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Proceedings

*Redefining Education, Learning and Teaching
in the 21st Century:
the Past, Present and Future of
Sustainable School Effectiveness*

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THE INFLUENCE OF CHILDREN'S ACADEMIC SELF-EFFICACY ON THEIR ACHIEVEMENTS: A GENDER-BASED EXPLORATION STUDY IN INDONESIA

Yulia Ayriza
Yogyakarta State University
ayriza_03@yahoo.co.id
yulia_ayriza@uny.ac.id

Abstract

Findings of research conducted in America and Europe have shown that children's academic self-efficacy is influenced by gender stereotypes of such environments as their parents and teachers (Eccles, 1989; Eisenberg, Martin, & Fabes, 1996; Junge & Dretzke, 1995). Consequently, children may have high self-efficacy in certain academic areas in accordance with how they perceive the gender-stereotypes they are exposed to. It is believed that boys are more excellent in mathematics and science than girls who are more talented in language. This study is aimed at exploring whether or not Indonesian male and female children show differences of academic self-efficacy in mathematics, science, and language; and whether or not their academic achievements in those three subjects are different. This study is also intended to examine whether children's academic self-efficacy influence their achievements. 375 fifth graders of private and public elementary schools in Yogyakarta, Indonesia were involved in this study. Using survey approach with scale and documentation methods to collect data, the results of the analyses showed that there were no differences of mathematics self-efficacy, science self-efficacy, and language self-efficacy between male and female children. Further, there were neither differences of mathematics achievement nor science achievement between male and female children. However, female children showed significantly higher language achievement than male. At last, children's academic self-efficacy was found to significantly influence their achievement. Some of these results contradicted those revealed in America and Europe, and are currently dealt with in this article.

Keywords: *academic self-efficacy; achievement; gender-based exploration study in Indonesia*

A. Introduction

The success of a human life is determined by many factors, both internal and external factors. One of the external factors that is quite influential is cultural influences of gender stereotypes that can be detrimental to children's development.

The influence of gender stereotypes exists everywhere, including in Indonesia, which still adheres to the patriarchal customs. This influence is extended to children through socialization agents such as families, schools, peers, and mass media. They influence children through their daily interactions. Specifically related to academic, parents often require different skills and academic achievements to boys and girls (Eccles, Jacobs, Harold, Yoon, Arbreton, & Freedman-Doan, 1993).



Meanwhile, teachers' beliefs about the different characteristics of boys and girls have unconsciously caused them distinguishing children by gender in their attitudes and behaviors. For example, elementary school teachers believe that boys have superior abilities in mathematics and science than girls (Shepardson & Pizzini, 1992).

Based on gender stereotype practices that happen from generation to generation, children adopt and internalize gender stereotyped values into their gender roles (Lips, 2005). As a result, children experience bias perception of their abilities in the areas of academic, interpersonal, and career interests (Bussey & Bandura, 2004).

This finding is in line with those showing that more girls have self-efficacy in language (Pajares, Miller, & Johnson, 1999), and more boys in science, mathematics, and technology (Pajares & Miller, 1994). A similar study with children aged 11-15 years also found that boys showed self-efficacy in mathematics and geography, while girls in language (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). Such academic self-efficacy further resulted in children's career self-efficacy, which later affected their academic and career choices in the future (Hackett, 1985), and their academic achievement (Bandura, 1997). Nevertheless, the research results on the relationship between self-efficacy and students' achievement are not yet consistent; there was a study which indicated that students' different self-efficacy by gender did not result in different academic achievement (Betz & Hackett, 1981).

Based on such facts described, in order to prevent children from developing bias academic self-efficacy as a result of gender stereotype influence, which might further affect on their career self-efficacy, this study, entitled "The Influence of Children's Academic Self-efficacy on Their Achievements: A Gender-based Exploration Study in Indonesia", was intended: (a) to investigate whether or not male and female children show differences of academic self-efficacy in mathematics, science, and language; (b) to investigate whether or not male and female children show differences of academic-achievement level in mathematics, science, and language; and (c) to examine whether children's academic self-efficacy significantly influences their achievements.

B. Theoretical Framework

The theoretical framework of this study includes the relationships between academic self-efficacy and gender orientation, and between academic self-efficacy and achievements which are described as follows:

1. Academic self-efficacy and gender orientation

In social cognitive theory, self-efficacy is believed to be affected by the existence of three major factors: parents, peers, and also institutions (Bandura, Barbaranelli, Caprara, & Pastorelli,



2001). In addition, besides affecting the development of self-efficacy, those three major factors are also affirmed to have a big influence in shaping gender roles as well (Bussey & Bandura, 2004). In view of that, in this section, the impact of gender orientation on self-efficacy beliefs will be discussed further.

Males and females indeed have differences in terms of the average level of confidence. As the result of many research conducted, the so-called gender differences in self-efficacy (Wigfield et al., 1991) illustrate the divergence of the performance of both genders in academic tasks. In certain academic areas such as mathematics, science, and technology, males perform better as they have higher confidence than females (Pajares & Miller, 1994; Wigfield, Eccles, & Pintrich, 1996). However, girls judge themselves to have better writing skills than boys (Pajares, Miller, & Johnson, 1999). In fact, the differences in self-confidence were interpreted as the function of the differences in self-efficacy (Wigfield, Eccles, Maclver, Reuman, & Midgley, 1991).

Regarding the fact that mathematics turns out to be the subject that females dislike, Eccles (1989) believes that the reason for this is actually a matter of cultural factor supported by some strong variables such as self-concept, self-esteem, and self-efficacy. However, Pajares (2002b) believes that self-efficacy is the strongest among the other variables which, thus, can be used for discovering this phenomenon better due to its specific characteristic than self-concept and self-esteem.

Students' different interests in certain academic areas as mentioned above actually show the function of gender orientation -- the stereotypic beliefs about gender they hold -- rather than of gender (Eisenberg, Martin, & Fabes, 1996; Matsui, 1994). Based on the findings of some research, it is proved that females have more interest in feminine activities rather than in scientific activities as they have higher sense of self-efficacy for the former (Junge & Dretzke, 1995). It is found out that women have high sense of self-efficacy for quantitative activities embedded in stereotypically feminine activities, but they have low sense of self-efficacy when these same quantitative activities are embedded in scientific activities.

Gender differences related to academic self-efficacy usually begin to emerge following children's transition to junior high school (Wigfield et al., 1991; Wigfield, Eccles, & Pintrich, 1996). This study is therefore intended to examine whether or not there are gender differences in academic self-efficacy and achievements students at Grade 5 who were considered in the transition period from elementary to junior high school.

2. Academic self-efficacy and achievement

Academic achievement in the context of this study is the school grades in mathematics, science, and language contained in the students' report books.



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Beliefs about self-efficacy can be developed through self-knowledge which is acquired from four main sources of information: enactive mastery experiences, vicarious experiences, verbal or social persuasion, and physiological and affective or emotional states (Bandura, 1997; Manstead & Hewstone, 1996; Pajares, 2002a; Pajares 2002b).

Developing self-efficacy belief involves cognitive and behavioral factors, and self-regulation by creating and performing a series of effective behaviors to manage living environment that changes along the time. The development of self-efficacy through real experience creates cognitive facilities and self-regulation for achieving goal effectively (Bandura, 1997).

In a study conducted by Mahyudin, Elias, Loh, Muhammad, Noordin, and Abdullah (2006), the results showed that the academic self-efficacy was significantly correlated with English achievement of the eighth grade students in Slangor, Malaysia.

In their experiment, Schunk and Rice (1987) trained a group of children with severe academic problems to make a diagnosis, to find a constructive solution, to monitor their adequate achievement, and to make changes as well as corrections when they make mistakes. It was found out that teaching about strategies and training applied to them were not able to increase their self-efficacy and achievements. However, with a strategy aimed at increasing self-efficacy, they managed to improve students' achievement. Thus, the result of the experiment suggests that the higher the children's self-efficacy increased, the higher the achievement attained. According to Bandura (1997), changes in self-efficacy result in cognitive processes in a person which convey diagnostic information that achievement attainment is more about instilling a sense of one's ability rather than achievement itself.

In a study conducted by Collins (1982) on children with three levels of mathematical ability, the children were asked to rate themselves the level of self-efficacy they had. Afterwards, they were given difficult math problems. The children at any ability level, as long as they had higher self-efficacy, would more quickly get rid of the wrong-solving strategies, solve more problems, choose to remain persistent to pursue if experiencing a failure, and work more accurately than children with the same level of ability but had lower self-efficacy. With this result, it was concluded that self-efficacy predicts higher on interest and positive attitude towards mathematics. On the contrary, math ability possessed by the children was not able to predict those things. Further, the study showed that children's low achievements were not caused by their abilities, but by their lack of self-efficacy, so that they could not perform optimally.

These results are supported by study of Bouffard-Bouchard (1990) which showed that students whose sense of self-efficacy was improved would have higher aspirations, show higher flexibility in the use of strategies to solve problems, achieve higher intellectual achievement as well as

evaluate the quality of their achievement more precisely than those with comparable cognitive abilities but be assured that they had lack of self-efficacy.

Self-efficacy also has a strong mediating effect on academic achievement from a number of independent variables such as the level of cognitive ability, training and previous achievements, and a number of other variables (Pajares & Kranzler, 1995).

All in all, it can be concluded that self-efficacy, either directly or indirectly, affects students' achievement.

Based on the theoretical framework, there are three hypotheses proposed in this study:

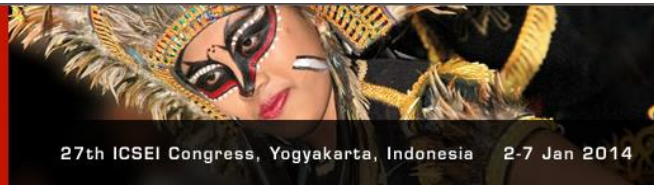
- H1 : There were significant differences of math self-efficacy, science self-efficacy, and language self-efficacy between male and female children.
- H2 : There were significant differences of math achievement, science achievement, and language achievement between male and female children.
- H3 : Children's academic self-efficacy significantly influence their academic achievements

C. Methods, Techniques or Modes of Inquiry

This study used a survey approach and the survey was conducted using questionnaires, comprising mathematic self-efficacy scale, science self-efficacy scale, and language self-efficacy scale. Documentation technique was also used to provide data of students' achievements in mathematics, science, and language.

D. Data Source or Evidence

The data were collected from 375 students at Grade 5 involved in this study, consisting of 171 male students and 204 female students. They were selected from private and public elementary schools in Yogyakarta, Indonesia. The sampling used was stratified random sampling. Stratified refers to the levels of school quality, determined by Scores of Nationally Standardized School Final Examinations/*skor UASBN (Ujian Akhir sekolah Berstandar Nasional)*. Each level of school quality consisted of student proportions approximating the family of symmetrical distribution, which were bottom 30 %, middle 40 %, and top 30 %. Random refers to the random choosing of schools in the population (of schools).



E. Research Findings and Discussion

This section reports the results of data analyses to test the hypotheses proposed in this research, containing the report on the analysis results and the concise interpretations.

1. Results

The data analyses show the results as displayed in Table 1.

As indicated on Table 1, there were no significant differences between male and female children's academic self-efficacy in mathematics, science, and language, each with t -values $-.603$, $.208$, and -1.508 respectively, all with $p > .05$. It means that hypothesis which stated: "There were significant differences of math self-efficacy, science self-efficacy, and language self-efficacy between male and female children" was rejected.

Table 1

The Results of t-tests between Male and Female Children's Academic Self-Efficacy and Achievements

Variable	Gender	N	M	t	df	sig	SE
Mathematics Self-efficacy	Male	179	117.29	-.603	373	.547	2.80
	Female	196	118.98				
Science Self-efficacy	Male	179	180.70	.208	373	.835	2.15
	Female	196	180.25				
Language Self-efficacy	Male	179	210.41	-1.508	373	.132	2.86
	Female	196	214.73				
Mathematics Achievement	Male	179	72.95	-.875	373	.382	1.12
	Female	196	73.94				
Science Achievement	Male	179	75.75	-1.533	373	.126	.92
	Female	196	77.17				
Language Achievement	Male	179	76.31	-3.153*	373	.002	.84
	Female	196	78.97				

Note. *. t -value is significant at the .05 level (2-tailed).

Still based on Table 1, it could be observed that there were no significant differences between male and female children's academic self-efficacy in mathematics and science, each with t -values $-.875$, and -1.533 respectively, all with $p > .05$. However, there found a significant difference between male and female children's academic self-efficacy in language, with t -value -3.153 and $p < .05$. Thus, the hypothesis which stated that "There were significant differences of math achievement, science achievement, and language achievement between male and female children" was partly approved, meaning that there were no significant differences between male children's mathematics and science achievements, but it did not hold true with their language achievement.

Further, the result of data analysis for the third hypothesis testing on the influence of children's academic self-efficacy on their achievements was significant with $F = 85.479$ and $p < .01$.



Thus, the hypothesis which stated that “Children’s academic self-efficacy significantly influences their academic achievements” was supported by the data, meaning that children’s academic self-efficacy predicted their achievements.

2. Discussion

In this section, the results of the study are discussed by interpreting and comparing them to the existing theories and or past research, and ended with conclusions.

The first hypothesis which stated that “There were significant differences of math self-efficacy, science self-efficacy, and language self-efficacy between male and female children” was not supported by the data, meaning that there were no significant differences between male and female children’s math self-efficacy, science self-efficacy, and language self-efficacy.

Referring to this finding, it is observed that there were differences of findings about elementary children’s academic self-efficacy between those in Indonesia and those in Western countries and North America, in which male students had higher self - efficacy in mathematics and higher IPA than female students (Pajares & Miller, 1994; Wigfield, Eccles, & Pintrich, 1996), meanwhile, female students have higher self-efficacy in writing compared with male students (Pajares, Miller, & Johnson, 1999). The differences between male and female children’s academic self- efficacy are caused by gender stereotyped attitudes towards children’s academic potentials from their environment (Eccles, 1989; Eisenberg, Martin, & Fabes, 1996; Junge & Dretzke, 1995 ; Matsui, 1994). Thus, it might be assumed that the gender stereotypes which occur in Indonesia, at least in Yogyakarta, do not reach academic areas. This was proved by the finding suggesting that the students' academic self- efficacy did not differ in terms of gender. This could be due to the fact that their self-efficacy has been developed normally based on the feedback obtained from the academic performances they achieved during their learning process. According to Schunk & Pajares (2002), the feedback of learning performances directs students to goal achieving, motivation maintaining, and self-efficacy strengthening.

Next, the second hypothesis which stated that “There were significant differences of math achievement, science achievement, and language achievement between male and female children” was partly approved, meaning that there were no significant differences between male and female children’s mathematics and science achievements, but it did not hold true with their language achievement; female children had significantly higher language achievement compared with their male counterparts.

The findings which showed that there were no significant differences between male and female children’s mathematics and science achievements were in line with the findings which showed



that there were no significant differences between male and female children's math self-efficacy, and science self-efficacy, since learning achievements help the students construct their academic self-efficacy. It is in line with the statement of Bandura that mastery experiences function as evidence for one's ability, and are usually the most significant source of self-efficacy belief (Bandura, 1997). When people do certain activities, they usually observe the outcomes, and use the information to build their beliefs of competency in delivering the performance. A success in performance will coincide with the development of self-efficacy belief (Pajares, 2002a).

The findings which were not in parallel were those between children's language self-efficacy and their language achievement, in which there were no differences of children's language self-efficacy by gender; however, in language achievement, female children showed significantly higher performance than male children. Considering that the higher language achievement of female children than male did not affect on their language self-efficacy, it is deemed to do replicate research in the same area to see whether or not the higher language achievement of female children than that of male is consistent. This consideration is based on the theory of Bandura (1997) that developing self-efficacy belief needs a long process by creating a series of effective behavior in managing living environment through enactive mastery experiences.

Finally, the third hypothesis which stated that "Children's academic self-efficacy significantly influence their academic achievements" was supported by the data; meaning that children's academic self-efficacy predicted their achievements; the higher the children's academic self-efficacy, the higher their achievements.

This finding was in line with the previous research finding by Schunk and Rice (1989) which proved that children who were trained to improve their self-efficacy in a training program showed the result that the higher they improved their self-efficacy, the higher the achievements they performed. This occurs because, comparing with students who have low self-efficacy, those who have higher self-efficacy would be able to get rid of unproductive strategy faster in solving problem so that they can solve more problems, sustain effort after facing failure, as well as do their tasks more rigorously (Collins, 1982).

Thus, in an effort to improve students' achievement, one of the contributors is improving their self-efficacy. Thereby increasing students' self-efficacy will be influential in improving their academic achievement.

F. Conclusion

Related to this gender-based exploration study, there were found no gender stereotype influences which reach children's academic potentials. There were no differences of mathematics self-efficacy, science self-efficacy, and language self-efficacy between male and female children. There



were neither differences of mathematics achievement nor science achievement between male and female children. However, female children showed significantly higher language achievement than male. Replicated study in the same area is suggested to perform in order to ascertain whether or not female children's higher language achievement than male is consistent. Lastly, children's academic self-efficacy was found to significantly influence their achievement; the higher the children's academic self-efficacy, the higher their academic achievement.



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