Investigating the Relationship between Kolb’s Learning Styles and General Self-efficacy of High School Female Students of Tehran in 2013-14 School Year

Leila Rezaei, Hassan Ahadi and Hassan Asadzadeh

Abstract

This paper aims to investigate the relationship between Kolb’s learning styles and general self-efficacy of high school female students in Tehran. The research method was correlation. The participants were 374 high school female students in Tehran and they were selected by multistage cluster random sampling. The instruments used for collecting data were Kolbs learning styles inventory and the Sherers general self-efficacy scale. The data were analyzed using Pearson correlation coefficient and stepwise regression analysis. The study results indicated that there is a significant and positive relationship between the converger learning style with the general self-efficacy of high school female students. There is a negative and significant relationship between the general self-efficacy and diverger learning style of the high school female students. Also, stepwise regression analysis revealed that the diverger learning style was a negative predictor of high school female students’ general self-efficacy.

Keywords:
- Kolb’s Learning Styles
- Converger learning style
- Diverger learning style
- Stepwise regression
- General self-efficacy

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INTRODUCTION

One of the important variables which have been the interest of researchers within the recent years is learning styles. Various models exist for learning styles [8]. One of these models considered by most researchers is the Kolb’s learning styles model. Kolb’s model is based on the experiential learning theory (ELT) of Kolb’s [11,5,14]. The Experiential Learning Theory is defined as "The process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" [11]. According to Kolb [12], the learning style is the learner preferred method to understand and transform information. The Experiential learning process is shown as a learning cycle [9]. In this model, learning occurs in a four-stage-cycle as:

Concrete experience (CE): This learning mode is characterized through feelings, communicate with others and new experiences process.

Reflective observation (RO): This learning mode is characterized through Reflection, accurate observation, viewing different viewpoints of objects and then formulating a judgment based on the observations.

Abstract conceptualization (AC): This learning mode is characterized through individual preferences for thinking and action, regular planning, cognitive thinking, rational application of ideas and concepts.

Active experimentation (AE): This learning mode is characterized through individual preferences to act, actively influence, and conviction and change of conditions, risk-taking, and being active in the learning process (Kolb, 1984). The dual combination of these learning modes gives four learning styles: assimilator, diverger, converger, and accommodator.

Assimilator (RO & AC): This learning style is a combination of two learning modes of reflective observation and abstract conceptualization. These learners prefer deductive reasoning and focus on abstract concepts. The assimilators tend to communicate with fewer people.

Diverger (CE & RO): This learning style is a combination of two learning modes of Concrete experience and reflective observation. These learners have the ability to solve problems by collecting various viewpoints...
generating diverse ideas, and achieving a creative solution. They tend to be reinforce in imagination and emotion.

Converger (AC & AE): This learning style is a combination of two learning modes of abstract conceptualization and active experimentation. These learners, similar to assimilators, prefer to hesitate about concepts rather than communicating with others. When there is only one right answer to a problem, the convergers have the best performance.

Accommodator (AC & CE): This learning style is a combination of two learning modes of abstract conceptualization and concrete experience. These learners with this learning style take more risks and are able to adapt quickly and they are superior to others, where they require immediate decisions [11,8,13].

Learning styles is a factor effective on student self-efficacy. The concept of self-efficacy is grounded in Albert Bandura's social-cognitive theory center [1]. Bandura [2] defines self-efficacy as the learner's belief to better cope with the learning situation. self-efficacy defines a motivational activator factor that guides behavior towards the learning objectives [16]. Some researchers consider this concept as a general concept and call it the general self-efficacy. The general self-efficacy is a set of diverse learning experiences that the learners transfer it into the new with learning situations [18]. The self-efficacy beliefs is one of the influential factors on students' motivation, learning, and achievement [17].

The self-efficient individuals act based on their chosen goals and rehearse responsible to determine their performance criteria and observe and judge their performance results. If they see any discrepancies between the actual and desired performance levels, they feel dissatisfaction, as this stimulus is their determinant and action correction [22]. Coutinho & Neuman [6] found in their research that self-efficacy has high contribution in predicting performance and, on the other sense, the learning styles are related to performance. There are few researches about the relationship between the learning styles and the self-efficacy [4,14,10,21,7]. Ozgen [14] studied the relationship between learning styles and ML self-efficacy beliefs among students'. Chu and Wang found that learners of RO learning mode had lower self-efficacy than learners of AE learning mode. Gholizadeh and Ahqar [7] stated that the students with the diverger learning styles had significantly higher self-efficacy ratio than the students' with the converger, assimilator, and accommodator learning styles. Yousef et al [21] reported significant relationships between the learning styles and the self-efficacy. Khaksar Boldaji [10] concluded in his study that those students' who use diverger learning style have higher self-efficacy compared to the students' with other learning styles.

The research literature indicates that the students' learning styles have important role in their self-efficacy. Therefore, this type of researches can identify the students' learning styles with higher general self-efficacy. Accordingly, the teachers attention to gather necessary knowledge and skills about the students' learning styles and its impact on their general self-efficacy could reduce educational weak outcomes and dropouts and prevent time and mental energy waste or the lack of productivity in human capital. When the teachers present students some information about modifying the learning process, this knowledge helps them to change their learning style and have more control over their learning process. Such information form self-efficacy beliefs among students' [15]. In other words, According to the role of students in learning and the lack of knowledge on students' learning styles are the obstacles in their development. This prominent study is performed among high school female students' who would enter university, particularly for course selection and consequently their career choices in future. Hence, The purpose of this study to was investigate the relationship between Kolb's learning styles with the general self-efficacy of the high school female students' of Tehran. the following questions were addressed:

1. What is the Kolb’s learning styles (assimilator, diverger, converger, and accommodator) distribution of high school female students’?
2. Is there a significant relationship between high school female students' general self-efficacy and their Kolb’s learning styles (assimilator, diverger, converger, and accommodator)?
3. Are the Kolb’s learning styles (assimilator, diverger, converger, and accommodator) a significant predictor of high school female students' general self-efficacy?

Methodology:

participants and research method:

Method of this research is of correlation type. The statistical population of this study includes all high school female students' in Tehran city in educational year of 2013-2014. Based on Morgan's table and through multiple-steps sampling, 374 female students' were selected as the sample. For data analysis, the statistical methods of Pearson's correlation coefficient and multiple regression were used.

Research scale:

Kolb's learning styles inventory version 3-1[13] The Kolb’s learning styles modified scale version 3-1 that was developed by Kolb & Kolb [13] to determine the learning styles of students' and adapted into Iranian by Valizadeh et al [19] was used. This inventory consists of 12 statements, each statement has 4 choices, the
subjects should respond to each statement by using the scores from 1 to 4. Eventually, the scores are added together. The scale gives two results: first, the learning modes, including four modes: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Thereby, the sum of the first item responses on 12 statements include concrete experience, and the second item include reflective observation, and the answers of the third item include abstract conceptualization and the answers of the fourth item include active experimentation. Then concrete experience scores is subtracted of the abstract conceptualization scores and the reflective observation scores is subtracted of the active experimentation scores, that these scores (AC-CE, AE-RO) represents the four learning styles: assimilator, diverger, converger, and accommodator [13]. Joy and Kolb [9] reported the reliability by using Cronbach’s alpha for the four learning modes from 0.79 to 0.94. Valizadeh et al [19] reported the reliability by using Cronbach’s alpha for the four learning modes from 0.70 to 0.90.

Sherer's general self-efficacy scale (SGSES): the Sherer’s general self-efficacy scale developed by Sherer et al [18] was administered to determine high school students’ general self-efficacy and adapted into Iranian by Barati [3] was used. It consisted of 17 items that aimed to measure general self-efficacy, as the items 3, 8, 9, 13 and 15 increase from left to right and the rest increase from right to left and the higher scores indicate higher general self-efficacy. Sherer et al [18] reported the reliability by using Cronbach’s alpha for the general self-efficacy from 0/71 to 0/86. alpha reliability coefficient of the scale was discovered as α = 0.79 [3].

Findings:
The data analysis was used on the descriptive statistics (mean and standard deviation) and the inferential statistical methods (Pearson correlation coefficient and stepwise regression analysis), Also Dummy coding was applied for the learning-style variable.

Indicators of descriptive statistics:

<table>
<thead>
<tr>
<th>Table 1: Statistical indices of general self-efficacy based on students' learning styles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>learning styles</td>
</tr>
<tr>
<td>assimilator</td>
</tr>
<tr>
<td>diverger</td>
</tr>
<tr>
<td>converger</td>
</tr>
<tr>
<td>accommodator</td>
</tr>
<tr>
<td>total</td>
</tr>
</tbody>
</table>

Result (table1) indicate that the converger learning style has the mean general self-efficacy (62.45), which is higher than the other learning styles. The diverger learning style has the mean general self-efficacy (57.43), which is lower than the other learning styles.

<table>
<thead>
<tr>
<th>Table 2: Frequency distribution of students' learning styles.</th>
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</thead>
<tbody>
<tr>
<td>learning styles</td>
</tr>
<tr>
<td>Assimilating</td>
</tr>
<tr>
<td>Diverging</td>
</tr>
<tr>
<td>Converging</td>
</tr>
<tr>
<td>Accommodating</td>
</tr>
<tr>
<td>total</td>
</tr>
</tbody>
</table>

As seen Table 2, among the female students’, the most prevalent learning style is Assimilating (46.9%) and it is followed by Diverging (26.1%), Converging (20.3%) and accommodating (6.4%). According to the score, female students’ prefer more Assimilator learning style than others learning styles.

Indicators of inferential statistics:

<table>
<thead>
<tr>
<th>Table 3: Correlation matrix of study variables.</th>
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<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>assimilator</td>
</tr>
<tr>
<td>diverger</td>
</tr>
<tr>
<td>converger</td>
</tr>
<tr>
<td>accommodator</td>
</tr>
</tbody>
</table>

According to the results of the correlation matrix (table 3), it can be seen that there is a significant and positive correlation between the converger learning style (P < 0.05) with general self-efficacy; and there is a significant and negative correlation between the diverger learning style (P < 0.01) with general self-efficacy.
Also, there is no significant relationship between the assimilator/accommodator learning styles with general self-efficacy.

Table 4: Multiple regression Analysis results for one Significant predictor variable on general Self-efficacy.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(constant)</td>
<td>61.348</td>
<td>.639</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diverger learning style</td>
<td>-.919</td>
<td>1.249</td>
<td>-.161</td>
<td>-.313</td>
<td>.002</td>
</tr>
</tbody>
</table>

Multiple R² = 0.161; R² = 0.026; Adjusted R² = 0.023; F = 9.846; *P< 0.05

As Table 4 indicates, only one variable (diverger learning style) explained a significant amount of variance in general self-efficacy, R² = 0.026, adjusted R² = 0.023, F(1,372) = 9.846, p = 0. 2.6 percent of the variances are explained by this variable. The value of Standardized Coefficients is -0.161 and Standard Error is 1.249 for this variable. converger, assimilator and accommodator learning styles use were excluded from the equation of predicting general self-efficacy because they did not have a significant contribution to variance in general self-efficacy (p >0.05).

According to the coefficients sign and by referring to the t-test statistics and the significant levels, it can be concluded that the obtained correlation is negative between the diverger learning style and the general self-efficacy. Finally, the mentioned explanation and the obtained coefficients can formulate the regression equation based on the constant amount and the un- Standardized coefficients (B) as following:

\( \text{(general self-efficacy)} = 61.348 - 3.919 \times (\text{diverger learning style}) \)

Discussion And Conclusions:

The Goal of this research is to study the relationship between Kolb’s learning styles with the general self-efficacy of the high school female students’ of Tehran in 2013-14 school years. In this study, Data analysis indicated high school female students’ were mostly assimilators and divergers followed by convergers and accommodators. The findings of this study are consistent with Gholizadeh and Aghar [7] research findings. Also, The present study results indicate that the converger and assimilator students' general self-efficacy means were higher than the means of diverger and accommodator students. This result was consistent with the study results given by Ozgen [14] which indicate higher mean ML self-efficacy beliefs of the converger and assimilator learners compared to the diverger and accommodator learners. If learning situations are set up According to different learning styles, a increase in general self-efficacy of the high school female students' might occur. According to the results of the present study, there is a positive and significant relationship between the converger learning style and the general self-efficacy and there is a negative and significant relationship between the diverger learning style and the general self-efficacy The findings of this study are consistent with Ozgen [14], Khaksar Boldaji [10], Youssefi et al [21], Gholizadeh and Aghar [7] find out that there is significant relationship between learning styles and the self-efficacy of students’. But the relationship between the accommodator/assimilator learning styles and the female students' self-efficacy was not statistically significant.In addition, the results of the stepwise regression analysis indicated that, among the Kolb's four learning styles, only the diverger learning style can significantly predict the variable criterion (general self-efficacy) at the rate of by 2.6%. That According to the obtained coefficients and t-test statistics and the significance levels, it can be concluded that The diverger learning style was negative predictor of the general self-efficacy. In a related study, Ozgen reported that the reflective observation learning mode (RO) was negative predictor of high school students’ ML self-efficacy beliefs. The findings rely on the diverger learning style as a combination of RO and AE learning modes (RO + AE) was consistent with the findings of the present study. The individuals with diverger learning styles have feeling, imagination, and creativity ability and they rather tend to the observation based opportunities than action, as these are the high school female students' innovative characteristics and creative ideas via the school factors (school, teachers, etc.) that are not considered or identified in their learning situations, thus they will result in reduced self-efficacy. According to Bandura, who emphasizes that the equal classroom training, causes the students', who have failed their homeworks, become discouraged and under developed compared to their classmates [20]. In other words, the lack of attention to the individual differences reduces the educational efficiency. Therefore, the learning contents and topics should be raised in proportion to the learners' situation [12]. According to the results of the present study, the high school female students' learning styles are identified, which is an important predictor of their general self-efficacy. It is hoped that teachers pay more attention to the learning styles and their impact on the high school female students' general self-efficacy. This study is about the learning styles with emphasis on the training-learning process to aid the reliability of the learning styles for the students’, so that they can learn to control and improve their learning process. Accordingly, they can be more efficient to obtain and process the educational content and prevent the negative impact of the learning styles on their self-efficacy. This study, similar to the other studies, has been conducted in the context of humanities, and had many constraints. In particular, the study is performed among the high school female students’. Therefore, the researchers are recommended, If possible, to repeat the
research in the other cities and among the high school male students. In addition, it is recommended to consider the aspects of the students' general self-efficacy in future researches.

REFERENCES