Moderating Role of Online Self-Efficacy in Relation between Learning Strategy and Online Performance

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Abstract: Data derived from 72 students in online English course showed that online self-efficacy was a moderating factor in relation between learning strategy and online performance. In high online self-efficacy group, online performance was predicted by learning strategy positively, which explained 23% of the performance variance. In low online self-efficacy group, online performance was not predicted by learning strategies significantly.

Keywords: Online self-efficacy, online performance, learning strategy, moderator

1. Introduction

Web-based instruction has become increasingly popular in recent years. It is a type of self-regulated learning. Learners’ motivation and strategy are responsible for their own learning processes and outcomes. Many researchers documented that as learners’ computer or Internet self-efficacy perceptions strengthened, their Web-based learning performance also noticeably improved (Whipp, 2004; Joo, 2000; Al-Khaldi, Al-Jabri, 1998; Hill, Hannafin, 1997).

Self-efficacy is people’s judgments of their capabilities to organize and execute course of action required to attain designated types of performance. It is not with the skills one has but with judgments of what one can do with whatever skills one possesses (Bandura, 1986). Self-efficacy exerts effect on performance directly as well as indirectly through various cognitive mechanisms such as learning strategies. Many documents showed that students with a stronger sense of self-efficacy tented to use more strategies, which eventually resulted in better classroom performance (Zhang, Zhang, 2003; Zhou, Zhang, Li et al., 1997; Pintrich, Groot, 1990). It seems to be conclusive that learners use more learning strategies will lead to better online-performance. However, what is role of online self-efficacy in the relation between strategies use and online performance? Is that relation linear with increasingly strong online self-efficacy? Or does that relation change with different online self-efficacy level? We are interested in confirming moderating role of online self-efficacy in the relation between strategies use and online performance.

2. Method
2.1 Participants
Participants were 72 online learners from Beijing Jiaotong University. The sample consisted of 28 males (39.4%) and 43 females (60.6%). There was 1 missing data of sex.

2.2 Measures

**Online self-efficacy.** Perceived capability to use Internet and computer to complete online learning tasks was assessed by 13 items adapted from the Distance Learning Self-efficacy Scale developed by Peng Huamao, Wang Ying, Huang Ronghuai and Chen Geng (2006). Sample items read: “I can use the links provided by teacher to find learning materials” and “I can’t participated discussions on the BBS about courses.” A response scale ranged from 1(not at all true) to 5(very true). The Cronbach’ α for this scale was .887. The high score on the scale exhibited high online self-efficacy.

**Learning Strategy.** 67 items developed from the LASSI (Weinstein, 1995) assessed learners’ strategy level. Items were revised to adapt to online learning. Sample items read: “I draw pictures or diagrams to summarize materials in the course;” “I always try to relate what I’m learning to my work,” and “I test myself to make sure if I understand what I have learned.” A response scale ranged from 1(not at all true) to 5(very true). The Cronbach’ α for this scale was .902. The high score on the scale exhibited high strategy level.

**Online performance.** Students’ online performances of English course were measured. Two types performance measure were obtained. One was online unit test. The other performance was performance of online collaborative learning. Two types performance were given equal weight. Therefore, online performance was summation of unit test score and collaborative learning score.

3. Results

3.1 Preliminary Analyses

Table 1 presents descriptive statistic of scales and online performance.

| Table 1 Descriptive Statistic of Scales and Online Performance |
|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | Female | | Total | |
| Scale | M | SD | N | M | SD | N | M | SD | N |
| Online Self-Efficacy | 4.02 | .63 | 28 | 3.91 | .74 | 43 | 3.95 | .69 | 72 |
| Learning Strategy | 3.52 | .43 | 28 | 3.46 | .42 | 43 | 3.50 | .43 | 72 |
| Online Performance | 60.54 | 17.92 | 28 | 54.15 | 23.90 | 43 | 56.78 | 21.69 | 72 |

A series of t tests was conducted to determinate whether there was any gender difference. No significant gender difference was found (t (71) = .663, p>.05; t (71)= .653, p>.05; t (71) = 1.283, p>.05).
3.2 Correlation Analyses

Pearson Correlation Coefficients were computed to examine relations among variables. As Table 2 shows, online performance correlated with highly scores of online self-efficacy ($r = .283$) and learning strategy ($r = .348$). There was positive correlation between self-efficacy and strategies use ($r = .561$). Self-efficacy correlated with performance directly, but what was its role in the relation between performance and strategy? It will be concluded through regression analyses.

<table>
<thead>
<tr>
<th></th>
<th>Online Self-Efficacy</th>
<th>Learning Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Performance</td>
<td>.283*</td>
<td>.348**</td>
</tr>
<tr>
<td>Learning Strategy</td>
<td>.561**</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: **. Correlation was significant at the 0.01 level. 
*. Correlation was significant at the 0.05 level.

3.3 Regression Analyses

The collected data was divided into two groups based on their mean value of online self-efficacy, 3.95. The group of students who scored less than or equal to the mean value were categorized as the group of low self-efficacy (n=36). Otherwise, students were categorized as high self-efficacy (n=36). Further regression analyses of these groups indicated that online self-efficacy was a moderating factor for the relation between online performance and learning strategy. Table 3 shows the results of linear regression used method of least squares.

<table>
<thead>
<tr>
<th>Group</th>
<th>$R^2$</th>
<th>$\beta$</th>
<th>$F$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Self-Efficacy</td>
<td>.028</td>
<td>.168</td>
<td>1.014</td>
<td>.321</td>
</tr>
<tr>
<td>High Self-Efficacy</td>
<td>.230</td>
<td>.479</td>
<td>9.849</td>
<td>.004</td>
</tr>
</tbody>
</table>

For the high online self-efficacy group, online performance was predicted by learning strategy level ($\beta = .479$, p< .01), which explained 23% of the performance variance. However, the indicator for the strength of the correlation dropped in the low online self-efficacy group. The performance was not predicted by learning strategy level significantly ($\beta = .168$, p> .05), which explained only 2.8% of the performance variance. In other words, if someone’s online self-efficacy was low, his online performance was not related to his learning strategy level. When his self-efficacy was high, his strategy level would affect performance positively. Therefore, regression analyses results indicated that online self-efficacy was a moderator variable in the relation between performance and strategy level.
4. Discussions

Online learners in our research are adults’ on-the-job and participating learning through Internet. The learning experiences for these online learners are not only relative to their work, but also relative to their computer skills (or internet skills) during e-learning. In a sense, computer skills are more and more important in e-learning.

Some findings indicate that self-efficacy is sensitive to experience, tasks and contexts. And self-efficacy of learners will have effect on latter learning behaviors. We believe if learners have successful experience or substitute experience for computer skills, they can enhance their conception through their own behaviors or others’ behaviors and improve their own self-efficacy.

Our research shows that self-efficacy is moderating variable in the relation between performance and learning strategy. In other words, it can improve learning strategy and online performance somewhat. Therefore, online tutors should support online learners with opportunities that learners can succeed easily so as to make learners have relevant experience and understand learning tasks. For high self-efficacy learners, online tutors give them more successful experiences, especially give them online learning strategies instructions directly, and help learners improve their online performance. For low self-efficacy learners, online tutors should pay much more attention to learners’ successful experience and not giving them too much learning strategies at first. Enhancing self-efficacy is the first step for low-efficacy learners. They need to increase successful judgments and enough confidence through enough experience of computer skills.

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References