

Investigating the Competence of Classroom Teachers in Terms of Nominating the Students with High Creativity and Gender-Biased Decisions

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Abstract

The main purpose of this study was to analyse the classroom teachers' competence in identifying above-average creative students, and their gender-bias during the identification process. A descriptive survey model was employed as a research method. A total of 317 elementary school students took part in this study. As data collecting tools, a teacher observation form, the creativity scale, and the Torrance Thinking Creativity Test were used. The results of the study enabled the determination of a teacher rating scale that helped the teachers categorize their students more clearly and differentiate them in such a way as to enable gender-bias to be reduced when compared to the teacher's opinion method. .

Keywords: Creativity, Identification, Gender-bias, Effectiveness, Efficiency, Teacher proficiency.

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Introduction

There is universal support for early and accurate identification of creativity because it is the first step in catering for the needs of students of above-average creativity. Classroom teachers fulfil an important task in the identification process by observing the students in their classes, leading to the possibility of the identification of above-average creative students being provided with relevant support (Sak, 2010). Creative potential can be found to a greater or lesser extent in every individual. Individuals with above average creativity exhibit different behavioural characteristics when compared to their peers (Feist, 2010; Rosenthal, Morrison & Perry, 1977). When students are identified in terms of creativity using the teacher rating scale or a teacher's opinion, it is assumed that creativity exists as a set of characteristics that can be isolated. The behavioural trait approach establishes a link between the psychometric perspective and the behavioural impressionistic perspective, both of which are based on observation in the identification of above-average creative students (Bakheit, 2013).

Gender-bias

One of the issues investigated in the research on creativity is whether or not there are gender-specific differences in creative potential (see Bal-Sezerel & Sak, 2013; Conti, Collins & Picariello, 2001; Kaufman, 2006; Kaufman & Baer, 2004). In one comprehensive review of gender differences in terms of creativity, over 80 studies compared the divergent thinking scores of males and females. Over half of these studies reported no difference; about two-thirds of the remaining studies favoured women or girls, with one-third favouring men or boys (Baer, 1999). Another review of recent studies on a similar topic was carried out by Baer and Kaufman (2008). The divergent thinking abilities of the participants were reviewed in 47 studies. With regard to these research studies, no significant difference in terms of gender was identified in 21 of the studies. However, males had higher significance scores than females in 3 studies, while the females had higher significance scores in 6 studies.

Hyde (2005) put forward the gender similarities hypothesis which holds that males and females are similar in most, but not all aspects, so proposing that gender differences for most cognitive variables are small or non-existent. In a meta-analytical study, Hyde determined that men's scores in terms of extraverted personal characteristics of the effects of creativity - such as openness and assertiveness in activity - were higher than women's scores ($d = .19, .51, \text{ and } .19$). However, women's scores with regard to neuroticism - such as anxiety and impulsiveness - were higher than men's scores ($d = .32, \text{ and } .01$). Another affective characteristic affecting the creativity of the individual is delay in terms of gratification (Silverman, 2003). In a meta-analytical study by Silverman (2003) which included 38 research studies, it was determined that women had higher scores than men with regard to delay of gratification ($d = .12$).

Despite the contradictory findings in the afore-mentioned studies (Baer, 1999; Hyde, 2005; Baer & Kaufman, 2008; Silverman, 2003), another meta-analysis by Peterson (2013) involving 130 research studies, demonstrating that boys were 1.19 times more likely to be identified as gifted compared to girls. However, these findings do not conclude that most teachers are hardly aware of being gender-biased (Berekashvili, 2012).

Teacher's nomination competence: effectiveness and efficiency

One of the most widely used tools of identification is the teacher rating scale (Hunsaker, Finley & Frank, 1997). Hoge and Cudmore (1986) have identified the effectiveness and efficiency of the nominating instruments:

The effectiveness reflects the ratio of the number of pupils nominated by the teacher as gifted [above-average creativity] relative to the total number identified as gifted [above-average

creativity] on the basis of the criterion measure. [...] The efficiency reflects the ratio of successful teacher designations relative to the total number identified by the teacher. p.12

The efficiency and effectiveness indices provide us with estimates of decision accuracy relative to a criterion. The effectiveness and efficiency ratio provides additional evidence related to the technical competence of the measuring instruments developed. However, these criteria do not tell us anything about the statistical significance of particular accuracy levels in particular situations.

The competence of teachers when it comes to nominating primary and/or secondary school students who were intellectually talented was analysed in a group of studies according to dimensions of effectiveness (Akar & Uluman, 2011; Alexander, 1953; Pagnato & Birch, 1959, cit. Gagne, 1994; Şahin & Çetinkaya, 2015). The efficiency ratio of mathematically gifted children with specific learning difficulties (Al-Hroub & Whitebread, 2008), students in groups with particular cultural and economic backgrounds (Gear, 1978), the gifted children in the pre-school period (Dağlıoğlu & Suveren, 2013) and the students of primary and/or secondary schools, were analysed in another group of studies (Alexander, 1953; Pagnato & Birch, 1959, cit. Gagne, 1994; Şahin & Çetinkaya, 2015). In another study, the effectiveness and efficiency of talented students terms of creativity were also analysed (Pagnato & Birch, 1959, cit. Gagne, 1994).

The strengths of the teacher rating scale were also investigated in a group study. It was determined that there was a relationship between standardised instruments and teacher rating scales (Akar & Uluman, 2013; Gagne, 1994; Mayfield, 1979; Neber, 2004), while teachers were able to successfully identify student talents when they used rating scales (Hunsaker, Finley & Frank, 1997). On the other hand, some aspects of teacher rating scales have been criticised by different researchers. One of the most important criticisms is that teachers may make a biased decision depending on student's gender in the nomination process (Endepohls-Ulpe & Ruf, 2005; Guskin, Peng & Simon, 1992; Hernandez-Torrano, Prieto, Ferrandiz, Bermejo & Sainz, 2013; Lindley & Keithley, 1991; Siegle, 2001; Siegle & Powell, 2004).

In theoretical terms, it is recommended that teachers be able to identify talented students in their classrooms when they have a list of characteristics (Hunsaker, Finley & Frank, 1997; Jost, 2006; Peters, 2009). However, an experimental study examining this issue is still lacking. The general purpose of this study is to analyse the competence of teachers in terms of identifying above-average creative students and their gender-biased decisions. In this framework, the answers to following questions were sought:

1. Do the performances of the teachers change according to the method they use in the nominating process and in terms of the gender of the students? Is there a significant relationship between the methods employed?
2. What are the performance levels of the teachers in the nominating process? Do the performances of the teachers change according to the method employed and according to the gender of the students?

Method

The research follows the descriptive survey model. The school where data was collected was chosen according to the principles of easily accessible convenience sampling.

Participants

The students who were evaluated during the nomination process were chosen from among students who have been studying with their class teachers for at least one year in the school where the evaluation was conducted. The students who failed to fulfil the requirements because they had enrolled recently were not included the study. Within this context, a total of 317 elementary school students took part in this study (grades to 2 from 4; age range 8-11; 161 female and 156 male). In

addition, the teachers who carried out the evaluation had been working as teachers for at least for two years in the institution in which the data was collected. A total of 19 elementary teachers of the students in the study group participated in the study (18 Bachelor's degrees, 1 Master's degree). Teachers were trained by the researcher. Such in-service training included the development of creativity thinking skills for 8 hours, some four months prior to the study.

Data collection tools

Torrance Test of Creative Thinking (TTCT). Students' creative potential was measured using the TTCT, figural form B. In this study, the 2007 version of the test was used, but a norm study had not been administered for Turkey for this version. However, it was noted that the studies were conducted in different cultures with TTCT figural forms, while no difference was observed in the creativity potential in terms of variables such as gender, race, socio-cultural and educational factors (Kim, Cramond & Bandalos, 2006). In the light of this result, the percentage norms of the United States of America were used in this study. The TTCT scores of the students in the study group were obtained from the guidance service of the school.

The Scale for Rating the Behavioural Characteristics of Gifted and Talented Students-Creativity (SRBCGTS-Creativity). The first sub-dimension of this scale, which was called the "creativity" of the scale and developed was by the Şahin (2013), was used as the teacher rating scale. The multi-dimensional theory and the models of giftedness and talent detailed above were utilised in the scale development. The scale is targeted to measure the individual's general creativity potential. The maximum score to be obtained from the scale is 45 and the lowest score is 9. Cronbach's α coefficient of the original scale was calculated as .82. In this study, a student who got a score of $27 \geq$ was considered as a candidate for consideration.

Teacher's Opinion Form. The teacher's observation form was created by the researcher. It contains a single statement: "*I think the students called are above-average creativity students.*" The students whose name appeared on the list were considered to be nominated and those who were not on that list were not considered for nomination.

Data analysis

The research data was first analyzed descriptively. The performance levels of the teachers involved in the nomination process were analysed through their effectiveness and efficiency ratios. Since the distribution failed to provide normality conditions, the differences between the groups were analysed using the Man-Whitney U test, and the relationship between the scores was analysed using Spearman Brown correlation analysis. The data was collected using TTCT and the nomination form was turned into standard scores (z value). Spearman Brown correlation analysis was then carried out.

Procedures

The research consists of two stages. In the first stage, the teachers who voluntarily participated in the study were asked to nominate the above-average creative students in their classes using the teacher's opinion form. In the second stage, one month after the first stage, the teachers were asked to evaluate the creativity of all the students in their classes using the SRBCGTS-Creativity instrument.

Results

The frequency and percentages related to the students who were nominated using the opinions of the teachers and the rating scale and those who were not nominated are therefore as shown in Table 1.

Table 1. *The distribution of nomination status, creativity level, and gender*

Nomination status			TTCT results	Gender	N	%	
Teachers' opinion	Nominated ones		Above–average	Female	7	53.85	
				Male	6	46.15	
				<i>Total</i>	<i>13</i>	<i>100.00</i>	
			Average	Female	23	32.39	
				Male	48	67.61	
				<i>Total</i>	<i>71</i>	<i>100.00</i>	
	Not nominated ones	Nominated ones		Above–average	Female	29	54.72
					Male	24	45.28
		<i>Total</i>	<i>53</i>		<i>100.00</i>		
		Average	Female	102	56.67		
			Male	78	43.33		
			<i>Total</i>	<i>180</i>	<i>100.00</i>		
Teacher rating scale		Nominated ones		Above–average	Female	15	53.57
					Male	13	46.43
			<i>Total</i>		<i>28</i>	<i>100.00</i>	
			Average	Female	25	32.47	
				Male	52	67.53	
				<i>Total</i>	<i>77</i>	<i>100.00</i>	
	Not nominated ones	Nominated ones		Above–average	Female	21	55.26
					Male	17	44.74
		<i>Total</i>	<i>38</i>		<i>100.00</i>		
		Average	Female	100	54.47		
			Male	74	42.53		
			<i>Total</i>	<i>174</i>	<i>100.00</i>		

The teachers in the study group evaluated a total of 317 students. The distribution of the students who were nominated according to the teachers' opinions is as follows: 30 (35.71%) are female, while 54 (64.29%) are male. But the students nominated by the teachers' rating scale were identified as 40 females (38.10%) and 65 (61.90%) males.

Among the total of 84 students nominated according to the teachers' opinions, 13 (15.48%) were determined as being above–average creative students, while 71 (74.52%) were determined as being average. A total of 233 (23.77%) students were not nominated. The students who were not nominated but were found to have an above–average degree of creativity was 53 (23.73%), while 180 (76.23%) were found to have an average degree of creativity. Among those students who were nominated according to the teachers' rating scale, 28 (26.67%) were identified as having above–average creativity while 77 (73.33%) were identified as being average. 105 (33.12%) of the students participating in the study were nominated while 212 (66.88%) of them were not nominated. The students who were not nominated but were found to have an above–average degree of creativity was 38 (17.76%), while 174 (81.31%) were just average.

Whether the performances of the teachers differed according to the method employed and the gender of the students was investigated. Afterwards, the methods used for accurately nominated students were compared. The Mann–Whitney *U* test was used to determine which group or groups caused the difference.

Table 2. Mann–Whitney *U* test results comparing gender and nomination process

	Group	<i>N</i>	Mean rank	Sum of ranks	<i>U</i>	<i>P</i>
Teachers' opinion	Above–average creative female	8	7.31	58.50	17.50	.711
	Above–average creative male	5	6.50	32.50		
	Average creative female	22	35.75	786.50	522.50	.945
	Average creative male	48	35.39	1698.50		
	Nominated ones	13	71.77	933.00	68.00	.000 ^a
	Not nominated ones	70	36.47	2553.00		
Teacher rating scale	Above–average creative female	15	18.13	272.00	43.00	.011 ^a
	Above–average creative male	13	10.31	134.00		
	Average creative female	25	45.26	1131.50	493.50	0.880
	Average creative male	52	35.99	1871.50		
	Nominated ones	28	91.50	2562.00	.00	.000 [*]
	Not nominated ones	77	39.00	3003.00		
Above–average creative	Teachers' opinion	83	83.73	6949.50	3463.50	.016 ^b
	Teacher rating scale	105	103.01	10816.50		
Average creative	Teachers' opinion	70	69.64	4875.00	2390.00	.237
	Teacher rating scale	77	77.96	6003.00		

^a*p* < .01, ^b*p* < .05.

There was a significant difference between the scores of the nominated and the non-nominated ones according to the teachers' opinions. This had a medium effect ($U = 68.00$, $z = -4.850$, $p < .01$, $d = .53$). When the mean rank is taken into consideration, it was seen that this observed difference is susceptible to those nominated according to the teachers' opinions (71.77). In addition, there is a significant difference between the scores of above–average creative females and above–average creative males according to the teachers' rating scales, stating that they had a medium effect ($U = 43.00$, $z = -2.531$, $p < .01$, and $d = .48$). The mean rank of the students was higher for female students (18.13) than for males (10.31).

When the scores of the nominated and non-nominated students were compared according to the teacher's rating scales, a slight difference in the level of significance was noted ($U = .00$, $z = 7.815$, $p < .01$, and $d = .00$). It was seen that this observed difference tended to apply to the nominated students according to the teachers' rating scale (91.50). Moreover, there was a significant difference between the above–average creative students according to the teachers' opinions and the teachers' rating scale, but with a small effect ($U = 3463.50$, $z = 2.414$, $p < .05$, and $d = .18$). The mean rank of the above–average creative students, according to the teachers' rating scale (103.01), was higher than the teachers' opinions (83.73). On the other hand, other comparisons showed no significant difference. Besides, the scores of SRBCGTS–Creativity and TTCT were found to have a significantly positive relationship and had a medium effect ($r = .53$, $r^2 = .28$, $p < .01$).

Table 3. Result of efficiency and effectiveness ratio (%)

		Efficiency	Effectiveness
Teachers' opinion	Female	23.33	19.44
	Male	11.11	20.00
	Total	15.48	19.70
Teacher rating scale	Female	37.50	41.66
	Male	20.00	43.33
	Total	26.67	42.42

According to the teachers' opinions, female, male and total effectiveness and the efficiency of the teachers are, respectively, 23.33%, 11.11%, 15.48%, 19.44%, 20.00% and 19.70%. However,

according to the teacher rating scale, those scores are determined respectively, 37.50%, 20.00%, 26.67%, 41.66%, 43.33% and 42.42%.

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Discussion

In the study, the performance of the teachers in terms of the nominating process will be discussed initially. We will also discuss whether or not the afore-mentioned performance changed according to the gender of the students.

It was found in the study that the scores of the students nominated by their teachers differed from those who weren't nominated when the teachers' opinion and teacher rating scales were used. This finding indicates the effectiveness of both methods with regard to the nominating process. When we compared the TTCT scores of the students who were nominated through two different methods, a significant difference was determined in favour of the teacher rating scale. Those findings may be considered as evidence supporting the theoretical suggestions (Jost, 2006; Peters, 2009) pointing out that the use of a measurement instrument during the identification process might increase performance during the identification process.

When the teacher rating scale was used during the nomination process, a significant difference was noted between the groups in accordance with gender. This finding was thought to be explained due to the expectations of the teachers and the interactions with their students. Namely, males and females students expressed different interests and talents (VanTassel-Baska, 1998). However, teachers' expectations with regard to males are higher than those with regard to females (Lindley & Keith, 1991). Siegle and Powell (2004) suggest that males receive special attention from teachers in the nomination process for gifted programmes because they receive more attention from them in the classroom. Moreover, teachers were inclined to spend more time interacting verbally and non-verbally with male students. When talking to their students face to face, they spend more time on male students than on female students (Sadker & Sadker, 1995, cit. Siegle, Moore Mann & Wilson, 2010).

From the findings obtained in this study, it may be concluded that there are higher expectations with regard to male students than is the case with regard to female students, which is in line with the findings in the literature. In other words, female students are nominated on condition that their creative thinking abilities are higher than their male peers. When the number of the nominated students was analysed, this estimation was verified; namely, 40 female and 65 male students were nominated when the teacher rating scale was used. Male students were nominated 1.38 times more than female.

When the number of the nominated students was analysed according to the teachers' opinions, the results indicate that gender-specific discrimination occurred. However, no significant difference was observed between the groups. The results of the analysis may be regarded as another finding indicating that the use of a tool such as a teacher rating scale during the nominating process helps in reflecting the opinions of the teachers.

Another topic analysed in the study is whether or not the performances of the teachers changes according to the methods used in the nominating process and the gender of the students. Various studies show that the effectiveness ratio with regard to the process in which the teachers nominate students considered as being talented in the intellectual area was .14-.45 (Akar & Uluman, 2011; Alexander, 1953; Pegnato & Birch, 1959, cit. Gagne, 1994) and the efficiency ratio was .27-.85

(Alexander, 1953; Al-Hroub & Whitebread, 2008; Dağlıoğlu & Suveren, 2013; Gear, 1978; Pegnato & Birch, 1959, cit. Gagne, 1994).

In terms of creativity, the effectiveness ratio was .15, while the efficiency ratio was .10 (Pegnato & Birch, 1959, cited Gagne, 1994). When the findings obtained from this study with regard to the effectiveness and efficiency ratio are compared to the study by Pegnato and Birch (1959, cit. Gagne, 1994), the teachers in this study may be considered to demonstrate higher performance.

According to the researcher, this difference may emerge as a result of an eight hour course that the teachers received four months prior to the research. The efficiency and effectiveness of the identification process are in line with teacher qualifications (Akar & Uluman, 2013; Gear, 1978; Hunsaker, Finley & Frank, 1997; Hoge & Cudmore, 1986; Rohrer, 1995; Şahin & Çetinkaya, 2013). Moreover, almost half a century has passed since the aforementioned study prepared in 1959. However, creativity started to attract the attention of educators following the studies by Guilford in the 1950s. Additionally, teachers have encountered numerous warnings concerning developments in communication technologies and scientific studies related to creativity. This situation may have affected the knowledge and attitudes of teachers.

In this study, the general average ratios concerning effective and efficiency in the groups were found to be 42.42% and 26.67%, respectively when the teacher rating scale was used in the process of nomination, while the ratios were found to be 19.70% and 15.48%, respectively when the teachers' opinions were used. Other studies show that the majority of the students who were nominated as being talented were chosen from the successful-bright and those students who won the favour of their teachers (Betts & Neihart, 1988; Schack & Starko, 1990; Rohrer, 1995). On the other hand, teachers did not pay attention to poor psychomotor development, lack of social skills, lack of emotional control or lack of advanced reading ability (Rohrer, 1995), nor to underachievers and children with low achievement motivation (Endepohls-Ulpe & Ruf, 2005).

Hollyhand (2013) has revealed that students displaying positive gifted characteristics, including creative properties, were three times more likely to be nominated for a gifted programme than students exhibiting negative gifted characteristics, including creative properties. According to Jost (2006), identifying talented students becomes difficult when the in-class performances of the students fall behind their ability levels. The effectiveness and efficiency ratios noted in the study were thought to be explained by this aspect. It is possible that the majority of the above-average creative students who were nominated in this study may have been chosen from the students who exhibit themselves and are bright.

The effectiveness ratios of the students who were nominated according to the teachers' opinion related to their gender have thus been analysed. It was determined that male students were identified more effectively than female ones, but the difference between the two genders was too slight to be significant. When the efficiency ratio was analysed, it was determined that female students (23.33%) were identified with hit rates that were more than twice as high as that of their male peers (11.11%). In this context, the effectiveness and efficiency ratios of teacher rating scales largely overlap with the data provided in terms of the teachers' opinions. This is in line with the findings of Peterson (2013) which were that male students were nominated 1.07 times more than their female peers. These findings are common in 9 studies, including the students who were nominated by their teachers for participation in gifted programmes.

Moreover, additional supporting evidence may be considered as the male students noted above tended to be evaluated with higher expectations than their female peers. In fact, using a tool as part of the process of nominating reduced gender bias from 1.70 to 1.38. This finding supports the theoretical suggestions that the use of a measurement tool might improve the outcome of the identification process.

Conclusion and Limitations

Within the scope of the study, 317 students were assessed by 19 teachers. Subsequently, 84 students were nominated according to the teachers' opinions, while 105 students were nominated when nominating scales were used. The teachers who used the teacher rating scale were able to nominate one in four students correctly, and choose two of the five above-average students in their classes. However, the teachers could correctly nominate three out of twenty students and choose one of the five above-average students in their classes by using the teachers' opinion form.

It was observed that the teachers nominate girls more than the boys. In this process, using an instrument enabled an increase in the identification process performance, and a decrease in gender-bias. This finding is important since it fills an important gap in the literature. On the other hand, the creativity perceptions of teachers in Turkey, and in this context, the reasons for their low expectations for female students, should be investigated. The culture-specific determination of the lower expectations of the educators in relation to female students is necessary for preventing/decreasing gender-bias.

This study has some limitations. The first one is that the information related to the teachers' creative thinking skills has not been evaluated. This is an important limitation affecting the nomination process of teachers. However, it may also have been possible to provide teachers with an 8-hour training session related to creative thinking within the scope of an in-service training programme in the schools where they work, four months prior to the study. This might have provided the basic knowledge they needed in nominating students with a high level of creativity.

A common emphasis on the definitions of above-average creativity adopted by different researchers is that the average has creativity. However, a consensus has not been established in the literature regarding the percentage of society who are creative, and on the need for such a discussion. In this study, the students in the first 25% segment according to the TTCT scores were regarded as being above-average in terms of creativity.

The nominating behaviour of the teachers was not controlled in terms of the Hawthorne effect. Accordingly, the numbers of the students who were nominated by the teachers may be increased or decreased. This situation threatens the external validity of the study, and so damages the generalisability of the research findings.

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