learning based exploratory education on students' self-efficacy and interpersonal relationship is therefore preceded in this study. It is expected to help students discuss, communicate, establish goals, solve problems, and generate trust in the interaction process in learning activities as well as connect specific experience in activities with life experience, transfer and generate meaning, encourage adventure and self-challenge, self-awareness, and discover

innovative thoughts and new potential to generate the natural development process of learning and change.

## Literature review

Chang *et al.* (2017) proposed the value of exploratory education that students would improve the problem-solving ability, team coherence, interpersonal interaction, frustration tolerance, character education, and self-concept after integrating learning by doing, reflection, teamwork, self-challenge, problem solving, trust building, and listening & expression, through exploratory education, into curricula. Rogers & Rose (2019) explained exploratory education as the learning approach integrating explored events, issues, or tasks into activities to guide participants' experience, perception, insight, comprehension, and application. Etherington (2017) stated that exploratory education created learning situations for learners and provided opportunities for self-search and team search so that people could find out the capability, value, enthusiasm, and responsibility. Bootsri & Taneepanichskul (2017) mentioned that teachers stressed on students' learning process maintained good relationship with students through interaction and positive feedback, carefully observed students responses, and properly provided guidance to cultivate students' behavior of active problem thinking in exploratory education curricula. Lagana *et al.* (2017) discovered that outdoor adventure & exploratory education camps could help elementary school students improve life effectiveness and self-concept. Phillips (2017) redesigned rope activity conforming to the idea of exploratory education with life effectiveness and team coherence oriented curriculum activity design and revealed learners' improvement on self-efficacy and team coherence after completing the course. The following hypothesis is therefore proposed in this study.

*H1: Exploratory education would affect self-efficacy.*

Yue *et al.* (2017) proposed interpersonal relationship theory that each person would need interpersonal relationship and classified interpersonal relationship into 3 dimensions. 1. Acceptance – referring to the feeling of being concerned. 2. Control – referring to the need for controlling others and being controlled by others. 3. Emotion – referring to the emotional feeling between two people. Warren (2019) mentioned that team based course model in exploratory education curricula allowed people understanding the importance of a team; therefore, the development of a team could be realized from individual interpersonal relationship. Ricke (2018) pointed out the improvement in self-realization and interpersonal relationship of learners, after participating in adventure education experience camps. The research result showed that exploration education could output life effectiveness, referring to individual ability indices in daily life, including time management, social skills, achievement & motivation, intelligence & flexibility, work leadership, emotion

control, proactivity, self-confidence, self-efficacy, interpersonal relationship, and team coherence. Breunig (2019) discovered that exploratory education could achieve self-efficacy, self-confidence to face difficulties, cooperation with peers, and problem-solving ability of the youth in high-risk families as well as cultivate the active learning and self-adjustment; students, after experience education, would start to face the shortage and search for solutions. Orlandi *et al.* (2019) discovered that planning and developing local activity with exploratory education could enhance cultural exchange in life and growth on education and learning; the combination of learning culture in experience with tourism would be more meaningful. Hill (2017) proposed the goals of interpersonal relationship in exploratory education, containing 1.regarding students as a team to learn from experience and solve problems through team discussion and 2.individuals and teams collaboratively breaking through difficulties to achieve the common goals. Urstad *et al.* (2018) explained to understand the importance of teamwork through designed courses and practice as well as to learn self-growth and respect other's opinions. Accordingly, the following hypothesis is proposed in this study.

*H2: Exploratory education would affect interpersonal relationship.*

Li *et al.* (2017) proposed the concept of self-efficacy with 3 major characteristics of 1.self-concept – referring to individual feeling and opinions, 2.control – personal execution ability being affected by personal experience, cognition, and self-confidence, and 3.cognitive process – judging the understanding of an affair with experience to affect individual motive for execution. Rasheed, Younas, & Sundus (2018) mentioned that a person with strong self-efficacy would present stronger self-concept, self-control, and initiative; on the contrary, a person with low self-efficacy appeared weaker self-concept, self-control, and initiative. Spieldenner *et al.* (2018) regarded self-efficacy as the cognition of personal ability; a personal with different self-efficacy would show distinct insistence on affairs. de Castro & Levesque (2018) indicated that students would have to complete lots of activities, assignments, and tasks at the learning stage; students with good self-efficacy would show better self-control and self-confidence; and, students might present better interpersonal relationship through mutual exchange for learning peers' advantages. Through adventure education experience camps, Horsman (2018) discovered that students achieved remarkable standards on self-realization and interpersonal relationship after the adventure education curriculum. Park & Yu (2018) studied campus interpersonal relationship and learning self-efficacy of students in senior high and vocational schools and found out positive effects of campus interpersonal relationship on learning self-efficacy. They further indicated that schools were the most direct small society where students enhanced the ability through observation and learning and attempted to acquire better interpersonal relationship and ability. Consequently, the following hypothesis is proposed in this study.

*H3: Self-efficacy presents remarkably positive effects on interpersonal relationship.*

## Methodology

### *Measurement of research variable*

*Self-efficacy*: Referring to Zhang, Cheung, & Law (2018), self-efficacy contains three dimensions in this study.

- 1) Cognitive effect: People with higher self-efficacy present higher ambition, longer perspectives, more considerations, and more willingness to accept challenge of difficulties, and would firmly devote to those challenges.
- 2) Motivation effect: Self-efficacy belief in being able to individually complete certain affairs would affect people's goal setting, action strategies, willingness to make efforts, insistence in facing challenges, and recovery from frustration.
- 3) Emotional effect: In face of dilemmas or threats, the pressure which people could bear depends on the degree of people being able to complete the affairs.

*Interpersonal relationship*: Referring to Lee *et al.* (2018), interpersonal relationship covers three dimensions in this study: (1) Open communication: to enhance relationship through communication; (2) Respect: mutual respect to get along with others; (3) Cooperation: to cooperate with others.

### *Research object and sampling data*

Taking a university in Fujian Province as the research object, total 214 students are preceded the 15-week e-learning based exploratory education experimental research (3 hours per week for total 45 hours). The research data are analyzed with SPSS, and factor analysis, reliability analysis, regression analysis, and analysis of variance are applied to test various hypotheses.

### *Analysis method*

Analysis of variance is applied in this study to discuss the effect of exploratory education on self-efficacy and interpersonal relationship, and regression analysis is further utilized for understanding the relationship between self-efficacy and interpersonal relationship.

## Results and discussion

### *Reliability and validity analysis*

With factor analysis, self-efficacy is extracted three factors of “cognitive effect” (eigenvalue=2.167,  $\alpha=0.83$ ), “motivation effect” (eigenvalue=1.842,  $\alpha=0.87$ ), and “emotional effect” (eigenvalue=1.491,  $\alpha=0.86$ ) in this study. The cumulative covariance explained achieves 73.188%.

Interpersonal relationship, with factor analysis, is extracted three factors of “open communication” (eigenvalue=3.752,  $\alpha=0.84$ ), “respect” (eigenvalue=2.935,  $\alpha=0.88$ ), and “cooperation” (eigenvalue=2.452,  $\alpha=0.82$ ) in this study. The cumulative covariance explained reaches 77.694%.

### *Effects of exploratory education on self-efficacy and interpersonal relationship*

1) *Variance analysis of exploratory education on self-efficacy.* According to analysis of variance, the effect of exploratory education on self-efficacy is discussed in this study, i.e. analysis and explanation of e-learning and traditional teaching. From Table 1, e-learning (4.04) reveals higher cognitive effect than traditional teaching (3.55), e-learning (4.42) appears higher motivation effect than traditional teaching (3.72), and e-learning (4.23) shows higher emotional effect than traditional teaching (3.86). H1 is therefore supported.

Table 1. Variance analysis of exploratory education on self-efficacy

variable		F	P	Scheffe post hoc
exploratory education	cognitive effect	17.251	0.000**	e-learning(4.04) >traditional teaching(3.55)
	motivation effect	26.733	0.000**	e-learning(4.42) >traditional teaching(3.72)
	emotional effect	22.186	0.000**	e-learning(4.23) >traditional teaching(3.86)

Note: \* stands for  $p<0.05$  and \*\* for  $p<0.01$ .

2) *Variance analysis of exploratory education on interpersonal relationship.* The effect of exploratory education on interpersonal relationship is discussed with analysis of variance, i.e. analysis and explanation of e-learning and traditional teaching. Table 2 shows the results of higher open communication in e-learning (4.38) than traditional teaching (3.64), higher respect in e-learning (4.17) than traditional teaching (3.92), and higher cooperation

in e-learning (4.55) than traditional teaching (3.46). As a result, H2 is supported.

Table 2. Variance analysis of exploratory education on interpersonal relationship

variable		F	P	Scheffe post hoc
exploratory education	open communication	21.387	0.000**	e-learning(4.38) >traditional teaching(3.64)
	respect	18.455	0.000**	e-learning(4.17) >traditional teaching(3.92)
	cooperation	25.633	0.000**	e-learning(4.55) >traditional teaching(3.46)

Note: \* stands for  $p < 0.05$  and \*\* for  $p < 0.01$ .

*Correlation analysis of self-efficacy and interpersonal relationship*

- 3) *Correlation analysis of self-efficacy and open communication:* To test H3, the analysis result, Table 3, presents notable effects of cognitive effect ( $\beta=0.255^{**}$ ), motivation effect ( $\beta=0.324^{**}$ ), and emotional effect ( $\beta=0.297^{**}$ ) on open communication.
- 4) *Correlation analysis of self-efficacy and respect:* To test H3, the analysis result, Table 3, shows significant effects of cognitive effect ( $\beta=0.312^{**}$ ), motivation effect ( $\beta=0.281^{**}$ ), and emotional effect ( $\beta=0.343^{**}$ ) on respect.
- 5) *Correlation analysis of self-efficacy and cooperation:* To test H3, the analysis result, Table 3, reveals remarkable effects of cognitive effect ( $\beta=0.268^{**}$ ), motivation effect ( $\beta=0.336^{**}$ ), and emotional effect ( $\beta=0.358^{**}$ ) on cooperation. As a consequence, H3 is supported.

Table 3. Analysis of self-efficacy to interpersonal relationship

dependent variable →	interpersonal relationship					
	open communication		respect		cooperation	
independent variable ↓						
self-efficacy	$\beta$	Beta	$\beta$	Beta	$\beta$	Beta
cognitive effect	0.255**	0.243	0.312**	0.295	0.268**	0.244
motivation effect	0.324**	0.306	0.281**	0.267	0.336**	0.305
emotional effect	0.297**	0.277	0.343**	0.314	0.358**	0.338



F	27.544	36.275	31.736
significance	0.000***	0.000***	0.000***
R2	0.253	0.346	0.291
adjusted R2	0.227	0.322	0.268

Note: \* stands for  $p < 0.05$  and \*\* for  $p < 0.01$ .

Data source: Self-organized in this study.

## Conclusion

The research findings show that self-efficacy and interpersonal relationship could be improved through the e-learning based exploratory education curriculum design. Exploratory education through e-learning could help students deal with efficiency by thinking and integrating opinions together. However, some students discover that rapidly dealing with affairs is not necessarily efficient. Furthermore, students find out the most efficient method as the execution after careful thinking to reduce failure and enhance efficiency. Finally, it is discovered that students comprehend the importance of efficiency in the activity. Efficiency is primary in time management, which starts from the time getting up for schools in daily life. In the activity, students do not simply find out the importance of careful thinking and efficiency, but regard searching methods in the interaction with others as a way to promote self-efficacy and interpersonal relationship. From the e-learning based exploratory education learning activities, students also discover that more opinions appear among more people; a lot of opinions might cause the dilemmas of not knowing what to do. In this case, a leader could integrate people's opinions into acceptable opinions. A leader requires leadership and certain social ability to acquire trust from others. The exploratory education curriculum is preceded with e-learning interaction, from which students could experience the feeling of social leadership.

### Recommendations

Aiming at above research results, the following suggestions are proposed in this study.

- 1) Since students, due to different experience, would receive distinct effects from e-learning based exploratory education curriculum, the future curricula could be arranged by pre-investigating students' situations in classes.
- 2) Warm-up activities or games could be added in the e-learning based exploratory education so that members could understand individual goals and confirm team

- goals to induce the interests and make comprehensive value contract to help individuals state individual goals and form team goals as well as promote the consensus to strive for the goals. It would also benefit learners' absorption.
- 3) Different reflection methods and reflection tools could be increased to enhance the willingness of members sharing and listening to experience and perception, e.g. diary writing, fishbowl, emotion exploration, picture drawing, and being along, as well as promote the participation in courses. As suggested by observers, reflection dices and reflection cards with activities as well as rewards could have students unconsciously speak out the reflection content and enhance guiders finding out conditions in the activities for students' discussion and review.
  - 4) The evaluation and improvement of e-learning based exploratory education curricula could enhance the research effect and expand the practicality of curricula. It is therefore suggested to carefully plan exploratory education activities and improve unfavorable courses to establish systematic exploratory education curricula.

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