

Relationship Between the Components of Interpersonal Self-Efficacy and Computer Self-Efficacy Among Teachers in Dezful City

Saeed Moshtaghi,^{1,*} and Neda Fathi²

¹Educational Psychology, Dezful Branch, Islamic Azad University, Dezful, IR Iran

²Educational Planning, Dezful branch, Islamic Azad University, Dezful, IR Iran

*Corresponding author: Saeed Moshtaghi, Educational Psychology, Dezful Branch, Islamic Azad University, Dezful, IR Iran. Tel: +98-9132003935, E-mail: saeedi788@gmail.com

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Abstract

Background: Teachers have a key role in using technology in educational settings. They deal with many variables that can interact with each other and facilitate or weaken their acceptance of technology. In this regard, self-efficacy is an important variable that should be emphasized when examining the use of information and communication technology. This study aimed to investigate the relationship between interpersonal self-efficacy and computer self-efficacy among teachers.

Methods: This was a correlational study conducted in 2014 - 2015. The study population included 994 teachers in Dezful city among whom, 278 teachers were selected as sample according to Cochran formula using stratified random sampling method. The research tools included teacher's interpersonal self-efficacy scale and computer self-efficacy scale. Construct validity and reliability of the questionnaires were confirmed through factor analysis and Cronbach's alpha coefficient, respectively. Following the collection of the questionnaires, the data were analyzed using descriptive statistics and regression analysis in SPSS version 20.

Results: The findings indicated that teachers' self-efficacy in using computer was moderate. However, Pearson's correlation coefficient showed that there was a significant positive relationship between interpersonal self-efficacy and computer self-efficacy in teachers and this variable could explain about 23% of computer self-efficacy variance ($P = 0.05$); nevertheless, the variable is affected by several other factors.

Conclusions: Researchers have identified several factors associated with computer self-efficacy; however, different aspects of the issue have not been completely known yet and further research is required in this area. The results of this study provided useful information for educational authorities and other researchers on the importance of interpersonal self-efficacy over computer self-efficacy.

Keywords: Self Efficacy, Computer, Instruction, Teachers

1. Background

Teachers play a key role in using technology in educational settings and have critical impacts on educational progress, behavioral and value systems, intellectual changes in students and their beliefs about technology. Applying technology in educational settings enables teachers to prepare, introduce, explain, and transfer knowledge to students in order to improve, encourage, and promote them to show better performance (1, 2). Teachers encounter numerous variables that can interact with each other and facilitate or weaken their acceptance of technology. Experts have classified barriers to teachers' striving to utilize information and communication technology (ICT) into two sets: external or the first barriers and internal or the second barriers (3). External barriers include those barriers that are often considered as key obstacles such as the issues related to having access to technology, training, and equipment support. It is almost impossible to talk about the integration of technology with education as long as there are such barriers. Even if the exter-

nal barriers are resolved, teachers will not automatically benefit from ICT to achieve meaningful results. Internal barriers are associated with teachers' philosophy in relation to teaching and learning. These factors are deeply rooted in daily activities. Examples of internal barriers are self-efficacy beliefs, teaching philosophy, and attitudes of teachers. Empirical studies support the significant impact of teachers' educational beliefs, self-efficacy, and attitudes towards computer on frequency and success of using ICT in education (4, 5). Self-efficacy is a teacher's image of teaching, his beliefs in doing assignments and responsibilities that is associated with his teaching experiences (6). Teachers' self-efficacy has become a matter of interest to researchers since a set of studies known as RAND showed that this structure anticipates both learners' progress and application of innovative teaching methods by teachers. Brouwers et al. (6) believe that three different realms of activity must be examined during the study of self-efficacy beliefs in any profession: 1) task realm; 2) interpersonal realm; and 3) organizational realm. Task realm is associ-

ated with technical aspects of the professional role. This realm is related to activities that are evaluated by teachers' self-efficacy scales. Organizational realm is associated with policy aspects of the professional role, i.e. activities that affect procedures within the organization. Interpersonal realm includes activities concentrating on developing and maintaining peaceful, pleasant, and helpful relationships with clients or students and organization members, i.e. co-workers, managers, and supervisors. There are three teachers' interpersonal activities including management and control of students' behavior in the classroom, winning colleagues' support, and winning school principal and corporate authorities' support. Another kind of self-efficacy is computer self-efficacy, which refers to one's belief in his/her ability to use computer. Those who have little confidence in their ability to use computer may show a weak performance in doing computer-based tasks. Previous experience of working with computers may lead teachers to believe that the use of computers in teaching process is easy. Gong et al. (7) stated that computer self-efficacy indicates users' assessment of their own ability to use computer that affects their perception of the ease of using technology and making decision to accept technology. High-self-efficacy impression can cause teachers to struggle harder to learn new technologies like computer systems (8). Igbaria (9) stated in their study that in an educational environment, computer self-efficacy impresses teachers in different ways. For example, it affects technological methods used by teachers in their daily educational experiences. They figured out that self-efficacy does not have a direct effect on using computer systems, instead it has a strong indirect effect on using the system mainly through its perceived ease of use and helpfulness. Durnell and Haage (10) conducted a research on students in Romania and found out that higher computer self-efficacy was associated with lower computer anxiety, more positive attitude towards internet, and further use of the internet. Similar findings in Iran indicate the direct effect of computer self-efficacy on the perceived ease of computer and its actual use (11). Moreover, Akbari Bourang and Rezaian (12) figured out in a research that there is a relationship between computer self-efficacy and computer anxiety among the students of Arak University. In another study on Tehran University students, Gholamali (13) observed that in particular, personal characteristics and computer experience can lead to the enhancement of computer self-efficacy that, in turn, reduces computer anxiety in students. Terujeni et al. (14) investigated the role of previous experience, self-efficacy, and computer anxiety in acceptance and usage of computers by teachers. The results indicated that computer anxiety and previous experience directly and indirectly affected teachers' use of computer, while computer

self-efficacy had no significant effect on the use of computer by the teachers. It seems that in addition to knowledge and technical skills, other elements (for instance teachers' knowledge, beliefs, and attitudes) are involved in teachers' success to integrate technology into teaching process. In integrating technology into teaching-learning process, it is believed that positive attitudes towards computer, high self-efficacy in using computer, and low levels of computer anxiety are important factors that help teachers and professors learn computer skills properly and use these skills in teaching process (15). Researchers in a longitudinal study believe that even though the environmental conditions that impress the use of technology (like technology infrastructures) have been emphasized and improved, a few studies have investigated the effect of internal and personal factors such as teachers' beliefs on the use of technology in teaching (1). The effects of teachers' pedagogical beliefs on class activities have been approved in several studies; however, the direct impact of educational beliefs on the use of computer is not well evident (16). Teachers might use their previous experiences, beliefs, and attitudes towards learning and teaching to form their beliefs in technology as a teaching method or pedagogical tool. In order to use computer as a cognitive tool in the construction of knowledge, teachers must accept computer as a learning tool and must be able to integrate it into class activities (17). Algan (18) demonstrated in a study that the teachers who know how to use computer and had used it for a long time, had a higher self-efficacy. In another study, a positive significant relationship was observed between informative knowledge, imaginary self-efficacy, and imaginary self-efficacy in computer (19). Based on the above mentioned points, the main purpose of this study was to investigate (simple and multiple) relationships between interpersonal self-efficacy components and computer self-efficacy among school teachers in Dezful city.

2. Methods

This is an applied research in terms of objectives and a correlational research in terms of control of variables. The study population included all male and female high school teachers in Dezful city who, according to the information obtained from the Department of Education, were 994 people (419 males and 575 females). According to Cochran formula and considering 5% error, the sample size was calculated to be 278 (120 males and 158 females) that were selected through stratified random sampling method. After getting the necessary permissions and taking ethical considerations of the research into account, the researchers introduced themselves and thanked teachers for dedicating their time to the research and explained them how to

complete the questionnaires and asked them to answer the questions very carefully and honestly. Inclusion criteria consisted of being high school teacher and being engaged in teaching during the school year of 2014 - 2015. Data collection tools in this study included:

1) Teacher's interpersonal self-efficacy scale (TISES) by Brouwers et al. (6): this scale includes three subscales of a) managing students' behavior in the classroom, b) the ability to gain colleagues' support and, c) the ability to gain the head master's support. The teacher's interpersonal self-efficacy scale comprises 23 items. The scoring is based on a 6-point Likert scale. The minimum and maximum total scores for the questionnaire are 23 and 138, respectively. The minimum and maximum scores are 13 and 90 for perceived self-efficacy subscale, 5 and 30 for perceived self-efficacy in gaining the colleagues' support, and 5 and 30 for perceived self-efficacy in gaining the head master's support, respectively. The makers of the scale reported its reliability based on Cronbach's Alpha coefficient for the three subscales of perceived self-efficacy in managing the classroom, gaining the colleagues' support, gaining the head master's support, and the total scale as 0.91, 0.90, 0.94, and 0.93, respectively (12). In this study, after translating the locutions of the scale from English into Persian, the Cronbach's Alpha coefficients were 0.91, 0.91, 0.85, and 0.92. The construct validity of the scale was investigated through exploratory factor analysis using the main components and Varimax rotation by SPSS. Based on pebble diagram, three factors were extracted explaining 64.44% of the total variance of the scale.

2) Computer self-efficacy scale (CSS), by Murphy, Coover, and Owen (20): this scale aims to evaluate the individuals' perceptions on gaining specific skills and knowledge related to computer. This scale includes 29 items, 16 of which evaluating the introductory level of computer self-efficacy and 13 assessing its advanced level. The scoring of computer self-efficacy is based on a 5-point Likert scale. The minimum and maximum total scores are 29 and 145 for the whole scale, 16 and 80 for the introductory level assessing subscale, and 13 and 65 for the advanced level assessing subscale, respectively. The makers of this scale reported the Cronbach's Alpha coefficient as 0.97 and 0.96 for the introductory and advanced level assessing subscales, respectively (20). In this study, the coefficients were obtained as 0.90 and 0.87 for the introductory and advanced level assessing subscales, respectively. The construct validity of the scale was investigated through exploratory factor analysis using the main components and Varimax rotation by SPSS. Based on scree plot, two factors were extracted explaining 48.46% of the total variance of the scale.

The collected data were analyzed in descriptive level

(mean and standard deviation) and inferential level using Pearson correlation analysis and regression analysis in SPSS 20.

3. Results

In this study, 57% of the teachers in the study sample were female and 43% were male. The mean and standard deviation were 42.30 and 5.81 for female teachers, and 41.74 and 5.89 for male teachers participating in the study, respectively. The average teaching experience was 20 years for female teachers and 19 years for male teachers.

As can be seen in Table 1, in the subscale of perceived self-efficacy in managing the classroom, the mean score for male and female teachers were 41.73 and 48.40, respectively that compared to the average score in this subscale which is 45, it is revealed that the mean score for females is higher and for men is lower than the moderate level. In the subscale of perceived self-efficacy in gaining the colleagues' support, the mean score for male and female teachers were 15.96 and 17.25, respectively that in comparison with the average score in this subscale which is 15, the mean score for males is at the moderate level and for females is higher than the moderate level. In the subscale of perceived self-efficacy in gaining the head master's support, the mean score for male and female teachers were 12.72 and 18.39, respectively, which compared to the average score in this subscale which is 15, the obtained mean score for males is lower and for females is higher than the moderate level. The mean total score for male and female teachers were 70.41 and 84.04, respectively, which both are higher than the questionnaire average score which is 69. Comparing the mean scores shows that the mean scores of both subscales as well as the mean total score of teacher's interpersonal self-efficacy scale are higher in female teachers than male teachers. Also, in computer self-efficacy scale, the mean scores show that they evaluated their efficacy in using computers higher than the moderate level. This is also true both at the introductory and at the advanced level of computer self-efficacy. At the introductory level, the mean score for male and female teachers were 46.24 and 50.71, respectively, which compared to the average score in this subscale which is 40 were higher than the moderate level. At the advanced level of computer self-efficacy, the mean score for male and female teachers were 37.78 and 42.30, respectively, which, compared to the average score in this subscale which is 32.5, are higher than the moderate level. The mean total score of the scale for male and female teachers were 84.02 and 93.01, respectively, which both are higher than the average total score of the questionnaire which is 72.5. In general, these findings show that

the male and female teachers consider their computer self-efficacy higher than the moderate level. Comparing the mean scores shows that the mean scores of both introductory and advanced levels as well as the mean total score of computer self-efficacy are higher in female teachers than male teachers.

To examine simple relationships, Pearson correlation coefficient was used. The correlation coefficient between the total score of teacher's interpersonal self-efficacy scale and that of computer self-efficacy scale was obtained as 0.39. This coefficient was calculated in female teachers (158 individuals) and male teachers (120 individuals) as 0.34 and 0.33, respectively, and all the coefficients were significant at the level of 0.01. [Table 2](#) shows the coefficients between the components of teacher's interpersonal self-efficacy and the components of computer self-efficacy in both gender groups.

To examine multiple relationships, regression model was used ([Table 3](#)). The results showed that the regression model is significant ($P=0.01, F=27.01$) and altogether, 22.8% of computer self-efficacy variance is explained by the three components of interpersonal self-efficacy.

4. Discussion and Conclusions

The main objective of this study was to investigate the relationship between teachers' interpersonal self-efficacy and computer self-efficacy. The results showed a positive significant relationship between interpersonal self-efficacy and computer self-efficacy among all the male and female teachers in the study sample. This finding was consistent with the findings of Campio and Higin (1995) and Lonie et al. (2004) quotes by Paraskeva et al. (3), Tschannen-Moran and Tschannen-Moran and Hoy (21), and Algan (18). For example, Tschannen-Moran and Hoy (21) found in a study that teachers who have strong sense of self-efficacy are very open-minded against new ideas and they not only provide new and different opportunities or learning experiences for students, but also are more willing to experience new methods. In this regard, Allegan (18) found in a study that teachers who know how to use computer and have used the computer for a long time have high self-efficacy. Some researchers found a positive relationship between informative knowledge, imaginary self-efficacy, and imaginary self-efficacy in computer (15). Paraskeva et al. (3) figured out that general self-efficacy has a positive significant effect on computer self-efficacy. Overall, it should be noted that a teacher who feels competent to make appropriate and constructive interpersonal relationships can have the same feeling in the use of computer. Moreover, it should be noted that self-efficacy in interpersonal self-efficacy facilitates and underlies the use of com-

puter in classroom. According to experts, teachers' self-efficacy beliefs are based on two interlinked judgments: assessment of the required tasks for teaching and evaluation of teachers' personal capabilities in connection with those duties. Assessment of the required tasks for teaching is teacher's belief in the required variables for teaching which are outside of him/her. These variables include school climate, collective self-efficacy, and interpersonal self-efficacy of teachers. Assessment of personal capabilities refers to the beliefs of a teacher in his/her capabilities and shortcomings to use the required sources for teaching (e.g. computer self-efficacy) (21). With regard to computer self-efficacy prediction model based on teachers' interpersonal self-efficacy components, it was found that nearly 23% of the teachers' computer self-efficacy variance was explained by interpersonal self-efficacy components among which two components, i.e. self-efficacy to win colleagues' support and self-efficacy to win the school principal, had the main roles. In the small school community, members trust in each other and their relationship with each other creates a special social space called "school climate". Therefore, school climate refers to the set of values, cultures, and interpersonal relationships between school members that causes the school to enjoy a special function (22). It is worth saying that colleagues' support can be effective in computer self-efficacy in several aspects: first, the colleagues can act as a source of feedback, so that they can assess teachers' successful or unsuccessful performance in using computer. Therefore, a teacher who can win the colleagues' support on receiving this feedback will have higher computer self-efficacy. On the other hand, the colleagues can play an encouraging and reinforcing role for teachers and this is considered as a powerful motivational variable for teachers' self-efficacy in relation to computer. Finally, teachers' self-efficacy in both winning colleagues' support and the use of computer might be rooted in their high general self-efficacy. Of course, it should be noted that school climate could just have a deeper effect on novice teachers' self-efficacy beliefs because, due to the lack of enough skills in teaching and integration with their colleagues, novice teachers, in comparison with experienced ones, do not have enough confidence in their own abilities to teach. Thus, they are seriously impressed by the school climate and conditions. Consequently, in comparison with experienced teachers, they significantly rely on the sources of support and school climate, and their beliefs about their self-efficacy are influenced by the school climate. According to the descriptive results of this study, it was found that in two subscales of perceived self-efficacy in managing the classroom and winning the head master's support, the mean scores of male teachers were below the moderate. This point can be explained in several aspects.

Table 1. Mean and Standard Deviation of Teacher's Interpersonal Self-Efficacy and Computer Self-Efficacy Scores

| | Components | Mean ± Standard Deviation | | | t | P Value |
|--|--|---------------------------|---------------|---------------|-------|---------|
| | | Total | Female | Male | | |
| Teacher's interpersonal self-efficacy | Managing students' behavior in the classroom | 41.73 ± 10.70 | 48.40 ± 9.55 | 45.52 ± 10.98 | -5.40 | 0.01 |
| | Ability to gain colleagues' support | 15.96 ± 4.65 | 17.25 ± 4.47 | 16.69 ± 4.81 | -7.58 | 0.01 |
| | Ability to gain the head master's support | 12.72 ± 6.78 | 18.39 ± 6.12 | 15.94 ± 6.26 | -2.31 | 0.01 |
| | Total score | 70.41 ± 18.09 | 84.04 ± 16.30 | 78.16 ± 17.47 | -6.70 | 0.01 |
| Computer self-efficacy | Introductory level | 46.24 ± 11.38 | 50.71 ± 11.57 | 48.78 ± 10.64 | -3.30 | 0.01 |
| | Advanced level | 37.78 ± 9.57 | 42.30 ± 9.17 | 40.35 ± 9.52 | -4.00 | 0.01 |
| | Total score | 84.02 ± 20.11 | 93.01 ± 19.89 | 89.13 ± 19.31 | -3.77 | 0.01 |

Table 2. Correlation Coefficients Between the Components of Teacher's Interpersonal Self-efficacy and the Components of Computer Self-Efficacy

| Components of Teacher's Interpersonal Self-Efficacy | Introductory Level | | | Advanced Level | | |
|---|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | Male | Female | Total | Male | Female | Total |
| Managing students' behavior in the classroom | 0.14 | 0.22 ^a | 0.23 ^a | 0.12 | 0.25 ^a | 0.24 ^a |
| Ability to gain colleagues' support | 0.42 ^a | 0.26 ^a | 0.37 ^a | 0.54 ^a | 0.40 ^a | 0.50 ^a |
| Ability to gain the head master's support | 0.24 ^a | 0.25 ^a | 0.27 ^a | 0.24 ^a | 0.26 ^a | 0.27 ^a |

^aP < 0.01.

Table 3. Regression Model of Computer Self-Efficacy Based on the Components of Teacher's Interpersonal Self-Efficacy^a

| Predictors | R | R ² | β | t | P Value |
|---|------|----------------|-------|-------|---------|
| Managing behavior in the classroom | 0.48 | 0.23 | -0.04 | -0.62 | 0.53 |
| Ability to gain colleagues' support | | | 0.17 | 2.69 | 0.01 |
| Ability to gain the head master's support | | | 0.42 | 6.89 | 0.01 |

^aF = 27.02, df = 3 and 274.

On the one hand, high school students, especially male students, are in special physical, psychological, and age conditions and the desire for independence, thrill-seeking behaviors, and winning attention are their most important characteristics. Thus, female students have more controlled and more social behaviors and their behaviors are not as strict as the behaviors of male students. Low perceived self-efficacy in managing the classroom might result from such rebellions and independence-seeking and thrill-seeking behaviors of male students. If this issue is followed with traditional and teacher-centered attitude in male teachers, it will result in a negative cycle where traditional and teacher-centered attitude aggravates indiscipline and insubordination among students and vice versa. In perceived self-efficacy to gain the head master's support, male teachers might face principals in their schools

who have lower sense of human relations management or collaborative management inducing the teachers that their problems in teaching process and classroom must be solved by teachers themselves. Alternatively, they might not basically have a close relationship with teachers, or it is likely that the teachers lack necessary communication skills to integrate with the principal and get help from him, or even the male teachers do not find it necessary to talk about their problems with the principal. In contrast, female teachers may be willing to use student-centered, constructivist-based teaching methods and establish human relationships with students, principal, and colleagues and behave in accordance with such trends and attitudes. On the other hand, collective self-efficacy predicts teachers' personal self-efficacy. Thus, in a school where the teachers enjoy high collective self-efficacy, the members

might expect to be successful in teaching and interpersonal communication and thus work better to succeed. In fact, school climate can affect teachers' personal self-efficacy beliefs and there has been certainly such a difference between schools with male and female teachers. The results of the study showed that generally, computer self-efficacy has not developed to a high level among teachers, yet. One of the possible reasons is the lack of attention by decision-making institutions in education to the promotion of teachers' knowledge and competence in ICT and its importance in teaching and learning process. In addition, while about 70% of the teachers have assessed their own computer self-efficacy as moderate, it should be examined whether their capabilities could meet the needs and requirements of the world of education in the current era or not. It should also be examined whether the students who are taught by these teachers have the same assessment of their teachers. In addition, whether these capabilities have left any sign or trace in the learning environment and classrooms or not? The results obtained in this study are related to high school teachers and their generalization to other academic levels should be done with caution. Therefore, it is recommended to investigate the causal relationship among research variables in other levels of education and populations in the form of structural equation models. Furthermore, as the qualitative methods have heuristic nature –unlike quantitative methods used in this study that have approval nature- researchers are recommended to investigate the research variables by using a combination of heuristic plans to make it possible to explore different aspects of the subject and compare the results of quantitative and qualitative methods. On the other hand, with regard to the positive consequences of self-efficacy for teachers and students, nowadays the practical use of self-efficacy in education system of developed countries has been marked by preparation programs and professional development based on self-efficacy (23), while these programs have not been emphasized in our country. Therefore, it seems that holding internship (or teacher training) courses for student-teachers as well as for employed teachers with the theme of empowerment based on self-efficacy and group activity are quite essential. Besides, implementing professional preparation and developmental programs based on computer self-efficacy and collaborative activities will empower the teachers; consequently, promoting the capabilities of teaching staff not only enhances education efficiency, but also reduces education costs.

Footnotes

Author's Contribution: The authors contributed to the preparation of this paper in the following ways: study design and concept: Saeed Moshtaghi and Neda Fathi; analysis and interpretation of data: Saeed Moshtaghi; drafting of the manuscript: Neda Fathi; critical revision of the manuscript for intellectual content: Saeed Moshtaghi.

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