



TEACHERS' VIEWS ON CO-EDUCATION: CO-EDUCATION OR SINGLE-SEX EDUCATION?

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Abstract: The purpose of this study is to investigate teachers' views on co-education. The study, which adopted a descriptive screening model, involved 240 teachers (142 females and 84 males) working in four primary schools and four secondary schools located in the central towns of Adana. Data were collected using Views on Co-education Scale (VCS). Analysis included descriptive statistics as well as Mann Whitney-U and Kruskal Wallis H tests. Results show that teachers mainly support co-education and do not adopt single-sex education. Religion teachers had the lowest scores in terms of supporting co-education.

Key words: Co-education, single-sex education, teachers

1. Introduction

The history of co-education is not very long; it emerged after the World War II in the majority of European countries, and after 1970 in many other countries (Eurydice, 2010). After the 1949 Revolution in China, all schools started to provide co-education with the purpose of providing everybody with equal education opportunities (Okçabol, 2013a). As for Turkish education system, as stated by Kurnaz (2011, 25), girls could attend only to Sibyan Schools (Primary Schools) until the declaration of Imperial Edict of Reorganization on 3rd of November, 1839. Daughters of top level executives could receive tutorings, but those tutorings were mainly about preparing for housewifery and motherhood. These schools taught reading and writing and religious knowledge (Önder, 2014). In 1869, Primary schools were made compulsory for boys aged between six-ten and for girls aged between seven-eleven. With this regulation, it was projected that separate schools would be opened for girls and boys in every region. Until these schools were opened, girls were allowed to attend the same schools with boys, on condition that they were in separate classes or sat in separate desks (Kurnaz, 1999).

In the Ottoman era, women's education at secondary school level started with "Kız Rüştüyeleri" (Girls' Junior High schools), which was opened in 1859 (Kurnaz, 1999; 2011; Önder, 2014). The teachers working in these schools were female, too. However, at first, until female teacher deficit was met, older and knowledgeable male teachers could also teach in these schools (Kurnaz, 1999). Rüştüyes made it necessary to educate female teachers, which led to the opening of Darülmualimat (teacher's training school for women) in 1870 (Tümer-Erdem, 2007). In the year 1910, the number of high schools which were opened for boys and girls separately was 458 for boys and 80 for girls (Önder, 2014). Girls' receiving education at high school level started with the first Girls' Idadi (High school in Ottoman era), which was opened in 1880 and whose name was changed as Sultani later (Kurnaz, 1999, 2011; Önder, 2014). Although in time various girls' schools were opened for vocational training, girls still continued having education in separate schools.

Women had the chance to have higher education with "İnas Darülfünunu" (University for women in Ottoman era), which was established in 1916. When in 1918-1919 this institution was moved to Istanbul Darülfünun building where boys were educated, girls started to receive education in the same building with boys for the first time. Although it was decided that girls and boys would receive education at separate times, this development was considered a prominent step for co-education (Tümer-Erdem, 2007). In time, the problems caused by the fact that girls and boys were educated in

the same school at different times made the authorities seek solutions. After years of debates, it was approved on 16th of September, 1921 that girls and boys could receive education together in the same classrooms, which started co-education. After transition to co-education in Science and Literature departments, Law and Medical schools started to have female students in the years 1921-1922 and 1922-1923 respectively (Kurnaz, 1999, 2011; Tümer-Erdem, 2007).

With the Law on Unification of Education launched in 1924, firstly primary schools (Akyüz, 2011) and then secondary schools started co-education in 1926 (Güven, 2010, p. 213). Then, with the The Basic Law of National Education No. 1739 of 197, co-education was adopted as one of the fundamental principles of Turkish National Education and “It is fundamental to have co-education at schools with boys and girls” sentence was added to the law. However, it was also added that “some schools could be allocated only to girls or only to boys, depending on the type of education, facilities, and obligations,”. The latest revision about co-education was making co-education compulsory in all schools in the 2000-2001 education year (Okçabol, 2013a). However, Girls’ Vocational High Schools, Girls’ Anatolian Religious Vocational High schools and general high schools, and Technical Schools for girls and boys separately continue to give single-sex education practically.

1. 1. Some Accusations Regarding Co-education

Current discussions about co-education and single-sex education indicate that people’s views on the education type they support are shaped by their religious and political approach. Hence, conservative groups object to co-education because they find it religiously inappropriate for girls and boys to receive education together and frequently mention concepts such as “sin, honor, chastity”.

On the other hand, more progressivist, democratic groups approach co-education with concepts such as human rights, democracy, equality, and justice, which again refers to their political understanding. As stated by Okçabol (2013b), “those who maintain their conservativeness to women may object to co-education, because co-education is a product of an understanding which sees men and women equal, an outcome of democratization, a prerequisite of being a citizen, and an indicator of modernity. Whether they are male or female, those who receive co-education have a higher tendency to see themselves equal”.

Some explanations regarding the accusations about co-education are as follows:

Co-education decreases success: One of the claims of single-sex education supporters is that co-education decreases success. However, studies indicate no differences between the two education types in terms of academic success, and little differences that existed were in favor of co-education. (Dale, 1969, 1971, 1974, cited in Chouinard, Vezeau, & Bouffard, 2008; Halpern et al., 2011; U.S. Department of Education, 2005; Wills, Kilpatrick, & Hutton, 2006). Gilson (1999), for example, investigated the differences in academic achievement and attitudes toward mathematics of female students from single-sex or co-educational middle schools. Result of her study show that there were no large differences for mathematics achievement or attitude for mathematics between the two groups. Pahlke, Hyde and Allison (2014), meta-analyzed data from 184 studies, representing the testing of 1.663.662 students in Grades K–12 from 21 nations, for multiple outcomes. In their meta-analysis they grouped the studies as uncontrolled (non-random assignment, it means compared school have unequal conditions) or controlled (random assignment, it means compared schools have similar conditions). As a result, it is seen that, uncontrolled studies showed very few advantages in favor of single-sex schooling for some outcomes. However, when studies using better methods (controlled, controls for selection effects) are examined, it is seen the examined studies show little or no advantage for single-sex schooling.

Co-education harms the development of gender roles: While “sex” refers to the biological and physiological characteristics that define men and women, “gender” means the socially constructed roles, behaviors, activities, and attributes that a given society considers appropriate for men and women (WHO, 2017). While gender is natural phenomena, social gender is created (Acker, 1992). In the socialization process, girls learn female roles, and boys learn male roles. These are the role expectations that are shaped in the social structure, and generally the roles expected from women

describe them as people who are weak, who are in need of protection, who are meek, and who are domestic, while men are strong, dominant, authoritative, decision makers, and managers. These traditional gender roles are also reflected in profession choices through adulthood. Professions appropriate to women are generally the ones such as housewives, teachers, secretaries, and nurses, which are parallel to motherhood. On the other hand, the professions that are seen appropriate for men include more prestigious, highly-paid ones such as engineers, doctors, and lawyers. As a social control mechanism and a socialization tool, schools reproduce the traditional gender roles for male and female students. Hence, the source of the problem- whether it is co-education or dominant culture in society, or other factors- should be discussed and searched in a more detailed way. Maybe single-sex education causes women to be more “feminine” and men to be more “masculine”. Hence, a study conducted by Karpiak, Buchanan, Hosey and Smith (2007) found no significant differences between the two school types in terms of girls' attitudes towards social gender equalities, while boys attending single-sex schools were found to have less equalitarian attitudes towards social gender roles. On the other hand, classes where only male students attended were found not to function at all in fighting with the “macho men culture” issue, it was rather found to intensify this culture (Jackson, 2002).

Choice of right field and profession is difficult in co-education: Girls are generally more inclined to verbal and social fields, while boys tend to be inclined to the fields such as mathematics and physics. In this inclination, it would be more appropriate to look for the relationships with the traditional gender roles in society, rather than the education type. Moreover, PISA 2012 national report in Turkey indicates that the difference in mathematics literacy which was in favor of girls in 2003 was reduced in 2012. Although this difference is no more statistically significant, girls' success in mathematics is still higher (MONE, 2013, p.29). However, even if their academic success is high, girls generally tend to choose professions that are appropriate to gender roles. A study on this issue shows that although there is vocational education in 37 fields in Girls' Technical and Vocational High Schools, 36% of the students are enrolled in fields such as “Child Development and Education”, 13% in “Information Technologies” (which is associated with secretaries and office members), and 12% in “Clothes Production Technologies”. In other words, 60 % of girls seem to choose fields according to social gender roles (Gökşen et al., 2011). In this regard, gender regime in the society seems to be maintained, reproduced, and sometimes intensified at schools, as well.

Co-education harms personal and social development: Saygılı (2012), who advocates single-sex schooling, reports that girls behave more timidly in co-education, their participation in classes and self-confidence decrease, while boys, who are more inclined to demonstrate decision-making, independent and violent behaviors - due to their interest in the opposite sex and increasing hormones- could experience distractions and decreases in mental performance (Saygılı, 2012). Scientific research results do not support these claims. For instance, Kenchappanavr (2012) found that female students who were educated in co-education collages had higher positive self-perceptions in comparison to female students who were educated in single-sex schools.

1.2. Purpose

Co-education in Turkey was accepted as one of the fundamental principles of national education with the The Basic Law of National Education No. 1739. On the other hand, discussions on co-education seem to be in the agenda these days. People who support and object to co-education have improved various arguments and tried to collect evidence from Turkey and other countries for supporting their views. However, teachers, who can state most accurate views on the issue, are ignored in these discussions which are far from scientific research and remain mainly at political level. In fact, teachers are people who have information about students' cognitive, social, psychological, physical, and all kinds of developmental stages. In this regard, the main purpose of this study is to explore teachers' views on co-education.

2. Method

2.1. Target Population and the Participants

Target population of this descriptive study involved class and branch teachers who worked in typical state schools located in the center towns of Adana. Using unbiased sampling method, eight schools were chosen (four primary schools and four secondary schools), and all the teachers who worked in these schools and volunteered to participate in the study were involved in the study. Accordingly, the participants of the study were 240 teachers. Of the 226 people who indicated their gender, 142 were female (62.8%) and 84 (37.2%) were male. Of the teachers who indicated years of experience in profession, 47 (19.2%) had from 0 to 5 years of experience, 40 (17.6%) had 6 to 10 years of experience, 49 (21.6%) had 11 to 15 years of experience, 48 (21.1%) had 16 to 20 years of experience, and 43 (18.9%) had experience of 21 years and over. Of the 229 teachers who indicated the school type they graduated from, 13 (5.7%) graduated from Education Institutes, 4 (1.7%) had undergraduate degree, 166 (72.5%) graduated from Education Faculties, 17 (7.4%) graduated from Science-Literature Faculties, and 29 (12.7%) graduated from other faculties. Of all the participants indicated their branch, 127 (58.3%) were class teachers and 91 (41.7%) were branch teachers.

2.2. Data Collection Tools

Data were collected through the Views on Co-education Scale (VCS) developed by Yolcu and Sari (2017). The 5-point Likert Scale (1. I totally disagree- 5. I totally agree) has 22 items and three subscales (1. Choice of Field and Profession, 2. Academic Success, 3. Personal and Social Development). The first factor is composed of 9 items related to choice of field and profession such as "In single-sex education, boys are better directed to Science and Maths fields". Cronbach Alpha internal consistency coefficient belonging to these items, which have factor loads between .68 and .79, was found .98. Second component of VCS was Academic Success subscale, which is composed of 6 items. This subscale has items related to success, such as "Success increases if girls and boys are educated in separate classes or schools". Factor loads of the items here range between .68 to .84, and Cronbach alpha coefficient is .97. The third subscale, "Personal and Social Development", is composed of 7 items such as "Both genders' self-confidence develops better in single-sex schooling". Factor loads of the items in this sub-scale range between .61 and .78, and the Cronbach Alpha internal consistency coefficient is .96. Cronbach alpha internal consistency coefficient for the total scale, which explains 88.46% of total variance, is .98.

2.3. Data Analysis

Kolmogorov-Smirnov (K-S) was performed in order to check whether VCS scores were distributed normally or not. K-S test scores were found 5.614 ($p < 0.05$) for Choice of Field and Profession subscale, 5.175 ($p < 0.05$) for Academic Success subscale, 4.687 ($p < 0.05$) for Personal and Social Development sub-scale, and 4.603 ($p < 0.05$) for the total scale scores. These findings indicate that the scale scores are not distributed normally, and thus non-parametric tests should be used. In this regard, while Mann Whitney-U test was utilized for paired comparisons, Kruskal Wallis H Test was used for the comparisons according to branch, years of experience, and the school type the teachers graduated from.

High scores obtained from VCS indicate favor for co-education, and low scores indicate favor for single-sex education.

3. Findings

3.1. Teachers' Views on Co-education

Table 1 demonstrates arithmetic means and standard deviation distributions in relation to the teachers' VCS scores.

Table 1. Means and standard deviation values of the teachers' VCS scores

Subscales	N	Mean	SD
Choice of Field and Profession	240	4.62	.68
Academic Success	240	4.54	.83
Personal and Social Development	240	4.50	.80
VCS Total	240	4.56	.71

An analysis of Table 1 shows that mean scores were quite high, over four, both in total scores and in subscales.

3.2. Teachers' Views on Co-education According to Gender

Table 2 demonstrates statistical findings in relation to the teachers' VCS scores according to gender.

Table 2. Means and standard deviation values in relation to VCS scores according to gender

Subscales	Female (n:142)		Male (n:84)	
	Mean	SD	Mean	SD
Choice of Field and Profession	4.78	.39	4.36	.94
Academic Success	4.71	.54	4.31	1.09
Personal and Social Development	4.67	.60	4.24	.099
VCS total	4.72	.45	4.31	.95

As it is seen in Table 2, female teachers' VCS mean scores range between 4.70 and 4.79, and male teachers' mean scores are between 4.26 and 4.40. Mann Whitney-U test results of teachers' VCS scores according to gender are presented in Table 3.

Table 3. Mann Whitney-U test results of teachers' VCS scores according to gender

Views on Co-education	Gender	N	Mean Rank	Sum of Ranks	U	p
Choice of Field and Profession	Female	142	123.59	17549.50	4531.500	.000
	Male	84	96.45	8101.50		
Academic Success	Female	142	122.15	17345.50	4735.500	.003
	Male	84	98.88	8305.50		
Personal and Social Development	Female	142	123.57	17547.00	4534.000	.001
	Male	84	96.48	8104.00		
VCS Total	Female	142	123.74	17570.50	4510.500	.001
	Male	84	96.20	8080.50		

*p<0.05

An analysis of the values in Table 3 indicates that there are significant differences in the views of male and female teachers in VCS subscales and total scores (p<.05); this difference is in favor of female teachers in all dimensions.

3.3. Teachers' Views on Co-education according to Branches

Table 4 demonstrates descriptive statistics of VCS scores according to branches.

Table 4. Means and standard deviations values of VCS scores according to branches

Branch	Choice of Field and Profession		Academic Success		Personal and Social Development		VCS Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Primary (n: 127)	4.62	.61	4.55	.83	4.48	.78	4.56	.67
Turkish (n:14)	4.34	1.08	4.15	1.22	4.34	.80	4.29	.98
Science (n:13)	4.70	.47	4.58	.72	4.48	1.04	4.60	.69
Social St. (n:6)	3.96	1.50	4.13	.90	4.04	1.02	4.03	1.13
English(n: 15)	4.91	.26	4.93	.17	4.80	.41	4.88	.24
Art (n: 3)	4.92	.12	4.77	.38	4.95	.08	4.89	.18
Music (n:3)	5.00	.00	5.00	.00	4.95	.08	4.98	.02
Religion (n:5)	3.04	1.22	2.80	1.23	2.77	1.14	2.89	1.18
Informatics (n:10)	4.90	.22	4.85	.37	4.83	.27	4.82	.29
Phys Ed. (n:5)	5.00	.00	5.00	.00	4.97	.06	4.99	.02
Mathematic (n:14)	4.57	.46	4.53	.57	4.53	.58	4.55	.48
Psy. Con.& Gd.(n:3)	4.77	.38	4.50	.86	4.57	.74	4.63	.62

An analysis of teachers' VCS mean scores according to branches indicate that Religion teachers had lowest scores in both subscales and total scores. Scores of all teachers in other branches was over 4.00 in all subscales and scale total scores, and very close to each other. Kruskal Wallis-H test was performed in order to analyze teachers' VCS scores according to branches. Subscale and total scores results of this test indicated that religion teachers did not favor co-education. Table 5 demonstrates Kruskal Wallis-H test results in terms of scale total scores according to branches.

Table 5. Kruskal Wallis-H test results of teachers' VCS total scores according to branches

Branch	Mean Rank	df	X ²	p	U
Primary (n:127)	109.46				ENG > PR
Turkish (n:14)	84.96				ENG > TR
Science (n:13)	120.42				ENG > MAT
Social St. (n:6)	78.00				SCI > TR
English (n:15)	138.33				PE > TR
Art (n:3)	135.17				REL < ENG
Music (n:3)	139.50	11	26.495	.005*	REL < PR
Religion (n:5)	15.60				REL < TR
Information Tech. (n:10)	128.40				REL < SCI
Physical Ed. (n:5)	147.90				REL < SS
Mathematic (n:14)	100.00				REL < IT
Psy. Con.& Gd.(n:3)	115.50				REL < PE
					REL < MAT

p<.05

As it is demonstrated in Table 5, VCS total scores differentiated significantly according to branches [X² (sd:11, N:218= 26.495)]. Mean scores of English (ENG) teachers were found to be significantly higher than the mean scores of Primary School Teaching (PR), Turkish (TR), Mathematics (MAT) teachers (p>.05). There were significant differences between Science (SCI) teachers and Turkish teachers (TR) in favor of the SCI teachers, between Physical Education and (PE) and Turkish (TR) teachers in favor of PE teachers (p<.05). As it is seen in Table 5, mean scores of Religion (REL) teachers, who had the lowest rank, were significantly lower than the mean scores of English (ENG),

Primary School (PS), Turkish (TR), Science (SCI), Social Studies (SS), Information Technologies (IT), Physical Education (PE) and Mathematics (MAT) teachers ($p < .05$).

3.4. Teachers' Views on Co-education According to Years of Experience

Table 6 demonstrates statistics about VCS scores according to the teachers' years of experience.

Table 6. Means and standard deviations of teachers VCS scores according to years of experience

Subscales	Choice of Field and Profession		Academic Success		Personal and Social Development		VCS Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Years of Experience								
0-5 years (n:47)	4.55	.70	4.38	.81	4.36	.89	4.45	.76
6-10 years (n:40)	4.80	.44	4.88	.30	4.71	.54	4.79	.40
11-15 years (n:49)	4.59	.60	4.51	.85	4.45	.86	4.53	.71
16-20 years (n:48)	4.60	.82	4.44	1.10	4.57	.77	4.55	.84
21 years and over (n:43)	4.64	.70	4.65	.63	4.49	.80	4.60	.65

An analysis of Table 6 indicates that all of the scores in relation to CVS subscales and total scores are over 4.00, and generally very close to each other. Kruskal Wallis-H test was performed to analyze the differences between the mean scores of the groups, and as it is seen in Table 7, no significant differences were detected between the mean scores according to years of experience ($p > .05$).

Table 7. Kruskal Wallis-H test results of teachers' VCS total scores according to the years of experience

Years of Experience	Mean Rank	df	X ²	p	Difference
0-5 years (n:47)	98.57				
6-10 years (n:40)	130.51				
11-15 years (n:49)	112.78	4	6.240	.182	---
16-20 years (n:48)	116.22				
21 years and over (n:43)	114.42				

3.5. Teachers' views on co-education according to the school type they graduated from

Table 8 demonstrates arithmetic mean and standard deviation values about VCS scores according to the school type teachers graduated from. As it is shown in Table 8, while the mean scores of all groups were over 4.00, mean scores for teachers who had undergraduate degree ranged between 3.66 and 3.84. On the other hand, Kruskal Wallis test results, which aimed to analyze the significance of the differences between the mean scores, showed that there were no statistically significant differences between the subscale scores or total scores (see Table 9).

Table 8. Descriptive statistics of VCS scores according to the schools teachers graduated from

Subscales	Choice of Field and Profession		Academic Success		Personal and Social Development		VCS Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
School Type								
Education Inst. (n:13)	4.53	1.1	4.67	.64	4.60	.81	4.59	.88
Undergraduate. (n:4)	3.77	1.89	3.66	1.88	3.84	1.81	3.76	1.86
Education Fac. (n:166)	4.64	.60	4.59	.74	4.51	.76	4.58	.64

Science-Lit. Fac. (n:17)	4.65	.50	4.25	1.18	4.46	.80	4.48	.73
Other Faculties (n:29)	4.65	.68	4.51	.92	4.56	.83	4.58	.78

Table 9. *Kruskal Wallis-H test results of teachers' VCS total scores according to the schools teachers graduated from*

School Type	Mean Rank	df	X ²	p	Difference
Education Inst. (n:13)	128.54				
Undergraduate. (n:4)	78.25				
Education Fac. (n:166)	114.52	3	2.453	.653	---
Science-Lit. Fac. (n:17)	109.53				
Other Faculties (n:29)	119.98				

4. Discussion, Conclusion and Recommendations

The present study investigated teachers' views on co-education. For all scores, the participants' mean scores were over 4.20 on a 5-point Likert scale, which is "very high". This finding indicates that the teachers participating in the study support co-education and do not favor single-sex education. Given that co-education is a requirement of democratic, secular, and scientific education, this finding is a pleasing one in terms of the quality of the teachers. However, as a limitation of the study, it should be mentioned that data were collected quantitatively, based on a self-report scale. The data collection tool used in the study, VCS, has statements such as "Female and male students' being in the same class decreases success". The participants were asked to indicate whether they agree with these statements or not. While assessing these items, teachers might have tended to show the desired features rather than the ones they have. This tendency is called "social desirability effect", and seen as a threat that affects the reliability of the assessment (Kođar & Gelbal, 2015). Therefore, while interpreting the high scores in the study, one should consider the social desirability effect; and before arriving at a final judgment, results of other studies that utilize similar and different methods should be waited.

The study investigated teachers' views about co-education in terms of gender, and all dimensions and scale total scores revealed significant differences in favor of the mean scores of the female teachers. Co-education is of importance particularly in terms of girls' access to education. Schooling proportions of female and male students in Turkey has not been balanced yet even at primary school level. Many families who do not want to send their daughters to school seize the right to their children's education. In this regard, co-education could be addressed as part of "female struggle". For instance, Turkish women were able to receive higher education in Science and Literature branches only after co-education started on 16th of September 1921, and then they started to receive education in Law in 1921-1922, which is followed by Medicine faculties in 1922-1923 (Kurnaz, 2011, p.106). On the other hand, co-education could be accepted as a kind of guarantee for boys and girls to receive equal and fair education. In schools where single-sex education is given, reproduction of traditional gender roles is inevitable; males are given strong, decision-maker, and higher level duties; and females are given low-paying and low-status jobs that they can do without ignoring their house; for instance, teaching and nursing. In a man-dominated culture, although it is not possible to prevent imposition of these traditional gender roles to individuals, at least it is possible to provide education to males and females in the same courses, in the same program. Here, it should be kept in mind that, just like it happened in our education history, in time needlecraft, food, and childcare courses could form majority of the curriculum in girls' schools. In this regard, in terms of protecting female rights, female teachers participating in the study might have valued and adopted the concept of co-education more than their male counterparts.

The other variables used for comparisons in the study included years of experience in profession, type of school the participant graduated from, and their branches. Among these, only the branch variable revealed significant differences in the teacher mean scores. While the mean scores of all other

branches were quite high, the lowest scores were found to belong to Religion teachers. In other words, the teacher group that is against co-education, that does not support co-education much is Religion teachers. An analysis of anti co-education discourse indicates that generally conservative segment of society advocates single-sex education, which is somewhat expected. In this regard, it is self-evident that if modern education is the main target, maintenance of co-education is needed for scientific, democratic and secular education.

The present study has found that teachers generally adopt co-education and are against single-sex education. As people who form an important part of Turkish education system, teachers' advocating co-education is of great importance in terms of making the system democratic, scientific, and secular, and creating the background needed for maintaining it. There is no doubt that co-education is not problem-free; hence, schools face various problems that range from violence to failure every day. However, while people are looking for solutions to these problems, science should be the fundamental guide at every stage of the system.

As stated by Okçabol (2013b), "co-education is a practice that generally happens as equality of men and women are adopted and popular sovereignty is prioritized. It is a product of nation formation, modernization, adoption of human rights, and humanity". Therefore, giving up co-education for the sake of finding solutions to the problems experienced is not a right thing to do. Instead, scientific studies and discussions should address the problems in education as well as possible solutions, and regulations should be provided accordingly.

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