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# ARCHITECTURAL EDUCATION IN EGYPT: TOWARDS A GENDER SENSITIVE STUDIO

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# ARCHITECTURAL EDUCATION IN EGYPT: TOWARDS A GENDER SENSITIVE STUDIO


## Abstract

Architecture is a profession that men have dominated for centuries, while the transmission model of education has been the common basis for architectural education. In Egypt, architectural education continues to be masculine despite the increase in the number of female students enrolled in architectural programs. In such a type of education, the studio is the venue where concepts and building competencies are transformed. Therefore, this research paper investigates the impact of gender inequality on architectural education by surveying the educational process in the studio among male and female students at Egyptian universities. By exploring the actual difficulties related to gender that face architectural education in Egypt, the research aims to enhance the quality of the educational process for architecture students in general, and help them to equally qualify for the profession. This in turn should raise awareness for all the participants in the educational process in order to create a better educational environment for architecture students with special regard to gender sensitivity.



## Keywords

Architectural education, gender, studio

# ARCHITECTURAL EDUCATION IN EGYPT: TOWARD A GENDER SENSITIVE STUDIO

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## ABSTRACT

*Architecture is a profession that men have dominated for centuries, while the transmission model of education has been the common basis for architectural education. In Egypt, architectural education continues to be masculine despite the increase in the number of female students enrolled in architectural programs. In such a type of education, the studio is the venue where concepts and building competencies are transformed. Therefore, this research paper investigates the impact of gender inequality on architectural education by surveying the educational process in the studio among male and female students at Egyptian universities. By exploring the actual difficulties related to gender that face architectural education in Egypt, the research aims to enhance the quality of the educational process for architecture students in general, and help them to equally qualify for the profession. This in turn should raise awareness for all the participants in the educational process in order to create a better educational environment for architecture students with special regard to gender sensitivity.*

## KEYWORDS

Architectural education, gender, studio

## 1. INTRODUCTION

Egyptian households as well as educational and religious institutions reinforce boys and girls to take different roles. Girls are mostly required to be submissive and ready to serve the needs of the family, while boys are brought up to interact in the public arena. Peers also reinforce the management of this type of social upbringing, while the expectations of the community govern this process at large. Thus, the public sphere has been difficult to access for many young women.

Despite the remarkable increase in the number of female students, architectural education continues to be masculine, and is not gender sensitive, since the educational process is conducted in a society that has not reached real gender equality yet, which makes the situation regressive and counterproductive. Many female students often complain about the physical effort, late work hours, mental stress, unjust grades, juries, and above all, the criticism they receive from staff members in the studio and during their project juries. Female architects are not usually given opportunities equal to those of male architects.

Therefore, this paper investigates the impact of gender inequality on architectural education by surveying five different Egyptian universities, and observing the involved conditions within the educational process among male and female students. The research works to find the actual reasons

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behind the difficulties facing female architecture students in Egypt, and consequently contribute to the elimination of those difficulties.

## 2. METHODOLOGY

This research paper employs qualitative research methods as it investigates the process of architectural education in the studio and the extent of its gender sensitivity at five architecture schools from four different regions in Egypt. The investigated universities are Cairo and Helwan (located in Greater Cairo region), Alexandria (serving Alexandria region), Asyut (serving Upper Egypt region), and Menofia (located in Shibin El-Kom and serving the Nile Delta region) (Fig. 1). A questionnaire was designed as a tool to gather information on aspects that affect architectural education in the studio. Furthermore, the researchers used focus group meetings with students to shed more light on issues raised in the responses to the given questionnaire. The survey was conducted during 2012-2013 by visiting each of the selected departments. Collected data were subject to a statistical analysis to determine the variations within and between the studied departments. 1,066 questionnaire forms were distributed to students, so the resulting observations represent almost one third of the number of students enrolled in the six departments under investigation (Table 1). The survey samples ensured the inclusion of male and female student from all grades.

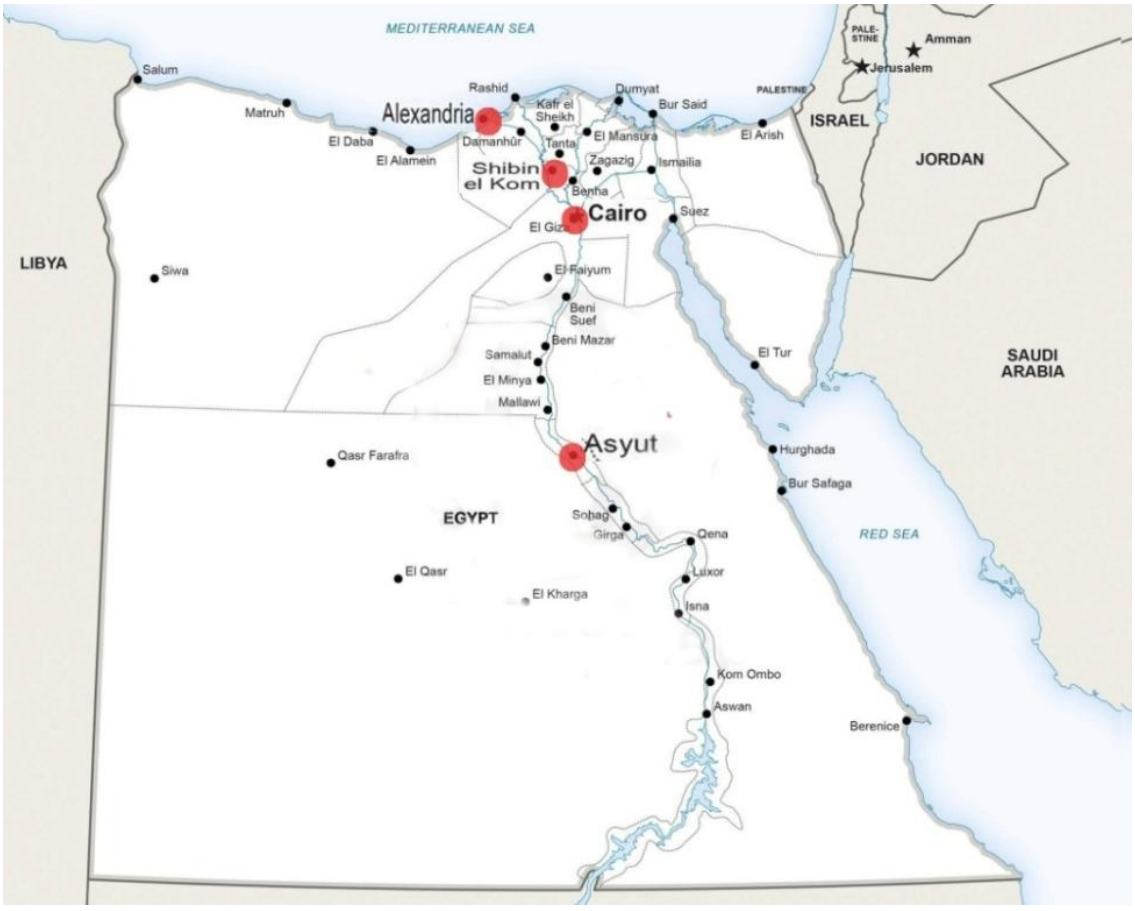


Fig. 1 Location of the Departments of Architecture included in the Study[1]
Reference: https://www.onestopmap.com/wp-content/uploads/2014/08/51-map-egypt-political.jpg

[1] The figure illustrates the location diversity of the studied sample of institutions, which is meant to indicate potential differences. There was no need for more illustrations of the schools themselves, since the study works essentially to investigate gender issues within architectural education through a questionnaire tool (as will be shown in the following).

Table 1. Number of Enrolled Students in Selected Departments of Architecture, Egypt
Reference: The Conducted Survey

| University | Faculty | Male | Female | Total |
|---|---|---|---|---|
| Asyut | Engineering | 64 | 114 | 178 |
| | | 36.0% | 64.0% | |
| Menofia | Engineering | 80 | 121 | 201 |
| | | 39.8% | 60.2% | |
| Helwan | Fine Arts, | 321 | 512 | 833 |
| | | 38.5% | 61.5% | |
| Alexandria | Engineering | 120 | 229 | 349 |
| | | 34.4% | 65.6% | |
| Alexandria | Fine Arts, | 399 | 510 | 909 |
| | | 43.9% | 56.1% | |
| Cairo | Engineering | 223 | 407 | 630 |
| | | 35.4% | 64.6% | |
| Total | | 1,207 | 1,893 | 3,100 |
| | | 38.9% | 61.1% | |

## 3. LITERTURE REVIEW

According to the results of the comprehensive 2010 Survey of Young People in Egypt (SYPE), women represent more than half of university enrolment, while 74% of female respondents have completed basic education or above, as discussed by Morsy (2010). Meanwhile, Egypt has one of the lowest female labor participation rates in the world and ranks 120 out of 128 countries in terms of gender gap. Morsy (2010) pointed that there is little female partaking in the Egyptian public or political life, which suggests that cultural barriers play a part in the segregation of women from public life (Morsy 2010, Sayed et al. 2010). As a matter of fact, the public sphere has been difficult to access for many young women. A large fraction of women never attain employment, even if this is desired, as an outcome of cultural as well as labor market barriers (Morsy 2010, Sayed et al. 2010).

As for architectural education, it is known to be the process by which information, knowledge, ideas and skills are taught to others through purposeful and conscious telling, demonstration, and guidance (Wilson 2015). In architectural education, the studio is the venue where concepts and building competencies are transformed. Recently, the increase in the number of female architectural students at Egyptian universities has been remarkable (Table 2). Despite this increase, gender in architectural education continues to be among serious research issues. Usually, female architects are not given equal opportunities to those of male architects.

Table 2. Male/Female Sample Count Used in the Study
Reference: The conducted survey

| University | Faculty | Male | Female | Total |
|---|---|---|---|---|
| Asyut | Engineering | 61 | 100 | 161 |
| Menofia | Engineering | 73 | 101 | 174 |
| Helwan | Fine Arts | 80 | 108 | 188 |
| Alexandria | Engineering | 53 | 130 | 183 |
| Alexandria | Fine Arts | 71 | 137 | 208 |
| Cairo | Engineering | 54 | 98 | 152 |
| | Total | 392 | 674 | 1,066 |

Combining insights from the sociological and political economy of the profession, Crysler (1995) provided a critique of the transmission model of education that has been dominating architectural training. Many researchers criticized the transmission model arguing that it tends to portray students as passive and homogeneous professional subjects removed from social and political forces, whereas Crysler (1995) proposed an alternative model of educational practices. Such a model is rooted in the theories of critical pedagogy which provides insights into how challenging the existing framework of architectural education is, thus permitting the development of a more democratic learning environment, where competing interpretations, alternative histories, and a new range of situated political issues inform the learning process (Crysler 1995).

Groat and Ahrentzen (1996) argued that the field of architecture must engage diversity in two worldly senses simultaneously; demographic composition and the substantive domain of architecture. The researchers reinforced their argument by conducting a research on 650 students at six different architecture schools to investigate the ways in which both the content and the form of architectural education might impede or support the progress of female and minority students. It was concluded that women and members of some ethnic groups (particularly African-Americans and Latinos) tend to experience the social dynamics and pedagogical practices of their educational milieu differently, often more negatively, than their male or majority counterparts. The findings also reveal that many women and minorities feel their career goals may mismatch the profession as it is currently defined. In that regard, Groat and Ahrentzen (1996) believed that all students would benefit from a collective reassessment of architecture's pedagogical conventions and of the definitional scope of the field.

Anthony (2002) reviewed literature about the need for diversity in the schools of architecture. She provided statistics documenting the relative lack of diversity, especially among architectural educators. She stressed the need to go beyond affirmative action requirements to promote a climate that values differences and manages diversity. Then, she proposed strategies such as writing diversity plans, restructuring the design evaluation process, and revising the architectural curriculum. The study also suggests mentoring and cross-training programs, more-flexible work environments, and public outreach as ways to promote diversity in architectural schools (Anthony 2002).

Demirbas and Demirkan (2007) focused on the education of architectural design using the Experiential Learning Theory (ELT). They explored the effects of learning styles and gender on the performance scores of freshman design students in three successive academic years. Their findings indicated that the distribution of design students through the "Learning Style Type Preference" was more concentrated in assimilating and converging groups. The first and third groups were found to be more balanced compared to the second group. The latter was mostly formed by southerners, which might suggest regional differences. However, gender did not significantly differentiate learning style preferences. Although there was no consistency in all three groups, the results indicated that the performance scores of males were higher in technology-based courses, whereas those of females were higher in artistic and fundamental courses as well as in the semester academic performance scores (GPA). The study also found that the performance scores of converging and diverging students differed significantly in favor of converging students only in design courses. Thus, it was recommended that in design education, instructors should provide a strategy that is relevant to the style of each learner during the design process in the studio (Demirbas and Demirkan 2007).

## 4. THE SURVEY

Diversity was considered in the selection of the studied universities. Thus, the survey included examples of the oldest schools of architecture in metropolitan cities, as well as relatively newer departments at regional universities in rather rural communities. As a tool for qualitative research, the executed questionnaire was designed to comprise four main axes as in the following:

- Reasons for studying architecture and the extent of students' satisfaction.
- Impediments for efficient architectural education.
- Adequacy of the studio as a venue for architectural education.
- Adequacy of the jury system as a means of assessment.

### 4.1 Reasons for Studying Architecture and the Extent of Students' Satisfaction

The majority of surveyed students (about 79% of male students and 73% of female students) chose to study architecture (Table 3). Some interviewees chose it simply because their high school grades allowed them to, while others joined architecture departments because of their parents' pressure, probably to serve their families' business. About 13% of male students at Cairo University joined the department based on their parents' recommendation, which is the highest among the six departments in this response. In Asyut,

21% of female students joined the department thinking that it would enable them to get office jobs at consulting firms in the future, as they thought that site jobs are only for civil engineers (likely, a sign of the socio-cultural impact in the conservative south).

Table 3. Students` Reasons for Studying Architecture
(Survey question: what were the reasons that made you enroll for studying architecture?)
Reference: The conducted survey

| University | Faculty | Male | | | | Female | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Personal Desire | Grades | Parents' Pressure | Others | Personal Desire | Grades | Parents' Pressure | Others |
| Asyut | Eng. | 83.60 | 6.60 | 4.90 | 4.90 | 57.00 | 20.00 | 21.0 | 2.00 |
| Menofia | Eng. | 87.70 | 2.70 | 4.10 | 5.50 | 85.10 | 5.00 | 5.90 | 4.00 |
| Helwan | Fine Arts | 77.50 | 15.00 | 6.20 | 1.30 | 75.90 | 12.10 | 10.0 | 2.00 |
| Alexandria | Eng. | 82.00 | 10.00 | 3.80 | 4.20 | 80.00 | 4.60 | 9.2 | 6.20 |
| Alexandria | Fine Arts | 74.60 | 12.70 | 5.60 | 7.10 | 75.00 | 12.60 | 6.6 | 5.80 |
| Cairo | Eng. | 66.70 | 9.30 | 13.0 | 11.0 | 66.30 | 8.20 | 13.3 | 12.20 |

When asked whether they were aware of the nature of study at the department, both male and female students from the studied universities mostly lacked the awareness before they joined architecture schools. While both male and female students at urban universities showed similar results in their unawareness of the field requirements, those at rural universities showed a wider range of difference, which may imply a gender based gap as a sign of the socio-cultural background (Table 4).

Table 4. Awareness of the Nature of Study at the Department
(Survey question: were you aware of the nature of studying architecture?)
Reference: The conducted survey

| University | Faculty | Male | | Female | |
|---|---|---|---|---|---|
| | | Yes | No | Yes | No |
| Asyut | Engineering | 59.00 | 41.00 | 25.00 | 75.00 |
| Menofia | Engineering | 65.80 | 34.20 | 42.60 | 57.40 |
| Helwan | Fine Arts | 43.80 | 56.20 | 39.80 | 60.20 |
| Alexandria | Engineering | 45.40 | 54.60 | 31.50 | 68.50 |
| Alexandria | Fine Arts | 43.40 | 56.60 | 24.80 | 75.20 |
| Cairo | Engineering | 43.40 | 56.60 | 36.70 | 63.30 |

When asked whether the study of architecture has altered their personality and attitude, the majority of students, particularly females, agreed (Table 5). It seems that being engaged in studio work and field visits have built their competencies to communicate properly and stand for themselves.

Table 5. Possible Impact on Students` Personalities by Studying Architecture
(Survey question: has studying architecture affected your personality?)
Reference: The conducted survey

| University | Faculty | Male | | Female | |
|---|---|---|---|---|---|
| | | Yes | No | Yes | No |
| Asyut | Engineering | 72.10 | 27.90 | 89.00 | 11.00 |
| Menofia | Engineering | 76.70 | 23.30 | 89.10 | 10.90 |
| Helwan | Fine Arts | 98.00 | 2.00 | 99.00 | 1.00 |
| Alexandria | Engineering | 79.20 | 20.80 | 84.60 | 15.40 |
| Alexandria | Fine Arts | 90.00 | 10.00 | 92.70 | 7.30 |
| Cairo | Engineering | 96.30 | 3.70 | 98.00 | 2.00 |

However, responses to the suitability of studying architecture turned out differently according to gender. Approximately 75% of male students found studying architecture suitable; whereas 58% of female students found that studying architecture is not suitable for them (Table 6).

Table 6. Suitability of Studying Architecture for Surveyed Students
(Survey question: do you find studying architecture suitable for you?)
Reference: The conducted survey

| University | Faculty | Male | | Female | |
|---|---|---|---|---|---|
| | | Yes | No | Yes | No |
| Asyut | Engineering | 75.40 | 24.60 | 40.00 | 60.00 |
| Menofia | Engineering | 73.00 | 27.00 | 49.50 | 50.50 |
| Helwan | Fine Arts | 80.00 | 20.00 | 37.00 | 63.00 |
| Alexandria | Engineering | 60.00 | 40.00 | 42.00 | 58.00 |
| Alexandria | Fine Arts | 81.70 | 18.30 | 40.10 | 59.90 |
| Cairo | Engineering | 83.30 | 16.70 | 43.90 | 56.10 |

## 4.2 Impediments for Efficient Architectural Education

There were many reasons why some students found the study of architecture not suitable. The reasons include travelling to school, physical effort, mental stress, field research, required skills, as well as the procedures involved in architectural education. However, the order of those reasons differed from one department to another due, in part, to the socio-cultural conditions of the local society, and how the educational process is conducted in the studio.

### 4.2.1 Travelling to School

Travelling seems to be an issue, particularly for those who commute to schools in Cairo and Alexandria, and suffer from traffic congestion. About 69.2% of male students and 74.4% of female students at the Faculty of Fine Arts - Alexandria, and the Faculty of Engineering – Cairo, respectively, perceived the daily trip to school as a major hindrance which negatively affects the educational process. Female students had the highest complaint compared to male students in the six departments.

Approximately, 20% of male students at Asyut University and 17.9% of male students at Menofia University found the travel unsuitable for them; while 30% of female students at Asyut University and 13.7% of female students at Menofia University believed that travelling is an issue.

### 4.2.2 Physical Effort and Mental Stress

Physical effort and mental stress explain why some students find studying architecture is inappropriate. All male respondents at Cairo University and 76.9% of male students at the Faculty of Fine Arts- Alexandria complained about the physical effort associated with the study of architecture. Another 60% of male students at Asyut University also complained about the required level of effort. Approximately 77.8%, 76.9%, 53.3%, and 60.7% of male students at Cairo University, the Faculty of Fine Arts - Alexandria University, Asyut University, and Menofia University, respectively, agreed that studying architecture is not suitable because of its mental stress. Meanwhile, 93.0% of female students at Cairo University, and 52.4% of female students at the Faculty of Fine Arts - Alexandria considered the level of effort excessive. An estimate of 47.4%, 33.3%, 55%, and 52.9% of female students at Cairo University, the Faculty of Fine Arts- Alexandria University, Asyut University, and Menofia University, respectively, agreed that mental stress is the reason for the unsuitability of studying architecture. Considering education as a way to escape poverty might be the reason for the response variation between those living in Cairo and Alexandria on one hand, and their peers living in rural areas on the other (such as Menofia and Asyut).

### 4.2.3 Field Research Requirements

In general, most female respondents did not favor field research as a part of studying architecture (expressed as “definitely not suitable” by16.77% and “not suitable” by 54.22%). Most female students at the Universities of Helwan (57.4%), Alexandria (both

Engineering 72.6% and Fine Arts 59.8%), Cairo (60.5%) and Asyut (41.7 %) regarded field research as not suitable. The reasons for such responses include the timing and circumstances of data collection, as Egypt (particularly major metropolitan areas) recently experienced public disorder and a lack of security after the January 2011 event. Another possible reason attributes to the socio-cultural aspects, since gender equality is not mainstreamed yet, as indicated earlier.

#### 4.2.4 Skill Requirements

Lacking required skills, such as imagination and creativity, in addition to the procedures used in architectural education, such as studio mechanisms and jury systems, may explain why students find studying architecture inappropriate. However, the majority of male students did not see the lack of required skills and the procedures of studying architecture as a problem. All male respondents from Cairo University plus 60.7%, 28%, and 53.3% of male respondents at Menofia University, the Faculty of Engineering - Alexandria University, and Asyut University, respectively, did not perceive that they lacked the skills required, and thought that the procedures of studying architecture were not the problem. An estimate of 39%, 18.6%, 43.3%, and 54.9% of female students at the Faculty of Fine Arts - Alexandria, and the universities of Cairo, Asyut, and Menofia respectively believed that they lacked needed skills, and that the procedures of studying architecture are part of the problem.

### 4.3 Adequacy of the Studio as a Venue for Architectural Education

When asked whether they felt comfortable in the studio as their study environment, many female students at Asyut and Menofia Universities responded negatively. Moreover, the majority of both male and female students at the Faculty of Fine Arts – Alexandria did not feel comfortable either in the studios where they study (Table 7).

Table 7. Expression of Comfort in the Studio
(Survey question: do you feel comfortable in the studio where you study?)
Reference: The conducted survey

| University | Faculty | Male | | | Females | | |
|---|---|---|---|---|---|---|---|
| | | Yes | Indifferent | No | Yes | Indifferent | No |
| Asyut | Engineering | 44.30 | 44.30 | 11.40 | 35.00 | 15.00 | 50.00 |
| Menofia | Engineering | 35.60 | 43.80 | 20.60 | 31.70 | 17.80 | 50.50 |
| Helwan | Fine Arts | 45.00 | 25.00 | 30.00 | 36.10 | 35.20 | 28.70 |
| Alexandria | Engineering | 45.30 | 39.60 | 15.10 | 39.20 | 36.20 | 24.60 |
| Alexandria | Fine Arts | 2.80 | 35.20 | 62.00 | 8.70 | 30.70 | 60.60 |
| Cairo | Engineering | 41.80 | 27.60 | 30.60 | 33.30 | 53.70 | 13.00 |

Moreover, both male and female students at Menofia University and the Faculty of Fine Arts - Alexandria University were not happy with the physical environment of their studios (Table 8). Male and female students at Menofia University who thought their studios require major improvements mounted to about 61.6% and 65.3% respectively of the drawn sample. At the Faculty of Fine Arts - Alexandria 93% and 85.4% of male and female students respectively thought their studios require major improvements as well. Based on campus visits to the Faculty of Fine Arts - Alexandria, the researchers observed that the studios of concern are small, and cannot efficiently accommodate the large numbers enrolled today. Student s at the other surveyed schools thought their studios still need some improvements, such as more electrical outlets for their computers and electronic devices, printing facilities, better Internet connections, and so forth.

Table 8. Students' Opinion of the Studio in Regard to the Need for Improvements
(Survey question: to what extent does the studio need improvements?)

Reference: the Conducted Survey

| University | Faculty | Male | | | Females | | |
|---|---|---|---|---|---|---|---|
| | | Major | Slight | No need | Major | Slight | No need |
| Asyut | Engineering | 23.00 | 54.00 | 23.00 | 50.00 | 24.00 | 26.00 |
| Menofia | Engineering | 61.60 | 30.10 | 8.30 | 65.30 | 28.70 | 6.00 |
| Helwan | Fine Arts | 12.50 | 42.50 | 45.00 | 21.30 | 64.80 | 13.90 |
| Alexandria | Engineering | 32.10 | 41.50 | 26.40 | 23.10 | 60.80 | 16.20 |
| Alexandria | Fine Arts | 93.00 | 4.20 | 2.80 | 85.40 | 14.60 | 0.00 |
| Cairo | Engineering | 46.30 | 51.90 | 1.80 | 6.10 | 41.80 | 52.00 |

### 4.4 Adequacy of the Jury System as a Means of Assessment:

The jury as a forum for architectural education in many schools needs serious attention. Unlike male students, the majority of the surveyed female students did not prefer group discussion, as it makes them shy and insecure (Table 9). Some instructors, as female students pointed in the focus groups, use "harsh language" during those discussions.

Table 9. Students' Preference of Group versus Individual Discussions
(Survey question: would you prefer group or individual discussion for your project review?)

Reference: The conducted survey

| University | Faculty | Male | | Female | |
|---|---|---|---|---|---|
| | | Group | Individual | Group | Individual |
| Asyut | Engineering | 49.20 | 50.80 | 10.00 | 90.00 |
| Menofia | Engineering | 60.30 | 39.70 | 30.00 | 70.00 |
| Helwan | Fine Arts | 68.80 | 31.20 | 36.10 | 63.90 |
| Alexandria | Engineering | 69.80 | 30.20 | 45.40 | 54.60 |
| Alexandria | Fine Arts | 69.00 | 31.00 | 38.70 | 61.30 |
| Cairo | Engineering | 55.60 | 44.40 | 40.80 | 59.20 |

Furthermore, the majority of both male and female students agreed that they mostly receive negative comments from the jury members while reviewing their projects (Table10). This indicates that both male and female students experience serious stress before, during, and after the jury. However, it seems that female students are more vulnerable to such stresses based on the responses indicated earlier (Tables 8 and 9).

Table 10. Students' Opinion of Jury Comments
(Survey question: what type of jury comments do you receive; positive, negative, both, or others?)

Reference: The conducted survey

| University | Faculty | Male | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Positive | Negative | Both | Others | Positive | Negative | Both | Others |
| Asyut | Engineering | 1.7 | 75.4 | 21.3 | 1.6 | 1.0 | 75.0 | 23.0 | 1.0 |
| Menofia | Engineering | 4.1 | 67.1 | 27.4 | 1.4 | 1.0 | 66.3 | 32.7 | 0.0 |
| Helwan | Fine Arts | 1.2 | 70.0 | 18.8 | 10.0 | 0.0 | 63.0 | 28.0 | 9.0 |
| Alexandria | Engineering | 0.0 | 83.0 | 15.1 | 1.9 | 1.5 | 54.6 | 43.9 | 0.0 |
| Alexandria | Fine Arts | 0.0 | 87.3 | 5.7 | 7.0 | 2.9 | 67.2 | 24.9 | 5.0 |
| Cairo | Engineering | 0.0 | 77.8 | 22.2 | 0.0 | 0.0 | 86.7 | 13.3 | 0.0 |

## 5. STATISTICAL INTERFERENCES

Data from the survey was statistically processed through a cross tabulation analysis and examined by Spearman's test in order to determine the relationships between the studied variables, and infer the research conclusions as shown in the following.

## 5.1 Relationship between Awareness of the Nature of Study and Willingness to Enroll

A cross tabulation analysis shows that 34.8% of surveyed students would not study architecture again if time went back. Out of the 34.8%, 12.5% knew the nature of studying architecture, while 22.3% were not really aware of that nature (Table 11).

Table 11. Awareness of the Nature of Study and Willingness to Enroll (All Students)
Reference: The conducted survey

| | | | Were you aware of the nature of studying architecture? | | |
|---|---|---|---|---|---|
| | | | Yes | No | Total |
| If time went back, would you study architecture? | Yes | Count | 296.0 | 399.0 | 695.0 |
| | | Expected Count | 279.7 | 415.3 | 695.0 |
| | | % of Total | 27.8 | 37.4 | 65.2 |
| | No | Count | 133 | 238.0 | 371.0 |
| | | Expected Count | 149.3 | 221.7 | 371.0 |
| | | % of Total | 12.5 | 22.3 | 34.8 |
| Total | | Count | 429.0 | 637.0 | 1066.0 |
| | | Expected Count | 429.0 | 637.0 | 1066.0 |
| | | % of Total | 40.2 | 59.8 | 100.0 |

Responses to whether students would study architecture in case time went back can be attributed to their gender. Half of male students knew about the nature of studying architecture, whereas most of them (83.9%) are still willing to join the department of architecture if time goes back (Table 12). To the contrary, 65.4% of female students did not know the nature of studying architecture, and 45.7% would not join the department again in case time went back (Table 13).

Reasons for those responses can reveal two issues. Firstly, the education system in Egypt is not flexible enough for students to change their track without losing the credit they have earned. If a student wishes to change his/her area of study, then s/he has to start all over in another discipline. This means s/he will lose all credits obtained in the past years. Hence, many students feel trapped. Secondly, many students, particularly females, are willing to endure their inconveniences until they get their degree, then they never actually work as architects. However, they still avail the opportunity to ascend the social ladder by working in other domains, especially if they come from rural areas, such as Asyut and Menofia.

Table 12. Awareness of the Nature of Study and Willingness to Enroll (Male Students)
Reference: The conducted survey

| | | | Were you aware of the nature of studying architecture | | |
|---|---|---|---|---|---|
| | | | Yes | No | Total |
| If time went back, would you study architecture? | Yes | Count | 173.0 | 156.0 | 329.0 |
| | | Expected Count | 164.5 | 164.5 | 329.0 |
| | | % of Total | 44.1 | 39.8 | 83.9 |
| | No | Count | 23.0 | 40.0 | 63.0 |
| | | Expected Count | 31.5 | 31.5 | 63.0 |
| | | % of Total | 5.9 | 10.2 | 16.1 |
| Total | | Count | 196.0 | 196.0 | 392.0 |
| | | Expected Count | 196.0 | 196.0 | 392.0 |
| | | % of Total | 50.0 | 50.0 | 100.0 |

Table 13. Awareness of the Nature of Study and Willingness to Enroll (Female Students)
Reference: The conducted survey

| | | | Were you aware of the nature of studying architecture | | |
|---|---|---|---|---|---|
| | | | Yes | No | Total |
| If time went back, would you study architecture? | Yes | Count | 123.0 | 243.0 | 366.0 |
| | | Expected Count | 126.5 | 239.5 | 366.0 |
| | | % of Total | 18.2 | 36.1 | 54.3 |
| | No | Count | 110.0 | 198.0 | 308.0 |
| | | Expected Count | 106.5 | 201.5 | 308.0 |
| | | % of Total | 16.3 | 29.4 | 45.7 |
| Total | | Count | 233.0 | 441.0 | 674.0 |
| | | Expected Count | 233.0 | 441.0 | 674.0 |
| | | % of Total | 34.6 | 65.4 | 100.0 |

## 5.2 Relationship between Suitability of Studying Architecture and its Influence on Student's Personality

Whether studying architecture was suitable or not for the surveyed students, it still has influenced their personalities. Out of the interviewed students, an estimated 89.5% think that studying architecture has influenced their personality, of whom 41.6% think studying architecture is not suitable for them, while 47.9% find it suitable (Table 14).

Table 14. Suitability of Studying Architecture and its Influence on Personality (All Students)
Reference: The conducted survey

| | | | Do you find studying architecture suitable? | | |
|---|---|---|---|---|---|
| | | | Yes | No | Total |
| Has studying architecture influenced your personality? | Yes | Count | 511.0 | 443.0 | 954.0 |
| | | Expected Count | 520.0 | 434.0 | 954.0 |
| | | % of Total | 47.9 | 41.6 | 89.5 |
| | No | Count | 70.0 | 42.0 | 112.0 |
| | | Expected Count | 61.0 | 51.0 | 112.0 |
| | | % of Total | 6.6 | 3.9 | 10.5 |
| Total | | Count | 581.0 | 485.0 | 1066.0 |
| | | Expected Count | 581.0 | 485.0 | 1066.0 |
| | | % of Total | 54.5 | 45.5 | 100.0 |

However, it seems that studying architecture is rather not suitable for female students, yet rather suitable for male students, as 58% of female students think that studying architecture is not suitable, while 76% of male students think that studying architecture is suitable. Meanwhile, 91% and 85.7% of female and male students, respectively, feel that studying architecture has influenced their personality (Tables 15 and 16).

Table 15. Suitability of Studying Architecture and its Influence on Personality (Female Students)
Reference: The conducted survey

| | | | Do you find studying architecture suitable? | | |
|---|---|---|---|---|---|
| | | | Yes | No | Total |
| Has studying architecture influenced your personality? | Yes | Count | 254.0 | 364.0 | 618.0 |
| | | Expected Count | 259.5 | 358.5 | 618.0 |
| | | % of Total | 37.7 | 54.0 | 91.7 |
| | No | Count | 29.0 | 27.0 | 56.0 |
| | | Expected Count | 23.5 | 32.5 | 56.0 |
| | | % of Total | 4.3 | 4.0 | 8.3 |
| Total | | Count | 283 | 391 | 674 |
| | | Expected Count | 283.0 | 391.0 | 674.0 |
| | | % of Total | 42.0 | 58.0 | 100.0 |

Table 16. Suitability of Studying Architecture and its Influence on Personality (Male Students)
Reference: The conducted survey

| | | | Do you find studying architecture suitable? | | |
|---|---|---|---|---|---|
| | | | Yes | No | Total |
| Has studying architecture influenced your personality? | Yes | Count | 257.0 | 79.0 | 336.0 |
| | | Expected Count | 255.4 | 80.6 | 336.0 |
| | | % of Total | 65.6 | 20.2 | 85.7 |
| | No | Count | 41.0 | 15.0 | 56.0 |
| | | Expected Count | 42.6 | 13.4 | 56.0 |
| | | % of Total | 10.5 | 3.8 | 14.3 |
| Total | | Count | 298.0 | 94.0 | 392.0 |
| | | Expected Count | 298.0 | 94.0 | 392.0 |
| | | % of Total | 76.0 | 24.0 | 100.0 |

## 5.3 Relationship between Comfort in the Studio and Teamwork

Using Spearman test[1] to check on whether students' feeling of comfort in the studio relates to teamwork, the Spearman's rho reached 0.625, significant at 0.000 levels (2-tailed). When running the same test based on gender, in the opinion of female students, Spearman's rho declined to 0.582, significant at 0.000 level (2-tailed), which is still a meaningful relation. In the meantime, when the researchers conducted the test using the responses of male students, the Spearman's rho increased to 0.673, significant at 0.000 level (2-tailed). In conclusion, students' feeling of comfort in the studio was proven relevant to their ability of conducting team work.

[1] Spearman's rank correlation coefficient, or Spearman's rho, is a nonparametric measure of statistical dependence between two variables. It assesses how well the relationship between two variables can be described using a monotonic function. If there are no repeated data values, a perfect Spearman's correlation of +1 or −1 occurs when each of the variables is a perfect monotone function of the other. It is appropriate for both continuous and discrete variables, including ordinal variables. The sign of correlation indicates the direction of association between the two variables. A negative sign indicates an inverse relationship between both variables, and vice versa. As the Spearman's rho approaches +1 or -1, the relationship between variables tend to be strong.

### 5.4 Relationship between Jury Systems and Willingness to Enroll

Generally, most students prefer the individual type of critique (55.3%). On the other hand, 34.8% are not willing to study architecture again if they are given the choice, of whom 24.2% prefer individual discussions, while only 10.6% prefer group discussions, which indicates an issue with the current jury systems (Table 17).

Table 17. Jury Systems and Willingness to Enroll (All Students)
Reference: The conducted survey

| | | | Type of critique | | |
|---|---|---|---|---|---|
| | | | Group | Individual | Total |
| If time went back, would you study architecture? | Yes | Count | 364 | 331 | 695 |
| | | Expected Count | 311.0 | 384.0 | 695.0 |
| | | % of Total | 34.1% | 31.1% | 65.2% |
| | No | Count | 113 | 258 | 371 |
| | | Expected Count | 166.0 | 205.0 | 371.0 |
| | | % of Total | 10.6% | 24.2% | 34.8% |
| Total | | Count | 477 | 589 | 1066 |
| | | Expected Count | 477.0 | 589.0 | 1066.0 |
| | | % of Total | 44.7% | 55.3% | 100.0% |

Moreover, most of female students prefer the individual type of critique (65.6%), of whom 34% are not willing to study architecture if time goes back (Table 18). In contrast, most male students are willing to study architecture again (83.9%), of whom 53.8% prefer group discussions ( Table **19**).

Table 18. Jury Systems and Willingness to Enroll (Female Students)
Reference: The conducted survey

| | | | Type of critique | | |
|---|---|---|---|---|---|
| | | | Group | Individual | Total |
| If time went back, would you study architecture? | Yes | Count | 153.0 | 213.0 | 366.0 |
| | | Expected Count | 126.0 | 240.0 | 366.0 |
| | | % of Total | 22.7 | 31.6% | 54.3% |
| | No | Count | 79.0 | 229.0 | 308.0 |
| | | Expected Count | 106.0 | 202.0 | 308.0 |
| | | % of Total | 11.7 | 34.0 | 45.7 |
| Total | | Count | 232.0 | 442.0 | 674.0 |
| | | Expected Count | 232.0 | 442.0 | 674.0 |
| | | % of Total | 34.4 | 65.6 | 100.0 |

Table 19. Jury Systems and Willingness to Enroll (Male Students)
Reference: The conducted survey

| | | | Type of critique | | |
|---|---|---|---|---|---|
| | | | Group | Individual | Total |
| If time went back, would you study architecture? | Yes | Count | 211.0 | 118.0 | 329.0 |
| | | Expected Count | 205.6 | 123.4 | 329.0 |
| | | % of Total | 53.8 | 30.1 | 83.9 |
| | No | Count | 34.0 | 29.0 | 63.0 |
| | | Expected Count | 39.4 | 23.6 | 63.0 |
| | | % of Total | 8.7 | 7.4 | 16.1 |
| Total | | Count | 245 | 147 | 392 |
| | | Expected Count | 245.0 | 147.0 | 392.0 |

| | | | Type of critique | | |
|---|---|---|---|---|---|
| | | | Group | Individual | Total |
| If time went back, would you study architecture? | Yes | Count | 211.0 | 118.0 | 329.0 |
| | | Expected Count | 205.6 | 123.4 | 329.0 |
| | | % of Total | 53.8 | 30.1 | 83.9 |
| | No | Count | 34.0 | 29.0 | 63.0 |
| | | Expected Count | 39.4 | 23.6 | 63.0 |
| | | % of Total | 8.7 | 7.4 | 16.1 |
| Total | | Count | 245 | 147 | 392 |
| | | Expected Count | 245.0 | 147.0 | 392.0 |
| | | % of Total | 62.5 | 37.5 | 100.0 |

Finally, it is noteworthy that despite the students' preference of individual critique and discussions, they seem to learn by listening to remarks about other students' work. Using their responses on whether they learn from remarks made on their work, and those made on other students' work, the Spearman's rho reached 0.753, significant at 0.000 level (2-tailed), which is considered a strong relationship. When running the test using the responses of female students, Spearman's rho increased to 0.760, significant at 0.000 level (2-tailed). Similarly, when running the test using the responses of male students, Spearman's rho declined to 0.748, significant at 0.000 level (2-tailed), which is still a strong association. In addition, the results of Spearman's rho show that feeling satisfied with the final jury correlates strongly with feeling satisfied with the way jurors treat students, where the Spearman's rho reached 0.684, significant (2-tailed) at 0.000 level. This association is slightly stronger among female students, where the Spearman's rho reached 0.697, significant (2-tailed) at 0.000 level; while the correlation is slightly weaker among male students, where the Spearman's rho reached 0.658, significant (2-tailed) at 0.000 level.

## 6. DISCUSSION AND CONCLUSIONS

A. Many male and female students expressed their dissatisfaction with architectural education in Egypt which can be attributed to: a) the lack of awareness about the nature of the profession and the type of education, b) the stress and physical effort associated with studying architecture; c) the poor conditions of the studios, and d) the manner in which the jury system is conducted.

B. The majority of interviewed students joined the department of architecture, either based on their preference, or on the recommendation of their families or friends. Many students, particularly those from rural areas, were not familiar with the nature of the profession.

C. Students of urban and rural governorates, both male and female, agree that studying architecture requires long working hours, and different forms of stress, alongside creative skills. It also requires self-education and training, in addition to financial affordability. However, the exerted physical effort did not seem to bother male and female students from rural areas as much as it bothered their peers in Cairo and Alexandria. Probably, those from rural communities regard such an effort as the cost to escape poverty and move up the social ladder.

D. While many female students from both urban and rural areas complained about field work and site visits, female students from rural areas in particular complained about the often need to travel outside their locality, return late at night, or worse, spending the night away from home. Such conditions also induce their families' resentment, negatively affect their ability to learn, and lead them to develop further dissatisfaction toward the requirements of architectural education.

E. Most students at the departments of architecture do not feel comfortable in their studios because of the lack of space or basic equipments. For instance, the inadequate space of studios at the Faculty of Fine Arts - Alexandria in relation to the large number of enrolled students was the prime reason for the students' discontent, while students at Menofia University complained about the poor ventilation, and the lack of appropriate lighting and electrical outlets.

F. Female students feel uncomfortable compared to male students because of their presence in the studio for long hours without a chance of relative privacy. In all departments, students repeatedly wished for places to rest, exercise, meditate, pray, etc. Female students, particularly in rural areas, asked for places to rest and/or take-off their "Hijab" (headscarf).
G. Students recall painful memories from juries. Thus, the modalities employed to conduct juries for the assessment of student's work might use more improvements. Aggressive comments negatively affect all students in general and female students in particular, as they mostly prefer a one-on-one discussion behind, alone with the members of the jury, to spare themselves the embarrassment.
H. The current status of architectural education in Egypt needs serious attention, taking into consideration that the concept of gender sensitivity is substantial for its improvement. Mainstreaming gender equality in architectural education can relieve female students from socio-cultural burdens and painful psychological pressures. Although such pressures are exerted on both male and female students, their impacts vary considerably according to gender and region.

## 7. RECOMMENDATIONS

A. Departments of architecture and societies of engineers in rural areas should carry the responsibility to outreach to the people, shedding light on the nature of architectural studies. For instance, architecture departments may hold open-house events and invite high-school students to visit their schools, and get a first-hand experience of what architects do, and what they study.
B. Assignments of field work and site visits should be fairly distributed throughout architecture programs, while location and timing should be arranged conveniently for the students in order to eliminate potential obstacles.
C. Basic requirements for a proper studio environment should be provided for the studio to be conducive to efficient education, while it is also recommended that departments avail, if possible, a space where students can rest more comfortably due to their long work hours.
D. Jury members should mention the positive sides, not just the negative sides of the reviewed projects. They should also consider being kinder and gentler with all students, and particularly more sensitive with females.
E. It is recommended that the Egyptian National Academic Reference Standards (NARS) - which are set by the National Authority for Quality Assurance and Accreditation of Education in Egypt - include indicators on mainstreaming gender equality when evaluating universities, faculties, and departments as part of the procedures required for the accreditation of academic institutions.

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