

Tourism And Hotel Students' Attitudes Toward Statistics In Egypt

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ABSTRACT: This study investigates the attitudes of tourism and hotel students in Egypt toward statistics and examines the impact of statistics anxiety on their academic performance. The research adopts a quantitative approach using a self-administered questionnaire distributed among undergraduate students enrolled in tourism and hotel colleges in Egypt. A total of 269 valid responses were analyzed using descriptive statistics, correlation, and regression analyses. The findings revealed that students generally exhibit moderate levels of positive attitudes toward statistics; however, they experience considerable anxiety when dealing with statistical content and exams. The study confirmed that students' interest in statistics and their effort to learn the subject have a significant positive effect on performance, while perceived difficulty shows a negative impact. Other dimensions, including affective, cognitive, and value-related aspects, did not demonstrate a statistically significant effect. The research contributes to understanding how psychological and motivational factors influence learning outcomes in non-mathematical disciplines. Practical recommendations are provided for educators and policymakers to reduce statistics anxiety and enhance learning engagement among tourism and hotel students in Egypt.

Keywords: Statistics Anxiety, Student Performance, Tourism and Hotel Education in Egypt

INTRODUCTION

The vital goal of any higher education institution is to provide its community with high-quality graduates, equipped with the necessary knowledge and skills to be successful (Yousef, 2019). So, since tourism entered higher education, statistical skills have commonly been included in tourism curricula, with due recognition of their importance in student training (Cladera et al., 2019). Furthermore, learning statistics is supposed to be of crucial importance for persons to solve problems, think critically, and make decisions (Kesici et al., 2011). Statistics provides students with skills to critically evaluate and understand various functions of the world in a meaningful way (Kohli et al., 2011). Statistics can be defined as an applied science that agreements with collection, compilation, analysis, and explanation of data (Verma, 2019). As Leung et al. (2018) have noted, the structure of hospitality curricula varies from country to country, due to different historical development; Statistics courses, when included, are listed as core courses in some institutions while others count them as general education courses. However, it appears that statistics courses have utilized significant challenges, among which the biggest is statistics anxiety, among a large majority of their learners (González et al., 2016), even graduate students (Ogbogo & Amadi, 2018). Some researchers have described statistics anxiety as arising from an individual's exposure to content, problems, instructional situations, or evaluative contexts concerning statistics (Malik, 2015) and as

presenting a persistent and habitual type of anxiety (Macher et al., 2015). In this respect, statistics anxiety, which is especially common among students studying non-mathematical subjects like the social sciences, has been connected to several negative consequences (Faraci & Malluzzo, 2024). Therefore, this research aims to clarify tourism and hotel students' attitudes toward statistics and the impact of statistical anxiety on student performance in statistics.

2. RESEARCH GAP AND SIGNIFICANCE

Based on a systematic review of previous studies, it is safe to say that there are still some defects in concealing the essence and reasons of statistics anxiety (Cui et al., 2019). Although statistical anxiety research is moving quickly, additional research is required to fully comprehend this kind of (Gibeau et al., 2023). Furthermore, future studies should aim to elucidate the primary elements of statistics anxiety (Faraci & Malluzzo, 2024). From a strategic perspective, Tine Nielsen and Kreiner (2018) & Cui et al. (2019) called for finding a causal relationship between statistical anxiety and attitudes toward statistics. Likewise, Perchtold-Stefan et al. (2024) called for future reappraisal intervention studies on statistics anxiety to be tested in larger, mixed-sex samples, ideally over an entire academic year. Therefore, this research aims to clarify tourism and hotel students' attitudes toward statistics and the impact of statistical anxiety on student performance in statistics.

On the other hand, Mackinnon et al (2025) also called for the application of statistical anxiety studies in the humanities. Therefore, the application will be on the faculties of tourism and hotels in Egypt. Therefore, the research will focus on analyzing the main causes of statistical anxiety. To find effective ways to reduce the statistical anxiety of tourism and hotel students in Egypt. Practically, this proposed model might offer fresh perspectives and various information for lecturers and statistical circulators in universities, a set of recommendations to improve the academic performance of students, and policymakers concerned with tourism education in Egypt.

3. RESEARCH HYPOTHESES

Based on a systematic review of previous studies, this research posits the following hypotheses:

- H1. There is a statistically significant positive impact of affect – students' feelings concerning statistics on student performance in statistics.
- H2. There is a statistically significant positive impact of cognitive competence concerning statistics on student performance in statistics.
- H3. There is a statistically significant positive impact of values concerning statistics on student performance in statistics.
- H4. There is a statistically significant negative effect of difficulty with statistics on student performance in statistics.
- H5. There is a statistically significant positive impact of interest in statistics on student performance in statistics.
- H6. There is a statistically significant positive impact of efforts concerning statistics on student performance in statistics.

4. LITERATURE REVIEW

4.1 THE CONCEPT OF STATISTICS ANXIETY

Statistics anxiety is "a negative state of emotional arousal experienced by individuals as a result of encountering statistics in any form and at any level" (Chew & Dillon, 2014; p.199). According to Cruise et al. (1985), a sense of unease arises during statistics classes

or during data collection, processing, and interpretation. In this respect, statistics anxiety is considered a habitual type of anxiety that generally persists throughout students' statistics courses (Kaufmann et al., 2022).

4.2 TOURISM AND HOTEL STUDENTS' ATTITUDES TOWARD STATISTICS

Developing strong statistical abilities and using statistical reasoning are crucial for students' academic and post-graduation careers (Ramirez et al., 2012). Furthermore, statistical courses are required in many sectors of study and training since statistics has been recognized as a valuable instrument in academic education across different disciplines (Trassi et al., 2022). In this respect, the way a student feels and thinks about the utility, significance, and worth of statistics is known as their attitude toward statistics (Dodeen & Alharballeh, 2024).

When faced with the principles, fundamentals, interpretation, analysis, and application of statistics that are a part of these courses, many college students exhibit a high level of anxiety (Onwuegbuzie & Wilson, 2003). According to Attentional Control Theory, anxiety impairs attention processes by drawing attention to threat-related stimuli, such as concern thoughts, and decreasing concentration on task-related (goal-directed) stimuli (Eysenck et al., 2007). Since the symptoms only manifest during specific times and situations, primarily during formal statistics learning or application, statistics anxiety is very situational (Onwuegbuzie, 2004).

On the other hand, High levels of statistics anxiety are reported by students majoring in various social science fields, such as psychology (Trassi et al., 2022). According to Chew and Dillon (2014), college students find statistics classes to be the most anxiety-inducing. However, high failure rates in statistics-related courses are a problem for many higher education institutions (Zakariya et al., 2022). To avoid the negative emotions associated with statistics anxiety, some students may decide not to attend classes or study the course materials. Others may try to participate in the course but find that their anxiety interferes with their ability to pay attention (Mendes et al., 2024; Trassi et al., 2022). Another element that has been linked to statistic anxiety is academic procrastination (Onwuegbuzie & Wilson, 2003).

4.3 STATISTICS ANXIETY AND STUDENT PERFORMANCE IN STATISTICS

Indeed, many students view statistics as the most difficult, dangerous, and unappealing course (Berk & Nanda, 1998). Students in numerous educational institutions consequently frequently perform poorly on statistics tests (Vigil-Colet et al., 2008). Through more general cognitive processes, statistics anxiety has also been shown to have a detrimental effect on performance in statistics courses (Mendes et al., 2025). Through non-cognitive processes including procrastination, decreased effort, and a lack of statistics self-efficacy, statistics anxiety can impact student performance in statistics (Zhang et al., 2021; Trassi et al., 2022).

Additionally, statistics anxiety has been found to have a significant impact on students' performance in statistics (Chew and Dillon, 2014). Therefore, statistics anxiety causes students to put off taking statistics classes until the very end of their degree programs (Onwuegbuzie, 2004). In addition, previous findings support that positive attitudes towards statistics could improve the adverse effects of statistics anxiety on students' academic performance (Najmi & Qazi, 2018).

According to studies, students who have statistical anxiety lose initiative and give up early, which lowers their self-efficacy and, ultimately, their performance (Kaufmann et al., 2022). Crucially, students who suffer from high levels of statistic anxiety are more likely to exhibit decreased motivation and learning engagement, which can lead to procrastination, course dropout, and ultimately poor performance (Luttenberger et al.,

2018). Furthermore, excessive anxiety during statistical information exposure affects student performance and intensifies unfavorable opinions about statistics (March et al., 2025).

On the other hand, students' performance in statistical courses is closely linked to their level of care in statistics (Razali et al., 2024). Therefore, one useful tool for enhancing pupils' learning is the ability to forecast their performance in advance (Riestra-González et al., 2021). In this respect, there will be more time to help at-risk students improve their performance if this concern is identified early (Riestra-González et al., 2021). Finally, this research aims to clarify tourism and hotel students' attitudes toward statistics and the impact of statistical anxiety on student performance in statistics.

5. RESEARCH METHODOLOGY

According to Mendes et al. (2025), future interventions should strive to employ larger sample sizes, well-validated metrics, and more comprehensive recruiting tactics that include all students registered in the course, not just those attending courses. Therefore, this research focuses on the second-year students who study the tourism and hotel statistics course in the colleges of tourism and hotels, the study sample. Furthermore, Lethbridge et al. (2024) recommend taking stratified random samples, so that the sample from which data is collected is more likely to reflect the target population, so the current research relies on a random sample. Similarly, Lethbridge et al. (2024) recommended that participants be currently studying statistics, so the current study relied on students who had recently completed the statistics course.

In concern the scale, Mackinnon et al (2025) suggest future research might look to use measures such as the Statistical Anxiety Scale, which focuses more narrowly on anxiety and has strong psychometric properties and convergent validity. So far, statistics anxiety has been measured nearly exclusively using the Statistical Anxiety Rating Scale (STARS). This scale measures not only the level of statistics anxiety but also attitudes towards statistics (Cui et al., 2019). Therefore, the current research used it.

Furthermore, the research adopts the quantitative approach in its empirical analysis. A self-administered questionnaire is employed as the instrument for collecting data from a sample of Tourism and Hotel Students in Egypt. The unit of analysis of this study is the faculties of tourism and hotel in Egypt. The questionnaire was designed depending on the literature. It was divided into two main parts. Part one is about personal data. The second part consists of 7 components such as (1) Affect – students' feelings concerning statistics (6 items). (2) Cognitive Competence - students' attitudes about their intellectual knowledge and skills when applied to statistics (6 items). (3) Value - students' attitudes about the usefulness, relevance, and worth of statistics in personal and professional life (9 items). (4) Difficulty - students' attitudes about the difficulty of statistics as a subject (7 items). (5) Interest – students' level of individual interest in statistics (4 items). (6) Effort - amount of work the student expends to learn statistics (4 items). All variables above are adapted and revised from the previous Statistical Anxiety Rating Scale (STARS) (Cui et al., 2019). (7) Student performance in statistics (6 items) it was adapted and revised from previous researches (Adnan et al., 2021; Khan & Ghosh, 2021; Wu et al., 2022). All the questions are measured using a five-point Likert scale that ranges from "strongly disagree" to "strongly agree."

To collect data, the current questionnaire targeted Students of tourism and hotel colleges and institutes in Egypt. From April to June 2025. To determine appropriate sample size of the research population was calculated using the Steven K. Thompson formula (Thompson, 2012) in the following manner:

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

$$n = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} = 384.16$$

Where: n: Appropriate sample size (385). Z: Standard degree (1.96 at significant level of 0.05). p: Sample proportion and neutral = (0.50). e: Maximum allowed error (0.05 at significant level of 0.05).

The optimal sample size for this study is 385 participants. Therefore, the researchers distributed an electronic questionnaire to students at several tourism and hotel colleges and institutes in the Arab Republic of Egypt at the following link: <https://forms.gle/v6HZGW7X5zcC7VXE6>

The questionnaire was provided in Arabic. A total of 269 valid questionnaires were collected for analysis.

5.1 Validity of the research

The researchers enlisted the expertise of a group of academics specializing in teaching statistics courses at tourism and hotel colleges and institutes in Egypt to gather opinions and suggestions regarding the research instrument. They used face validity as a means of ensuring the reliability of the data collection tools. Using this approach, the researchers ensured the research instrument's ability to test its hypotheses.

5.2 Reliability of the Research

Table 1: Reliability Analysis of Research Variables

The Axes	No. of statements	Alpha Coefficient
Affect – students' feelings concerning statistics	5	0.751
Cognitive Competence	6	0.764
Value	9	0.777
Difficulty	7	0.708
Interest	4	0.917
Effort	4	0.918
Student performance in statistics	6	0.888
The Overall	41	0.853

Based on the previous table, the reliability of the questionnaire was assessed using the Cronbach's Alpha test. The Cronbach's Alpha coefficient was calculated for all scale items and yielded a value of 0.853, indicating good reliability. According to Gliem and Gliem (2003), a Cronbach's Alpha level above 0.8 is considered good for reliability.

6. Results and Discussion

6.1 Personal Data

Table 2: The Sample Characteristics Statistics

Variable	Response	Frequency	Percent	Rank
Gender	Male	145	53.9	1
	Female	124	46.1	2
	Total	269	100	--
	Luxor	181	67.3	1

Department of Tourism and Hotels University / Institute of	Taiba Technology	70	26.0	2
	Higher Institute of Tourism and Hotels EGOH Luxor	1	0.4	3
	Mansoura	10	3.7	3
	Minya	3	1.1	5
	Other	4	1.5	4
	Total	269	100	--

In terms of gender distribution, the findings in Table 2 indicate that the percentage of males (53.9%) was higher than that of females (46.1%) in the sample under investigation. Furthermore, the vast majority of students from Luxor University participated at a rate of 67.3%, while participation from Higher Institute of Tourism and Hotels EGOH Luxor was notably lower at 0.4%.

6.2 Variables Analysis

6.2.1 Affect – students' feelings concerning statistics

Table 3: Descriptive statistics for Affect – students' feelings concerning statistics

Statement	Response	F	%	M	SD	R
I like the statistics course	Strongly Disagree	17	6.3	3.61	1.04	1
	Disagree	16	5.9			
	Neutral	69	25.7			
	Agree	119	44.2			
	Strongly Agree	48	17.8			
	Total	269	100.0			
I feel insecure when solving statistics problems.	Strongly Disagree	28	10.4	2.85	1.09	3
	Disagree	80	29.7			
	Neutral	84	31.2			
	Agree	57	21.2			
	Strongly Agree	20	7.4			
	Total	269	100.0			
I feel frustrated when reviewing for statistics tests in class.	Strongly Disagree	34	12.6	2.76	1.10	4
	Disagree	83	30.9			
	Neutral	81	30.1			
	Agree	53	19.7			
	Strongly Agree	18	6.7			
	Total	269	100.0			
I feel nervous during statistics lectures.	Strongly Disagree	54	20.1	2.56	1.11	5
	Disagree	93	34.6			
	Neutral	55	20.4			
	Agree	50	18.6			
	Strongly Agree	17	6.3			
	Total	269	100.0			
I enjoy studying statistics.	Strongly Disagree	21	7.8	3.47	1.11	2
	Disagree	27	10.0			
	Neutral	69	25.7			
	Agree	108	40.1			
	Strongly Agree	44	16.4			

Statement	Response	F	%	M	SD	R
	Total	269	100.0			
Overall				3.05	0.53	--

F= Frequency M= Mean SD= Std. Deviation R= Rank

From the previous table, " I like the statistics course " is the most common in effect – students' feelings concerning statistics (M= 3.61, SD= 1.04). Followed by "I enjoy studying statistics." (M= 3.47, SD= 1.11). Moreover, "I feel insecure when solving statistics problems." comes at a third rank (M= 2.85, SD= 1.09). On the other hand, "I feel nervous during statistics lectures." came at the last rank.

The statistical analysis results in the above table indicated that the total mean of the effect – students' feelings concerning statistics was (3.05) with a standard deviation of (0.53), which indicated a good degree of agreement for all the effect – students' feelings concerning statistics phrases which means that this variable has a good level at universities, these results agree with Poldrugovac et al., (2016), where they stressed that efficiency is one of the key factors of management control and a prerequisite for making improvements in hotels performance.

6.2.2 Cognitive Competence Variable

Table 4: Descriptive statistics for cognitive competence variable

Statement	Response	F	%	M	SD	R
I have difficulty understanding statistics because of the way I think.	Strongly Disagree	28	10.4	2.84	1.10	5
	Disagree	85	31.6			
	Neutral	77	28.6			
	Agree	59	21.9			
	Strongly Agree	20	7.4			
	Total	269	100.0			
I have no idea what's going on in statistics.	Strongly Disagree	44	16.4	2.52	1.08	6
	Disagree	108	40.1			
	Neutral	61	22.7			
	Agree	44	16.4			
	Strongly Agree	12	4.5			
	Total	269	100.0			
I make a lot of mathematical errors in statistics.	Strongly Disagree	25	9.3	3.01	1.11	3
	Disagree	68	25.3			
	Neutral	81	30.1			
	Agree	71	26.4			
	Strongly Agree	24	8.9			
	Total	269	100.0			
I was able to learn statistics.	Strongly Disagree	11	4.1	3.36	0.93	2
	Disagree	32	11.9			
	Neutral	96	35.7			
	Agree	108	40.1			
	Strongly Agree	22	8.2			
	Total	269	100.0			
I understand statistical equations.	Strongly Disagree	16	5.9	3.39	1.04	1
	Disagree	36	13.4			
	Neutral	72	26.8			
	Agree	117	43.5			
	Strongly Agree	28	10.4			

Statement	Response	F	%	M	SD	R
	Total	269	100.0			
I found it difficult to understand the concepts of statistics.	Strongly Disagree	21	7.8	2.99	1.07	4
	Disagree	72	26.8			
	Neutral	84	31.2			
	Agree	72	26.8			
	Strongly Agree	20	7.4			
	Total	269	100.0			
Overall				3.02	0.51	--

F= Frequency M= Mean SD= Std. Deviation R= Rank

From the previous table, "I understand statistical equations." is the most common in cognitive competence variable concerning statistics (M= 3.39, SD= 1.04). Followed by "I was able to learn statistics." (M= 3.36, SD= 0.93). Moreover, "I make a lot of mathematical errors in statistics." comes at a third rank (M= 3.01, SD= 1.11). On the other hand, "I have no idea what's going on in statistics." came at the last rank.

The statistical analysis results in the above table indicated that the total mean of the cognitive competence variable was (3.02) with a standard deviation of (0.51), which indicated a good degree of agreement for all the cognitive competence variable phrases which means that this variable has a good level at universities, these results agree with Poldrugovac et al., (2016), where they stressed that efficiency is one of the key factors of management control and a prerequisite for making improvements in hotels performance.

6.2.3 Values concerning statistics Variable

Table 5: Descriptive statistics for values concerning statistics variable

Statement	Response	F	%	M	SD	R
Statistics are worthless.	Strongly Disagree	96	35.7	2.07	1.09	9
	Disagree	101	37.5			
	Neutral	38	14.1			
	Agree	23	8.6			
	Strongly Agree	11	4.1			
	Total	269	100.0			
Statistics should be a mandatory part of my college/institute studies.	Strongly Disagree	24	8.9	3.32	1.11	3
	Disagree	33	12.3			
	Neutral	76	28.3			
	Agree	105	39.0			
	Strongly Agree	31	11.5			
	Total	269	100.0			
Statistical skills will increase my chances of getting hired.	Strongly Disagree	15	5.6	3.65	1.04	1
	Disagree	18	6.7			
	Neutral	67	24.9			
	Agree	116	43.1			
	Strongly Agree	53	19.7			
	Total	269	100.0			
Statistics are not useful to ordinary professionals.	Strongly Disagree	38	14.1	2.54	1.03	8
	Disagree	107	39.8			
	Neutral	74	27.5			
	Agree	42	15.6			
	Strongly Agree	8	3.0			

Statement	Response	F	%	M	SD	R
	Total	269	100.0			
Statistical thinking is not applicable to my life outside of my job.	Strongly Disagree	46	17.1	2.58	1.11	7
	Disagree	92	34.2			
	Neutral	76	28.3			
	Agree	39	14.5			
	Strongly Agree	16	5.9			
	Total	269	100.0			
I use statistics in my daily life.	Strongly Disagree	24	8.9	3.33	1.16	2
	Disagree	36	13.4			
	Neutral	80	29.7			
	Agree	86	32.0			
	Strongly Agree	43	16.0			
	Total	269	100.0			
Statistical conclusions are rarely made in everyday life.	Strongly Disagree	18	6.7	3.08	1.00	4
	Disagree	57	21.2			
	Neutral	93	34.6			
	Agree	87	32.3			
	Strongly Agree	14	5.2			
	Total	269	100.0			
I will have no application of statistics in my future career.	Strongly Disagree	30	11.2	2.69	1.03	5
	Disagree	99	36.8			
	Neutral	85	31.6			
	Agree	40	14.9			
	Strongly Agree	15	5.6			
	Total	269	100.0			
Statistics are irrelevant to my life.	Strongly Disagree	33	12.3	2.73	1.14	4
	Disagree	92	34.2			
	Neutral	76	28.3			
	Agree	50	18.6			
	Strongly Agree	18	6.7			
	Total	269	100.0			
Overall				2.83	0.54	--

F= Frequency M= Mean SD= Std. Deviation R= Rank

From the previous table, "Statistical skills will increase my chances of getting hired." is the most common in value of statistics (M= 3.65, SD= 1.04). Followed by "I use statistics in my daily life." (M= 3.33, SD= 1.16). Moreover, "Statistics should be a mandatory part of my college/institute studies." comes at a third rank (M= 3.32, SD= 1.11). On the other hand, "Statistics are worthless." came at the last rank.

The statistical analysis results in the above table indicated that the total mean of the value of statistics variable was (2.83) with a standard deviation of (0.54), which indicated a good degree of agreement for all the value of statistics variable phrases which means that this variable has a good level at universities, these results agree with Poldrugovac et al., (2016), where they stressed that efficiency is one of the key factors of management control and a prerequisite for making improvements in hotels performance.

6.2.4 Difficulty of statistics Variable

Table 6: Descriptive statistics for difficulty of statistics variable

Statement	Response	F	%	M	SD	R
Statistical formulas are easy to understand.	Strongly Disagree	11	4.1	3.31	0.97	5
	Disagree	41	15.2			
	Neutral	96	35.7			
	Agree	96	35.7			
	Strongly Agree	25	9.3			
	Total	269	100.0			
Statistics is a complex subject.	Strongly Disagree	14	5.2	2.88	1.06	7
	Disagree	102	37.9			
	Neutral	81	30.1			
	Agree	46	17.1			
	Strongly Agree	26	9.7			
	Total	269	100.0			
Statistics is a subject that most people learn quickly.	Strongly Disagree	18	6.7	3.11	0.98	6
	Disagree	49	18.2			
	Neutral	100	37.2			
	Agree	89	33.1			
	Strongly Agree	13	4.8			
	Total	269	100.0			
Learning statistics requires great discipline.	Strongly Disagree	5	1.9	3.78	0.85	1
	Disagree	12	4.5			
	Neutral	69	25.7			
	Agree	134	49.8			
	Strongly Agree	49	18.2			
	Total	269	100.0			
Statistics involves huge calculations.	Strongly Disagree	6	2.2	3.39	0.93	4
	Disagree	37	13.8			
	Neutral	102	37.9			
	Agree	94	34.9			
	Strongly Agree	30	11.2			
	Total	269	100.0			
Statistics is a very technical subject.	Strongly Disagree	5	1.9	3.49	0.87	3
	Disagree	27	10.0			
	Neutral	93	34.6			
	Agree	118	43.9			
	Strongly Agree	26	9.7			
	Total	269	100.0			
Most people have to learn a new way of thinking to practice statistics.	Strongly Disagree	9	3.3	3.54	0.93	2
	Disagree	23	8.6			
	Neutral	85	31.6			
	Agree	119	44.2			
	Strongly Agree	33	12.3			
	Total	269	100.0			
Overall				3.36	0.52	--

F= Frequency M= Mean SD= Std. Deviation R= Rank

From the previous table, " Learning statistics requires great discipline." is the most common in value of statistics (M= 3.78, SD= 0.85). Followed by "Most people have to learn a new way of thinking to practice statistics." (M= 3.54, SD= 0.93). Moreover, "Statistics is a

very technical subject." comes at a third rank (M= 3.49, SD= 0.87). On the other hand, "Statistics is a complex subject." came at the last rank.

The statistical analysis results in the above table indicated that the total mean of the difficulty of statistics variable was (3.36) with a standard deviation of (0.52), which indicated a high degree of agreement for all the difficulty of statistics variable phrases which means that this variable has a high level at universities, these results agree with Poldrugovac et al., (2016), where they stressed that efficiency is one of the key factors of management control and a prerequisite for making improvements in hotels performance.

6.2.5 Interest of statistics Variable

Table 7: Descriptive statistics for interest of statistics variable

Statement	Response	F	%	M	SD	R
I care about my ability to communicate statistical information to others.	Strongly Disagree	9	3.3	3.40	0.92	4
	Disagree	34	12.6			
	Neutral	86	32.0			
	Agree	120	44.6			
	Strongly Agree	20	7.4			
	Total	269	100.0			
I am interested in using statistics.	Strongly Disagree	17	6.3	3.46	1.01	3
	Disagree	22	8.2			
	Neutral	80	29.7			
	Agree	119	44.2			
	Strongly Agree	31	11.5			
	Total	269	100.0			
I care about understanding statistical information.	Strongly Disagree	14	5.2	3.56	0.97	1
	Disagree	18	6.7			
	Neutral	76	28.3			
	Agree	126	46.8			
	Strongly Agree	35	13.0			
	Total	269	100.0			
I am interested in learning statistics.	Strongly Disagree	16	5.9	3.52	1.02	2
	Disagree	23	8.6			
	Neutral	70	26.0			
	Agree	125	46.5			
	Strongly Agree	35	13.0			
	Total	269	100.0			
Overall				3.49	0.88	--

F= Frequency M= Mean SD= Std. Deviation R= Rank

From the previous table, "I care about understanding statistical information." is the most common in interest of statistics variable (M= 3.56, SD= 0.97). Followed by "I am interested in learning statistics." (M= 3.52, SD= 1.02). Moreover, "I am interested in using statistics." comes at a third rank (M= 3.46, SD= 1.01). On the other hand, "I care about my ability to communicate statistical information to others." came at the last rank.

The statistical analysis results in the above table indicated that the total mean of the interest of statistics variable was (3.49) with a standard deviation of (0.88), which indicated a high degree of agreement for all the interest of statistics variable phrases which means that this variable has a high level at universities, these results agree with

Poldrugovac et al., (2016), where they stressed that efficiency is one of the key factors of management control and a prerequisite for making improvements in hotels performance.

6.2.6 Effort of students in statistics Variable

Table 8: Descriptive statistics for effort of students in statistics variable

Statement	Response	F	%	M	SD	R
I was planning to complete all my statistics homework.	Strongly Disagree	12	4.5	3.46	0.99	4
	Disagree	30	11.2			
	Neutral	81	30.1			
	Agree	114	42.4			
	Strongly Agree	32	11.9			
	Total	269	100.0			
I was planning to work hard in statistics.	Strongly Disagree	10	3.7	3.73	0.95	2
	Disagree	17	6.3			
	Neutral	57	21.2			
	Agree	136	50.6			
	Strongly Agree	49	18.2			
	Total	269	100.0			
I was planning to study hard for all of my statistics tests.	Strongly Disagree	12	4.5	3.71	1.01	3
	Disagree	19	7.1			
	Neutral	58	21.6			
	Agree	126	46.8			
	Strongly Agree	54	20.1			
	Total	269	100.0			
I was planning to attend all the lectures in the statistics course.	Strongly Disagree	9	3.3	3.81	0.94	1
	Disagree	12	4.5			
	Neutral	62	23.0			
	Agree	128	47.6			
	Strongly Agree	58	21.6			
	Total	269	100.0			
Overall				3.67	0.87	--

F= Frequency M= Mean SD= Std. Deviation R= Rank

From the previous table, "I was planning to attend all the lectures in the statistics course." is the most common in interest of statistics variable (M= 3.81, SD= 0.94). Followed by "I was planning to work hard in statistics." (M= 3.73, SD= 0.95). Moreover, "I was planning to study hard for all of my statistics tests." comes at a third rank (M= 3.71, SD= 1.01). On the other hand, "I was planning to complete all my statistics homework." came at the last rank. The statistical analysis results in the above table indicated that the total mean of the effort of students in statistics variable was (3.67) with a standard deviation of (0.87), which indicated a high degree of agreement for all the effort of students in statistics variable phrases which means that this variable has a high level at universities, these results agree with Poldrugovac et al., (2016), where they stressed that efficiency is one of the key factors of management control and a prerequisite for making improvements in hotels performance.

6.2.7 Student performance in statistics Variable

Table 9: Descriptive statistics for student performance in statistics variable

Statement	Response	F	%	M	SD	R
Understand the basic concepts in statistics (such as mean, standard deviation, etc.)	Strongly Disagree	15	5.6	3.48	1.06	3
	Disagree	29	10.8			
	Neutral	80	29.7			
	Agree	101	37.5			
	Strongly Agree	44	16.4			
	Total	269	100.0			
I am able to apply statistical concepts in daily life.	Strongly Disagree	14	5.2	3.37	1.00	4
	Disagree	33	12.3			
	Neutral	90	33.5			
	Agree	104	38.7			
	Strongly Agree	28	10.4			
	Total	269	100.0			
I am able to apply statistical concepts to solve practical problems.	Strongly Disagree	15	5.6	3.34	1.01	5
	Disagree	35	13.0			
	Neutral	89	33.1			
	Agree	104	38.7			
	Strongly Agree	26	9.7			
	Total	269	100.0			
I am able to design a statistical study to solve a specific problem.	Strongly Disagree	16	5.9	3.26	1.02	6
	Disagree	42	15.6			
	Neutral	91	33.8			
	Agree	95	35.3			
	Strongly Agree	25	9.3			
	Total	269	100.0			
I am able to collect and analyze data to draw conclusions.	Strongly Disagree	15	5.6	3.49	1.02	2
	Disagree	24	8.9			
	Neutral	82	30.5			
	Agree	109	40.5			
	Strongly Agree	39	14.5			
	Total	269	100.0			
I believe that the statistics course is relevant to my field of study.	Strongly Disagree	21	7.8	3.71	1.15	1
	Disagree	14	5.2			
	Neutral	60	22.3			
	Agree	101	37.5			
	Strongly Agree	73	27.1			
	Total	269	100.0			
Overall				3.44	0.83	--

F= Frequency M= Mean SD= Std. Deviation R= Rank

From the previous table, "I believe that the statistics course is relevant to my field of study." is the most common in student performance in statistics variable (M= 3.71, SD= 1.15). Followed by "I am able to collect and analyze data to draw conclusions." (M= 3.49, SD= 1.02). Moreover, "Understand the basic concepts in statistics (such as mean, standard deviation, etc.)" comes at a third rank (M= 3.48, SD= 1.06). On the other hand, "I am able to design a statistical study to solve a specific problem." came at the last rank.

The statistical analysis results in the above table indicated that the total mean of the student performance in statistics variable was (3.44) with a standard deviation of (0.83),

which indicated a high degree of agreement for all the student performance in statistics variable phrases which means that this variable has a high level at universities, these results agree with Poldrugovac et al., (2016), where they stressed that efficiency is one of the key factors of management control and a prerequisite for making improvements in hotels performance.

6.3 Test of HYPOTHESES

To test H_1 , Pearson and linear regression tests were used as follows:

Table 10: Correlation between affect – students' feelings concerning statistics and student performance in statistics

Variables		Student performance in statistics
Affect – students' feelings concerning statistics	Pearson Correlation	0.048
	Sig. (2-tailed)	0.437
	N	269

**. Correlation is significant at the 0.01 level (2-tailed).

Table 11: Regression coefficients for the impact of affect – students' feelings concerning statistics on student performance in statistics

Model	B	R ²	T	Sig.
(constant)	3.213	0.002	10.717	0.000
Affect – students' feelings concerning statistics	0.075		0.778	0.437

From tables (10) and (11) the, (R) value (0.048) with Sig. value that more than 0.05 (0.437) referred that there is no statistical correlation between affect – students' feelings concerning statistics and student performance in statistics, as well as the coefficient of determination (R^2) is (0.002), suggesting that 0.2% of the variation of the student performance in statistics was explained by the affect – students' feelings concerning statistics variable. Moreover, it seems that the regression coefficient statistically not significant, $P > 0.05$ (0.437), so the variable of (Affect – students' feelings concerning statistics) has no statistical effect on student performance in statistics. This result coincided that H_1 is not accepted. This is inconsistent with Chiheb et al. (2019), where they indicated that BDA helps organizations to make better and effective decisions.

To test H_2 , Pearson and linear regression tests were used as follows:

Table 12: Correlation between cognitive competence concerning statistics and student performance in statistics

Variables		Student performance in statistics
Cognitive competence concerning statistics	Pearson Correlation	0.008
	Sig. (2-tailed)	0.898
	N	269

**. Correlation is significant at the 0.01 level (2-tailed).

Table 13: Regression coefficients for the impact of cognitive competence concerning statistics on student performance in statistics

Model	B	R ²	T	Sig.
(constant)	3.405	0.000	11.233	0.000
Cognitive competence concerning statistics	0.013		0.128	0.898

From tables (10) and (11) the, (R) value (0.008) with Sig. value that more than 0.05 (0.898) referred that there is no statistical correlation between cognitive competence concerning statistics and student performance in statistics, as well as the coefficient of determination (R²) is (0.000). Moreover, it seems that the regression coefficient statistically not significant, $P > 0.05$ (0.898), so the variable of (Cognitive competence concerning statistics) has no statistical effect on student performance in statistics. This result coincided that H2 is not accepted. This is inconsistent with Chiheb et al. (2019), where they indicated that BDA helps organizations to make better and effective decisions. To test H₃, Pearson and linear regression tests were used as follows:

Table 14: Correlation between values concerning statistics and student performance in statistics

Variables		Student performance in statistics
values concerning statistics	Pearson Correlation	0.056
	Sig. (2-tailed)	0.898
	N	269

**. Correlation is significant at the 0.01 level (2-tailed).

Table 15: Regression coefficients for the impact of values concerning statistics on student performance in statistics

Model	B	R ²	T	Sig.
(constant)	3.689	0.003	13.630	0.000
values concerning statistics	0.087		0.924	0.356

From tables (10) and (11) the, (R) value (0.056) with Sig. value that more than 0.05 (0.356) referred that there is no statistical correlation between values concerning statistics and student performance in statistics, as well as the coefficient of determination (R²) is (0.003), suggesting that 0.3% of the variation of the student performance in statistics was explained by the values concerning statistics variable. Moreover, it seems that the regression coefficient statistically not significant, $P > 0.05$ (0.356), so the variable of (Values concerning statistics) has no statistical effect on student performance in statistics. This result coincided that H3 is not accepted. This is inconsistent with Chiheb et al. (2019), where they indicated that BDA helps organizations to make better and effective decisions.

To test H₄, Pearson and linear regression tests were used as follows:

Table 16: Correlation between difficulty of statistics and student performance in statistics

Variables		Student performance in statistics
Difficulty of statistics	Pearson Correlation	0.250

	Sig. (2-tailed)	0.000
	N	269

**. Correlation is significant at the 0.01 level (2-tailed).

Table 17: Regression coefficients for the impact of difficulty of statistics on student performance in statistics

Model	B	R ²	T	Sig.
(constant)	2.080	0.063	6.377	0.000
Difficulty of statistics	0.406		4.225	0.000

From tables (16) and (17) the, (R) value (0.250) referred that there is a low degree of correlation between difficulty of statistics and student performance in statistics, as well as the coefficient of determination (R²) is (0.063), suggesting that 6.3% of the variation of the student performance in statistics was explained by the difficulty of statistics variable. Moreover, it seems that the regression coefficient statistically significant, $P > 0.05$, so the variable of (Difficulty of statistics) has a statistical effect on the student performance in statistics. This result coincided that H₄ is acceptable; the following equation can be inferred to predict the student performance in statistics from the level of difficulty of statistics as follow:

Student performance in statistics = 2.080 + (0.406 * Difficulty of statistics)

To test H₅, Pearson and linear regression tests were used as follows:

Table 18: Correlation between interest in statistics and student performance in statistics

Variables		Student performance in statistics
Interest in statistics	Pearson Correlation	0.663**
	Sig. (2-tailed)	0.000
	N	269

**. Correlation is significant at the 0.01 level (2-tailed).

Table 19: Regression coefficients for the impact of interest in statistics on student performance in statistics

Model	B	R ²	T	Sig.
(constant)	1.239	0.440	7.897	0.000
Interest in statistics	0.632		14.479	0.000

From tables (18) and (19) the, (R) value (0.663) referred that there is a high degree of correlation between interest in statistics and student performance in statistics, as well as the coefficient of determination (R²) is (0.440), suggesting that 44% of the variation of the student performance in statistics was explained by the interest in statistics variable. Moreover, it seems that the regression coefficient statistically significant, $P > 0.05$, so the variable of (Interest in statistics) has a statistical effect on the student performance in statistics. This result coincided that H₅ is acceptable; the following equation can be inferred to predict the student performance in statistics from the level of interest in statistics as follow:

Student performance in statistics = 1.239 + (0.632 * Interest in statistics)

To test H₆, Pearson and linear regression tests were used as follows:

Table 20: Correlation between efforts concerning statistics and student performance in statistics

Variables		Student performance in statistics
Efforts concerning statistics	Pearson Correlation	0.552**
	Sig. (2-tailed)	0.000
	N	269

** . Correlation is significant at the 0.01 level (2-tailed).

Table 21: Regression coefficients for the impact of efforts concerning statistics on student performance in statistics

Model	B	R ²	T	Sig.
(constant)	1.495	0.302	8.072	0.000
Efforts concerning statistics	0.530		10.806	0.000

From tables (20) and (21) the, (R) value (0.552) referred that there is a moderate degree of correlation between efforts concerning statistics and student performance in statistics, as well as the coefficient of determination (R²) is (0.302), suggesting that 30.2% of the variation of the student performance in statistics was explained by the efforts concerning statistics variable. Moreover, it seems that the regression coefficient statistically significant, $P > 0.05$, so the variable of (Efforts concerning statistics) has a statistical effect on the student performance in statistics. This result coincided that H₆ is acceptable; the following equation can be inferred to predict the student performance in statistics from the level of efforts concerning statistics as follow:

Student performance in statistics = 1.495 + (0.530 * Efforts concerning statistics)

7. Conclusion

The research pointed to a number of results with respect to the research pointed to a number of results with respect to tourism and hotel students' attitudes toward statistics in Egypt in the investigated governorates. The points of the conclusion can be presented in the following:

1. The vast majority of students feel frustrated when reviewing for statistics tests in class.
2. The results confirmed that students felt anxious during statistics lectures.
3. The results confirmed that students' statistical skills will increase their chances of getting a job.
4. The results confirmed that learning statistics requires a great deal of discipline.
5. The statistical results confirmed a highly technical subject.
6. The results confirmed that most people need to learn a new way of thinking to practice statistics.
7. The results confirmed that students are keen on understanding statistical information.
8. The results confirmed that the students are keen to attend all the lectures in the statistics course.
9. There is no statistically significant positive impact of affect – students' feelings concerning statistics on student performance in statistics.
10. There is no statistically significant positive impact of cognitive competence concerning statistics on student performance in statistics.
11. There is no statistically significant positive impact of values concerning statistics on student performance in statistics.

12. There is a statistically significant negative effect of difficulty with statistics on student performance in statistics.
13. There is a statistically significant positive impact of interest in statistics on student performance in statistics.
14. There is a statistically significant positive impact of efforts concerning statistics on student performance in statistics.

8. Limitation and Future Research

Although this research has a number of limitations, it opens up possibilities for further study. First, this research included only students from tourism and hotel colleges, particularly from Upper Egypt. Second, the research was limited to tourism colleges, and the majority of the students were from Luxor Governorate. Furthermore, future studies should focus on examining students' attitudes towards statistics in other colleges in Egypt and abroad, as well as in higher institutes specializing in tourism and hotels. Additionally, special attention should be given to studying the difficulties they face when learning statistics. Finally, we recommend that future researchers test participants before, during, and after studying statistics, as one of the limitations of the current study is that it relied on students who had completed the course.

9. Implications and Recommendations

Based on the results, university senior management should provide training for faculty members on the use of effective teaching techniques that reduce students' anxiety and stress in all courses, especially in courses related to mathematics, such as statistics. Furthermore, university senior management should provide training for students on thinking skills and strategies that help them understand statistics and other courses more easily and quickly. Finally, university top management should provide training for students on how to maintain discipline and commitment in the classroom, which will certainly reflect on their overall academic achievement and particularly on their personal lives.

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