

Analysis of Educational Effects according to the Teaching Methods in Online-Education for Underprivileged Elementary Students

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ABSTRACT

In this research, online-education was given to Korean 6th grade underprivileged students, then education efficiency was analyzed. In order to carry that out, education result based on the teaching method in online-education was analyzed. The teaching method was divided into two, one with both online mentor and offline teacher helping and the other with just the online mentor. As a result, help of both online mentor and offline teacher showed higher achievement in education performance result, online-education participation rate, and assignment completeness. Therefore help of both online mentor and offline teacher is more effective in online-education of underprivileged elementary students.

CCS Concepts

• Social and professional topics → User characteristics → Cultural characteristics

Keywords

Underprivileged students; Online-education; Mentoring

1. INTRODUCTION

The fact that students in rural area, or from underprivileged class, have less chance to get gifted education is an undeniable reality. Following the rule of equal educational opportunities in education, high quality gifted education should be provided to everyone regardless of region and economic situation. Due to unconsidered policy of Korea's science-gifted education center, many misfits came out. The policy that requires to choose certain ratio of underprivileged students without mediation of education was the main cause of the production of misfits. In order to solve this problem, continuous education program should be provided to underprivileged students to enhance student's adaptability. As one of the solutions, online-education, which is free from the limits of time and space, is given. Thus, proposing an effective teaching method in online-education for underprivileged elementary

students is the goal of this research. The detailed research problems are as follows.

(1) How is the achievement different according to teaching method in online-education for underprivileged elementary students?

(2) How do participation rate and assignment completeness vary depending on teaching method in online-education for underprivileged elementary students?

2. LITERATURE REVIEW

2.1 Underprivileged Gifted Students

Underprivileged gifted students do not have much chance to promote their giftedness, leading to difficult situation for them to grow into gifted students. The definition of Underprivileged gifted students in Korea, USA, and China are as follows. First, Korea has various definitions for underprivileged gifted students. Most typical ones are socially and economically low status, students from multi-cultural family, students from rural area, and disabled students[1]. Thus, students with relatively low chance of gifted-education are called underprivileged gifted students. In the case of USA, race or ethnic group such as African Americans, Hispanics, Native American are the standards for dividing underprivileged. Also students who do not have English as their mother tongue, poor students, students who live in certain region like retention area are defined as culturally, economically underprivileged students[2]. In China, people in unstable social status due to disability or political, economical, social deficiency are defined as underprivileged students. In other words, underprivileged students are defined as economically poor and living a low quality life[3].

In this research, neglected class student was defined as student with potential of giftedness in math and science who has difficulties to get gifted-education due to economical and cultural hindrance.

2.2 Characteristic of Underprivileged Gifted Students

Categorizing and examining characteristics of gifted underprivileged students in recognition and affective gives the following. Heo(2005) related gifted students' characteristic with poverty during adolescent period. The most important key in adolescent's problematic behavior is poverty. It delays physical development, and causes problems in recognition development, mental development and aggressive behavior[4]. Corcoran(2001) and Barron(1963) also claimed that poverty greatly affects IQ, and it is connected to low academic achievement, resulting low social status in adulthood[5][6]. Thus, underprivileged students'

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recognition trait is related to poverty issue, giving negative characteristics such as language ability deficiency, lack of stimulation in Q&A, lack of advanced learning process, lack of parent's understanding in education, and etc. Affective trait of underprivileged gifted students less gets negative influence in social, emotional development from poverty. However these students show a tendency of high self-respect, open mind for experience, and strong solidarity for groups [3].

Analyzing recognition and affective characteristics above, it is hard to anticipate any change through education in a situation like poverty. However, keeping their potential giftedness by providing education program which reflects student's positive recognition characteristic and affective characteristic is needed.

3. RESEARCH METHOD

In this research, online-education was given to underprivileged students, and differences in education effectiveness depending on teaching method were analyzed. The teaching method was divided into two, one with online mentor and offline teacher and the other with just the online mentor, then effectiveness, was analyzed. For statistical analysis, independent two-samples t-test and average difference were done through SPSS 20.0.

3.1 Research Participants

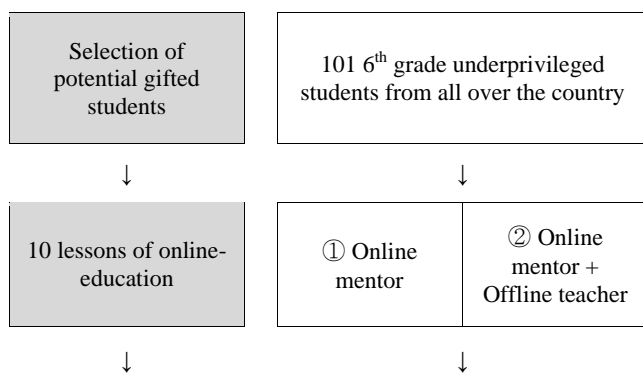
101 underprivileged students with interest in math and science were chosen all over the country in this research. Subject according to the goal of the research are shown in Table 1. 23 male students and 15 female students received teaching method only from the online mentor. 40 male students and 23 female students received study guidance from both online mentor and offline teacher.

Table 1. Research Participants

Teaching Method	Male	Female	Total
Online mentor	23	15	38
Online mentor + offline Teacher	40	23	63

3.2 Research Procedure

This research consists three steps. First, 101 students are selected. They are given ten lessons of subject oriented online-education and subject researching, then effectiveness of the online-education was analyzed. Research procedure is shown in Figure 1.



Analysis on effectiveness of online-education

Result analysis, Conclusion and Suggestion

Figure 1. Research Procedure

4. RESULT OF RESEARCH

The effectiveness of teaching methods in online-education was analyzed. Ten lessons of online-education were given to students, then online-education performance result was analyzed. All students were given for every classes. When students finished their work, it was graded by online-mentors. Education performance result was analyzed class by class, and average at assignment grade was calculated. The online-education participation rate was analyzed through the number of students who turned in their assignments. Finally, assignment completeness was analyzed through the number of submission.

4.1 Result of Achievement According to Teaching Method

The result of achievement according to teaching method was analyzed with grades of ten assignments. Based on assignment grades, mean difference and t-test were analyzed class by class. More effective online-education method could be proposed. Assignment performance result by classes are shown in Table 2.

Table 2. Result of achievement according to teaching method

Teaching Method	N(101)	Performance Result(M)	<i>t</i>	<i>p</i>
Online mentor	38	33.5	-1.968	.052
Online mentor + offline Teacher	63	47.0		

As a result of dividing into two classes by teaching method, the class with both online mentor and offline teacher showed higher performance result($t=-1.968$). However, it does not show statistically meaningful difference.

4.2 Result of Participation Rate According to Teaching Method

Participation rate was calculated by counting number of assignment submissions. This shows which teaching method is inducing more continuous participation of students. The participation rates are shown in Table 3.

Table 3. Result of participating rate according to teaching method

Teaching Method	N(101)	Participation rate(M)	<i>t</i>	<i>p</i>
Online mentor	38	4.1	-2.157	.033
Online mentor + offline Teacher	63	5.9		

Just like the assignment performance result, the class with online mentor and offline teacher showed higher participation rate($t=-$

2.157, $p=.033$). Also it showed statistically meaning difference in significance level .05.

4.3 Result of Assignment Completeness According to Teaching Method

In order to analyze assignment completeness, students who finished all 10 assignments out of ten were counted. Results are shown in Table 4.

Table 4. Result of assignment completeness according to teaching method

Teaching Method	N(101)	Assignment Completeness (N, %)	Mean Difference (A-B)
Online mentor	38	10 (26.3%)	-3.8%
Online mentor + offline Teacher	63	19 (30.1%)	

As a result, the class with online mentor and offline teacher showed about 3.8% higher assignment completeness than the other. However, as a characteristic of online-education, both of the classes showed low completeness.

5. CONCLUSION AND PROPOSAL

Online-education performance results were analyzed in three parts: assignment achievement result, participation rate, and assignment completeness.

As a result of analyzing above three, all the classes generally showed low performance results in all the categories. As with the different teaching methods, the class with online mentor and offline teacher showed higher achievements. Assignment

completeness was specially very low, meaning only a few finished all the given assignments.

This data tells that the low performance rate of online-education is similar to high halfway drop-outs rate. In order to prevent this problem, man-to-man personalized online-mentoring is needed. If the subject is an elementary student from neglected class, active study guidance from offline-mentor alongside with online-mentor's guide is needed. Lastly, offline-education such as orientation, camp and meeting with mentors are necessary to increase the participation rate of online-education. Through offline-mentoring, affective problems which are hard to deal with online-education can be solved. Also through Q&A, student's defect can be compensated right away. Therefore, parallel support of online and offline is necessary.

6. REFERENCES

- [1] Ministry of Science and Technology. 2007. The 3rd Plan of Cultivation and Development for Science Gifted Education.
- [2] Tonemah, S. 1987. Assessing American Indian gifted and talented students abilities. *Journal for the Education of the Gifted*, 10, 181-194.
- [3] Hyun Chul, J., Jiyoung R., Jiseon K. 2017. Cyber Bridge Program for Underprivileged students. Korea Foundation for the Advancement of Science and Creativity. BD17040007-6.
- [4] Nam Soon, H. 2005. The Well-being of Children in Poverty. Hakjisa .
- [5] Corcoran, M. 2001. Mobility, persistence, and the consequences of child poverty for children: Child and adult outcomes. In *Understanding poverty*, Ed. S. Danziger and R. Haveman, 127-40. Cambridge, MA: Harvard University Press.
- [6] Barron, F. (1963). *Creativity and psychological health*. Princeton, NJ: Van Nostrand.