The relationship between self-directed learning and technology with entrepreneurial curriculum based on mediator role of students' attitudes

(Case Study: The views of high school students of smart schools in Isfahan)

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Abstract

The purpose of this study was relationship between self-directed learning and technology-based entrepreneurship curriculum mediated with attitude. The research method is correlation. The population was all students of smart schools in Isfahan in the year of 1394-1395. Sampling method was multi-stage cluster which 372 students were chosen randomly. Three researcher-made questionnaires related to self-directed learning, information technology and technology-based entrepreneurship curriculum were used which their content validity was accepted and their Cronbach’s alpha coefficients were .93, .89 and .87 respectively. Correlation and path analysis were used to analyze data. The results showed that self-directed learning and information technology and communication had significant and positive correlation with development of technology-based entrepreneurship curriculum and it was mediated by attitude of students. Also, attitude had a mediated effect.

Key words: self-directed learning, technology-based entrepreneurship curriculum, attitude
Introduction

Smart school is an educational institution reconstructed as an organized system for learning process and for improving management to prepare students for the information age. The role of students in the smart school is teaching and learning. In this school, curriculum is not restrictive and the students are allowed to take steps beyond their lesson plans. Therefore, it appears that the ground must be provided, so that entrepreneurial lessons increase for students and even their parents. In these schools, method of teaching is student-centered. Emphasis on thinking skills and providing a teaching-learning environment are of the strategies and policies of smart schools. Seven key principles in smart schools include creative knowledge, learning talent, attention to comprehension, learning with the aim of mastering and imparting it, concentrated assessment of learning, overcoming difficulties, and the school as a learning organization (2003, Rahimah). The efforts to develop smart school entrepreneurial curriculum and to identify factors affecting it are important steps to increase the efficiency of the curriculum of such schools and their being welcome by students. One of the problems of the educational systems has been the point that curriculum is offered to the students in such a way that does not empower students. This issue has influenced the motivation of students to learn as much as possible in a way that, it even causes educational failure, so attention to entrepreneurship curriculum and developing it in the fields of teaching have been the focus of curators, students, and all educational stakeholders. Entrepreneur curriculum consists of a set of learning-teaching activities after completing, which, students are immediately enabled in such a way that they are self-confident and without the help of others; they enter economic, social, and cultural fields in the community and have self-employment (Kallio et al., 2007).

One factor affecting the development of smart school entrepreneurial curriculum is self-directed learning. Long (2009) considers self-directed learning as a targeted process, which is usually identified with the behavioral activities involved in identifying and searching for information, and the learner admits responsibility for decisions relating to the objectives and activities (Zare et al., 2010). The results of the Third International Mathematics and Science Study (TIMSS) designed and implemented by the International Association for Evaluation of Educational Progress indicate that lesson contents of most countries have not focused much on skill. Self-directed learning involves three dimensions: motivation, metacognition, and self-regulation. Knowles quoted Williamson that students who enter education and training programs without self-directed learning skills suffer anxiety, frustration, and failure. According to Chao and Chen (2008), Saravi’s Studies (1980), Harriman (1990), Anderson (1993), Darmianti (1994), Morris (1995), Horeng (1995), Agazon (1995), Hagerty (2000), Hesu and Shio (2005), and Stewart (2007) there is a significant relationship between self-directed learning and academic performance. Attention to the motivation to study is of utmost importance at in attracting students at smart schools. Learning motivation, individuals' acquired beliefs about being valuable, abilities, or capabilities, goals, expectations of the individual for success or failure, and positive activities (curiosity and anxiety) are due to the self-assessment process. Academic motivation in terms of
goals is divided into two categories: extrinsic motivation: to appease the parents, reaching external rewards such as good grades, and social recognition. Strong emphasis on external academic motivation can have great consequences. Intrinsic academic motivation, which is to satisfy internal needs of the students and learned information and beliefs of the individual, has an important role in his learning motivation. One of the factors affecting students' academic motivation is better understanding of the subjects taught. Making material meaningful, complexity, ease, or difficulty of the content, the teacher's behavior such as looking the same to all, and quality of writing of the teacher all directly affect students' attention and this issue plays a significant role in learning. In Perkins' (1992) idea, students' motivation is under the influence of what he is to learn rather than the ways, which teachers employ in its presentation.
Utilizing information technology tools such as the use of personal computers, educational software, and the Internet strengthen self-directed learning in schools. In order to foster self-directed learning in students, teachers of smart schools should design teaching-learning process based on educational goals. However, this is not possible without teachers' awareness of factors affecting self-directed learning. Undoubtedly, the role of ICT in this context is undeniable and of other factors affecting the development of entrepreneurship curriculum in smart schools.
According to Vonderwell and Turner (2005), active involvement of the learners in controlling the learning processes could help learners to improve their ability in the use of resources and strategies. Finally, some see it as a new medium that provides a new opportunity for students to discuss, participate, and collaborate on construct and scientific subjects (Attaran, 2002). The results of the study by Keshavarzi and Rahgozar (2010) show that curriculum should be connected to the requirements of society and the world of work and be able to satisfy needs of industry by providing skilled work force. Amin Khandaghi (2010) concluded that all cognitive dimensions of curriculum of Bruner (2001) have great importance in the educational systems of industrial companies, but in terms of the application of these achievements, educational systems of industrial companies have a poor and weak status.
Findings of Quine Sun (2011) showed that the most significant factor noteworthy in the development of curricula is management of learning opportunities for creating a bridge between the content of teaching and the labor market. The findings of Andrewkomery (2011) showed that for streamlining the curriculum and meeting the needs of future students, curriculum should be modified. The findings of Josephine (2011) indicate that for better outcome of curricula, learning factors should be integrated based on the experience, establishing interaction between the learning system and community with each other based on theoretical scientific theories, and logical thinking to enable students to work in the community.
Curriculum used will be efficient and effective when by studying them learners' will possess the required capabilities and skills. The major problem in our educational system is that teachers' teaching is in such a way that, the students cannot apply their learned points in different social areas. Therefore, this would be a waste of funds spent on education. Learning at mastery level
causes students to be more satisfied with their curricula and meets their needs based on the talents that have.

Many studies (Maleki, 1996) show that students obtain academic achievement when efficient teaching is used. In such a case, they meet their needs of learning and reach a point of understanding from teaching materials (Saadatmand, 2011). In every society, the ultimate goal of education is provision of appropriate opportunities to acquire knowledge, skills, and attitudes in the form of specific competencies for students to help them in the effectiveness of their activities and being beneficial for the community. Since this growth should be reflected in the curriculum, the curriculum and its solidarity with society's needs require special attention. To prepare entrepreneurial curriculum, the views of experts, observers, students, and all stakeholders must be taken into account, and all procedures and processes of teaching and learning approaches that are effective in this regard should be considered. In this way, the curriculum will have the high performance required. If the curriculum is described as learning outcome, evaluating the curriculum refers to actual products and consequences of the learning process. If the philosophy of a curriculum does not focus on specific competencies, its products will not be ready for work in the labor market so will not be accepted by society.

Therefore, to reduce the levels of unemployment and underemployment, special professional merits should be paid attention to in developing the curriculum and steps should be taken for developing entrepreneurial curriculum. Thus, the main issue of this study is the relationship between self-directed learning and ICT-based entrepreneurial curriculum with students' attitudes mediation.

![Figure 1: Conceptual model](image_url)

**Figure 1: Conceptual model**

**Research Methodology**

Research methodology in this study is descriptive and correlational. A correlational study is one of the descriptive (non-experimental) methods that aim to investigate the relationship between variables based on the research goals.
To ensure the validity of the questionnaire in terms of content, the views of dozen of relevant professors and experts were used. Cronbach's alpha was used to calculate the reliability of the questionnaires that were 0.93, 0.89, and 0.87. To analyze the data, descriptive statistics (minimum, maximum, mean, standard deviation, skew, and kurtosis) and inferential statistics (Pearson correlation and path analysis) were used.

**Population, sample, and sampling**

The study population included all high school students in Isfahan smart schools (11368 people) in the academic year 2015-2016. Sampling was multi-stage clustering, where eventually 372 students of the smart school to be studied are randomly selected for the study. To select the sample, two-stage cluster sampling was used. In the first stage, five districts were randomly selected from among all the districts of education system of Isfahan. Then, in schools where ICT was used to some extent in the teaching-learning process, survey questionnaires were distributed among the students.

**Research Tools**

Research tools were three researcher-made questionnaires including self-directed learning and ICT, students' attitudes to curriculum, and components of entrepreneurial curriculum, whose validity in terms of content was obtained and in this regard, the views of teachers and experts were used. The reliability coefficient of the questionnaires was determined using Cronbach's alpha as given in Table 1.

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Cronbach's alpha coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>The researchers-made questionnaire of self-directed learning and ICT</td>
<td>0.87</td>
</tr>
<tr>
<td>The researchers-made questionnaire of students’ attitudes to curriculum</td>
<td>0.93</td>
</tr>
<tr>
<td>The researchers-made questionnaire of components of entrepreneurial curriculum</td>
<td>0.89</td>
</tr>
</tbody>
</table>

**Research findings**

**Table 2: Pearson's correlation matrix between the variables**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-learning</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Technology</td>
<td>0.38**</td>
<td>-</td>
<td></td>
<td></td>
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</tbody>
</table>

http://www.ijhcs.com/index.php/ijhcs/index  Page 1491
As is seen in Table 2, all the correlations between variables are significant. There is a positive relationship between all variables.

In this study, to evaluate the direct and indirect effects of self-directed learning and ICT on attitudes and development of components of entrepreneurial curriculum, a hypothetical model was designed based on the background. Before providing the standardized path coefficient, indices of goodness of fit are checked. These indicators are presented in Table 3.

<table>
<thead>
<tr>
<th>Index</th>
<th>Estimation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goodness of fit index (GFI)</td>
<td>0.98</td>
</tr>
<tr>
<td>Adjusted goodness of fit index (AGFI)</td>
<td>0.94</td>
</tr>
<tr>
<td>Root mean square error of approximation (RMSEA)</td>
<td>0.04</td>
</tr>
<tr>
<td>Chi-square ()</td>
<td>9.37</td>
</tr>
<tr>
<td>Degrees of freedom (df)</td>
<td>3</td>
</tr>
</tbody>
</table>

After parameter estimation, it is the time to measure model goodness. In this study goodness of Fit Index has been reported as GFI, AGFI, RMSEA, and $X^2$. There is no fixed amount for the desirability of GFI and AGFI, but as this value gets closer to one, the model has a better fit. RMSEA index is less than 0.05 for good models.

Last index is $X^2$ that measures the difference between observed and estimated matrix, and its lack of significance represents the good fit of the model. However, due to the sensitivity of this index, it is referred to sample size and multivariate deviation from the assumption of normality. In case of its significance, it is referred to other indices such as chi-square ratio to degree of freedom, root mean of residual squares, adjusted goodness of fit index or index root mean square error of approximation. In total, the fit indices indicate a good fit of the model.

<table>
<thead>
<tr>
<th>Paths</th>
<th>Direct effects</th>
<th>Indirect effects</th>
<th>Total effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized coefficients</td>
<td>t</td>
<td>Standardized coefficients</td>
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<td></td>
<td>Standardized coefficients</td>
<td>t</td>
<td>Standardized coefficients</td>
</tr>
</tbody>
</table>

Table 4: Estimation of the coefficients of direct, indirect, and total effects of the model
According to the data in Table 4, direct effect of self-directed learning on the attitude is 0.64 and on curriculum is 0.48, and it is significant, this means that with increase in self-directed learning, attitudes, and entrepreneurship of curriculum increase. Moreover, the direct effect of technology on the attitude is 0.24 and on curriculum is 0.52 and significant, where with the increase in technology, attitudes and entrepreneurship curriculum increase.

As can be seen in Table, the indirect effect of self-directed learning on the curriculum is 0.20 and significant, so it can be said that attitude plays the role of a mediator between these two variables. The indirect effects of technology on learning curriculum is 0.08 and significant, it can be said that attitude has the role of a mediator between these two variables.

In addition, the table shows the estimation of total effects of the model. As can be seen in the table, the total effect of self-directed learning on the curriculum is 0.68 and technology on curriculum is 0.59 and significant at 0.01 level.

![Diagram of estimation path of the parameters of the model of entrepreneurial curriculum](http://www.ijhcs.com/index.php/ijhcs/index)
Conclusion
This article aimed to study the mediator role of attitude in the relationship between self-directed learning and technology on the development of entrepreneurial curriculum. As was seen, self-directed learning (motivation, metacognition, and self-regulation) largely affects the development of entrepreneurial curricula in smart schools. According to Van Pitgam (2008), the study by Lanik Child (2001) showed that, self-directed learning as a personal learning strategy for individual students is unique and in this way can pursue the goals in the curriculum and reach them. The findings of Vonderwell and Turner (2005) showed that the active involvement of the learners in controlling learning process helps learners to improve their ability effectively in the use of resources and strategies.


The research by Haqqani and Khadjivzadeh (2009) showed that teaching learning skills training is effective on educational achievement of students, motivating them, and finally plays an important role in their academic progress. Abinakifard (2003) showed that, there is a significant relationship between self-esteem and academic achievement as well as achievement motivation and academic achievement of students. The results also showed that there is a direct correlation between ICT in the curriculum (developmental activities, innovative activities, leadership activities) and development of entrepreneurial curriculum in smart schools.

Powell (2002) noted that technology could potentially eliminate unequal opportunities for students with different academic backgrounds and allow them to benefit equally from the treasures of information available on the Internet. Therefore, development of issues such as self-regulation, metacognition, and motivation should be paid attention to in developing self-directed learning in the students. Moreover, since ICT is effective in the development of entrepreneurial curriculum, it is recommended that ICT be used in the curriculum process.
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