

# Specialization versus Generalization in Undergraduate Architectural Education

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## Abstract

In fact, the issue of specialization in the architectural profession and education seems to be controversial. Within the distinct diversity of their types, some undergraduate architectural programs introduce specialized education, while many other programs still offer generalized education. This situation raises a question, to what direction should the future of undergraduate architectural education be oriented? The intention to conduct this study is to introduce an objective basis to settle this controversy, to bridge the gap in literature dealing with this issue, and to emphasize its impact. The research included in this study investigated the opinions of 121 academic and professional architects worldwide through an online survey. This paper includes five sections; the first provides an overview of the topic. The second documents the survey and its procedures. The third and fourth sections include the quantitative and qualitative findings of the survey. And finally, the fifth discusses the findings and provides answers to the research questions. Findings were revealed regarding several aspects; the level of specialization required in undergraduate architectural education, the appropriate timing and methods for integrating the specialized education in architectural programs, the impacts and concerns of specialized education in architecture, and finally, the current important specializations in architecture.

**Keywords:** Architectural Education; Architectural Profession; Specialized Education; Generalized Education.

## 1. Introduction

Throughout history, the characteristics of the architectural profession, as well as the role of architects, have always been affected by the growth in the complexity and size of buildings. Formerly, this fact separated the building process from the design process and transformed the architects' roles from master builders to designers. Recently, it directed the decline of the single designer and supported the emergence of the collaborative design teams. Currently, as new technologies continue to emerge, this fact also drives the need for more specialization in the architectural work.

Therefore, it has been expected that this change in the profession will affect the architectural education and its directions. However, during the preparation of some previous research (Ghonim, 2017; Ghonim

& Eweda, 2018), which involved the investigation and analysis of more than 30 worldwide ranked undergraduate architectural programs, the authors noticed that the number of specialized programs is actually increasing, while many other architectural programs still offer a generalized education, which shows a disagreement regarding specialization and generalization in undergraduate architectural education, so to what direction should the future of this education be oriented?

Moreover, few works of literature have tackled this issue that seems to be controversial, and there is no literature -until now- that provided a clear conclusion to this controversy. Accordingly, this problem calls for studying the issue of specialization in undergraduate architectural education to introduce an objective foundation to settle this controversy, to bridge the gap in literature dealing with this issue, and to focus on its impacts. Accordingly, this research addresses a number of questions; should undergraduate architectural programs introduce specialized or generalized education? When should students get specialized? How should students get specialized? What are the concerns regarding specialization in undergraduate architectural education? If specialized education should be achieved, what are the current and future specializations that are suitable for undergraduate architectural students?

In architecture, the term ‘Generalized Education’ refers to the educational activities that aim at developing the knowledge, skills and attitudes of students and qualifying them to practice architecture in a comprehensive manner. While the term ‘Specialized Education’ refers to the educational activities that focus on a particular specialty of a specific area of knowledge within the profession of architecture such as digital architecture, environmental design, building technology, etc.

This research aims at investigating the opinions of a group of academic and professional architects about specialization in undergraduate architectural education. To achieve this aim, the research applied quantitative and qualitative approaches supported by a survey among worldwide academic and professional architects. This paper includes five sections; the first section provides an overview of the topic and reviews the available literature. The second section documents the survey and its procedures. The third and fourth sections include the quantitative and qualitative findings of the survey. Finally, the fifth one discusses the findings and provides answers to the research questions.

### **1.1 Expertise as a Creativity Influence**

Through literature, the term ‘expertise’ appears relevant to the term ‘specialization’. Expertise is defined as the optimal level at which a person is able and/or expected to perform within a specialized field of human activity (Swanson, 2001). It is a process of continual life-long development (Reilly, 2008). In architecture, the subject of expertise of the architect has been studied by Akin (1987) who differentiated between the performances of architects and lay people in design. Moreover, Lawson

and Dorst (2005) introduced a model that classified the expertise of architectural designers into eight levels, and they described each level and shed light on the knowledge and skills required to move forward. According to this model architectural education only develops the lower levels of expertise, which they called; naïve, novice, and advanced beginner, while higher levels are developed after graduation until the architectural designer becomes a visionary (Lawson & Dorst, 2005).

The impact of expertise and specialization on creativity was the concern of several works of literature (Amabile, 1997; Bilalić and Mcleod, 2008), however, diverse perspectives were introduced. The componential theory of individual creativity by Amabile (1997) shows that there are three necessary ingredients for creativity: expertise, creative thinking, and intrinsic motivation, so expertise is essential for creativity. According to Bilalić and Mcleod (2008), creativity is a consequence of expertise, because the production of something novel and useful requires mastering the previous knowledge in the domain, and accordingly, expertise does not hinder creativity. Other studies (Frensch & Sternberg, 1989; Kaufman & Kaufman, 2007; Sternberg, 2006) agreed on the necessity of expertise for creativity but to a specific level, as they agree that too much knowledge in a specific domain may hinder creativity.

However, Teodoridis et. al., (2017) state that the lack of specialization can foster creativity because it allows individuals to borrow unconventional ideas and methods from other domains, so specialization can hinder the unusual approaches that lead to creativity and increase the probability of using previous thinking patterns. Seeking a diversified and generalized knowledge is required to avoid the drawbacks of specialization, as specialists usually impose their previously knowledge components in dealing with new situations (Teodoridis et. al., 2017). According to DeBono (1968), too much experience within a field may restrict creativity because knowing so well how things should be done might lead to being unable to escape and come up with new ideas.

## **1.2 Breadth versus Depth of Learning in Architectural Education**

In literature, when tracking the topic of generalized or specialized education, the topic of breadth and depth of learning is linked. According to SESC (2019), breadth of learning refers to the full span of knowledge of a subject, while the depth of learning refers to the extent to which specific topics are focused upon, amplified and explored. Practicing architecture requires a wide range of knowledge and skills, as architects need to understand mathematics, aesthetics, economics, and sociology, and they should have creative and critical thinking skills in addition to other professional skills such as management and communication. Accordingly, architectural education can be perceived as a wide-ranging education that targets to grow a comprehensive set of competencies. It is expected that architectural education needs to offer students a broader base of ideas from which to draw, different

ways of knowing, diverse methods of research and analysis, and several approaches and attitudes (Koch, 2002).

According to Hirsch (2001), it is hard to gain deep understanding without having broad general knowledge. The best approach to learn a topic is to learn its basics and to study a broad range of examples that show those basics, however, studying too many examples may be a waste of time. This finding affects the depth versus breadth issue in education, as gaining broad knowledge is the best way to gaining deep knowledge. For example, topics may be introduced gradually starting with summaries or abstracts, and once students gain the broad context by developing a sense of the whole domain, they can mentally fit into and understand the various parts that follow into that whole, and make sense of them (Hirsch, 2001).

In architectural education, professors and students share the responsibilities of learning, and these responsibilities should be wisely managed. For example, the professors are responsible for introducing the breadth of knowledge related to the course subject, while the students are responsible for acquiring the depth of knowledge in a specific area by conducting research and extra study. To achieve more expandable architectural curricula that could cover generalized education as well as specialized one, a combination between breadth of learning in some subjects and depth of learning in others is recommended.

### **1.3 Specialized or Generalized Architectural Education?**

There is a distinct diversity and disagreement in the types and practices of architectural education even among the highly ranked educational programs. A recent study, which analyzed the content of 30 worldwide programs, has reported this diversity and called for more agreement on the best practices of architectural education (Ghonim, 2017). One of the aspects of this disagreement relates to specialization in architectural education. Edvard Hiorthoy, the Norwegian academic architect, claims that there are some expressions of hesitation as to whether architectural education should be generalized and/or specialized (Nadimi, 1996). The problem of generalized education and further specialization is considered a challenge facing recently graduated architects as they know little about everything but not adequate to specialize in something (Erasmus, 2018).

Specialized education means that students graduate with particular skills and knowledge in certain areas of their choice (Dovey, 2013). According to the International Union of Architects (UIA), the contemporary trend of architectural education systems is to be distinguished with multiple specializations that fit within a cultural framework and prepares students for broader interdisciplinary practices (UIA,

2014). At present, specialization could be offered through in-depth studies or elective courses during the final years of architectural programs (Ghonim & Eweda, 2018).

Some concerns were observed and reported, specialized education requires relatively larger architectural schools with higher staff capacities, this, in turn, needs to be balanced against the sense of student alienation emerged in large schools (Dovey, 2013). Additionally, due to the broad spectrum of disciplines within architecture; it is a challenge to teach general ideas and in the same time to specialize during the undergraduate education (Erasmus, 2018)

Moreover, the timing is an important factor influencing the success of specialization, according to Malamud (2010), early specialization in education provides for more specific skills in a certain field but fewer skills in a range of fields, as compared to later specialization. Students who specialize later have less time to acquire specific skills in their field, but they receive more indications in each field prior to specialization, so they will be more accurate in choosing their appropriate desired field (Malamud, 2010). Another concern is that architecture is a creative discipline and the creative skills of architects might be affected by specialization and expertise, as previously discussed.

### **1.3 Specialization in Architectural Profession**

*“A good architect is a generalist who knows enough to lead a team, but not enough that you can eclipse the team around you.” By Clinton Cuddington in (Roberts, 2014)*

The architectural profession is interdisciplinary, as teams of architects, designers, and engineers collaborate to complete the process of architectural design. Within these teams, some members look at the broad picture so they are called generalists, while other members focus on the specific details so they are called specialists. Since the main responsibility of an architect is to provide and control the general perspective of an architectural project, he/she is considered a generalist and a team leader. According to Marx (2006), the contemporary leaders are expected to be skillful in their specialties, however, at the same time, they should be generalists who are ready to connect a broad range of individuals and ideas. So, if architects are team leaders, they are expected to have a wide range of knowledge and skills, to be capable of coordinating the interdisciplinary objectives of architectural works, and to communicate with team members from other disciplines, and finally, to integrate the emergent ideas of the team.

*“If architects are to remain the generalist leaders of design teams, they need to be able to understand the language of multiple disciplines and of particular areas of expertise.” (Koch et al., 2002)*

On the other hand, some architects are considered specialists as they seek to specialize in certain areas of architectural knowledge in order to accomplish the highest standards in these areas (UIA, 2014), and as a response to the requirements of the marketplace (Harris, 2015), as some marketplaces expect that those specialists possess higher skills to deal with the complex projects and the emerging building technologies. Though, Anderson (2012) claims that generalization does not mean incompetence in handling large or complicated projects, and criticizes some conservative practices in the architectural market that drive entrepreneurs to search for specialist architects, thereby increasing the value of specialization in the architectural profession and depriving generalist architects of competition in such area. Moreover, Anderson (2012) argues that neither the large office nor the large project precludes the possibility of highly creative work by generalist architects.

It could be noticed that specialization in architecture is an advantage, as all architects should be basically generalists. According to the UIA in its architectural education reflections and recommendation, the specialization of architects should be considered as subsequent to their formation as generalists (UIA, 2014). In addition, architects should avoid overspecialization as well as overgeneralization, and the limits of both sides should be balanced, the following quote indicates this point of view.

*“The trouble with generalists is that they know less and less about more and more, until eventually know nothing about everything. The trouble with specialists is that they know more and more about less and less, until eventually know everything about nothing” (Harris, 2015)*

Therefore, as a result of the lack of clear agreement on the subject, this study attempts to explore the different viewpoints about specialization and generalization in undergraduate architectural education, that would also indicate different viewpoints about the same issue in the profession.

## **2. The Survey: Investigating the Opinions of Architects**

To investigate the issue of specialization versus generalization in undergraduate architectural education a survey was conducted. This section focuses on describing and documenting the survey and its procedures.

### **2.1 Methods**

The survey was conducted between the beginning of October 2017 and completed by the end of January 2018, it aimed at exploring the opinions of a sample of academic and professional architects about the subject of specialization in undergraduate architectural education. An electronic questionnaire was generated to collect data, it was prepared online using Google Forms, then the link to this questionnaire was sent to the participants' emails together with a cover letter that explains the objectives of the survey and encourages them to complete the questionnaire. The emails of the participants have been collected from the websites of their affiliations.

The questions and their options were written after intensive readings and thoughtful discussions, some of them were derived from literature, while some of them were based on a series of discussions among the authors and their colleagues during developing some architectural programs. Accordingly, the questions focused on investigating the appropriate level of specialization in undergraduate architectural programs, the optimal time for architecture students to start their specialization, and the means by which they could get specialized, the concerns that are relevant to specializing architecture students in undergraduate education, and finally, the current and proposed future specializations that are suitable for undergraduate students.

The questionnaire had an introductory paragraph that explained the aim and scope of the survey and started by questions to collect the respondent's personal information such as name, email, country, career, position, and experience. Moreover, fifteen questions were included in the questionnaire to collect quantitative data as well as qualitative ones. Seven questions were mandatory and closed-ended (Q1, Q3, Q5, Q7, Q9, Q11, and Q13) and had two types of questions; MCQs that allow selecting only one option and checkboxes that allow for selecting more than one option. Eight questions were open-ended (Q2, Q4, Q6, Q8, Q10, Q12, Q14, and Q15) and integrated to the questionnaire to allow the respondents to comment and/or elaborate their answers in the previously mentioned mandatory questions.

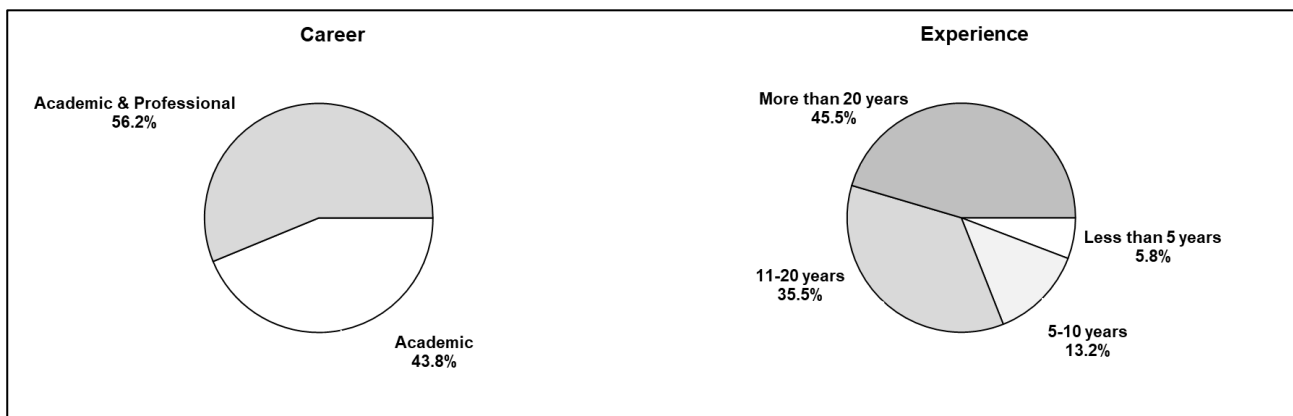
A pilot study was applied to check the wording, to obtain some comments, and to test the information of the open-ended question. The first responses showed enthusiasm to the questionnaire, reflected the significance of the topic and the questions, and established the appropriateness of the research questions. Slight refinements were applied to the wording of some questions and their options.

The quantitative part of this questionnaire was used to draw generalizations about the answers to the research questions, and to deduce the extents of consensus and controversy relevant to the subject. While the qualitative part sought the respondents' experiences and opinions to widen the perspective about the research problem and its solutions. Data analysis included quantitative and qualitative methods. The qualitative data collected by the open-ended questions were analyzed using the thematic content analysis technique introduced by Wolcott (1994), which begins by highlighting specific information in texts of the responses, then identifying categories and linked themes, and finally demonstrating and discussing the findings (see Anderson, 2007; Creswell, 2013; Osborne, 2008; Wolcott, 1994). Participants' responses were coded and then read carefully to identify potential categories. Codes were classified depending on their content, the findings included quotes from the participants' responses.

## 2.2 Participants' Profiles

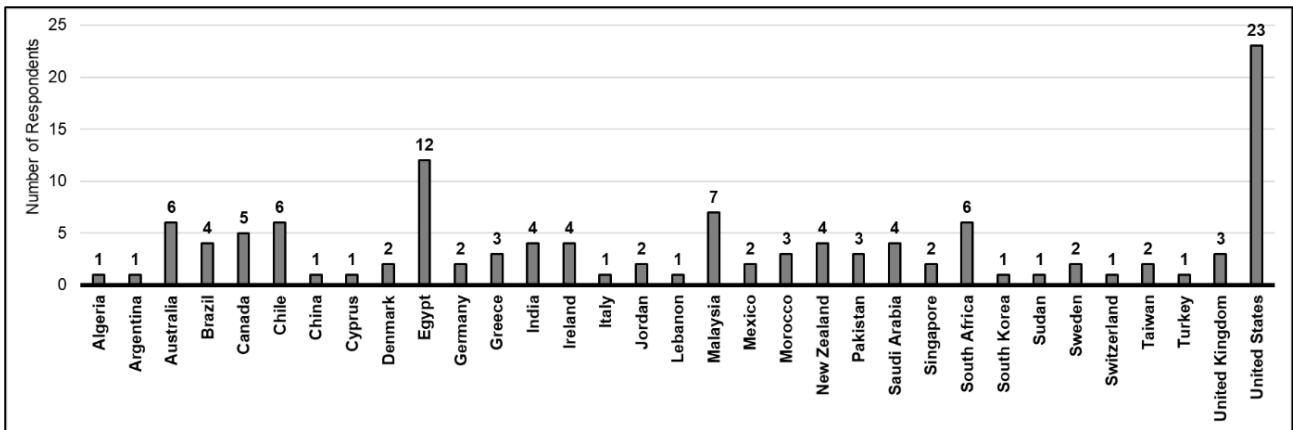
The sample of the survey was selected according to three criteria. Firstly, because the topic is tackling a link between architectural education and the profession of architecture, the sample was planned to include academic architects, academic architects with professional experience, as well as professional architects with academic experience. Secondly, to open the discussion among different schools of thought from diverse cultures and communities and to check the local causes of controversy related to the topic, the sample was intended to be worldwide and geographically distributed. Thirdly, the participants' experience was considered and the priority was given to the highly experienced architects, while to check the temporal causes of the diversified perspectives to the topic, a limited portion of different levels of experience were maintained.

A large sample was initially targeted; 1605 architects were invited to participate. Only 121 questionnaires were completed and returned, with a response rate of 7.54%. The final sample size is considered valid with a confidence level of 95% and a margin of error of 8.91%. Sample analysis according to career and experience is represented in Fig. 1.



**Figure 1** Analysis of the participants according to their career and experience.

The sample of 121 participants had the following career distribution, 56.2% are both academic and professional architects, while 43.8% are academic architects. In respect to experience, the highest portion of the sample (45.5%) had experience of more than twenty years, 35.5% of the sample had experience from 10 to 20 years, 13.2% of the sample had experience from 5 to 10 years, while the lowest portion of the sample 5.8% of the sample has less than five years of experience. The geographic distribution of the sample is shown in Fig. 2, and the academic affiliations of the participants are included in Table 1.



**Figure 2** Distribution of the participants by country.

**Table 1.** The academic affiliations of the participants.

#	Continent	Universities
1	Africa	Al-Azhar University; Alexandria University; Assiut University; Cairo University; École nationale d'architecture; Helwan University; Suez Canal University; University of Johannesburg; University of the Witwatersrand, Johannesburg
2	America	Auburn University; Carleton University; Clemson University; The Ohio State University; The University of Kansas; The University of Memphis; The University of New Mexico; Universidad Autónoma de Yucatán; University of Miami
3	Asia	Bahçeşehir Üniversitesi; German Jordanian University; King Saud University; Korea University; Manipal University; National Taiwan University of Science and Technology; National University of Singapore; Taipei Tech; Taylor's University; University of Engineering & Technology, Lahore; University of Management and Technology; Universiti Putra Malaysia
4	Australia	Bond University; Griffith University; The University of Adelaide; The University of Sydney; Victoria University of Wellington
5	Europe	Aarhus School of Architecture; Bauhaus-Universität Weimar; Bergische Universität Wuppertal; Cork Institute of Technology; ETH Zurich; Lund University; National Technical University of Athens; Nottingham Trent University; Università di Bologna; University of Cyprus
6	S. America	Universidad Católica del Norte; Universidad de Buenos Aires; Universidad de Chile; Universidade Federal da Bahia; Universidade Federal do Rio de Janeiro

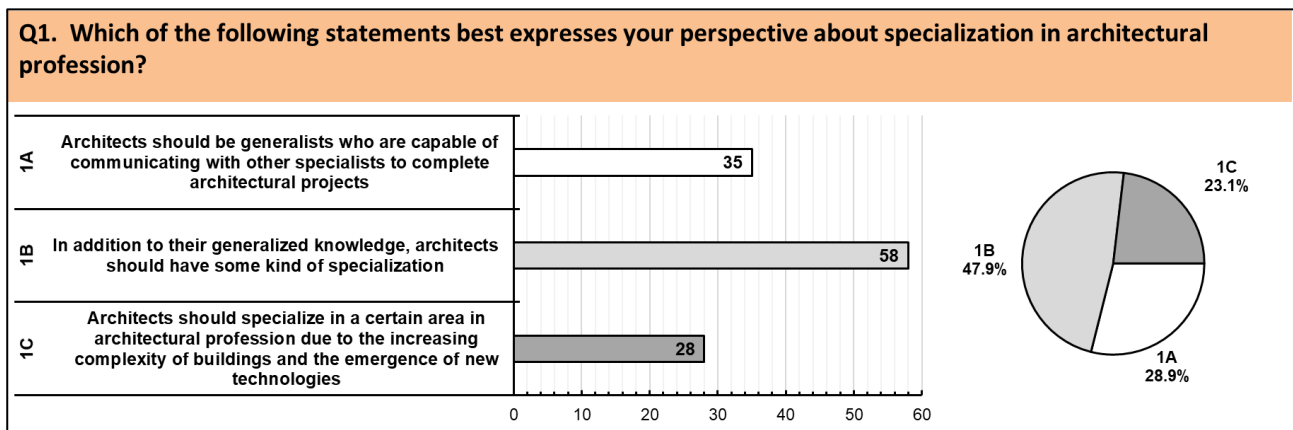
### 3. Quantitative Findings and Survey Statistics

This section presents the quantitative findings of the survey, it includes the questions of the survey, their options, and the analysis of the responses. Each of the following sub-headings deals with one question as it is arranged in the questionnaire.

#### 3.1 Question 1

In the first question, participants were asked to identify their perspectives about specialization in the architectural profession, Fig. 3 shows the analysis of responses to this question. Almost half of the

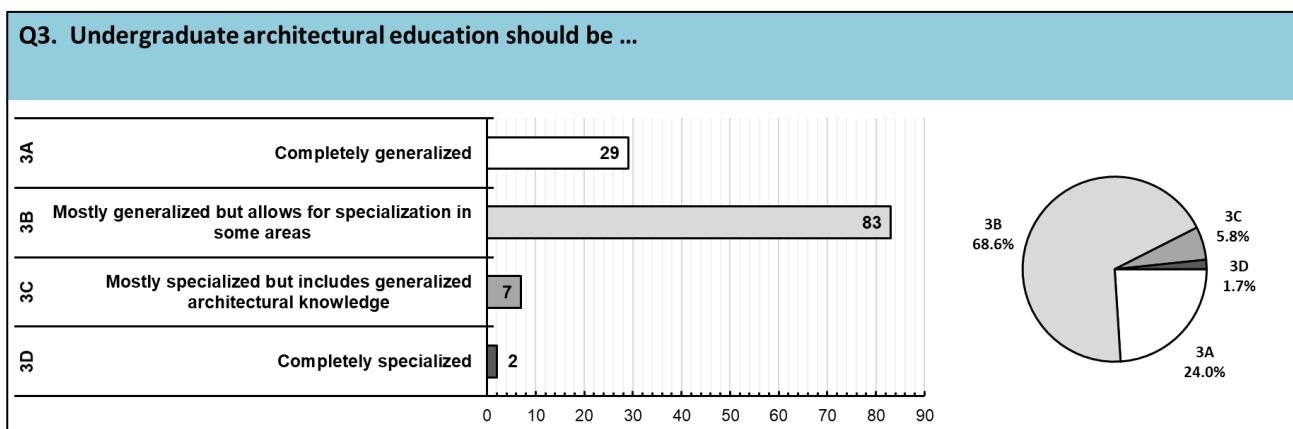
participants (n = 58, 47.9%) reported that architects should have some kind of specialization in addition to their generalized knowledge. The minority of the participants (n = 35, 28.9%) reported that architects should be generalists who are capable of communicating with other specialists to complete architectural projects. While, few participants (n = 28, 23.1%) reported that architects should specialize in a certain area in the architectural profession.



**Figure 3** Analysis of the responses to question 1.

### 3.2 Question 3

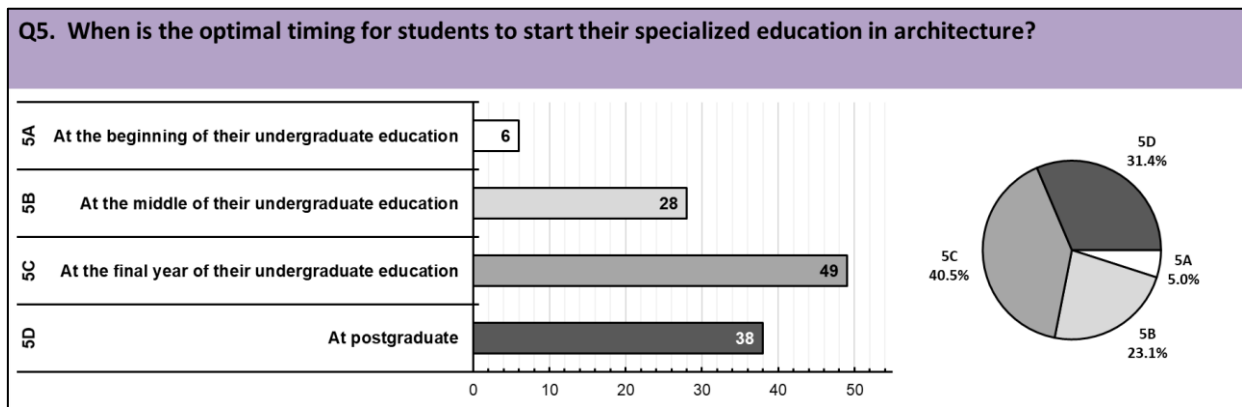
In question 3, participants were asked to express their opinions about the identity of architectural education Fig. 4 shows the analysis of its responses. The majority of the responses (n = 83, 68.6%) showed that undergraduate architectural education should be mostly generalized but allows for specialization in some areas. Few responses (n = 29, 24.0%) showed that it should be completely generalized. A minority (n = 7, 5.8%) showed that it should be mostly specialized but includes generalized architectural knowledge. Only two responses (1.7%) showed that it should be completely specialized.



**Figure 4** Analysis of the responses to question 3.

### 3.3 Question 5

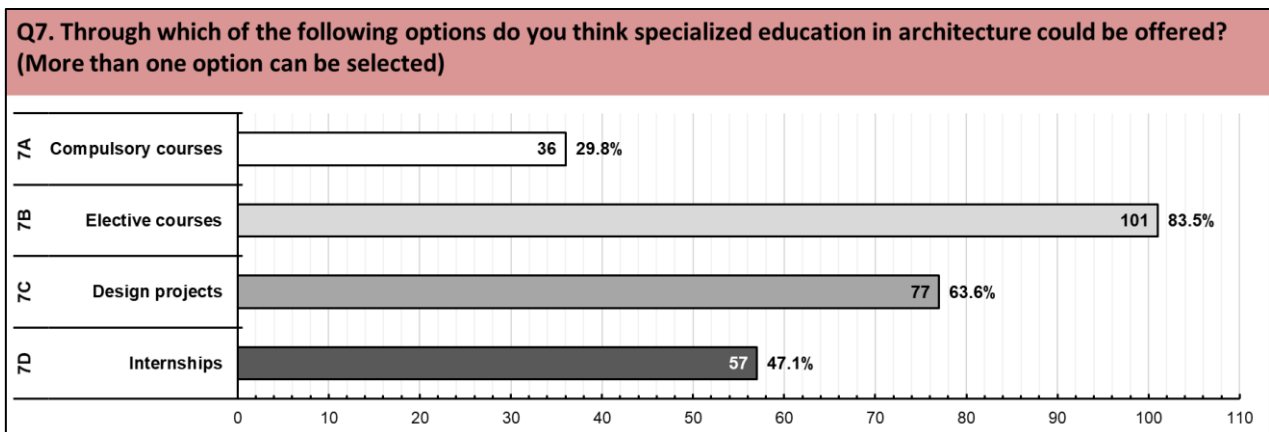
Question 5 sought the optimal timing for starting specialized education, Fig. 5 shows the analysis of the responses to this question. Less than half of the participants (n = 49, 40.5%) showed that students should start their specialized education during the final year of their undergraduate education. About one-third of the participants (n = 38, 31.4%) showed that the optimal timing is at the postgraduate level. Almost one quarter of the sample (n = 28, 23.1%) showed that students should start their specialized education in the middle of their undergraduate education. While few participants (n = 6, 5.0%) showed that the optimal timing is at the beginning of undergraduate education.



**Figure 5** Analysis of the responses to question 5.

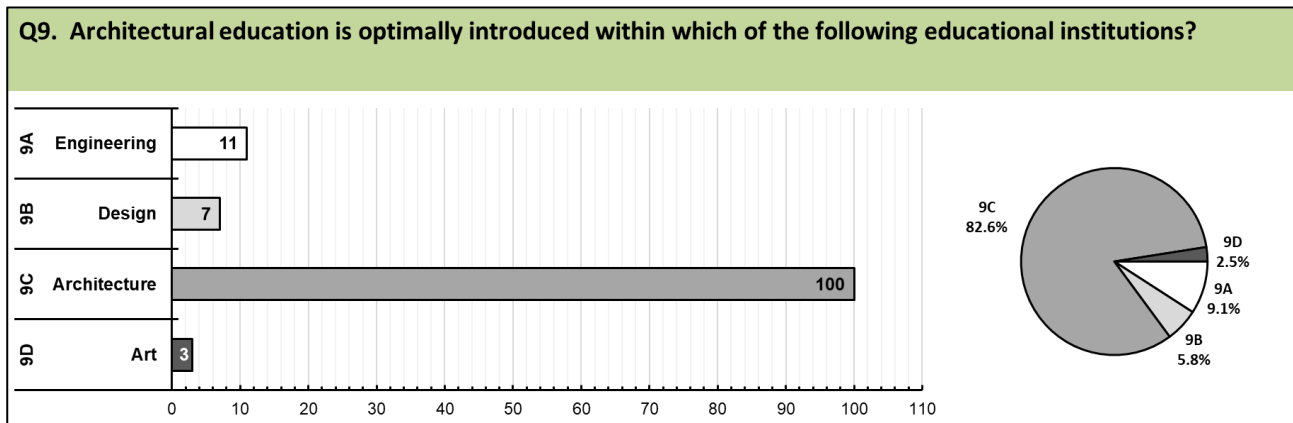
### 3.4 Question 7

This question targeted to investigate how specialized education in architecture could be offered, it was a checkbox question that allowed the selection of more than one option, Fig. 6 shows the analysis of the responses to its options. Most of the participants (n = 101, 83.5%) recommended the use elective courses. The majority of participants (n = 77, 63.6%) supported the use of design projects. About half of the participants selected internships (n = 57, 47.1%). Nearly one-third of the participants (n = 36, 29.8%) selected the compulsory courses.



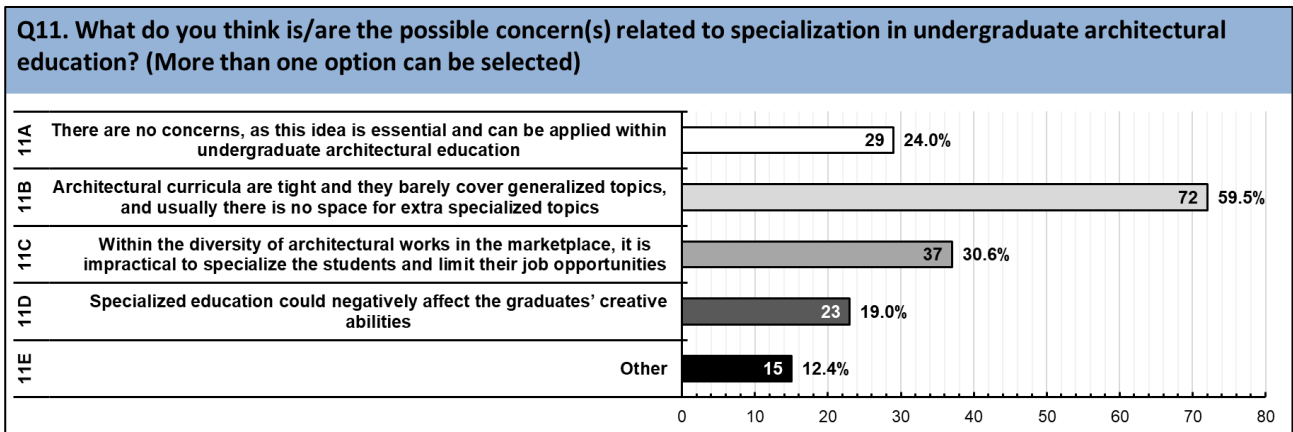
**Figure 6** Analysis of the responses to question 7.**3.5 Question 9**

Question 9 explored the optimal educational institution to host architectural education, Fig. 7 shows Question 9 and the responses to its options. Most of the responses (n = 100, 82.6%) specified that architecture schools are the optimal place to host architectural education. Few responses (n = 11, 9.1%) specified that engineering schools are the optimum place. Also, few responses (n = 7, 5.8%) recommended design schools. While three responses (2.5%) recommended art schools.

**Figure 7** Analysis of the responses to question 9.**3.6 Question 11**

Through this question, the authors investigated the possible concerns and limitations to specialization in undergraduate education. This question was a checkbox question that allowed the selection of more than one option, Fig. 8 shows Question 11 and the responses to its options. More than half of the participants (n = 72, 59.5%) stated that architectural curricula are tight and they barely cover generalized topics. About one-third of the participants (n = 37, 30.6%) reported that within the diversity of architectural works in the marketplace, it is impractical to specialize the graduates. Few participants (n = 23, 19.0%) referred that specialized education could negatively affect the graduates' creative abilities. On the other hand, nearly one-quarter of the participants (n = 29, 24.0%) stated that there are no concerns, as this idea is essential and can be applied within undergraduate architectural education.

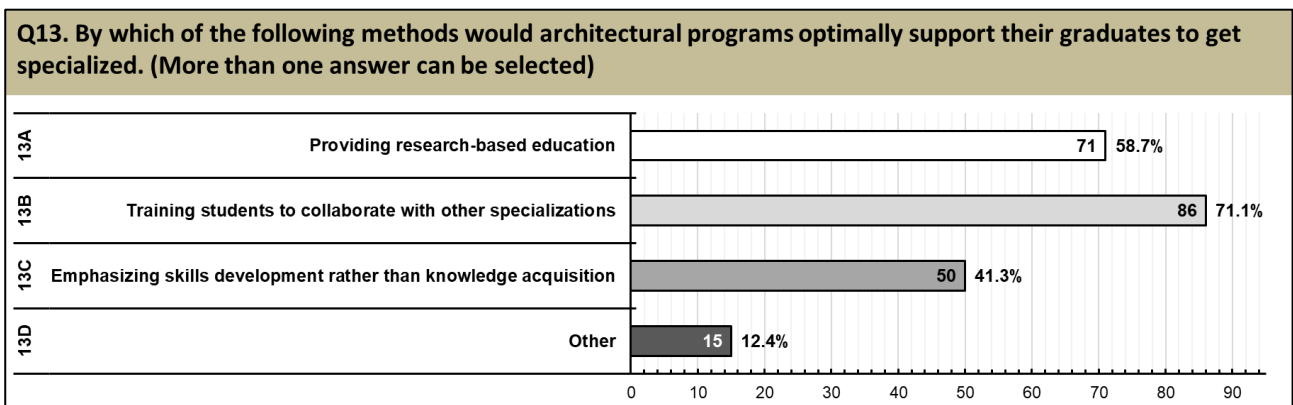
The minority of the participants (n = 15, 12.4%) selected the option 'Other' to add more concerns, and two groups of concerns were extracted from their responses. The first is the level of students' maturity, as they are less mature and lack the experience to decide about their specialization, and specialization would be better during the postgraduate stage or after gaining some professional experience. The second is the lack of architecture faculty, showing that the idea of specialized education requires more human resources.



**Figure 8** Analysis of the responses to question 11.

### 3.7 Question 13

This question surveyed the methods by which architectural programs would support their graduates to get specialized, the analysis of its responses is shown in Fig. 9 shows. Most of the participants (n = 86, 71.1%) selected the option of training students to collaborate with other specializations. More than half of the participants (n = 71, 58.7%) recommended the providing of research-based education. The minority of the participants (n = 50, 41.3%) recommended that programs should emphasize developing students' skills rather than emphasizing on acquainting them with knowledge. Few participants (n = 15, 12.4%) used the option 'Other' to add more options, the following summarizes their proposals; postgraduate programs, internships, elective courses, and workshops.



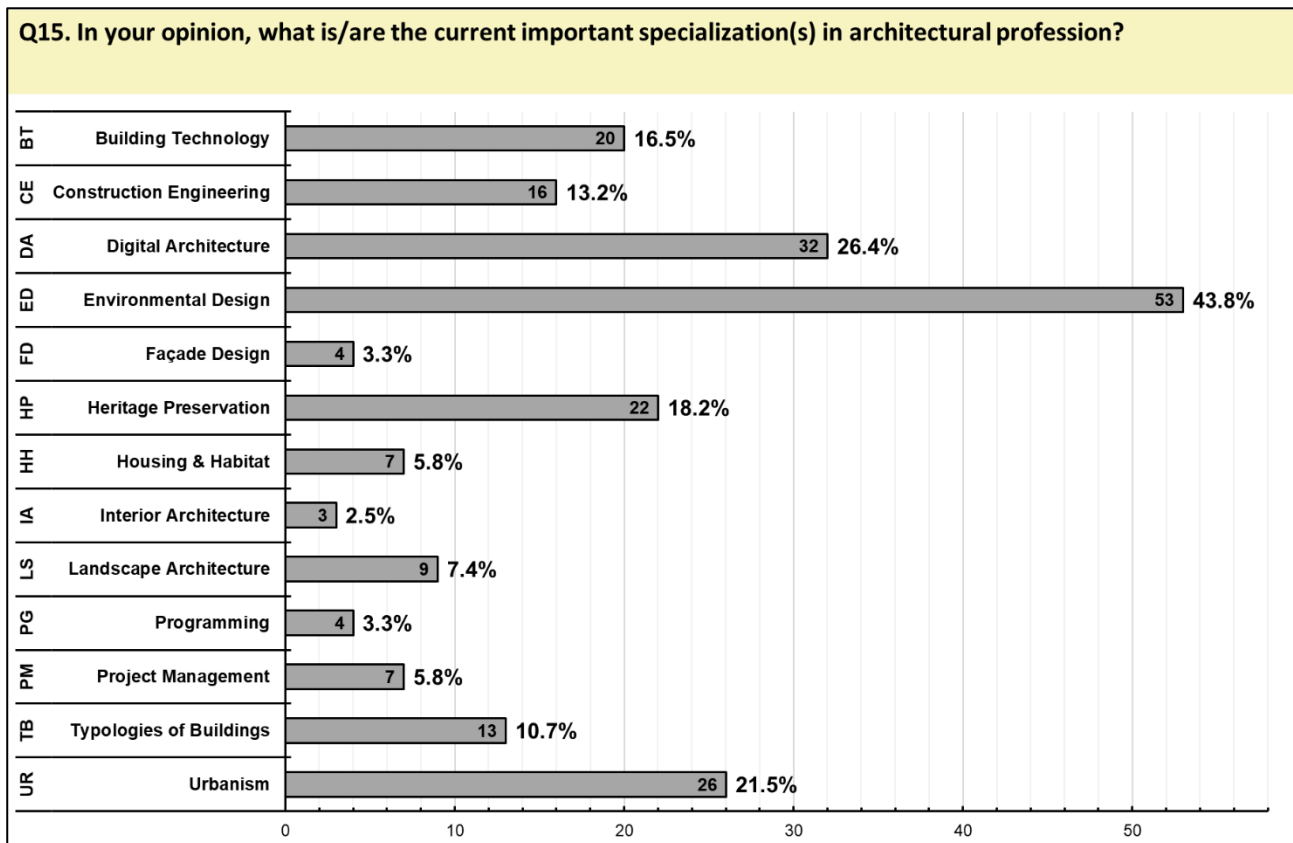
**Figure 9** Analysis of the responses to question 13.

### 3.8 Question 15

This question was open-ended and mandatory, it aimed at exploring the current important specializations in architecture. Although this question was open-ended, its responses were numerous and were analyzed quantitatively, considering that the quantitative analyses followed a process of

qualitative analysis that categorized the specified specializations. The findings of this question are shown in Fig. 10.

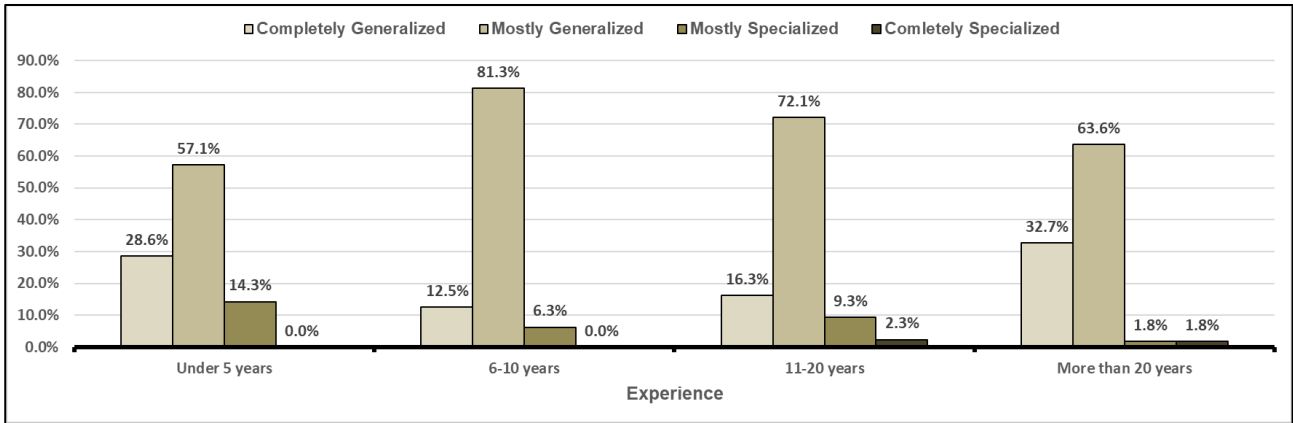
The majority of the participants (n = 105, 86.8%) specified one or more specializations. Few participants (n = 9, 7.4%) did not specify any specializations but mentioned that there are many important specializations in the profession of architecture. Few participants (n = 7, 5.8%) commented with 'None', showing that architects should remain generalists.



**Figure 10** Analysis of specializations mentioned in question 15.

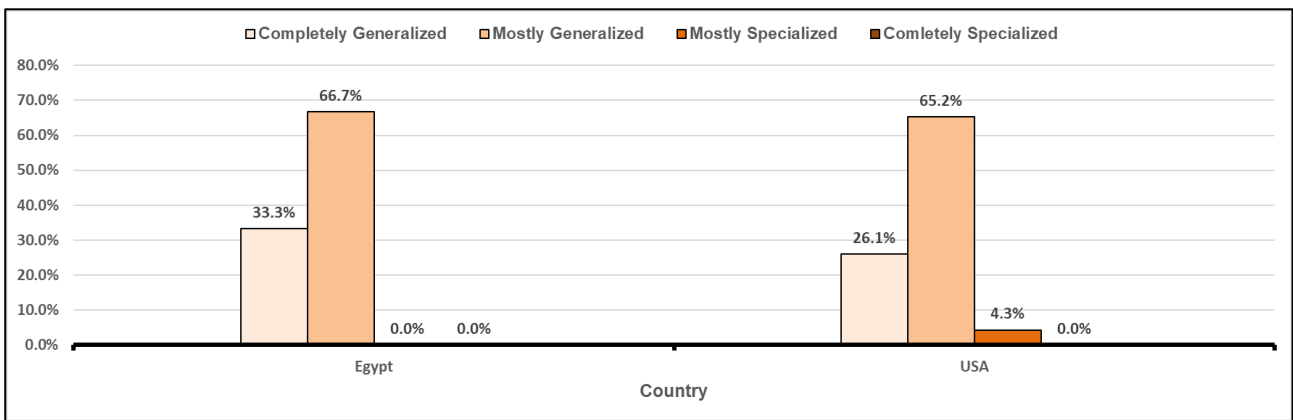
### 3.9 Comparative Analyses

To check the relation between the recommended type of architectural education and the experience of the participants, the column chart in Fig. 11 was generated. According to their category of experience, this chart analyzes the percentages of the participants' answers to Question 2 that seeks to specify the recommended type of architectural education and represents the main question of this research. This analysis showed consistency among all categories of experiences, as the highest percentage of participants in all categories recommended that architectural education should be mostly generalized, followed by percentages that recommended that it should be completely generalized, while the least percentages recommended that it should be mostly specialized, with almost an absence for selecting the fourth option which is completely specialized.



**Figure. 11** The recommended type of architectural education versus the participants’ experience.

To check if there is a relation between the recommended type of architectural education and the participants’ local realm, the column chart in Fig. 12 was generated. Of the countries included in the survey, the authors selected two countries with different economies and market situations, which are Egypt and USA, to check if the issue of specialization in undergraduate education is influenced by local factors. The sample was intended to include high percentages of both countries to facilitate the comparison. This analysis showed that participants from both countries provided almost the same percentages of selections for Question 2.



**Figure 12** Comparative analysis of the recommended type of architectural education from Egypt and USA.

**4. Qualitative findings**

This section of the study provides the qualitative findings of the survey. The comments of the participants included in the open-ended questions (Q2, Q4, Q6, Q8, Q10, Q12, and Q14) were analyzed qualitatively. Through analyzing the codes, several categories emerged, then, these categories were grouped together into larger themes that provided the instructors’ perspectives on the issue of specialization in undergraduate architectural education, Table 2 shows the themes and their categories. Finally, quotes were included to reflect the viewpoints of each category.

**Table 2.** The emerged themes and categories.

#	Themes	Categories
1	Justifying the Different Perspectives about the Architect.	Why should architects remain generalists? Why should architects be generalists with some levels of specializations? Why architects should become specialists? Why all types of architects are accepted?
2	Justifying the Different Perspectives About Architectural Education.	Why should undergraduate architectural education be completely generalized? Why should undergraduate architectural education be mostly generalized?
3	Specialization in Architectural Education Depends on Some Aspects...	It depends on the local marketplace. It depends on the maturity of architecture students. It depends on the duration of the program.
4	The appropriate context for architectural education.	Architectural education would be better introduced in architecture institutions. Architectural education can be introduced in several contexts.
5	Concerning the Concerns	More concerns. More planning, less concerns. No concerns.
6	A Comprehensive Scheme of Architectural Education	–

#### 4.1 Theme 1: Justifying the Different Perspectives about the Architect

In Question 2, some of the participants justified their responses to Question 1 and explained their perspectives about the architects and about specialization in the architectural profession as well.

##### Why should architects remain generalists?

Architectural design is a process that involves continuous research, and architects seek to solve complex and multidisciplinary problems when designing buildings. During the design process, architects deal with large amount of information, so they must have the ability to research and analyze problems continuously as well as call specialists and experts -when needed- to successfully complete the design process. The previous statements were the opinions of three participants who selected option ‘1A in Q1’ (Architects should be generalists who are capable of communicating with other specialists to complete architectural projects), the following two quotes are indicative of these opinions.

*“The key characteristic of the architectural discipline is the ability to sift overwhelming amounts of general information, research as needed, and draw together specialists when required.” (P050)*

*“A design project is a research in itself. Once you have accumulated multiple experiences in one speciality, you would be better positioned and effective in running your practice and projects ...” (P067)*

##### Why should architects be generalists with some levels of specializations?

Three participants who selected option '1B in Q1' ensured that architects should be originally generalists who have a broad range of generic skills, and they should keep their capacity of communication and coordination. In addition, they may focus on a professional specialization. The following two quotes reflect this viewpoint.

*"All architects should have a broad range of generic skills and knowledge but specialist focus should be nurtured if possible." (P024)*

*"Architects are essentially generalists, who should have a wide ranging perspective combining artistic and engineering capabilities. However, in addition to this, a specific focus, which may involve a professional specialization or involve a particular orientation to the field, is beneficial for career progression." (P095)*

### **Why architects should become specialists?**

One participant justified the choice for option '1C in Q1' (Architects should specialize in a certain area in the architectural profession due to the increasing complexity of buildings and the emergence of new technologies), this participant showed concern in case architects remained generalists.

*"I still think first statement is crucial especially in the construction projects." (P014)*

### **Why all types of architects are accepted?**

Four participants commented that both generalist architects and specialist architects are accepted. Two participants explained that this case is similar to other professions like medicine where generalists and specialists are present and accepted. Quotes below are indicative of this viewpoint.

*"The real "answer" may be both the first and third; like medicine where there are both many generalists and also many specialists., ..." (P068)*

*"All of the above mentioned kinds of architects is needed. I believe there have to be room for them all, because we need both specialist and generalist architects ..." (P099)*

## **4.2 Theme 2: Justifying the Different Perspectives about Architectural Education**

In question 4, some of the participants justified their perspectives about the architects and about specialization in the undergraduate architectural education, as a response to question 3.

### **Why should undergraduate architectural education be completely generalized?**

One participant reported that architectural postgraduate programs are responsible for providing the specialized education in architecture.

*"The M. Arch is the place where specialties may be developed. Students can apply to attend whichever school offers their desired specialty area." (P037)*

One participant commented that undergraduate architectural education should be the place for the generalized education that provides a mixture of sciences and arts required to perform architectural tasks, and notified that generalized education in architecture is more capable of stimulating students' creativity.

*“Architecture could be well placed in domain of Social Sciences. A generalized mixture of Sciences and Arts would provide a broader platform to stimulate students' creativity both in aesthetics and function of a built environment as compared to a specific stream of knowledge.” (P083)*

### **Why should undergraduate architectural education be mostly generalized?**

Basically, undergraduate architectural education should mainly offer generalized education, while optionally, provide a wide range of disciplinary topics. After acquiring the general education, lengthy undergraduate programs over three or four years can provide a space for the different specializations in architecture. The following quotes reflect this opinion.

*“Architecture is one of the last cross-disciplinary fields in academia and "real life". You should cover a wide range of topics from advanced digitalization and fabrication to freehand drawing and descriptive geometry. From Theory and History of Architecture to Philosophy and Poetry, etc.” (P020)*

*“Undergraduates should experience the "through lines" that connect the attributes of their major in architecture with striking attitudes found in other disciplines of their choice, this is what I like to call discovery-based education.” (P080)*

However, no justifications were provided neither for answer ‘3C in Q3’ (Mostly specialized but includes generalized architectural knowledge), nor for answer ‘3D in Q3’ (Completely specialized).

### **4.3 Theme 3: Specialization in Architectural Education Depends on Some Aspects**

#### **It depends on the local marketplace**

Two participants claimed that specialization in undergraduate architectural education is a relative issue that depends on local requirements of the marketplace.

*“This will vary country by country, in many countries it is unusual for architects to design single houses, but in my country (New Zealand) it is quite common. Architects need to have that broad general understanding of the building process, but most architects will eventually find their niche and specialize to some extent.” (P025)*

*“Specialization is relative to local industry, ....” (P043)*

### **It depends on the maturity of architecture students**

Five participants believe that students should freely decide their areas of specialization and these decisions require a great level of maturity. Thus, it is unreasonable to let them specialize in their early years of education. The following two quotes indicate this viewpoint.

*“... most undergraduate students do not yet know what they want to specialize in, ..., while in school and to be other than generalists might hinder them after graduation.” (P037)*

*“The maturity of the learners in deciding towards which area they want to specialize in -at this level- is too early for me, ... after internship, and after having the taste and bigger outlook of the industry, then they would want to decide or more informed of their decision, as to their interest and area of specialization.” (P063)*

### **It depends on the duration of the program**

Two participants explained the relation between the program duration and its capacity to handle the specialized education in architecture.

*“It depends on the duration of the course.” (P053)*

*“It depends a bit on the different systems that exist for undergraduate and post-graduate education. In Australia, undergraduate education is three years, and specialisation in year three is perhaps slightly too early. In Japan (for example), undergraduate education is four years, and specialisation starts to happen in the last year of undergraduate programs.” (P095)*

## **4.4 Theme 4: The appropriate context for architectural education**

Some participants used Question 10 to comment on their responses to Question 9 that explored the most optimal educational institutions to host architectural education. Two categories emerged as follows.

### **Architectural education would be better introduced in architecture institutions**

Five participants commented to ensure the necessity to provide architectural education in institutions dedicated to architectural education. They see architecture as a distinct field of inquiry that combines aspects of art, design, and engineering, however, it has its original characteristics. The following three quotes indicate this perspective.

*“Over the past five decades, undergraduate schools of architecture have worked long and hard to arrive at their present ...” (P080)*

*“I completely disagree with hybrid formulas like "architectural engineering" which often confuse the need of specialized knowledge/skills ...” (P086)*

*“Architecture is a distinct field, combining aspects of art and engineering, ...” (P095)*

### **Architectural education can be introduced in several contexts.**

Five participants confirmed that architectural education can benefit from being hosted in art, design, and engineering. The next three quotes reflect this meaning.

*“..., all of the above can do a good job and give a diversity to architectural education that is valuable.” (P050)*

*“In my experience, the overarching school or faculty doesn't really matter, as long as the department is truly architecture.” (P068)*

*“Architectural education can thrive in each of the contexts suggested here” (P112)*

### **4.5 Theme 5: Concerning the Concerns**

#### **More concerns**

The lack of architecture faculty was the concern of one participant who stated that specialized education requires more human resources. Another concern was about the elimination of the generalized education for the benefit of the specialized one, as there are no concerns on specialized education if generalized education will not be compromised. Another participant warned from specialization in architectural education.

*“Specialisation fosters obsolescence, ..., I think architecture has been damaged by overspecialisation.” (P066)*

#### **More planning, less concerns**

Providing specialized education in undergraduate architectural programs requires more planning and awareness to avoid its negatives, this was the opinion of two participants.

*“These are valid concerns, but can be overcome by appropriate curriculum planning.” (P025)*

*“A good cultural basis will allow the student to make informed choices about possible specialisations.” (P107)*

#### **No concerns**

Six participants explained how to help architecture students get specialized.

*“Give the students optimal theoretical and equipment support all the way long”. (P020)*

*“The combination of professional practice & postgraduate study is very effective to develop skills” (P013)*

*“Support of interdisciplinary research and cooperation.” (P077)*

#### **4.6 Theme 6: A Comprehensive Scheme of Architectural Education**

Three participants introduced comprehensive schemes for how undergraduate architectural education can offer specialized education. The following quotes are their perspectives.

*"A comprehensive program of architectural education should firstly inculcate the broad culture of the field and profession along with its general knowledge and skills (over 2-3 years); then offer an increasing range of specialised or particular options for further study (such as specialised studios). These can be combined like items on a menu to allow students to develop their own combination of interests and aptitudes." (P095)*

*"Architectural education needs to start with very general knowledge and rapidly spread to very advanced knowledge, but the specialised knowledge should happen later. First year is very general. Second year starts to get a bit more advanced knowledge, but the students are still at a very basic stage. By third year, the students are starting to understand quite a bit, and are looking for what direction to take. In fourth year, the students should be doing almost 100% specialised subject topics. So, it is in third year that they need to be introduced to specialised education topics so that they can figure out their future, post-graduate pathways." (P025)*

#### **5. Discussion**

This section discusses the results of the research and provides answers to the research questions. In addition, it proposes general guidelines that could effectively help in dealing with the issue of specialized undergraduate architectural education.

##### **5.1 Should Architects Be Generalists or Specialists?**

Although the quantitative analysis of the responses revealed low consensus among the participants, the responses to the open-ended questions succeeded in providing a reasonable answer to this research question. As expected, architects, in addition to their generalized knowledge, should have some level of specialization. This answer comprises three standards. The first standard shows that architects are mainly generalists who are able to deal comprehensively with the divergent and complex problems of architecture and they should be adequately skilled to communicate with other specialists to complete architectural projects. The second standard indicates that specialization is an advantage for architects and should happen later in their professional career after gaining the generalized knowledge and skills. The third standard confirms that the level of specialization of architects should be moderate, as overspecialization is expected to reduce the ability of specialist architects to introduce overall perspectives about architectural projects, and it might push them to look closely at the details and hinder their comprehensive ideologies.

## **5.2 Specialized or Generalized Undergraduate Architectural Education?**

The quantitative results revealed a consensus among the participants and confirmed that undergraduate architectural education should be mostly generalized but allows for specialization in some areas. While, the qualitative results explained that specialization in undergraduate level should be limited to exposing students to the different kinds of specializations, and providing an introduction to these specializations. However, real specialization should be at the post-graduate level.

## **5.3 When Should Students Get Specialized?**

Before answering this research question, it is worth mentioning that the definition of undergraduate architecture programs varies through countries. Some countries have three-year undergraduate programs such as most of the European countries and Australia, while undergraduate programs in other countries are four-year or five-year programs as in America, Canada, India and most of the Middle East countries. Therefore, the capacity of an undergraduate program to include specialized education depends on its duration. The quantitative results showed that specialization should happen during the final years of undergraduate education or start at the postgraduate level. The qualitative results showed that three-year programs might not be able to host specialized education, while longer programs can gradually accommodate the seeds of specialization after the third or fourth years.

## **5.4 How Can Students Get Specialized?**

This research question was twofold and involved two questions. The first question was: What are the most appropriate options of offering specialized education in undergraduate programs? While the second was: What skills should be developed in undergraduate programs to keep the graduates capable to specialize after graduation? Regarding the first question, the results confirmed the validity of the proposed options of offering specialized education; compulsory courses, elective courses, design projects, and internships, taking in consideration that elective courses were the most proposed option. Regarding the second question, the results recommended that training the students to collaborate with other specializations is the most effective way to help them specialize. This result calls for engaging architecture students with their fellow students of engineering and other related disciplines in multidisciplinary and real projects.

## **5.5 What are the Concerns Regarding Specialization in Undergraduate Architectural Education?**

This study confirmed that there are some concerns regarding specialized undergraduate education in architecture. As a result, the tightness of architectural programs is the main concern. This result confirms that the idea of specialized undergraduate education in architecture is not rejected, but since the specialized education should be initiated after a comprehensive generalized one, the time allowed for undergraduate

programs will not be enough to achieve these two goals. Moreover, the need for advanced specialized education in architecture depends on the characteristics of the marketplace, within the diversity of architectural works in marketplace, it seems impractical in some contexts to specialize the graduates and limit their job opportunities.

### **5.6 What Are Current Significant Specializations in Architecture?**

The survey provided a list of specializations that are currently significant. Out of this list, five specializations dominated, which are environmental design, digital architecture, urbanism, heritage preservation, and building technology, respectively. However, the importance of some specializations was considered contextual, for example, some countries focus on improving the residential sector, while others have programs for heritage preservation.

### **5.7 To What Direction Should the Future of Architectural Education Be Oriented?**

Architecture is a genuine knowledge area that is associated with a number of disciplines, it collaborates with and benefits from them, and it is a fertile context for the applications of their sciences and theories, but, in the same time, it is difficult to categorize architecture under any of them. Therefore, it is unreasonable to classify architectural education under the category of engineering education or art education as one of their sub-specializations. We do believe that this classification may affect our perception on the nature of architectural programs and their contents, and may drive them to be more specialized in the engineering aspects of architecture, or in contrast, to be very generalized when classified under art education. Architecture is and should remain its own knowledge area.

This situation calls to consider that undergraduate architectural programs should remain generalized but include seeds of specializations that could be developed through postgraduate studies or through self and continuous learning. Resolving the tightness of the undergraduate programs is required to allow for more space for elective specialized courses, and this might be achieved by balancing the time assigned for both the depth and breadth of learning of subjects. For example, the responsibility of the programs is to teach the broad knowledge of a subject with a focus on some detailed examples and how to acquire in-depth knowledge related to the subject, while the students are responsible for in-depth learning. In this case, programs should focus on teaching the methods of inquiry related to each subject as well as developing the students' research and self-learning skills, and the students should be aware that architectural knowledge is broad and acquiring most of it is their responsibility and requires life-long learning.

## **6. Conclusion**

This study was intended to resolve the controversy related to the issue of specialization in undergraduate architectural education in an objective manner. It raised a number of questions regarding when and how

architectural programs can integrate specialized education. The study investigated the opinions of 121 academic and professional architects worldwide through an electronic survey. It then discussed the quantitative and qualitative findings of the survey, answered the research questions, and provided recommendations that may guide the orientation of undergraduate architectural programs toward either specialized or generalized education.

In relation to the subject of specialization, this study had reached specific descriptions of the architectural profession and the characteristics of undergraduate architectural education. Architects, in addition to their generalized knowledge, should have some kind of specialization, taking into consideration that specialization is an advantage and should happen later in their professional career after gaining the generalized knowledge and skills. Undergraduate architectural education should be mostly generalized but allows for specialization in some areas, and it should target exposing the students to different types of specialization while provides overviews to each of them. Finally, the capacity of an undergraduate program to include specialized education depends on its length.

This study arrived at several findings regarding when and how undergrads architectural programs can integrate the specialized education. Firstly, specialized education should be initiated after a comprehensive a generalized one and start later in the final years, however, real specialization should be in the postgraduate level. Secondly, offering elective courses is the most recommended method for providing specialized undergraduate education in architecture. Thirdly, training the students to collaborate with other specializations is the most effective way to support them get specialized. Also, the survey provided a comprehensive list of specializations that are currently significant.

Moreover, architecture is and should remain its own area of knowledge, and architectural education should be well balanced. Classifying or integrating architectural education under other disciplines may direct it toward excessive specialization or generalization. Architects are considered generalists and team leaders, they initiate the architectural work, bring together teams of specialists, and guide them toward achieving the goals of this work. Although the architectural profession needs and accepts all types of architects, generalists and specialists, overspecialization could negatively affect the architects' roles in this profession.

Finally, it is important to note that the architectural practice is ever changing, temporally and locally, thus, establishing specialized architectural programs based on the current or local market requirements, even if it might seem to be temporarily successful, is expected to fail in the near future. However, the success of the architectural programs lies in their abilities to introduce graduates capable of adapting their expertise to meet the changeable market requirements. This paper provides a perspective on some issues related to

the subject of specialization in undergraduate architectural education while inviting further research and discussions on the same subject.

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