



AN INVESTIGATION OF PRE-SERVICE SCIENCE AND MATHEMATICS TEACHERS' PERSONAL GROWTH INITIATIVE

Hilal Büyükgöze

Abstract: The current paper primarily aims to investigate pre-service science and mathematics teachers' personal growth initiative levels. The second aim of the study is to examine whether participants' initiative levels differ in relation to their gender, grade, department, perceived academic achievement, and willingness to attend graduate education after graduation. The study group consists of 212 pre-service teachers (156 female, 56 male). 80 of them attend science education program, whereas 79 of them attend primary mathematics education and 53 of them attend secondary mathematics education program in two different state universities located in Aksaray and Ankara, Turkey. The participants were surveyed by "The Personal Growth Initiative Scale-PGIS" developed by Robitschek (1998) and adapted into Turkish by Akın and Anlı (2011). The data collected during the spring term of 2014/15 academic year. The construct validity of the scale was verified by confirmatory factor analysis, and the reliability was examined by calculating the Cronbach alpha value of the PGIS. The results showed that (1) pre-service teachers have moderate levels of personal growth initiative, (2) their PGI levels statistically differ in relation to their willingness to attend graduate education, and (3) juniors have higher levels of personal growth initiative than freshman and sophomores.

Key words: personal growth initiative, pre-service teachers, teacher education, science, mathematics

1. Introduction and Theoretical Background

The idea of personal growth mainly focuses on the assumption that as people face various challenges, transitions, and experiences throughout their lives, ongoing personal growth is needed to be able to remain psychologically healthy individuals (Ivtzan, Chan, Gardner, & Prashar 2009). Similarly, Robitschek (1998, p.184) defines personal growth initiative (abbreviated as PGI) as "active, intentional engagement in the process of personal growth". She further claims that "personal growth initiative" is a metacognitive construct which has cognitive and behavioral aspects within itself (Akin & Anlı, 2011; Robitschek, 2003; Robitschek & Cook, 1999). As Martin (2009) stated, motivation to change, knowledge of the change process, and efficacy concerning the change process may be given as the examples of cognitive aspect of the construct. Regarding the behavioral component, determination of particular goals, and goal pursuit and attainment may be presented (Martin, 2009).

Personal growth initiative, in a more extended sense, urges individuals to pursue new challenges and growth leading them to succeed general and personal goals, and therefore experience the feeling of fulfilment (Raphael & Paul 2005; Robitschek, 1998). The construct consists of four components (Robitschek et. al., 2012). *Readiness for change* refers to preparedness to engage in personal growth processes and activities, while *planfulness* is described as the ability to be organized throughout the self-change attempts (Robitschek et. al., 2012; Sharma & Rani, 2013). *Using resources* is mainly defined as the ability to determine and reach external resources, and *intentional behavior* refers to the self-monitoring of personal change plans and efforts (Malik, Yasin, & Shahzadi, 2013; Robitschek et. al., 2012; Sharma & Rani, 2013; 2014).

Personal growth initiative has proven to have significant relationships with several psychological constructs related to development and socialization by ample evidence obtained from empirical studies (Caldwell, 2000; Thoen & Robitschek, 2013; Whittaker & Robitschek, 2001). PGI has been documented to correlate positively with self-confidence and self-esteem (Abacı & Okyay, 2013;

Malik, Yasin, & Shahzadi, 2013), assertiveness, internal locus of control and reflective coping (Robitschek & Cook, 1999), concentration on tasks (Robitschek, 1998), goal directedness and intrinsic motivation (Bartley & Robitschek, 2000), reflective and experiential growth motivation (Bauer, Park, Montoya, & Wayment, 2014). It has also been reported to be associated with self-actualization (Ivtzan et. al., 2009; Robitschek, 1999; Rapheal & Paul, 2014), psychological and social well-being and risk-taking (Lasun & Odufowokan, 2012; Negovan, 2010; Ogunyemi & Mabekoje, 2007; Robitschek & Anderson, 2011), and family functioning clusters as family processes, family organization, and personal growth (Whittaker & Robitschek, 2001) significantly. Personal growth initiative has been found to be related to job satisfaction (Wang & Tien, 2011), and stress reduction (Soons, Brouwers & Tomic, 2010), as well. However, PGI negatively correlates with psychological distress (Robitschek & Kashubeck, 1999).

In the same sense, Loo, Tsai, Raylu and Oei (2014) state that PGI has been clarified to have enormous contribution to mental health disorders and psychopathology in the process of recovery (Robitschek, 1998). They propel the idea that individuals take advantage of that recovery process in different aspects of their lives such as seeking new ways of experiencing fulfilment in case of, let's say, job dissatisfaction (Loo, Tsai, Raylu & Oei, 2014). Ho and Dempsey (2010) evidenced that PGI positively correlates with the act of forwarding electronic content (e-WOM). They claim that people with higher levels of PGI may be more motivated to control their environment and less eager to take part in e-WOM as they may be participating in other activities so as to pursue their actual personal growth.

Correspondingly, general and social self-efficacy has been documented to be positively correlated with PGI in some studies (Ogunyemi & Mabekoje, 2007; Okurame, 2014; Ruggiero, Rabaino, Richards & Martin, 2013). Ogunyemi et al. (2007) suggests that self-efficacy refers to individuals' beliefs on their potential to achieve personal goals and exhibit necessary performance to attain those goals, which could have influence individual's fulfilment levels and personal growth initiatives in various ways. Okurame (2014) also claims that these two constructs are related to future, and may be linked effectively to affect individuals' expectations and intentions.

It is obvious that personal growth initiative is related with a broad body of positive psychological constructs. Though there have been limited study on pre-service teachers. Accordingly, the current study aims on following research questions:

- What is the overall personal growth initiative level of pre-service science and mathematics teachers?
- Do pre-service science and mathematics teachers' personal growth initiative differ in relation to gender, grade, department, perceived academic achievement, and willingness to attend graduate education after graduation?

2. Method

Participants

The study group consists of 212 (156 female, 56 male) pre-service teachers from two different state universities located in Turkey. Of the participants, 80 (37,7 %) attend science education program, 79 (37,3 %) of them are enrolled in primary mathematics education, and the rest 53 (25 %) attend secondary mathematics education program. The age of the participants ranges from 17 to 25 with a mean of 20,14. The study group consists of 119 freshman, 31 sophomores, 31 juniors, and 31 seniors. 131 (61,8 %) of them are willing to attend a graduate education program after completion of their undergraduate degrees, whereas 81 (38,2 %) participants do not have such a plan. Students with high perceived academic achievements only consist 21,7 per cent of the participants, whereas moderate achievers are 123 (58 %) and low achievers are 43 (20,3).

Instruments

The personal growth initiative level of pre-service science and mathematics teachers was measured by "The Personal Growth Initiative Scale-PGIS" developed by Robitschek (1998), and adapted into Turkish by Akin and Anlı (2011). The scale itself consists of 9 items and it has single dimension. The

PGIS is a Likert type scale, ranging from “(1) totally disagree” to “(6) totally agree” options. An individual can get minimum 9 points and maximum 54 points at the PGIS. Higher scores obtained from the scale points to the higher levels of personal growth initiative, whereas lower scores show lower levels of PGI. The single dimension of the scale examined by confirmatory factor analysis (CFA) performed on IBM AMOS 23.0 program (Arbuckle, 2006). The fit indices results yielded by the CFA are as follows: [$\chi^2/df = 1,40$; RMSEA = .05; AGFI = .78; GFI = .80; NFI = .95; CFI = .95; IFI = .95]. The ratio of chi-square to the degree of freedom is supposed to be lower than 5,00 (Kline, 2005). In addition, the RMSEA value is expected to be lower than 0,80. Therefore, it is clear that the PGIS has a good model-data fit and adequately valid to be used in measuring individuals' personal growth initiative. The Cronbach alpha coefficient of the scale was calculated to be ,807 within the current study. This value also verifies that the PGIS is adequately reliable to be used as a data collection tool.

Procedure

The forms were distributed and collected during the spring semester of 2014-2015 academic year with the permission of the instructors before or after the classes. Participation was held voluntarily. The response rate was calculated to be 95 %.

Data analysis

The internal consistency analysis of the scales was investigated by Cronbach alpha coefficient. The construct validity of the data collection instruments were tested by confirmatory factor analysis on IBM AMOS 23.0 program. Other calculations were performed on SPSS 23.0 version. Preliminary screening of the data set resulted that there was no problematic issues regarding distribution and homogeneity. For the variables which had 2 sub-categories (gender, and willingness to attend graduate education), *t* tests were used in the study. For the variables with 3 or more sub-categories (department, grade, and perceived academic achievement) ANOVA was performed. Then, LSD test of post-hoc tests were utilized to determine the difference occurred among groups.

3. Results

The overall personal growth initiative level of the participants and descriptive statistics were presented in Table 1.

Table 1. Descriptive statistics

Variable	<i>N</i>	Mean	<i>SD</i>
Personal growth initiative	212	4,48	,651

As shown in Table 1, participants have moderate level of personal growth initiative ($X = 4,48/6,00$).

An independent samples *t* test was conducted to determine whether participants' personal growth initiative level vary in relation to their gender. The *t* test results are demonstrated in Table 2.

Table 2. *t* test results for gender

Variable	Groups	<i>N</i>	Mean	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>
Personal growth initiative	Female	156	4,512	,669	210	1,078	,282
	Male	56	4,402	,596			

Pre-service science and mathematics teachers' personal growth initiative was investigated in relation to gender. *t* test results showed that participants' personal growth initiative did not vary concerning their gender ($t_{(212)} = 1,078$ and ,282 $p > .05$).

An analysis of variance (ANOVA) was conducted to determine whether pre-service science and mathematics teachers' personal growth initiative varies in relation to their grade. The ANOVA results are presented in Table 3.

Table 3. ANOVA results for grade

Variable	Groups	Source of Variance	Sum of Squares	df	Mean of Squares	F	p	Significant difference
Grade	Freshmen	Btw groups	2,305	2	,768	1,831	,040*	Juniors-Freshmen Juniors-Sophomores
	Sophomore	Within groups	87,278	208	,420			
	Junior	Total	89,582	211				
	Senior							

Participants' personal growth initiative level was examined in relation to their grade by ANOVA (see Table 3). The results showed that pre-service science and mathematics teachers' growth initiative differed regarding their grade ($F_{(3-211)} = ,040$, $p < ,05$). Third graders have higher levels of growth initiative ($X = 4,70$) than freshman year students ($X = 4,44$) and sophomores ($X = 4,36$).

Similarly, an ANOVA analysis was performed to determine whether participants' growth initiative differed by their program. The ANOVA results are presented in Table 4.

Table 4. ANOVA results for program

Variable	Groups	Source of Variance	Sum of Squares	df	Mean of Squares	F	p	Sig
Program	Primary science education	Btw groups	,120	2	,060	,140	,870	-
	Primary mathematics education	Within groups	89,463	209	,428			
	Secondary mathematics education	Total	89,582	211				

As can be seen in Table 4, participants' personal growth initiative was examined in relation to their undergraduate programs by ANOVA. Participants' personal growth initiative level did not differentiate regarding their undergraduate major programs ($F_{(2-211)} = ,870$, $p > ,05$). It is obvious that participants from primary science education, primary mathematics education and secondary mathematics education programs have similar personal growth initiative levels.

Again, an independent samples t test was performed to determine whether participants' personal growth initiative varied regarding their willingness to attend a graduate education program after completion of their undergraduate education. The t test results are presented in Table 5.

Table 5. t test results for willingness to graduate education

Variable	Groups	N	Mean	SD	df	t	p
Personal growth initiative	willing	131	4,56	,680	210	2,420	,016*
	not willing	81	4,34	,580			

As presented in Table 5, pre-service science and mathematics teachers' personal growth initiative level was investigated via t test. Participants' growth initiative level differed statistically significantly in relation to their willingness to attend a graduate program following their completion of major programs ($t_{(212)} = 2,420$ and $,016 p > ,05$). Accordingly, pre-service teachers who are willing to attend a graduate program after undergraduate education have higher levels of personal growth initiative ($X = 4,56$) than the rest who do not plan to attend a graduate program ($X = 4,34$).

An analysis of variance was conducted to determine whether pre-service science and mathematics teachers' personal growth initiative varies in relation to their claimed perceived academic achievement. The ANOVA results are presented in Table 6 below.

Table 6. ANOVA results for perceived academic achievement

Variable	Groups	Source of Variance	Sum of Squares	df	Mean of Squares	F	p	Sig
Perceived Academic Achievement	Low	Btw groups	1,593	2	,797	1,892	,153	-
	Moderate	Within groups	87,989	209	,421			
	High	Total	89,582	211				

As can be seen in Table 6, participants' personal growth initiative was examined in relation to their perceived academic achievement by ANOVA. Participants' personal growth initiative level did not differentiate regarding their perceived academic achievement ($F_{(2-211)} = ,153$, $p > .05$). It is clear that regardless of perceived academic achievement levels, pre-service teachers have similar levels of personal growth initiative.

4. Discussion and Conclusion

The results of the analyses conducted within the current study has revealed that pre-service science and mathematics teachers have moderate level of personal growth initiative ($X = 4,48/6,00$). This finding is consistent with a number of scientific studies (Malik, Yasin, & Shahzadi; Negovan, 2014). However, some studies have reported to calculate higher levels of growth initiative among their participants (Bauer, Park, Montoya, & Wayment, 2014; Raphael, & Varghese, 2014).

The t test findings have figured out that participants' PGI did not vary regarding their gender. Abacı and Okyay (2013) also reported no statistically significant difference between female and male participants. The findings have also shown that participant pre-service teachers have relatively similar levels of personal growth initiative regardless of their undergraduate education programs. Similarly, the perceived academic achievement levels of the pre-service science and mathematics teachers' did not lead any statistical difference in relation to their growth initiative.

The findings of the present study have revealed that pre-service teachers who are willing to continue their education after completing their major program have reported to have higher levels of personal growth initiative than those who are not willing to. As discussed earlier in literature (Okurame, 2014; Ruggiero, Rabaino, Richards & Martin, 2013), individuals' beliefs on their potential trigger them to future goals and plans. As findings have uncovered, within the present study, pre-service teachers with higher levels of personal growth initiative have positive beliefs on their capacity to determine and then achieve personal goals and demonstrate required performance to reach those goals. As personal growth initiative is related to future and may have effect on individuals' expectations and intentions, pre-service teachers with higher levels of PGI may have more structured future plans than those with lower levels of PGI. In addition, analyses have also demonstrated that third grade students have higher levels of PGI than first and second graders. It may be claimed that as juniors come to the end of the undergraduate education, they may be more eager to investigate and find various ways of self-actualization.

Overall, in line with the results of the study, some recommendations may be offered. Only the pre-service teachers attending state universities participated in the current study. A broader study of which participants consist of both participants from state and private universities may be conducted to improve the study. Within the present study, the level of personal growth initiative of pre-service teachers was investigated in relation to their gender, program, grade, perceived academic achievement, and willingness to go on a graduate education program. As personal growth initiative is relatively new construct in literature, to determine and reveal potential relationships of PGI with other constructs, various studies may be conducted in several different research designs such as mixed type designs.

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Authors

Hilal Büyükgöze, Hacettepe University, Ankara, Turkey, e-mail: buyukgoze@hacettepe.edu.tr

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