


Assessing the Effect of General Self-efficacy on Academic Achievement Using Path Analysis: A Preliminary Study

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ABSTRACT

Although self-efficacy is a construct born originally out of and into the field of psychology, its importance and relevance extend de facto outside its original field of research to span multiple closely related disciplines including, but in no way limited to, applied linguistics and educational psychology mainly for its demonstrably strong association to a vast range of language-related educational phenomena. In the present study, we set out to examine, by means of the Spearman correlational test and through the construction of a direct effect model, the relationship between general self-efficacy beliefs and academic achievement. For this, we used responses of one hundred and thirty-eight (N = 138) EFL students of undergraduate and graduate levels from numerous universities across different regions in Morocco. Findings show a very moderate significant correlation between self-efficacy and academic achievement as measured by GPA. Further, a constructed direct-effect path model showed a significant positive impact of self-efficacy on academic achievement, substantiating further the existing link between the two constructs. In addition, a gender-based comparison in terms of self-efficacy using an independent sample t-test revealed that females reported higher self-efficacy beliefs than their male counterparts. Finally, we conclude with a summary of the study and some recommendations for future research.

1. Introduction

There is an increasing concern about self-efficacy and academic achievement. Much research has been undertaken to assess the extent to which self-efficacy can predict learners' academic achievement across a number of social contexts. The term self-efficacy has been defined as "perceived capabilities for learning or performing actions at designated levels" (Shunk & Pajares, 2009, p. 35). It has been argued that self-efficacy is influenced by several factors, including (1) performance accomplishments, also referred to as personal mastery experience, (2) vicarious experiences, (3) forms of social persuasion (verbal persuasion), and (4) physiological feedback (Bandura, 1977).

Bandura (2010) elaborates more on the issue contending that personal mastery experience is the most effective and prominent source that influences self-efficacy. Personal mastery experience comprises the ability to enhance determined and forceful beliefs and promote trust based on previous experiences. Although much research has been geared to investigate the link between self-efficacy and academic achievement in Western and some Asian countries, there is up to now, at least to the best of our knowledge, a dearth of such research in the Moroccan context. The present paper comes to fill in this gap in research by examining the relationship between general self-efficacy beliefs and academic achievement at both the correlational and the direct effect levels among a group of higher education learners of EFL in Morocco.

Using bivariate correlational and path analyses, the present quantitative study seeks to investigate the statistical relationship between general self-efficacy, as measured by the New General Self-efficacy Scale (NGSE) and academic achievement, as measured by university grade point average (GPA, henceforth) scores. Another aim of the study is explore whether there are any gender-

based differences regarding learners' reported self-efficacy levels. Accordingly, along with an introduction and a conclusion, the paper consists of four major sections. Section one is a theoretical background explaining the main key terms in the paper and presenting a literature review regarding the relationship between the two constructs. The second section is concerned with explaining the research method comprising a description of the participants, the research instruments and the data collection procedures. The general findings of the study, along with their discussion, are presented in sections three and four, respectively. The paper ends with some recommendations for future research.

2. Literature Review

2.1 Self-efficacy

Individuals typically have judgments about their capability, and the construct of self-efficacy is a measurable psychometric reflection of those judgments (Ponton et al., 2001). Self-efficacy is a manifestation of "people's beliefs in their ability to influence events that affect their lives" (Bandura, 2010), and general self-efficacy beliefs are "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). They express "how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982). Self-efficacy finds its genesis in part in performance accomplishment (Bandura, 1977) as it is also a contributor to how individuals perceive themselves and their performance (Schunk, 1991).

General self-efficacy reflects perceived task-related performance capacity (Gist & Mitchell, 1992); it "influences how people think, feel, motivate themselves, and act" and "affects behavior and outcomes" (Zulkosky, 2009, p.101). It is seen as a significant predictor of behavioral change (Lenz & Shortridge-Baggett, 2002). Interestingly, in what appears to be a self-reinforcing mechanism, positive self-efficacy beliefs actually increase the chances of obtaining the believed result (Gist & Mitchell, 1992).

Since its inception, self-efficacy theory has been implemented across a confluence of disciplines because of its link to learning, achievement and motivation, which pertain primarily to education (Schunk, 1995). In the present study, we seek to examine the role of self-efficacy in relation to achievement operationalized as GPA using a convenience sample in an academic university context.

2.2 Self-efficacy and academic achievement

By virtue of its predictive and explanatory importance, self-efficacy has been shown to play an influential role in a host of domains at the educational level (Schunk & Pajares, 2009). At a more practical level, self-efficacy contributes to academic learning as such and how students perceive and evaluate themselves (Schunk, 1991). As a matter of fact, self-efficacy beliefs are strong predictors of behavior mainly because they are seen as reliable determinants of one's accomplishments (Pajares, 1996).

In this respect, there is a wide range of various studies across multiple contexts demonstrating conclusively that self-efficacy strongly, reliably and consistently predicts academic achievement (Schunk, 1991; Bandura et al., 2001; Caprara et al., 2008; Caprara et al., 2011; Di Giunta et al., 2013) whether it be at the university level with studies targeting undergraduate students population (Lent et al., 1984; Yip, 2012; Afari et al., 2012) or in schools (Diseth et al., 2012; Köseoglu, 2015; Hwang et al., 2016; Schneider, & Preckel, 2017) as numerous meta-studies and meta-analyses in the subject matter have demonstrated (Brown & Lent, 1991; Richardson et al., 2012).

With regards to the effect-driven relational level, evidence from path analysis models indicates significant paths from self-efficacy to GPA (e.g., Diseth et al., 2012), and that self-efficacy impacts directly GPA (Yusuf, 2011). This is in complete concordance with previous findings reported using path analysis techniques among various groups (Schunk, 1981, Bjørnebekk et al., 2013) and across different subjects (e.g., Pajares, 2003). Moreover, through hierarchical regression analysis, similar results have confirmed in another context that self-efficacy affects significantly and positively predicts academic achievement (Adeyemo, 2007). However, in other social settings, self-efficacy was also found to play no direct role in affecting academic outcomes (Alhadabi & Karpinski, 2020; Ghaleb et al., 2015).

2.3 Gender differences in self-efficacy

There is a considerable body of evidence in the literature surrounding the topic of gender differences in terms of self-concept and self-efficacy in particular. However, this relevant evidence yields inconsistent and often contradictory results, as pointed out by researchers. These two divergent lines of conclusions are best summed up by the several meta-analyses, of which many results showed that boys scored higher in self-efficacy than their female counterparts (Diseth et al., 2012). Further, along the same lines, in a meta-analysis of more than two hundred independent studies, aggregate results showed that males demonstrated slightly higher overall self-efficacy than females, consistent with referenced previous meta-studies (Huang, 2013).

Conversely, one classical study by Schunk et al. (1985) reported no significant sex difference in self-efficacy scores. This conclusion is supported by considerable additional subject-specific findings suggesting no significant difference regarding male and female self-efficacy scores (Ayotola & Adedeji, 2009).

3. Methodology

3.1 The hypotheses

In light of what has been discussed in the review of the literature, we, therefore, put forth the following hypotheses to the test in the Moroccan context:

- 1) Self-efficacy correlates significantly with academic achievement as measured by GPA.
- 2) Self-efficacy has a positive direct effect on academic achievement.
- 3) There are no significant gender differences in self-efficacy scores.

3.2 Participants and data collection

3.2.1 Participants

The sample consisted of 70 (51 %) university EFL male students and 68 (49 %) female students of the total one hundred and thirty-eight (N = 138) participants. The most common age bracket is 25-or-less (41 %); followed by 25-30-year-old students (27 %), while 22 (15%) participants are between 35 and 40 years old. 11 participants (8%) reported being in the range of 30-35 when 10 (7%) students reported having 40-or-more years. The highest grade reported is 16.00 and the lowest grade is 10.45. The mean GPA score is ($M = 12.81, SD = 1.07$).

3.2.2 Data collection

As part of a battery of tests, participants completed the New General Self-Efficacy Scale (NGSE) and reported their GPA scores in addition to a personal information sheet. Under the restrictions imposed during the Corona-virus pandemic rendering the conditions to conducting classroom administration difficult, data were gathered through electronic questionnaires presented to a non-probability convenience sample of students from various universities in Rabat-Sale-Kenitra and Beni Mellal-Khenifra regions. Obtained data were processed through Amos (24), Microsoft Office (2007) and SPSS (20).

3.3 The research instruments

3.3.1 Self-efficacy

The New General Self-efficacy (NGSE) is a self-report self-efficacy scale. It has shown good reliability and validity (Chen et al., 2001). The NGSE is an eight-item instrument, and it comprises statements such as "I will be able to successfully overcome many challenges." and "Even when things are tough, I can perform quite well." that range from "Strongly disagree" = 1 to "Strongly agree" = 5 as it is conceived as a 5-point Likert scale (Chen et al., 2001).

3.3.1 Academic achievement

Academic achievement is operationalized as a grade-point average (GPA) of a two-year fundamental program consisting of preparatory courses and crowned with a diploma in the universities of Morocco. The program's overall GPA is calculated based on the grades of all preparatory modules. These modules include but are not limited to advanced English reading and composition, intermediate and advanced English grammar, public speaking and debated lectures and practice modules, in addition to the study of the science of linguistics, cultural studies and classical English literature.

4. Results

This section examines two levels of the relationship between self-efficacy and academic achievement. The first one concerns itself with the linear bivariate correlation. The second test is for the direct effect of self-efficacy on GPA using path analysis. On the other hand, the third test examines gender differences between males and females based on mean scores.

4. 1 Correlational analysis

Using the Spearman correlational test between the main variables of self-efficacy and academic achievement, we obtained a result of ($r_s (136) = .17, p < .05$) based on standardized summed scores (See Table 1.1). The correlation is moderate but significant in statistical terms.

Table 1.1 Self-efficacy, GPA and key socio-biographical variables: Spearman correlation and descriptive statistics (N = 138)

Variables	1	2	3	4	M	Min	Max	SD
1 GPA	—				12.81	10.45	16	1.07
2 General Self-efficacy	.17*	—			34.27	13	40	4.97
3 Age ^a	.06	.12	—		—	25-or-less	40-or-more	—
4 Gender ^b	.24**	.20*	.17*	—	—	—	—	—

Age^a: 1 = 25 or less, 2 = 25-30, 3 = 30-35, 4 = 35-40, 5 = 40 or more; Gender^b: 0 = male, 1 = female.

p* = .05. *p* = .01.

4. 2 Direct effect analysis

With the intent of testing the unidirectional effect, a direct effect path model linking self-efficacy and GPA was constructed (Figure 1) and tested (Figure 2). The results $\chi^2(24) = 37.445, p=.039, CFI=.973, TLI=.959, RMSEA=.064, SRMR=.0436$ (Table 1.2) of the statistical model indicate a significant impact of self-esteem on reading motivation (Fig .2). The corresponding effect obtained is $\beta = .352, p = .015$, with a coefficient of $B = .222$ (See Table 1.2).

Figure 1. Conceptual direct effect model of Self-efficacy on GPA

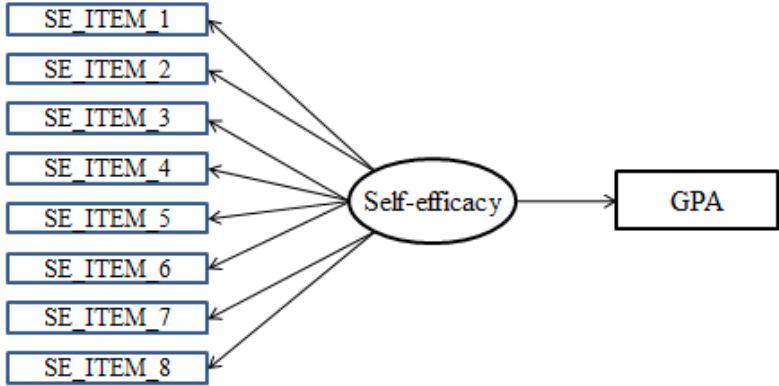


Figure 2. Statistical direct effect model of Self-efficacy on GPA

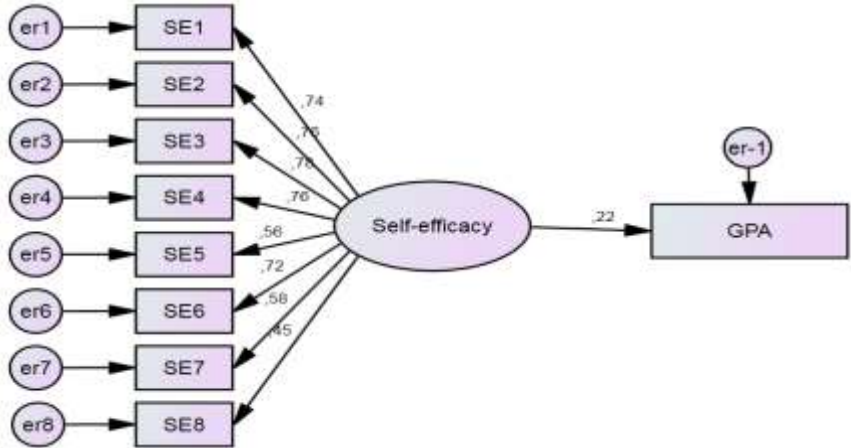


Table 1.2 Path analysis direct effect of self-efficacy on GPA

Effect	β	β	S.E.	C.R.	P
Self-efficacy --> GPA	.352	.222	.145	2,429	.015

S.E: Standard error; C.R.: Critical value; β = unstandardized estimate; β = standardized estimate

4. 3 Gender differences in self-efficacy

We conducted an independent *t*-test to examine gender self-efficacy score differences. Results were subsequently obtained, and since Levene’s test showed unequal variances, we interpreted the independent *t*-test results accordingly. On average, male students reported relatively lower SE results (M=33.10, SD=5.66) than females (M=35.48, SD=3.82). In accordance with that, the results of the comparison showed a moderately significant statistical difference between the two groups $t(136) = -2.90, p = .004$.

Table 1.5 Independent *t*-test results of comparison between men and women in self-efficacy

Variables	Men (n=70)		Women (n=68)		<i>t</i>	<i>p</i>
	M	SD	M	SD		
Self-efficacy	33.10	5.66	35.48	3.82	-2.90	.004

5. Discussion

Given the typology and the distribution of self-efficacy and GPA data (See Appendix A and B), we opted for the Spearman test to examine the linear correlation, regression-based path analysis for the unidirectional impact of self-efficacy on GPA, and finally, the independent sample *t*-test to evaluate the possible significant difference between the two sex groups.

At first, correlational results between self-efficacy and academic achievement ($r_s(136) = .17, p < .05$) (Table 1.1) indicated a positively significant result using the Spearman correlational test despite the low value of .17. The obtained result, however moderate it revealed to be, is in line with the various reported results (e.g., Schunk, 1989; Adeyemo, 2007; Diseth et al., 2012). Having made this observation and in alignment with the reported literature (e.g., Yusuf, 2011; Ward & Khine, 2012; Bjørnebekk et al., 2013), evidence confirms the hypothesized convergence (H1), stating the existence of a significant correlation between self-efficacy and academic achievement as measured by GPA.

Further, we looked at the path linking self-efficacy and GPA. The results from the path analysis model as conceptualized in (Figure 1) indicate a significant path from self-efficacy to GPA (Figure 2) as they appear in (Table 2). The corresponding results indicate an acceptable model explaining .22 per cent of the variance as it shows good fit indexes ($\chi^2(24) = 37.445, p=.039, CFI=.973, TLI=.959, RMSEA=.064, SRMR=.0436$). However contradictory the evidence obtained when it comes to the effect of self-efficacy on academic achievement is, the results we obtained in our context clearly join the studies concluding unidirectional positive effect on GPA (e.g. Schunk, 1981; Yusuf, 2011; Diseth et al., 2012; Bjørnebekk et al., 2013). Thus, we confirm H2 stating that self-efficacy positively affects academic achievement measured by GPA.

In terms of gender difference, the independent sample *t*-test showed that female students reported higher ($M=35.48, SD=3.82$) self-efficacy results than men ($M=33.10, SD=5.66$), indicating a moderate significant statistical difference $t(136) = -2.90, p = .004$. The obtained results seem not to support prior research findings, which stress males reporting marginally higher self-efficacy scores than females. Our results contradict the reported existing evidence and seem to call for more additional research under similar conditions that may either substantiate or refute them.

6. Conclusion

In the present study, we have conducted multiple statistical tests to reach different conclusions. First, correlational analysis examining the link between self-efficacy and academic achievement showed a mild positive relationship. Another equally considerable finding is the empirically demonstrated positive unidirectional link between self-efficacy and academic achievement through a structural equation model. Furthermore, we have demonstrated a significant difference in terms of self-efficacy scores between the two sexes as females reported higher scores than males.

However, given the multiple constraints imposed by the covid-19 lockdown, we would like to make recommendations for more research avenues. In an attempt to overcome the limitation of a relatively limited sample size and enhance classroom administration rigour, we propose the use of a more extensive and more diverse sample in a classroom-administered environment. We also recommend the inclusion of other more enhanced statistical tools to control any extraneous variables that might have been operating unrecognizably to shape the overall conclusions about the impact of self-efficacy on academic achievement. It is further recommended that EFL teachers design more classroom-oriented research to foster and nurture the spirit of self-efficacy, particularly among students who might appear through investigation and examination to be less self-efficacious.

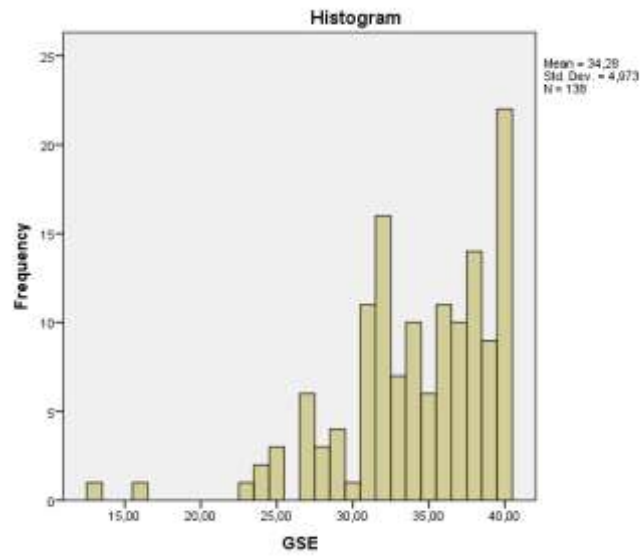
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Appendix A



Appendix B

