

The effect of test anxiety on academic achievement of adolescents in educational practices

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Abstract

The present study aims at examining the relationship between test anxiety and academic achievement, and determining the effect of gender variables, and academic specialization (sciences/Letters) at the level of test anxiety and academic achievement, among adolescents in educational practices. The sample was based on the convenience sampling, 114 pupils from the upper secondary education in Morocco (between the ages of 16 and 17 years, 57.02% of them were sciences students and 42.98% were Letters students). They all passed the Sarason test anxiety scale, which was the research instrument, and analyze data, and the first continuous assessment scores was used as an indicator of the academic performance of the sample. The results of this study confirmed a statistically significant correlation between test anxiety and academic achievement, with statistically significant differences at the level of test anxiety due to the gender variable, with no differences recorded at the level of academic achievement, and the absence of differences at the level of test anxiety and the level of academic achievement due to the academic specialization (sciences/Letters). Given the negative effects of text anxiety on learner's academic achievement, finding solutions to overcome test anxiety proves to be a pedagogical requirement.

Keywords: test anxiety, academic achievement, gender, academic specialization, adolescents

Introduction

Academic achievement is the key to sustainable social development; it is directly linked to social and economic development of the country (Alemu & Feyssa, 2020). In this regard, researchers have been interested in academic achievement from educational and psychological perspectives, especially in the light of tremendous scientific and technical development that has forced societies to pay more attention to the qualitative aspects of education to keep with the ongoing development (Almezughi, 2011).

Nael (2010), on the basis of a literature survey on the topic, considers that academic achievement, undoubtedly like any other variable in educational practices, may be hampered by a number of interrelated factors that negatively affect the learner, namely physical, mental, gender, psychological, emotional, social, economic and educational factors.... By determining these factors and their effects on academic achievement, the obstacles to the learning process can be controlled and avoided through the development of appropriate methods for academic achievement standards. Thus, academic achievement is considered not only as mere promotion to the upper level and better qualifying grades, but it is also the leading requirement to the rightly chosen study and career, and to determining the future social role and status of the individual (Hamwi & Al-Ahmad, 2010). This requires an adequate education, which Tugan (2015) considers to be the student's ability to succeed in his/her tasks and studies, and that test scores being a crucial instrument widely used to measure it (D'Agostino et al., 2022).

Given the importance of secondary education, in that it coincides with the stage of adolescence, and given its major role in shaping the learner's choice of higher education or careers in different fields (Medjadi, 2019), the significance of studying the effect of the learner's gender, academic specialization and test anxiety level on his/her academic achievement becomes clearly obvious and of paramount importance. Therefore, the idea behind approaching this topic lies in the fact that the starting point for any reform in any educational system is the evaluation of the achievements of this system. Thus, this topic is framed within the problematic of education in its emotional and cognitive dimensions, illustrated by examining the relationship between the level of test anxiety and the level of academic achievement and the effect of gender and academic specialization on each of them.

Test anxiety and academic achievement: variables and effects

Although testing is one of the required assessment methods, it may be a source of anxiety for the learner, as it is the fundamental determinant of the learner's academic and career future (Sisbane, 2019), which may result in the phenomenon of anxiety as an experience of feeling an intense moment of fear or panic before or during a test or assessment (Yazici (2017; City in Bolbolian et al., 2021). Invoking the factors influencing the academic achievement, many studies (Sifour, 2020) have concluded that the learner's academic success is linked to whether his/her choice of the academic specialization is appropriate, assuming that the learner's abilities and personal interests are reflected on the quality of his/her motivation and achievement. It is also linked to the learner gender, which is an important factor in determining the academic achievement, which makes the gender variable a topic of great interest by many scholars all over the world, primarily among academics (Unity & Igbudu, 2015). In view of the above, we will theoretically highlight some of these factors, and examine their effects on academic achievement.

Relationship between test anxiety and academic achievement

The relationship between test anxiety and academic achievement has been the subject of several studies (Alemu & Feyssa, 2020; D'Agostino et al., 2022; DordiNajad et al., 2011; Okoye et al., 2020; Rehman et al., 2021; Rizwan & Nasir, 2010; Sideeg, 2015) that confirmed the negative correlation between them. Alemu & Feyssa (2020) assumes that test anxiety and academic achievement are not independent of each other, as the higher the test anxiety the lower the academic achievement is. Anxiety is also a factor that is responsible for learners' low performance, but it can be managed and overcome by appropriate training strategies. As a matter of fact, there have been noticed some mismatches in terms of the interpretation given to the issue (Medjadi, 2019), some analysts consider that such a negative relationship is due to ineffective test preparation; others who reveal that some learners' performance falls short of their mental abilities in some stressful assessment situations like test situations. In another context, some other research confirmed the absence of differences in the level of test anxiety due to the level of academic achievement (Almjammi, 2019), which is linked to her/his own academic specialization choice; i.e., the choice of the learner's specialization reflects his/her abilities and personal interests and preferences, which in turn is reflected on the quality of his/her academic achievement.

Gender effect on test anxiety and on the level of academic achievement

The review of previous studies shows some inconsistency of their results. Thus, we can classify them into results that did not show any differences in the level of test anxiety due to the gender variable (Ahmad et al., 2018; Ndirangu et al., 2008; Talha, et al., 2020; Timoty, 2015), those results that have shown statistically significant differences between males and females at the level of test anxiety in favor of females (Alemu & Feyssa, 2020; Núñez-Peña, 2016; Syokwaa et al., 2014), and finally results that have confirmed the differences in favor of males (Bhat & Farooq, 2017). The interpretations of this topic vary depending on the obtained results; the lack of gender difference in the level of anxiety can be attributed to the fact that test anxiety is a common phenomenon that is likely to affect everyone.

As for studies dealing with the relationship of gender and academic achievement, they are divided into categories with conflicting results. The first group emphasizes the absence of differences in academic achievement due to gender variable (Faisal et al., 2017). The second group shows differences between males and females in the level of academic achievement in favor of males (Sisbane, 2019). The third group exhibits differences in the level of academic achievement in favor of females (Ahmad et al., 2018; Parajuli & Thapa, 2017; Timoty, 2015). The fourth group emphasizes differences between Males and females in certain subjects (D'Agostino et al., 2022), as males excel in mathematics and sciences, and score poorly in reading, compared to females. High-performing learners are also affected by test anxiety more than low-performers, because of emotional reactions.

Similarly, Workman & Heyder (2020), conclude that females exert more effort in schools and outperform males in academic achievement indicators. Therefore, the study patterns which conclude that males are superior in mathematics and sciences and females in languages do not accurately reflect the differences between them in the level of academic achievement, as female learners achieve higher degrees than male learners, and join similar demanding or even more demanding courses in the field of mathematics and science, and not only in the field of languages.

A review of related studies (c.f., Delaney & Devereux, 2021) confirms a lack of consistency in results, though they have addressed many factors affecting the differences in terms of academic achievement between males and females, and have attributed such inconsistency, in part, to the methodological differences between the studies, and to the heterogeneity of their educational systems. Therefore, there is scope to encourage more studies to better understand these heterogeneities, as many of them do not isolate other variables that may affect these results, in addition to the gender variable, which makes us unsure of its definitive effect.

The effect of academic specialization on test anxiety and on academic achievement

Several studies confirmed that academic specialization is one of the factors affecting the level of test anxiety (c.f., Sayhi, 2012); nevertheless, these studies have also revealed a number of inconsistencies in their results; some confirm these differences (Sciences- Letters) in predicting test anxiety in favor of scientific specialization, while others confirm the differences in favor of Letters specialization. Almjamm (2019), On the one hand, has noticed the absence of differences in the level of test anxiety due to academic specialization. Other studies, on the other hand, other studies denied the existence of differences in the level of academic achievement due to academic specialization (Yousfi & Taouririt, 2018).

All that has previously been put forward leads us to note that test anxiety is a common phenomenon, affecting both low and high-score students, but differs in how they manage it. Thus, the importance of our current study emerges when evoking the conflicting results of different studies on this subject; which indicates that this relationship needs further research and deeper investigation, especially in the context of secondary education; its importance lies equally in the expected educational outcome, which is about uncovering factors affecting academic achievement, by looking closely into some of the learner's learning barriers. In connection with the research problem of this study, the discussed results lead us to question the nature of the relationship between test anxiety and academic achievement in Moroccan secondary education context, and whether or not there are differences due to gender and academic specialization.

We will start from our previous question to formulate general and operational hypothesis; the general hypothesis states that there is a relationship between test anxiety and academic achievement, with the absence of differences in them due to the variables of gender and academic specialization. This general hypothesis is reformulated into four operational hypotheses:

1. A statistically significant negative correlation exist between test anxiety and academic achievement.
2. No statistically significant differences in the level of test anxiety due to gender variable.
3. No statistically significant differences in the level of academic achievement due to gender variable.
4. No statistically significant differences in the levels of test anxiety and academic achievement due to academic specialization variable (Sciences/Letters).

Method

Participants

114 Moroccan participants were selected among first year upper secondary school students, aged between age 16 and 17 years (50% females and 50% males), and represented two specializations (57.02% Sciences and 42.98% Letters), and the academic achievement was determined on the basis of learners' scores of the first semester of the academic year (2019/2020).

Instruments

Sarason's Test Anxiety Scale (TASC). We used the Sarason Test anxiety Scale, translated and adapted to Moroccan adolescent students (Zarhbouch et al., 2021); this instrument includes 38 short self-evaluation items, rated on a 4-point Likert scale ranging from 1 "completely disagree" to 4 "completely agree". It is a one-dimensional scale assessing the presence or absence of test anxiety. The highest score a learner can get is 152, and the lowest is 38, and it takes approximately 10 min to complete. This measure had an overall reliability of $\alpha = .96$, thus confirming a very high reliability.

Procedure

Data for this study were collected from among Moroccan upper secondary school students, after obtaining the required administrative permission and the learners' consent and voluntary participation; the participants were informed about the objective of the research topic and were assured about privacy and confidentiality of data that would be used only for research purpose. Participant took an average of 10 minutes to complete the scale. JASP software was used for data analysis.

Results

Table 1

<i>Correlation between Test Anxiety and Academic Achievement</i>	
Variables	Academic Achievement
Test anxiety	-.60**

Note. ** $p < .01$.

The validity of the first hypothesis was confirmed. As shown in results of table 1, the Pearson's correlation results demonstrate a significantly negative correlation between the overall test anxiety score and the overall academic achievement score ($r = -.60, p < .01$).

Table 2*Gender Differences on Test Anxiety and Academic Achievement*

Variables	Male	Female	<i>t</i> (112)	<i>P</i>
	(<i>n</i> = 57)	(<i>n</i> = 57)		
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)		
Test Anxiety	2.14(.69)	2.68(.65)	-4.32	.000**
Academic Achievement	13.21(3.17)	12.41(2.91)	1.39	.167

Note. ***p* < .01. Note. *P*(.167) > .05.

The validity of the second hypothesis was not confirmed, As shown in results of table 2, the differences in the level of test anxiety due to the gender variable are statistically significant, ($t(112) = -4.32, p < .01$). Whereas, females scored a higher level of test anxiety ($M = 2.68, SD = .65$) than males ($M = 2.14, SD = .69$).

The validity of the third hypothesis was confirmed. As shown in results of table 2, the differences in the level of academic achievement due to the gender variable are not statistically significant, ($t(112) = 1.39, p > .05$).

Table 3*Academic Specialization Differences on Test Anxiety and Academic Achievement*

Variable	Sciences	Letters	<i>t</i> (112)	<i>p</i>
	(<i>n</i> = 65)	(<i>n</i> = 49)		
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)		
Test Anxiety	2.41 (.70)	2.40 (.76)	.12	.906
Academic Achievement	12.56(2.78)	13.14(3.39)	-.998	.320

Note. *p* > .05.

The validity of the fourth hypothesis was confirmed, as shown in results of table 3. On the one hand, the differences in the level of test anxiety due to the academic specialization variable (Sciences/Letters) are not statistically significant ($t(112) = .12, p > .05$); and, on the other hand, the differences in the level of academic achievement due to the academic specialization variable are not statistically significant (Sciences/Letters) ($t(112) = -.998, p > .05$).

Discussion

The result of our first hypothesis agrees with previous studies (Alemu & Feyssa, 2020; D'Agostino et al., 2022; Onyekuru & Ibegbunam, 2014; Rehman et al., 2021; Rizwan & Nasir, 2010; Tugan, 2015). The explanation for this result according to researchers (C.f. Almezughi, 2011) is that test anxiety is a state of overall stress that affects learners when facing a test situation, and that it is a natural feeling which is considered as a source of motivation in learning. However, the high degree of anxiety accompanying assessment situations becomes an obstacle that negatively affects academic achievement. In this context, Medjadi (2019) indicates that students suffering from test anxiety have an excessive ability to self-focus in assessment situations, and it is assumed that this self-interest inhibits good performance by getting them distracted between task-related activities and self-focused preoccupations.

Therefore, anxiety arising from school tests situation is not the only intended phenomenon, but any test or evaluation situation that the individual may be exposed to in life may make him/her tense and anxious. The difference lies in how the learner deals with anxiety, and the stresses associated with it.

It is clear that the result of the second hypothesis: (i) is in agreement with studies which confirm differences in test anxiety due to gender variable in favor of females (Alemu & Feyssa, 2020; Karatas et al., 2013; Núñez-Peña, 2016; Rehman et al., 2021), (ii) it differs from other studies that confirm the absence of the differences in test anxiety due to gender variable (Ahmad et al., 2018; Crişan & Copaci, 2015; Talha, et al., 2020; Timoty, 2015), and (iii) it differs from other studies which conclude that there are statistically significant differences in test anxiety that are due to gender variable in favor of males (Bhat & Farooq, 2017). The difference in the level of test anxiety between males and females can be explained by the disparities in terms of culture and socialization contexts.

The result of the third hypothesis aligns with the results of studies that demonstrates the absence of differences in academic achievement due to gender variable (Crişan & Copaci, 2015; Faisal et al., 2017). However, it differs from results of some other studies which confirm these differences in favor of males (Sisbane, 2019), it also differs from other studies which assert the differences in favor of females (Ahmad et al., 2018; Parajuli & Thapa, 2017; Timoty, 2015). In general, the inconsistency of the results can be explained by the fact that academic excellence is not related to gender itself, as much as it is related to other factors: subjective, psychological, social, economic, educational, environmental ... etc. From this we can infer that the gender variable is highly sensitive to cultural contexts, age, and to the nature of socialization in particular.

The results of the fourth hypothesis agree with a study that demonstrates the absence of differences in the level of test anxiety due to academic specialization (Almjammi, 2019), and with other studies which confirm the absence of differences in the level of academic achievement due to academic specialization (Yousfi & Taouririt, 2018). In contrast, other studies confirm the differences in the level of test anxiety in favor of scientific specialization (Talha et al., 2020). However, we can explain the absence of these differences in this study, either at the level of test anxiety or academic achievement, by the fact that they are not related to a specific specialization, as all disciplines require learners to make the same effort and as there is no academic specialization judged logically more difficult than another, but rather the whole issue is particularly dependent on the learner's tendencies and abilities and assessment conditions as well. Hence, the difficulties are related to the learner's poor choice of the specialization, and not to the specialization itself. This certainly requires conducting further research on the nature of choices, representation and appreciation of the difficulties related to a given specialization.

Conclusion

By way of conclusion, we would say that academic achievement and assessments are behind many important decisions that affect the learner's academic, professional, and social life. Furthermore, tests have a great value in every individual's life; for test related anxiety may affect his/her whole life. It is a kind of conditioning that he/she undergoes, as a result of overemphasizing scholastic assessments. The great importance of the pedagogical and educational process, as a system of activities and procedures, lies in the fact that it aims at meeting educational needs and providing the learner with educational skills that are supposed to positively affect his/her development. We believe that it is the duty of the educational

system to find ways to mitigate the negative effects of anxiety on learners; this can be achieved by integrating training, remedial and preventive counseling programs to improve their focus and concentration and attenuate the negative effect of test anxiety during their academic journey. The problem is not a cognitive one or is related to learning difficulties only, or to lack of competence, but it is rather an emotional problem par excellence.

Disclosure statement

The authors reported no potential conflict of interest.

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