STUDENT WORKLOAD IN ARCHITECTURAL EDUCATION: AN EXPLORATORY INVESTIGATION

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Abstract. Architecture student workload has been a key issue since the formalization of architectural education. The nature of the architectural discipline, with design at its core, makes it demanding in terms of time and mental and physical effort. This results in perceptions of a heavy workload, which may affect student learning quality and well-being. Previous research has linked heavy workload to increased stress, surface learning, and unethical conduct. This paper investigates student workload in architectural education, in terms of quantity and quality, to identify opportunities for workload moderation and optimization. It provides an exploratory quantitative estimation of workload through short online questionnaires that compare student and faculty perspectives. It also explores key factors influencing workload perception through in-depth interviews with architecture students and professors in Egypt. The quantitative analysis reveals a discrepancy between the number of study hours reported by students and assumed by faculty, although both agree on the high workload. Students highlighted several issues that affect their workload experience, including the amount of workload, scheduling issues, course content, and teaching methods. Professors validated many of these issues, proposing implementable solutions for some and recommending further investigation into others. They also emphasized student responsibilities, including time management, commitment, and self-discipline.

Key words: architectural education, student workload, higher education, workload perception, workload factors.

1. Introduction

Student workload is the stress students experience due to syllabus requirements and assessment tasks (Entwistle and Ramsden, 1983; Kember, 2004). It is shaped by the available study time compared to the quantity of content and its level of difficulty (Karjalainen *et al.*, 2006). Previous studies have classified workload into objective and perceived workload, as students are also influenced by their perception when experiencing academic workload (Kember and Leung, 1998; Kember, 2004; Bowyer, 2012).

Objective Workload is the time needed by the average student to complete weekly coursework tasks, including both class time and independent study (Bowyer, 2012). The time needed to complete projects, labs, exams, and other learning activities is also included in the objective workload (Baeten *et al.*, 2010). On the other hand, Perceived Workload, also known as subjective workload, includes experiential factors related to students, teachers, and the topic of study (Bowyer, 2012). Factors related to students include their background knowledge, personal circumstances, and personal characteristics, such as learning style, motivation, self-confidence, and self-efficacy, while factors related to teachers include pedagogical knowledge and teaching style (Bowyer, 2012). Additionally, the learning environment, curriculum design, nature of assignments, and forms of assessment all contribute to the perceived workload (Kember and Leung, 2006; Kyndt *et al.*, 2014). Perceived workload also accounts for time, but it regards the actually utilized time rather than the needed or given time, which is known as quantitative workload (Kyndt *et al.*, 2014). A study revealed that objective workload accounts for only 4% of the variance of perceived workload, making the factors discussed above quite significant to workload (Kember and Leung, 1998).

The regulation of student workload (SWL) has been a recurring research topic since the 1970s (Karjalainen *et al.*, 2006). The Bologna Declaration in 1999 played a role in regulating student workload by standardizing the European Higher Education credit system, known as ECTS (Scully and Kerr, 2014). Credit Systems estimate the objective workload by accounting for respective contact and independent study hours (Kyndt *et al.*, 2014). The ECTS system, for instance, assigns 60 credits per academic year, with each credit accounting for 25-30 hours of work (Souto-Iglesias and Baeza-Romero, 2018). Publications and academic guides widely relate weekly study hours—contact and independent, to a full-time working week, 40 hours—eight hours a day, five days a week (Chambers, 1992; Scully and Kerr, 2014). Guided by higher education standards, architectural engineering higher education institutes globally suggest an average student workload of 42.5 hours per week, ranging from 26 to 54 hours (MASH, 2020; Bath, 2024; UNISA, 2024).

The impact of excessive workload on students manifests in the state of their mental health and the quality of their learning. Several studies have linked heavy workload to emotional stress and burnout (Karjalainen *et al.*, 2006; Jagodics and Szabó, 2023). Additionally, studies suggest that stress from heavy workload may drive students to adopt passive learning approaches, such as rote learning or surface learning, as students struggle to differentiate between relevant and non-relevant information (Karjalainen *et al.*, 2006; Scully and Kerr, 2014; Hu and Yeo, 2020). Moreover, the stress may lead to unethical conduct, as students resort to plagiarism and cheating to save time (Karjalainen *et al.*, 2006; Devlin and Gray, 2007). Poor retention, resulting from the prolonged studies due to repeatedly failing courses, has also been linked to heavy workload (Bowyer, 2012).

2. Workload challenges in architectural higher education

Formal architectural education, with the design studio at its core, has been in place since the 19th century (Charalambous and Christou, 2016; Pasin, 2017). While some

of its aspects have changed, it maintained its basic structure, combining theory and practice (Wong, 2023). The design studio employs a project-based learning approach, with other courses, like architectural history and theories, construction technology, environmental studies, and design communication, acting as its support (Ibrahim and Utaberta, 2012; Wong, 2023).

Architectural education has unique characteristics that make it inherently time-consuming and mentally and physically demanding. The dual nature of architecture, combining theory and practice, as well as creativity and rationality, makes it mentally challenging, causing a high perception of workload (Danaci, 2015; Albukhari, 2021; Ayalp and Çivici, 2021). Also, the design process is fundamentally lengthy as it involves problem identification, data analysis, case study analysis, and intensive thinking to generate a concept (Albukhari, 2021). According to research, the longer the incubation phase, the better the outcome (Taneri and Dogan, 2021). Additionally, design problems are ambiguous, often described as 'wicked problems', as they lack definitive formulation, rules, and solutions, resulting in uncertainty that could lead to stress (Buchanan, 1992; Mahmoud *et al.*, 2020). Furthermore, technological advancements in software applications for drafting, modeling, and analysis, though helpful, do not necessarily reduce workload, as students need to address the learning curve for these tools and fulfill more requirements (Kember and Leung, 1998; Soliman *et al.*, 2019). Finally, the physical demands of the discipline, including long hours of limited movement, poor posture, and repetitive motions while hunching over drawing boards, sitting before screens, or doing intricate handwork, lead to physical strain and musculoskeletal issues, in addition to the psychological stress and burnout (Choksi and Gokhale, 2022; Algabbani, 2024).

Beyond its inherent characteristics, some long-standing practices in architectural education have come under criticism for their impact on the learning and well-being of the students. One of these practices is the design studio, which has not significantly deviated from its traditional form (Hettithanthri and Hansen, 2022). The studio has been criticized for lacking explicit instruction and prioritizing the product over the process, which leads students to rely on intuition and artistic skills over rational thinking (Bashier, 2014; Van Dooren *et al.*, 2014). Research also revealed that the jury as an assessment method stresses students due to unclear evaluation criteria and contradictory comments, which prompts assessment-driven surface learning (Smith, 2011; Musa, 2020; Yorganc1oğlu *et al.*, 2022). Additionally, the conventional grading system limits the development of the students as they become fixated on the grades as a measure of their performance at the expense of the creative process (Wragg *et al.*, 2023). Another persistent issue is the disjunction between studio and lectures, likely stemming from a curricular structure that assumes students acquire knowledge sequentially, not in recurring cycles (Gelernter, 1984). This disjunction arguably results in the prevalent disconnection between education and practice (Turkkan *et al.*, 2010). Finally, architectural education has nurtured a culture that normalizes excessively long working hours, sleep deprivation, and the sacrifice of social life, affecting the wellness and learning of the students (Xie *et al.*, 2021).

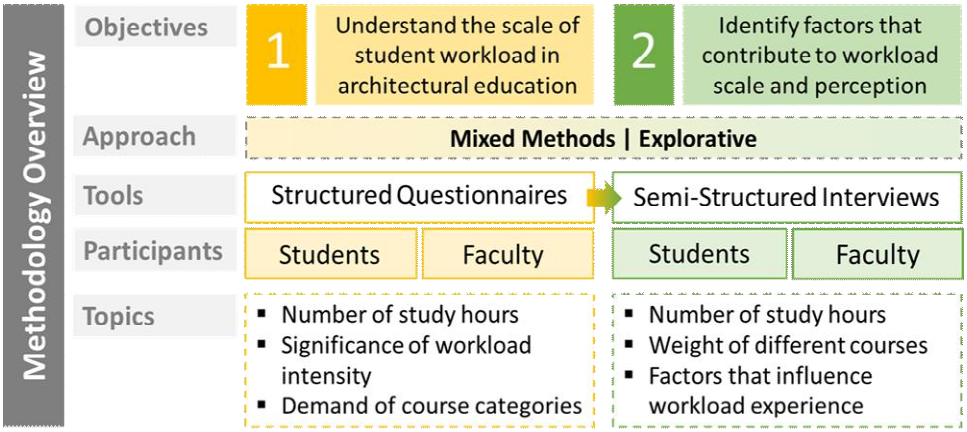

Fig. 1. Methodology Overview (Source: Author).

Table 1. List of factors influencing student workload based on existing research (Source: Author).

Factor	Sub-Factors	References
Nature of Discipline	Multiplicity of topics, Subjectivity, Difficulty	Kember, 2004; Bowyer, 2012; Ayalp and Çivici, 2021; Xie *et al.*, 2021
Curriculum Design	Structure, Core Content, Topic Difficulty, Coursework Diversity, Learning Outcomes, Course Load, Course Design, Instructional Approach, Assessment Method	Chambers, 1992; Kember, 2004; Karjalainen *et al.*, 2006; Bowyer, 2012; Kyndt *et al.*, 2014; Scully and Kerr, 2014; Oluwatayo *et al.*, 2015; Smith and Lilly, 2016; Gerrard *et al.*, 2017; Hernesniemi *et al.*, 2017; Hailikari, 2018; Ayalp and Çivici, 2021
Learning Environment	Class Size, Academic Atmosphere, In-Class Discussions	Kember, 2004; Bowyer, 2012; Scully and Kerr, 2014; Oluwatayo *et al.*, 2015; Hailikari, 2018
Academic Progression	Units, GPA, Attendance, Regulations	Bowyer, 2012; Oluwatayo *et al.*, 2015; Hailikari, 2018
Program Delivery	Class Scheduling, Flexibility, Intensity, Semester Phase	Scully and Kerr, 2014; Oluwatayo *et al.*, 2015; Gerrard *et al.*, 2017; Ayalp and Çivici, 2021
Time Commitment	Contact Hours, Studio Time, Independent Study, Workload to Credits Ratio	Chambers, 1992; Kember, 2004; Bachman and Bachman, 2006; Karjalainen *et al.*, 2006; Kyndt *et al.*, 2014; Hernesniemi *et al.*, 2017
Quality of Teaching	Enthusiasm, Encouragement, Clarity, Expertise, Fairness, Atmosphere	Kember, 2004; Karjalainen *et al.*, 2006; Bowyer, 2012; Oluwatayo *et al.*, 2015; Smith and Lilly, 2016; Gerrard *et al.*, 2017; Hernesniemi *et al.*, 2017; Hailikari, 2018
Student Support	Academic Guidance, Counseling, Access to Staff, Resources, Peer Interaction, Social Activities	Kember, 2004; Bachman and Bachman, 2006; Karjalainen *et al.*, 2006; Bowyer, 2012; Kyndt *et al.*, 2014; Oluwatayo *et al.*, 2015; Smith and Lilly, 2016; Hernesniemi *et al.*, 2017; Hailikari, 2018
Learning Characteristics	Planning, Self-Regulation, Study Skills, Adaptability, Self-Efficacy	Bachman and Bachman, 2006; Karjalainen *et al.*, 2006; Bowyer, 2012; Kyndt *et al.*, 2014; Smith and Lilly, 2016; Gerrard *et al.*, 2017; Hailikari, 2018
Student Demographics	Age, Gender, Residency, Native Language, Enrollment Type, Year of Study	Bowyer, 2012; Scully and Kerr, 2014; Oluwatayo *et al.*, 2015; Hailikari, 2018; Xie *et al.*, 2021
Student Commitment	Intrinsic Interest, Effort, Learning Approach, Goals	Chambers, 1992; Bowyer, 2012; Kyndt *et al.*, 2014; Hailikari, 2018
Personal Circumstances	Study-Leisure Balance, Family, Financial and Health Situations, Employment, Commute, Background, Preparation	Chambers, 1992; Bachman and Bachman, 2006; Karjalainen *et al.*, 2006; Bowyer, 2012; Gerrard *et al.*, 2017; Hailikari, 2018; Ayalp and Çivici, 2021
Perceived Workload Biases	Satisfaction, Course Value, Cultural Conceptions	Bachman and Bachman, 2006; Gerrard *et al.*, 2017; Xie *et al.*, 2021
External Pressures	Societal Expectations, New Technologies	Karjalainen *et al.*, 2006; Hailikari, 2018; Ayalp and Çivici, 2021

Previous survey studies have consistently ranked architecture among the top most time-demanding disciplines, though estimates of workload widely varied across studies (Alarcon *et al.*, 2013; Neves *et al.*, 2024). To further explore the factors shaping student workload in architectural education, a review of 15 published research studies about student workload in higher education was conducted, with five focusing on architectural education. The studies were identified using relevant keywords: 'student workload', 'student academic workload', 'perceptions of workload', 'study time', and 'factors affecting student workload', then "Workload in architectural education" and "architecture student workload". Selection criteria included relevance, number of citations, publishing journal, author expertise, and publication date. The review resulted in a list of 125 factors, narrowed down by removing duplicates and merging related factors and categorized as shown in the concise version in Table 1. This list formulates a theoretical framework for understanding the factors influencing architecture student workload.

The above overview pointed out the impact of workload on the learning of higher education students, as well as their physical and psychological well-being. It highlighted the specific challenges that architectural education faces in this respect. While several studies addressed the topic of student workload, only a few particularly addressed architectural education, going comprehensively into the factors that shape student perception of workload. These studies focused on either the psychological aspect—stress, or student performance, leaving a gap in understanding the relationship between workload, its contributing factors, and the overall quality of education. This gap warrants further exploration into both the quantity and quality of student workload in architectural education.

3. Study

Building on the identified gap, this study initiates an exploratory investigation into student workload in architectural education by addressing two main questions: what is the scale of student workload in architectural education? What factors influence the workload experience from the student's perspective? It uses a mixed-method approach, comprising two phases, as Fig. 1 demonstrates. In the first phase, students and faculty answer two short questionnaires—one for each group, about study hours and workload perception. In the second phase, students participate in in-depth semi-structured interviews, revealing the time required to fulfill their coursework and the factors contributing to their workload experience, with Egypt serving as a case study. Afterward, faculty staff members reflect on the issues revealed by the students through semi-structured interviews as well. The study aims to enhance architectural education by providing a comprehensive insight into student workload, which is essential for building an understanding between students and educators and identifying opportunities for workload moderation and optimization.

3.1. Survey

In the first phase, two short questionnaires were shared online with students and faculty, via Google Forms, each comprising three sections: introductory info about participants, questions about student workload, and optional feedback. The student version

was shared through teaching staff and international student associations, while the faculty version was shared via academic emails and platforms. Responses were anonymous, but participants could provide email addresses for further contact. The results were subject to descriptive and inferential statistical analysis, using IBM SPSS Statistics 26 for the inferential statistical tests; however, the inferential statistics are only for exploratory purposes due to sample size constraints.

3.1.1. Student survey findings

The student questionnaire received 87 responses, from 18 different institutes. Though shared locally and globally, most responses came from local students in Egypt, 51 students (59%), followed by Iraq, 31 students (37%), with smaller contributions from the US (5%) and Rwanda (1%). About 6% of the respondents were in their first academic year, 15% in their second, 25% in their third, 32% in their fourth, and 22% in their fifth. The GPA scores of respondents came as follows: 27% between 3.6 and 4.0, 38% between 3.0 and 3.6, 23% between 2.5 and 3.0, 9.5% between 2.0 and 2.5, and 2.4% lower than 2.0.

Moving to the core part of the questionnaire, in response to the first question about the number of weekly independent study hours, the most common response (mode) was ‘more than 50’ hours, selected by 26% of the students. The distribution of other responses is shown in Fig. 2. The median response is ’30-40’, with a mean of 37 hours. The interquartile range spans from '20-30 hours' to 'More than 50 hours', with both the third quartile and maximum in the 'More than 50’ hours category, indicating variability among the middle 50% of students and a concentration of responses in the highest range.

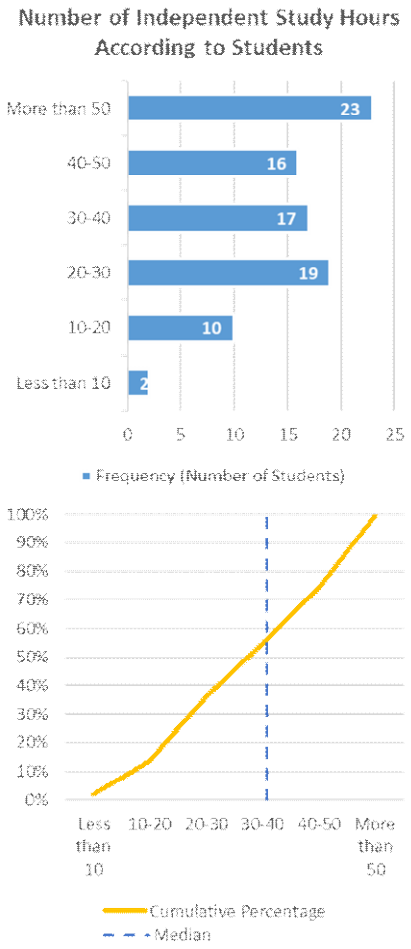

Fig. 2. Distribution of number of independent study hours reported by students (Source: Author).

As for the second question regarding the total number of weekly study hours, including contact hours, the most common response (mode) was ‘more than 70’ hours, selected by 32% of the students. The distribution of other responses is shown in Fig. 3. The median response is ’60-70’, and the mean is 58.7 hours. The interquartile range spans from '40-50 hours' to 'More than 70’ hours, with both the third quartile and the maximum in the 'More than 70’ hours category, also indicating variability among the middle 50% of students and a concentration of responses in the highest range.

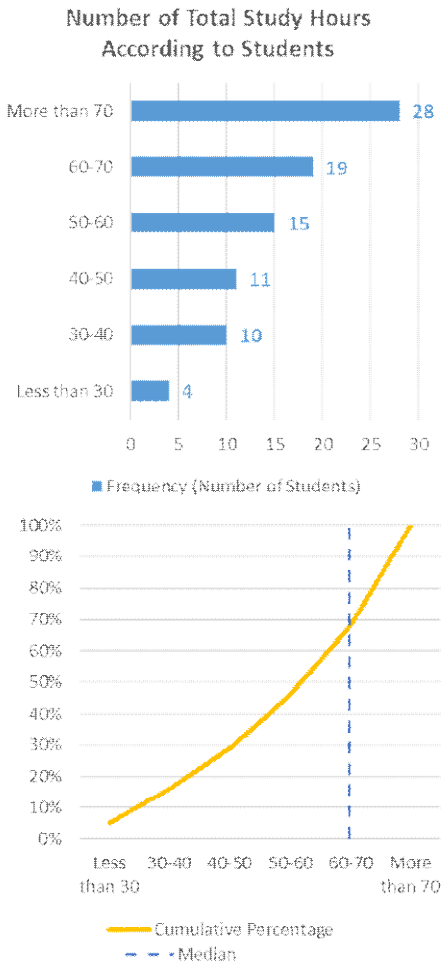

Fig. 3. Distribution of total study hours reported by students (Source: Author).

The interquartile ranges for both independent and total study hours span at least 30 hours. This suggests that variation in total study hours is mainly driven by independent study hours. A Spearman's correlation test confirms this observation, with a Spearman's rho correlation coefficient of 0.815 and $p < 0.001$, indicating a strong positive correlation between independent study hours and total study hours and implying low variation in contact hours.

In answer to the third question, on a scale of 1 (strongly disagree) to 5 (strongly agree), to what extent students agree that student workload in architecture education is significantly high, a majority of 75% strongly agreed, with the mode and median both being '5'. Fig. 4 shows the complete distribution. The interquartile range spans from '4' to '5', with both the third quartile and the maximum in the category '5', indicating small variability among the middle 50% and the concentration of responses in the top ratings. These results point to a majority agreement, further confirmed through a one-sample t-test, which revealed that the mean ($M = 4.52$, $SD = 1.01$) for $N=87$ is significantly higher than the neutral midpoint (3), $t(86) = 14.01$, $p < .001$. The mean difference of 1.52 (95% CI [1.30, 1.73]) suggests that students perceive their workload as substantially higher than average.

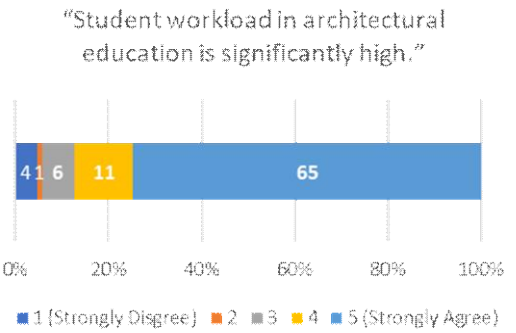

Fig. 4. Distribution of student responses to the statement 'student workload in architectural education is significantly high' (Source: Author).

In the fourth question, students ranked eight architectural course categories from the most (1) to least (8) demanding. Design courses were ranked first by a majority of 86%, followed by Working Drawings, ranked second by 59% of the participants. Electives were ranked last by a majority of 57%. The remaining course categories did not show similar consistency in their rankings. According to the average ranking per course category, the most to least demanding categories are as follows: Design Courses (1.36), Working Drawings Courses (2.67), Theoretical Courses (4.33), Visual Presentation Courses (4.87), Technical Courses (4.89), Structural Engineering Courses (5.44), Software-Based Courses (5.51), and Elective Courses

(6.94). The complete distribution is shown in Fig. 5. A Friedman test confirmed statistically significant differences in rankings across course categories, with Chi-Square = 309.389 and P-value < 0.05.

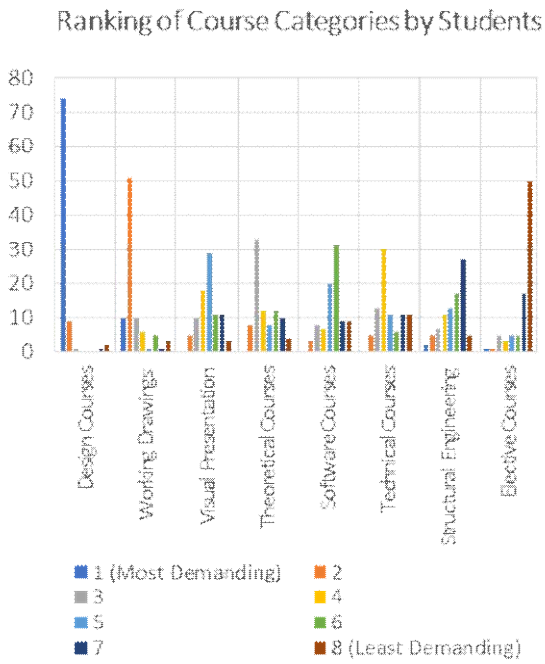

Fig. 5. Distribution of rankings of course categories by students (Source: Author).

Finally, in answer to the fifth question about whether students chose to study architecture out of personal interest, the results came as follows: 59% chose to study architecture out of interest and are still interested, 33% chose to study architecture out of interest but eventually lost interest, and 8% were never interested in studying architecture. A Kruskal-Wallis test examined whether interest in studying architecture influenced student workload perception, indicated in the third question. The result revealed a statistically insignificant difference in perceived workload across varying levels of interest, with H = 3.141 and p = 0.208 (P > 0.05).

To test the correlation between the amount of workload and perception of workload, Spearman's Correlation test was conducted between the total study hours indicated in the second question, and workload perception indicated in the third question. A Spearman's rank correlation coefficient of 0.317 and P-value of 0.003 (P < 0.05) indicates a statistically significant positive correlation between the amount and perception of workload. On the other hand, Spearman's rank correlation coefficient between Total Study Hours and Academic Year, -0.064 with P-value = 0.557 (P > 0.05), indicates a weak, non-significant negative correlation, which suggests no meaningful relationship.

3.1.2. Faculty survey findings

A total of 51 faculty members from 18 countries answered the questionnaire, with the majority being from Egypt 15 (29%), followed by Iraq 13 (26%). Contributions from other countries ranged from 1 to 3 each, coming from: India, Turkey, Jordan, UAE, South Africa, Algeria, Bahrain, Bosnia Herzegovina, Iran, Malaysia, Mexico, Nigeria, Qatar, Russia, Serbia, and Spain. Academic ranks included assistant professors (57%), associate professors (23%), and professors (20%). Among the participants, 96% took part in constructing a course outline/syllabus or specifications, 82% in developing academic plans for students, and 67% in setting rules, regulations, and policies for an architecture program.

Moving to the questions about student workload, the largest group (39%) expected that students spend '10-20' hours per week studying independently. The complete distribution is shown in Fig. 6. The median falls in the '20-30' hour category, and the mean is 25.4 hours. The interquartile range goes from '10-20' to '30-40', spanning three categories, which indicates moderate variability among the middle 50% and skew towards the lower ranges.

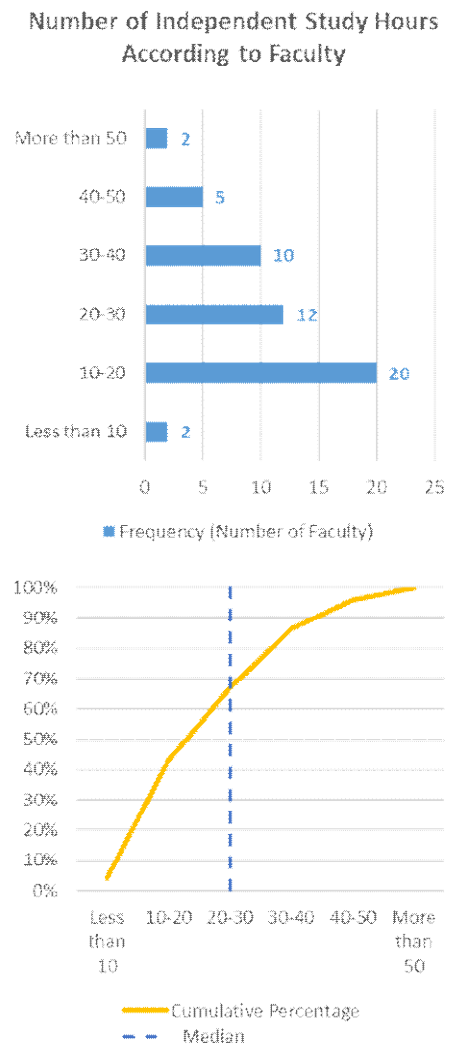

Fig. 6. Distribution of the number of independent study hours reported by faculty (Source: Author).

As for the expectations regarding the total study hours, 29% selected ’40-50’ hours, and an equal 29% selected ’30-40’ hours, making both categories the mode for this data set, with the average mean being 45 hours. Fig. 7 shows the complete distribution. The interquartile range spans three categories, from '30-40’ to '50-60’, again indicating moderate variability among the middle 50% and a skew towards the lower ranges.

The interquartile ranges for both independent and total study hours span at least 20 hours. This again suggests that variation in total study hours is mainly driven by independent study hours, not contact hours. A Spearman’s correlation test confirms this deduction, with a Spearman's rho correlation coefficient of 0.814 and $p < 0.001$, indicating a statistically significant positive correlation between the two variables.

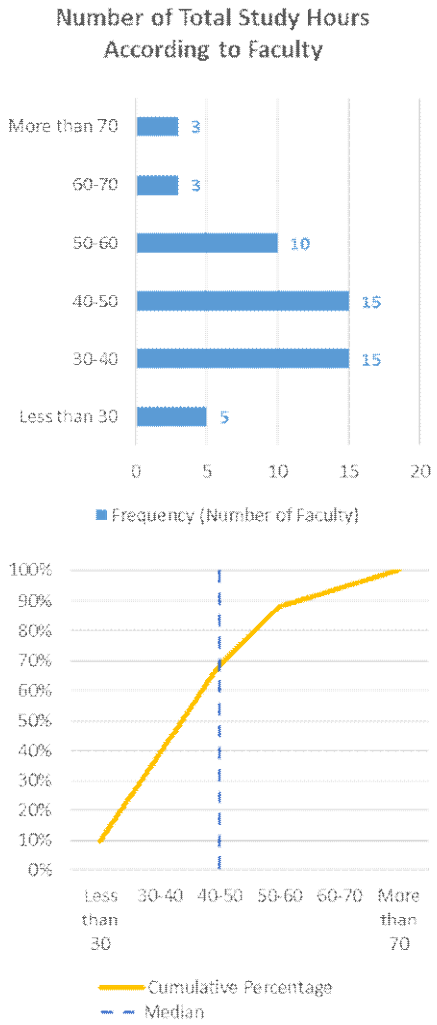

Fig. 7. Distribution of the number of total study hours reported by faculty (Source: Author).

When similarly asked to what extent they agreed that student workload in architecture education is significantly high, 57% of the respondents strongly agreed and 33% agreed. The interquartile range entirely falls in the top rating category ‘5’, which indicates limited variability among the middle 50% with the concentration of responses being in the top category, as Fig. 8 shows. This again reveals a majority agreement with the question statement, further confirmed

through a one-sample t-test, with the results being (M = 4.412, SD = 0.853), significantly different from the neutral midpoint (3), t(50) = 11.824, p < .001. The mean difference 1.412 (95% CI [1.17, 1.65]) also suggests strong agreement.

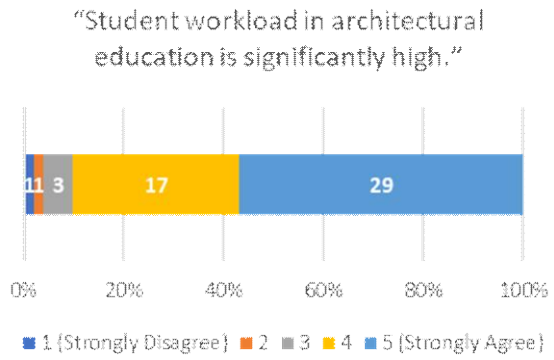

Fig. 8. Distribution of faculty responses to the statement 'student workload in architectural education is significantly high' (Source: Author).

Then, in answer to whether faculty members believe there is a problem with student workload in architectural education, 84% answered 'yes', indicating a majority agreement that was further verified through a binomial test. The observed proportion (0.84) is significantly higher than the hypothesized proportion (0.5) with p < 0.001, suggesting that a statistically significant majority perceive a problem with the student workload in architectural education.

Faculty also ranked the eight architectural course categories demonstrated earlier from the most (1) to least (8) demanding. Design courses again ranked first by an overwhelming majority of 94%, Working Drawings ranked second by 80%, and Elective Courses ranked last also by a majority of 88%. The remaining five categories similarly did not show consistency in their rankings. According to the average ranking per course category, the categories from most to least demanding are as follows: Design Courses (1.08), Working Drawings Courses (2.29), Structural Engineering Courses (4.37), Theoretical Courses (4.55), Visual Presentation Courses (4.59), Technical Courses (5.51), Software-Based Courses (5.82), and Elective Courses (7.78). Fig. 9 shows the complete distribution. A Friedman test confirmed statistically significant differences in rankings across course categories, with Chi-Square = 255.693 and P-value < 0.05.

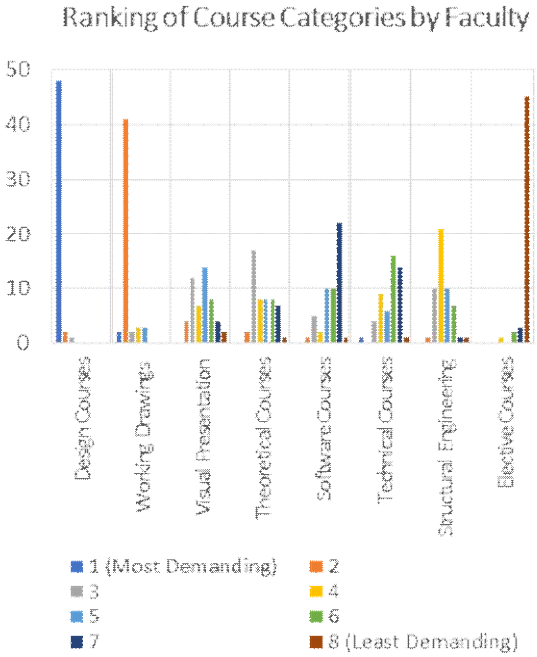

Fig. 9. Distribution of rankings of course categories by faculty (Source: Author).

Spearman's Rho correlation analysis assessed the relationship between the total study hours assumed by faculty and the extent of their agreement that student workload in architectural education is significantly high. The results indicated a statistically insignificant weak positive correlation (ρ = 0.026, P-value = 0.857 > 0.05, suggesting a virtually non-monotonic relationship between the two variables.

3.1.3. Survey comparative analysis

The survey revealed significant discrepancies between students and faculty

regarding study hours. While the largest groups of students reported more than 50 hours of independent study and 70 hours of total study per week, faculty mostly selected 10-20 hours for independent study and 40-50 hours for total study hours. Referring to the 40-50 hours standard, reported in the literature, 71% of students reported total study hours exceeding this range, noticeably higher than 41.2% of faculty participants who exceeded the range. On the other hand, both groups generally agreed, with varying degrees, that the workload in architectural education is significantly high and mostly agreed about the rankings of course categories in terms of demand.

To read more into the results, a comparative subgroup analysis focusing on Egypt and Iraq, which represent the majority of responses for both groups, was conducted. Starting with independent study hours, students in Egypt selected the range "More than 50" the most, with the median being "40-50" and the average mean, based on the range midpoint, being 42.1 hours. On the other hand, students in Iraq selected the range "20-30" the most, shortly followed by '10-20', with the median being "20-30" and the average mean 28.2 hours. As for total study hours, students in Egypt selected "More than 70" the most, with the median being "60-70" and the average mean 65.4 hours, while students in Iraq selected "30-40" the most, with the median being "40-50" and the average mean 48.2. Finally, regarding workload perception, most students in Egypt (86%) strongly agreed that student workload in architectural education is significantly high, with the median being "5" and the average mean 4.7. Students in Iraq also strongly agreed but with a smaller majority (55%), with the median also being "5" and an average mean of 4.2.

As for faculty expectations, faculty members in Egypt mostly assumed architecture students spend '30-40' hours per week on independent study, with the median being '30-40' and the average mean 31 hours. On the other hand, faculty members in Iraq assumed a range of '10-20' hours of weekly independent studies, with the median also being '10-20' and the average mean 23.5 hours. Regarding total study hours per week, faculty in Egypt mostly selected the range '50-60' hours, with the median being '50-60' and the average mean 55 hours, while faculty in Iraq equally selected '30-40' and '40-50' the most, with the median being '40-50' and average mean 45.8. Moving to workload perception questions, faculty in Egypt agreed less than faculty in Iraq that student workload in architectural education is significantly high, though both groups generally agreed. The majority of faculty participants from Egypt (73%) strongly agreed or agreed that the workload is significantly high, with the median being '4' and average mean 3.9, while all faculty participants from Iraq (100%) strongly agreed or agreed, with the median being '5' and average mean 4.6. However, in answer to the question of whether there is a problem with student workload in architectural education, faculty in Egypt agreed by a majority of 87%, while faculty in Iraq agreed by 77%.

Looking at the four groups, students in Egypt seemed to have the highest perception of workload, followed by faculty in Egypt. Referring to the standard student workload, which falls in the range of 40-50 hours per week, 90% of students from Egypt and 73% of faculty from Egypt reported or assumed hours exceeding this range. In contrast, 61% of students from Iraq and 70% of faculty from Iraq reported or assumed hours at

or below this range. Fig. 10 illustrates the variations in the selections of all four groups in the dataset, compared to the standard range.

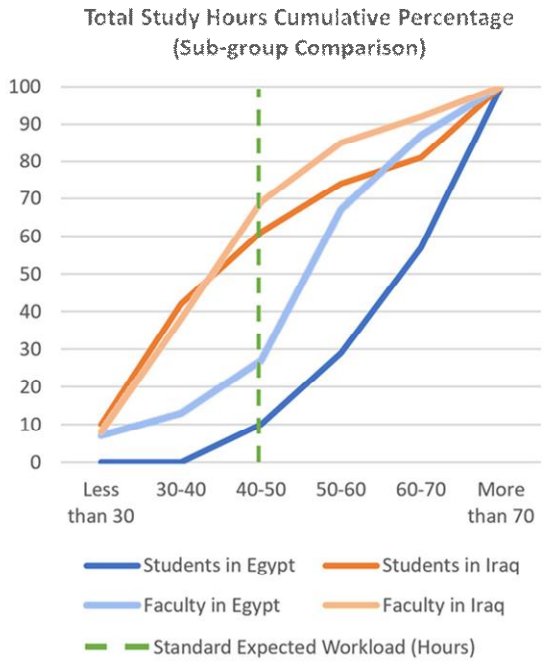

Fig. 10. Cumulative percentage for selections of weekly total study hours by students and Faculty in Egypt and Iraq (Source: Author).

In conclusion, the survey revealed differences between students and faculty regarding their perception of workload intensity, with noteworthy variations between countries. Participants from Iraq showed little deviation from the standard expected workload, while participants from Egypt exhibited a notable gap. However, faculty in Iraq showed higher agreement on the significance of workload intensity compared to their Egyptian counterparts. While these findings cannot be generalized due to sample constraints, they warrant further investigation into the factors influencing student workload in architectural education. Consequently, the next part of the study takes Egypt as a case study, interviewing students and professors to confirm the previous observations and uncover their underlying causes.

3.2. Interviews

This part explores factors influencing student workload in architectural education through interviews with students and faculty staff. In the first phase, eight students from one public and one private institute in Egypt participated in in-depth interviews. Participants were from three academic years: two in their third year, two in their fourth year, and four in their fifth year. Their GPA scores ranged from 2.75 to 3.8. The interviews took place online via Zoom, averaging one hour per student. First, participants answered questions about the number of courses they took, the hours spent on each course, and the challenges they faced in their previous semester. Then, they identified factors that influenced their workload experience throughout their studies, first through brainstorming and then by reviewing the factors derived from the literature. Participation was voluntary, and participants were assured confidentiality and anonymity. All participants submitted an online consent form and reconfirmed their consent on record at the beginning of the interview.

In the second phase, seven faculty staff members participated in the interviews: four assistant professors, two associate professors, and one professor, with teaching experience ranging from 15 to 43 years, (average 23 years). The participants represented both public and private institutes and had diverse roles, including curriculum development, course coordination, scheduling, academic advising, and quality assurance. The interviews mainly aimed to validate the themes identified in the student interviews. Professors commented on reported student study hours, their distribution among course categories, and the workload issues raised by students, providing validation and critique of the findings.

This section comprises two sub-sections, a quantitative analysis of the time-related data and a thematic analysis of the qualitative insights, covering both students' experience and professors' validation and critique. Fig. 11 highlights the different objectives of the interviews with both groups and how they complement each other.

Fig. 11. Objectives of interviews with students and faculty (Source: Author).

3.2.1. Quantitative analysis

According to the bylaws of both institutes from which students were interviewed, as dictated by the Supreme Council of Universities in Egypt, one credit is equivalent to one lecture hour or three studio hours. Course specifications indicate expected self-study hours equivalent to the number of contact hours per course. For example, a 3-credit theoretical course includes three hours of lectures per week (45 contact hours for a 15-week semester) and an equal number of expected self-study hours. On the other hand, a 3-credit studio-based course may include two lecture hours and three studio hours, making a total of five contact hours (75 hours for a 15-week semester) and an equal number of expected self-study hours.

Students reported taking an average of 5.25≈5 courses in their last semester, ranging from 4 to 7. Fifth-year students were enrolled in fewer courses than third and fourth years. Students reported registered credits ranging from 14 to 21, with an average of 24.2 contact hours per week, ranging from 20 to 30 hours, indicating expected total study hours ranging from 40 to 60 hours per week, with a mean average of 48.4 hours. However, students reported an average of 50.4 independent study hours per week, and, accordingly, 74.6 total study hours, revealing a gap between the expected and reported total study hours. The average difference is 26.2, with differences per student ranging from 9.8 to 51.5 hours, and a standard deviation of 17.1. These figures indicate that students consistently reported studying more hours than required, with variability in the extent of excess hours.

Design Courses were the most demanding in terms of study hours, followed by Working/Construction Drawing courses, which aligns with the survey rankings. However, elective courses ranked in the middle, along with visual presentation and theoretical courses, followed by technical courses, and civil engineering courses came last, along with a newly added category 'others' for non-architecture courses. None of the interviewed students had software-based courses in their schedules so their ranking could not be verified. The reported electives included design-based, visual presentation, and theoretical courses. The design-based electives were consistently the most time-consuming, while visual presentation and theoretical electives individually varied. When comparing the average total study hours reported per course category relative to the Design courses (1), the ratios are as follows: Working (0.55), Theoretical (0.29), Technical (0.20), Visual (0.27), Civil (0.16), Electives (0.29), and others (0.16). Fig. 12 illustrates how the course categories compare based on the reported study hours.

Professors generally found the reported average of 74.6 total weekly study hours reasonable due to the time-demanding

nature of coursework in architectural education. They noted that this average was closer to reality than the standard of 40-50 hours per week. They also agreed with the reported distribution of study time, with design courses making up about half of it, followed by working drawings, which takes half the time needed for design courses. However, one professor criticized the dominance of design courses in the workload, suggesting that working drawings and fieldwork should account for more, as most graduates work as technical and site architects, and design skills are largely innate. In response, another professor argued that site-related knowledge could be acquired faster and more efficiently through summer industrial training, but design skills require nurturing through studies and guidance.

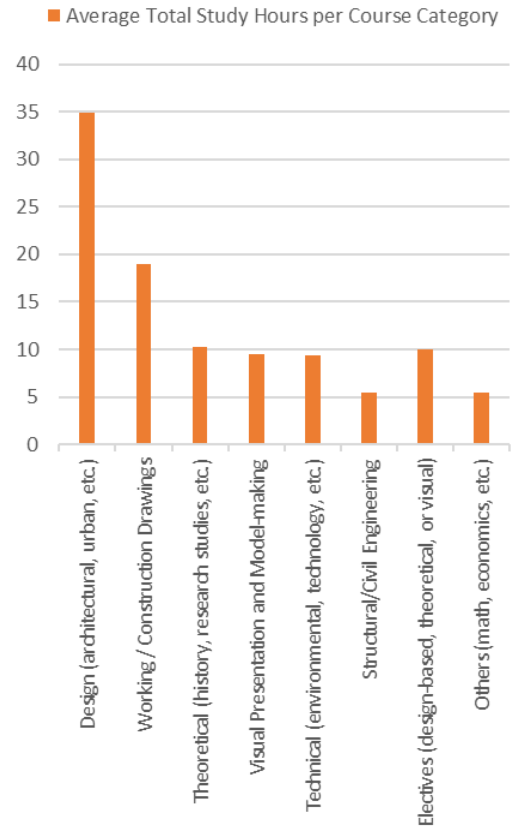

Fig. 12. Average total study hours per week for different course categories based on student interviews (Source: Author).

3.2.2. Qualitative analysis

The interviews with students uncovered some recurring themes regarding the factors influencing the workload of architecture students. A detailed thematic analysis was conducted to identify these themes and their pertaining issues. The discussions with the professors validated several of these issues and challenged some of them. The findings are outlined under the points below.

3.2.2.1. Time management and scheduling

Students reported never-ending coursework, especially in design courses, and faced challenges balancing multiple courses and their requirements. One student explained that the overwhelming requirements caused a mental block, worsened by inadequate time management skills. Clustered deadlines put them under significant stress. One student said: *"It seems like professors are not aware of all the other courses we are studying so they ask for too much work and everything overlaps."* Another student laid the issue on the lack of coordination among professors. Professors generally acknowledged these challenges but partly attributed them to individual problems, such as procrastination and distractions. They also cited scheduling issues as a cause of clustered deadlines. They urged students to speak up when facing conflicting deadlines, as professors may not always be aware.

Students also cited scheduling issues as a cause of workload stress. These issues included scheduling demanding courses on consecutive days, long academic days—10 to 12 hours, and early morning classes, as they often stayed late to finish assignments. Some students noted that they would not mind long contact hours if it reduced homework but that was rarely the case. Students preferred shorter

study weeks and a mid-week day off, explaining that the distribution of courses over the whole week increased wasted time on commute and recovery. They also noted that some semesters were particularly intense because of the combination of demanding courses, especially design courses. Professors agreed with students on the negative impact of these scheduling issues, in terms of stress and quality of work. However, they explained these issues are often the result of resource constraints, such as limited studio spaces and staff shortages. They recommended limiting the academic day to no more than eight hours, scheduling design studios on separate days, as they can be mentally draining, and limiting days with only theoretical courses to five or six hours to maintain focus. They added that five to six courses per semester in the earlier years, and four courses in later years, as workload intensifies, seems reasonable.

3.2.2.2. Course structure and content

Students emphasized the significance of course relevance, content depth, and practical applications. They felt most burdened by heavy but shallow or irrelevant content, driving them to rote learning. They consistently cited civil engineering courses as examples of such irrelevance, believing them to be essential but their content was unnecessarily detailed and misdirected. Some students disclosed resorting to copying assignments that seemed irrelevant: *"I copy assignments that feel irrelevant because I wouldn't waste effort on something that will not benefit me."* In response, professors believed that students were not well positioned to judge the relevance of courses. One professor noted that students often establish mental barriers between courses, possibly driven by a lack of intrinsic motivation and focus on grades, leading them to perceive some content as irrelevant. However, they acknowledged that unsuitable teaching methods could make the content seem disconnected, and they valued student feedback in this regard. They also suggested reorienting non-architecture courses, such as structural engineering, towards architectural applications, with architecture faculty approval. As for theoretical architecture courses, professors suggested including small design and analytical exercises to demonstrate practical applications and projects that mimic real-life experiences to foster student engagement. They cited examples of such practices, including a villa design project, where students adopted the design philosophy of regional architects from their history course, and a movie production project, where students designed settings based on historical eras.

Students reported that heavy content with complicated terminology required substantial time to understand, especially if not taught effectively. They also struggled with unfamiliar assignment types and complex design projects, with challenging site conditions, particularly when assigned in earlier semesters before they had acquired the necessary knowledge to tackle them. However, clear requirements and expectations significantly improved their workload experience. One student shared: *"For an unusual assignment, we take time to figure it out. We discuss it between us, ask seniors, make guesses, and try, or wait for the professors to answer our questions...Some professors provide clear step-by-step instructions, making things much easier."* In this regard, professors acknowledged that staff are sometimes unclear about their expectations. However, they also noted that students could more effectively address this by proactively seeking clarification through questions, research,

and review of exemplars or previous student work.

Students found some courses, especially electives, disproportionately demanding for their credits, which took away from the time for core courses. One student recounted, *"This elective was informative, but its workload was overwhelming. The extra projects and juries felt excessive for its credits and theoretical nature."* While professors criticized the perception of electives as less important than compulsory courses, they agreed their workload should align with their credits. They acknowledged that some staff do not modify content or activities for courses with reduced credits, believing they must be taught in the same traditional manner, which results in excessive workload. Regarding including practical assignments in theoretical courses, which students felt increased workload, professors explained that modern teaching methods require combining theory with practice to engage students and demonstrate content relevance. Professors suggested reducing workload by replacing most homework with in-class activities, breaking research projects into smaller tasks performed during weekly workshops within contact hours, and assigning group work to minimize individual workload.

3.2.2.3. Teaching methods and faculty support

Students highlighted the influence of teaching methods on their perception of workload. They believed that some teaching staff adopted ineffective and outdated methods, which hindered their learning, explaining that even relevant could seem irrelevant due to unfit teaching methods. They perceived courses based on memorization as more irrelevant than courses that require deep understanding. They also noted that a professor's enthusiasm and engaging teaching style positively affected their workload perception, often sparking their interest in topics they never expected to enjoy. In this regard, professors acknowledged the impracticality of some traditional teaching methods in architectural education, owing to generational differences. They recommended updating these methods to ensure compatibility with the current generation, who need faster and smarter methods. Suggestions included incorporating gamification, minimizing one-side lectures, and breaking them into 15-minute segments, integrated with varied teaching activities to maintain student focus and alleviate boredom. However, they acknowledged that resistance to change among staff remains a significant challenge.

Students valued constructive and timely feedback that enhanced their work. They preferred illustrated feedback on tracing paper over verbal feedback to avoid misunderstandings. They also noted communication issues with teaching staff when receiving feedback: *"I feel professors sometimes get offended when I ask why something is wrong, telling me to go do my research, but I've already done that and this is what I learned."* Additionally, they did not appreciate sarcastic critique or staff vocally undermining their efforts. Professors agreed that design feedback should be verbal and visual for clarity, emphasizing the importance of one-to-one feedback for personalized guidance. However, they were against drawing complete sketches, leaving students no room for independent thinking, explaining that feedback should vary in detail by academic year. One professor further highlighted the importance of developing students' ideas rather than

imposing their own, distinguishing between right and wrong while allowing room for self-expression. Professors acknowledged that students have the right to question feedback and emphasized the importance of their active participation by asking clarifying questions and taking notes. However, they noted that some students debate changes without any basis, which can be frustrating.

Students also noted confusion arising from the misalignment between professors in the design studio due to differing design philosophies, which blurred the expected learning outcomes. Moreover, they believed that teaching staff were not always equally invested in all projects, believing that students who suffered received less attention despite their efforts. Professors acknowledged the misalignment, suggesting that forming teams with aligned approaches and specialized expertise in the particular area of focus of each design studio, could improve the consistency and quality of feedback. As for concerns over selective treatment, they admitted that they find reward in seeing fruitful results from students, so some might give more effort to those who seem more promising. They also noted that some students believe they are working hard, but their efforts are insufficient or misdirected. Others, despite significant effort, may fall short due to a lack of aptitude, limiting the staff's ability to help them. Nonetheless, one professor emphasized that most students could achieve satisfactory results with proper guidance.

Students highlighted the impact of guidance and support from teaching staff on their morale and perception of workload. They emphasized its significance during the first year when they felt most confused. They also commended teaching assistants who were easily contactable and followed up with them, offering advice on time management and study skills. Professors similarly stressed the importance of guidance, especially for first-year students. They recommended supervised class exercises for first-year students that target foundational skills like drawing and visualization. One professor additionally emphasized the staff's responsibility to guide students through the vagueness of the design process using relevant theoretical frameworks, noting that some staff prefer a hands-off approach, expecting students to learn by doing, which undermined their role as mentors. Finally, professors highlighted the valuable role of teaching assistants in guiding students through insightful design feedback, tips on essential skills, and support in transitioning into architecture, as they can be more empathetic and relatable.

Finally, students reported issues caused by insufficient teaching staff. The shortage affected the quality of instruction, as staff struggled to provide adequate feedback to all students within the allotted time. Also, class time often extended beyond the scheduled contact hours, adding to workload stress. Professors strongly agreed with students on this issue, explaining that the large number of students and time constraints limit their ability to give detailed individual feedback. They recommended reducing the 1:10 staff-to-student ratio, which they perceived as too high, to a lower ratio, ranging from 1:5 to 1:7, for more effective communication, and staff properly planning their time in the studio.

3.2.2.4. Assessment and grading

Students raised concerns about the subjectivity in grading, citing

inconsistencies between teaching staff and the lack of clear assessment criteria. They also questioned comparative grading, especially across groups with varied performance levels or assignment difficulties. While students understood subjectivity is inherent in the discipline, they believed it could be better controlled to ensure fairness. They also highlighted the psychological impact of repeated low grades and rejections without clear explanations, which often led to anxiety and procrastination. Professors acknowledged subjective grading as a long-standing issue in architectural education, which could be minimized through detailed rubrics but cannot be eliminated, as rubric criteria may still allow for subjectivity. One professor emphasized the importance of transparent feedback to help students understand their grades and learn from their mistakes. Another professor suggested regular pin-up sessions to reduce assessment variations, as public discussion would minimize conflicting feedback and increase perceived fairness among students.

Some students preferred frequent grading, especially in design courses, to keep track of their performance, while others found it stressful. One student said, *"It's challenging to be consistent all semester. Having to reach 100% every week is hard."* Another student criticized the *"unavailability of second chances,"* explaining that re-submitting assignments after receiving feedback enhanced their understanding and improved their grades, reducing grade-induced stress. Students also had an issue with high-stakes final exams, especially for drawing-based courses, expressing concern over the objectives of these exams: *"It doesn't feel like the exam is assessing my understanding, but rather a speed test."* While professors acknowledged the inconvenience of high-stakes final exams, they believed them necessary to ensure students do their own work and can handle time pressure effectively. They proposed that exams could be intermediate with lower weights of the coursework grade to address learning gaps early and reduce the stress of summative assessment. They also suggested that weekly submissions should not always be graded, but they acknowledged that students are largely motivated by grades.

3.2.2.5. Group work dynamics

Students expressed mixed feelings about group work. They explained that problems arose when the goals and values of group members did not align, or when their performance levels widely varied. Students cited coordination issues, such as setting meetings, agreeing on procedures, and handing work off, especially for sequential tasks, as delays from one member left the rest with insufficient time. Additionally, students with a deeper sense of responsibility would often take on extra work to compensate for the shortcomings of others. Thus, students found it unfair when all group members received the same grade regardless of individual effort. As for potential solutions, students agreed that reporting their peers is unlikely as it could strain relationships. They believed professors were responsible for identifying non-contributing members through careful assessment. Professors acknowledged this responsibility, revealing that they try to hold personalized discussions and adjust the grades accordingly. However, they admitted that the large number of students and limited time often made it difficult. Another professor suggested that assignment design could ensure equal participation, for example, by

requiring each group member to research and present a case study within a group report. That said, professors emphasized that group work is a skill in itself, explaining that group assignments should be assessed not only on the final product but also on the planning and coordination within the group.

3.2.2.6. Self-learning demands

Students viewed self-learning as integral to studying architecture, crediting it with almost 80% of their knowledge. One student suggested that self-learning distinguishes high-achieving students from the rest, explaining, *"While comparing our work with students from other universities, I noticed that those who excel often attribute their success to self-learning, while those who struggle usually blame the professors for not teaching them."* Some students even appreciated the freedom to explore new topics and approach assignments in their own way. However, students also found all the reliance on self-learning challenging sometimes, especially with complex topics. They believed more structured support would be helpful, noting that time constraints eventually led them to replace self-learning with rote learning.

Professors similarly emphasized the importance of autonomous learning through research, site visits, and continuous observation of the surrounding environment. They also urged students to dedicate time during their summer break to learn new tools and enhance their skills. One professor added that architecture students are also researchers; hence, they should first make an independent effort to find information and seek help only when necessary. Another professor suggested empowering students to research their own questions and present their findings in class, fostering knowledge exchange and consolidating understanding through discussion, in alignment with modern student-centered teaching methods. Nonetheless, professors expressed concerns that students today are accustomed to spoon-feeding and generally less willing to work hard, so they perceive any required self-learning as an excessive workload. They attributed this to the multitude of distractions present today and the fact that many students pursue architectural engineering due to family pressure rather than personal interest.

3.2.2.7. Technical and software skills

Students revealed facing significant challenges with the technical demands of the discipline, citing the constant need to learn new software applications and deal with their technical issues, which increased their workload. One student explained, *"I know how to draw correctly, but I can't do it right on Revit…More technical tasks, like working drawings, require more than self-learning; they should be included in the curriculum."* Another student added that the time students needed to perform the same task varied based on their software proficiency, sharing that some students are cautious about experimenting to avoid risks: *"During the semester, we're too overwhelmed and don't want to take risks, so we avoid trying anything new that could make things easier or faster."* Some students suggested learning essential software skills before joining the program to reduce struggles during their studies when time is limited. However, they noted difficulty retaining these skills when not used frequently and added that the lack of software knowledge among teaching staff compounded the problem, as they had no one to consult when stuck. In response to these issues, professors agreed that integrating short tutorials for teaching specific technical details into core courses

would be helpful. They also added that students should enhance their software skills during summer break to alleviate workload stress during the semester. Finally, they acknowledged that not all teaching staff are well experienced with the digital tools used by students but considered it unrealistic to expect them to be fully proficient in every software.

Students also expressed a concern that software advancements were shifting focus from the essence of architecture. One student explained that the overreliance on software apps for construction drawings led to a lack of an actual understanding of the details. Another student was dissatisfied with spending a long time experimenting with modeling and rendering tools instead of perfecting the design. Professors mostly agreed with these concerns, noting that while digital tools have simplified tasks and improved visuals, they did not enhance design quality. On the contrary, they believed students have become less detail-oriented, lacking essential manual skills for developing their architectural sense, and less capable of defending their work. Professors emphasized that students should start with manual drawing in their first year to develop spatial awareness and hand-eye coordination before transitioning to digital tools, highlighting the need for a balanced approach to ensure professional preparedness. Some professors also brought up the emergence of AI tools, emphasizing the need to incorporate them but with careful consideration of the timing, to avoid hindering the students' cognitive development and with clear ethical guidelines.

3.2.2.8. Learning environment and resources

Students complained about limited studio access, inadequate furniture, poor ventilation, and financial burdens from tools, materials, and printing, which they felt were often overlooked by faculty. They appreciated professors providing handouts and references, especially for technical content, but found note-taking during lectures also acceptable if the pace was adjusted to facilitate it. They also noted that the availability of resources, like textbooks, codes, and fabrication tools on campus could be time-saving. While class size was not a major concern for students, they noted that large studio classes led to long waits for feedback, frequent interruptions, and loss of focus. They also felt that larger classes meant more competition, which could be stressful; however, they perceived healthy competition as a motivator. Students valued the collaboration and support within their community, noting that discussions among peers facilitated their learning experience. They also highlighted the major role of online groups in maintaining communication, allowing them to ask each other questions and share information.

Tackling the above points, professors emphasized the benefits of extended studio access, allowing students to work together and socialize while learning from each other and enabling a spontaneous transfer of knowledge between senior and junior students. However, they cited safety concerns as the main challenge, especially in remote campuses. Professors also suggested providing on-campus co-working spaces for group work, as well as printing and fabrication facilities, to reduce time and financial pressures on students. One professor additionally proposed limiting printing to when necessary and investing in digital touch screens for feedback demonstration, promoting both cost-efficiency and sustainability.

3.2.2.9. Mental health and well-being

Students discussed the significant impact of studying architecture on their mental health and well-being. Academic stress affected their well-being, but also personal stress affected their academic performance. The transition to architecture was particularly challenging for first-year students who experienced emotional challenges and burnout. Students repeatedly highlighted the role of teaching staff in making or breaking their morale, citing lack of empathy as a significant demotivating factor, even more than poor grades or inadequate feedback. One student said, *"When your teacher doesn't care, it becomes frustrating…you feel let down."* Professors commented that students have become mentally fragile and less resilient toward challenges and criticism. One professor attributed this change to uncertainty about the future, the economic crisis, and a lack of independence, as evidenced by increased parental involvement in students' academic matters, rendering students incapable of facing challenges on their own. Professors also highlighted the need for mental health support on campus, emphasizing the need for methodological approaches. One professor further suggested integrating stress management training into architectural education, deeming it essential for adequate performance and quality of work.

Long academic days and extensive workload disrupted the daily routines and social lives of the students. Sleep deprivation affected their mental and physical capabilities, impacting their academic performance and the time needed to finish work. Physical health was also a persistent concern, with frequent complaints of back pain and weakened eyesight due to long hours of work. Moreover, students felt they had no time to recover when ill because of the workload, which compelled them to push themselves to avoid falling behind. One student referred to Maslow's hierarchy of needs, suggesting that architecture students are misled into believing they are at its top: *"Maslow's pyramid highlights basic needs like sleep, food, and social interactions as foundational, yet studying architecture often disrupts these essentials. You barely sleep, eat, or go out, while convincing yourself that, as an aspiring architect these needs are trivial. This mindset leaves you feeling lost and depressed, yet unaware of the underlying problem."* Professors acknowledged that architecture is inherently time-demanding, with the quality of work being proportional to the time invested. They agreed that the mental and physical strain from working under pressure and for prolonged hours shape students' perception of workload. They also confirmed that architecture students often experience poor sleep and may pull all-nighters. While some professors believed this to be inevitable, others viewed it as an unhealthy practice with serious consequences for the students' well-being and attributed it to poor time management and procrastination.

3.2.2.10. Personal factors

Students agreed that personal factors play a major role in their workload experience. They emphasized the role of interest in architecture in sustaining motivation despite pressure. One student shared, "*I don't think I would have given this much time, effort, and patience for another major."* Varied interests and approaches in different courses or assignment types affected their time. They highlighted individual traits like perfectionism and reluctance to ask for help as aspects influencing their workload perception. They additionally

noted varying degrees of comprehension and focus among them as important factors, believing that even with a competent teacher, some students may still perform inadequately. Moreover, students perceived creative aptitude and family background in architecture as advantageous, especially in the first year, but they also cited resilience and self-discipline. One student explained, *"Those less creative have it hard, getting motivated by a good grade or demotivated by a bad one, so discipline is important to keep going."*

Professors believed that students should be familiarized with the demands of architectural education before joining the program. They also acknowledged the significant role of aptitude in students' perception of workload, explaining that those lacking the necessary skills struggle to visualize, understand, and respond to design feedback. Some professors suggested an aptitude test for architecture program admission to address this issue. However, professors noted that while excelling in architecture may require intrinsic motivation and talent, passing only requires hard work and self-discipline. They added that motivation and talent do not necessarily reduce perceived workload, explaining that creative students may reach ideas faster but could keep refining them, not knowing when to stop.

3.2.2.11. Academic policies

Students criticized some academic policies that affected their workload experience, particularly the strict attendance policy. One student said: *"Attendance should be driven by intrinsic motivation rather than grades … The policy should be more flexible, especially for courses mainly dependent on self-learning."* While professors agreed that attendance should be motivated by intrinsic factors, they believed attendance policies were crucial. They cited students' lack of commitment and the misconception that lectures offer little value to their learning and can be completely replaced by self-learning. While unsuitable teaching methods might contribute to this perception, professors noted that students today show less enthusiasm for visiting expert talks compared to previous generations, indicating a shift in mindset. One professor attributed this shift to the widespread availability of online videos, including lectures and talks. However, professors argued that in-person communication remains essential for promoting focus and interaction, which is why they opposed replacing in-class attendance with online attendance for some courses, as one student suggested.

4. Discussion

The study uncovered a range of issues that shape the workload experiences of architecture students. The survey revealed discrepancies in workload perception between students and faculty, evident in reported versus assumed study hours. While students mostly reported study hours beyond the average weekly standard of 40-50 hours, faculty estimates greatly aligned with this standard. This difference suggests that students possibly experience or perceive a heavier workload than faculty assumes. Interviews with students and faculty in Egypt revealed agreement on workload intensity and study hours, although survey analysis showed that staff in Egypt expected less workload than students reported, with both groups indicating higher workloads compared to their counterparts in Iraq. The survey additionally revealed how each course category ranks in terms of demand, with interviews largely confirming these rankings except for elective courses,

which ranked higher, and structural engineering courses, which ranked lower based on reported study hours.

The interviews uncovered multiple factors that influence student workload, interconnected by two main aspects: time and stress. Some factors directly affected workload by increasing the time needed to complete tasks, while others indirectly influenced it by affecting the students' mental state. Students raised program- and teaching-related issues but also acknowledged personal factors like planning, time management, communication, intrinsic interest, and self-discipline. The key factors they consistently identified included heavy workloads from numerous courses and assignments, lack of clarity and guidance leading to misunderstandings and redoing work, and the sheer amount of independent studying and self-learning within a limited time. Students also highlighted the role of faculty support in alleviating workload stress, academically and emotionally. They additionally emphasized the impact of intrinsic interest on their workload experience, although survey results suggested no correlation between interest and study hours in the dataset. Professors, on the other hand, validated most of the issues raised by the students explaining their reasons and suggesting solutions when applicable. However, they also noted shortcomings from the students that need to be addressed. They repeatedly cited scheduling issues, large class sizes, and time constraints as causes of many problems that reflect on student workload experience. They additionally cited their own academic workload as an issue that needs to be addressed, explaining how it reflects on their development and capability of benefitting students.

The interviews revealed a concerning observation about the coping mechanisms adopted by architecture students to deal with workload challenges, with some students perceiving positivity in unhealthy practices. For instance, one student did not mind the clustered deadlines, despite the ensuing stress and exhaustion, as they boosted their productivity. Another key observation was that students tended to prioritize academic performance over stress management. This was evident in their preference for more frequent, low-weight submissions, to minimize the risk of significant grade loss, and their suggestion to allow assignment re-submissions, despite the extra workload.

Finally, the tertiary relationship between student workload, learning approach, and learning quality was tangible in all interviews, as students repeatedly admitted to adopting surface learning approaches to deal with the overwhelming workload, although they perceived them negatively. The relationship was further noted in the professors' interviews who always had eyes for the quality of work, as they validated students' concerns and suggested solutions.

The findings of this study mostly align with existing research, while also highlighting particular issues and adding new dimensions to them. The findings are valuable to both faculty and administration, as they specify teaching practices that deeply influence the student workload experience and learning quality, along with several administrative issues and academic policies. Table 2 outlines the main factors influencing student workload, their underlying issues, and their relevance to workload, classifying them by their

primary impact: time or stress, and secondary if applicable, as well as their validation status: validated, partially validated, or not validated.

Table 2. Main factors and underlying issues influencing architecture student workload classified by their impact on time and stress (Source: Author).

Main Factor	Issue	Relevance	Validation	Form of Impact	
				Time	Stress
Scheduling and Time Management	Overlapping deadlines	Multiple simultaneous deadlines reduce the time for each task.	Validated		●
	Long academic days	Extended contact hours leave less time for independent coursework and personal needs.	Validated	●	
	Course distribution	Scheduling heavy courses on consecutive days within the same semester increases workload stress.	Validated	●	
Course Structure and Content	Imbalance between credits and workload	Courses exceeding their credit allocation cause time management problems across all courses.	Validated	●	
	Relevance and depth of content	Irrelevant or exceedingly complex content takes more time to process.	Validated	●	
	Clarity of requirements	Unclear requirements lead to wasted time on misunderstandings and rework.	Validated	●	
Teaching Methods and Faculty Support	Quality of feedback	Insufficient and inconsistent feedback increases time spent on submissions and revisions due to uncertainty.	Validated	●	
	Clarity of instruction	Unclear instructions waste time on task interpretation rather than execution.	Partially validated	●	
	Teaching staff capacity	Shortage in staff leads to lower feedback quality and extended contact hours.	Partially validated	●	
	Guidance and support	Lack of guidance and empathy increases confusion and workload stress.	Partially validated		●
Assessment and Grading Practices	Subjective grading	Attempts to meet unclear standards lead to overwork and repeated revisions.	Validated	●	
	Assessment frequency	Weekly graded assessments increase grade-related workload stress.	Partially validated	●	
	High-stake final exams	High weight of final exams jeopardizes semester-long effort.	Partially validated		●
Group Work Dynamics	Coordination issues	Time spent on organizing meetings and aligning schedules reduces productive work time.	Validated	●	
	Uneven workload distribution	Some students carry a disproportionate weight of the workload compensating for other group members.	Partially validated	●	
Self-Learning Demands	Heavy reliance on self-learning	Students spend excessive time trying to understand content on their own.	Partially validated	●	
Technical and Software Skills	Learning multiple software	Time spent learning new software reduces time for improving design.	Not validated	●	
	Technical issues	Troubleshooting software problems detracts from time for coursework tasks.	Validated	●	
	Varying proficiency levels	Less skilled students take longer time to complete the same tasks.	Validated	●	

Main Factor	Issue	Relevance	Validation	Form of Impact	
				Time	Stress
Learning Environment and Resources	Resource availability	Limited access to necessary tools or spaces leads to inefficient use of time.	Validated	●	○
	Class sizes	Large class sizes result in longer waits for feedback, potentially wasting time.	Validated	●	○
	Competition	The level of peer competition can intensify the perceived workload.	Partially validated	○	●
	Collaboration and support	Strong peer support can make heavy workload feel more manageable.	Validated	○	●
	Cost of tools and materials	Financial stress from tools and materials further compouds perceived workload.	Validated		●
Mental and Physical Well-Being	Academic stress	The pressure of studies, emotional challenges, and burnout affect the perception of workload.	Validated	○	●
	Empathy from teaching staff	Lack of empathy from staff can make workload feel more overwhelming.	Partially validated		●
	Sleep deprivation	Lack of sleep impacts focus and perception of task difficulty.	Partially validated	○	●
	Physical strain	Musculoskeletal problems and eye strain from long work hours add to workload stress.	Validated	○	●
Personal Factors	Interest and intrinsic motivation	Level of interest in the field affects motivation to handle workload.	Validated		●
	Cognitive aptitude	Perceived creative and spatial abilities can influence how challenging the workload feels.	Partially validated	○	●
	Individual traits	Traits such as self-efficacy, self-discipline, and perfectionism shape perceptions of workload.	Validated	○	●
Academic Policies	Strict attendance policy	Rigid policies can add to stress and a high perception of workload.	Not validated	○	●
● Primary ○ Secondary					

The study identified strategic approaches to improving the student workload experience, proposing recommendations that address all factors from the thematic analysis. These recommendations aim to optimize perceived quantitative workload and minimize workload-induced stress while considering the role of students in their implementation—ensuring students' rights or encouraging their responsibilities, as shown in Fig. 13. Table 3 presents a matrix categorizing the recommendations by their objectives and the nature of students' involvement.

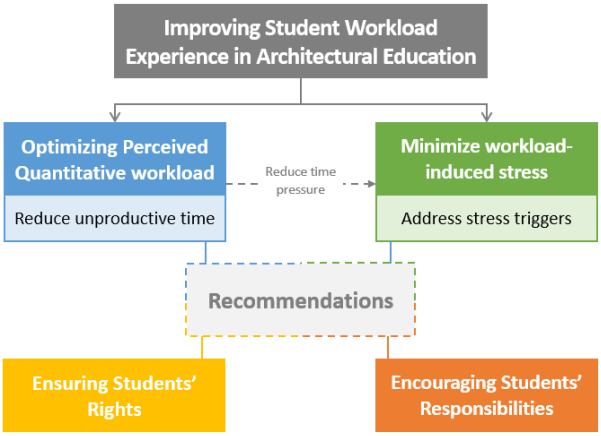

Fig. 13. Framework for recommendations to improve student workload experience in architectural education (Source: Author).

Table 3. Recommendations matrix based on objectives and student involvement (Source: Author).

	Optimizing Perceived Quantitative Workload	Minimizing Workload-Induced Stress
Ensuring Students' Rights	▪ Reduce the duration of the academic day, considering shorter days for theoretical courses. ▪ Avoid scheduling design studios with other courses on the same day. ▪ Minimize the concentration of heavy courses in the same semester or on consecutive days. ▪ Coordinate final submission deadlines across courses to avoid overlapping. ▪ Provide students with exemplars and sample previous assignments to reduce uncertainty about the expected outcomes. ▪ Adapting course content and activities to match its credit value. ▪ Replace homework with in-class activities for courses with fewer credits. ▪ Incorporate small design and analytical exercises into theoretical courses to demonstrate practical applications. ▪ Involve architecture professors in the curriculum review for non-architecture courses to ensure alignment with the discipline. ▪ Balance the quantity and depth of design projects to ensure varied experience and reasonable focus on technical aspects. ▪ Balance the emphasis on design skills and site-related knowledge in the curriculum for a holistic learning experience. ▪ Design group assignments to include individual components to ensure equal contributions from group members. ▪ Continuously review and update teaching methods to ensure relevance and efficiency. ▪ Conduct supervised foundational drawing and visualization exercises for first-year students to enhance core skills. ▪ Emphasize manual drawing skills in the early stages of architectural education to develop students' architectural sense. ▪ Incorporate new digital tools to enhance design quality and workflow without diminishing critical thinking and creativity. ▪ Enable access to studio spaces beyond contact hours to foster collaborative learning and spontaneous knowledge transfer among students. ▪ Provide on-campus co-working spaces and fabrication facilities to save time and additionally reduce financial pressures. ▪ Limit printing to necessary tasks while investing in digital touch screens for feedback demonstration.	▪ Incorporate student-oriented teaching methods like gamification and discussion-based approaches to foster student engagement. ▪ Break long lectures into short segments alternating with engaging learning activities. ▪ Prioritize projects that mimic real-life experiences to enhance practical skills. ▪ Develop detailed and balanced rubrics to minimize subjectivity and clarify expectations. ▪ Incorporate regular pin-up sessions with collective feedback from professors to reduce variations in feedback and assessment. ▪ Introduce intermediate exams with smaller weights to identify learning gaps early and reduce stress from high-stakes exams. ▪ Provide transparent feedback to help students identify their mistakes, improve their work, and reduce grade-related anxiety. ▪ Plan studio sessions to ensure equitable and quality feedback for all students. ▪ Encourage open communication with students regarding feedback, while establishing clear guidelines for constructive dialogue. ▪ Reduce the staff-to-student ratio in the studio to improve individual communication and quality of feedback. ▪ Provide students with guidance to navigate the vagueness of the design process, based on researched theoretical frameworks. ▪ Deliver verbal and visual, individualized feedback tailored to each academic level to enhance learning and development. ▪ Form teams of faculty with aligned approaches and expertise in the design studio to ensure consistency and quality of feedback. ▪ Ensure equitable treatment for all students by balancing attention to both high-potential and struggling students. ▪ Empower teaching assistants to play an active role in student learning through feedback, study advice, and moral support. ▪ Hold personalized discussions with group members to address unequal contributions and ensure a fair assessment of group work. ▪ Familiarize students with the demanding nature of architectural education and its required skills through orientation sessions before enrollment. ▪ Introduce an aptitude test for admission that assesses students' readiness based on both cognitive and non-cognitive skills.

	Optimizing Perceived Quantitative Workload	Minimizing Workload-Induced Stress
Encouraging Students' Responsibilities	▪ Request objective feedback from students on course content and teaching methods. ▪ Encourage students to connect knowledge across courses through interdisciplinary exercises. ▪ Incorporate summer industrial training programs to enhance practical knowledge and site-related experience. ▪ Assess group work holistically, considering planning, task distribution, and coordination skills. ▪ Encourage autonomous learning and a research mindset by engaging students in self-directed research, site visits, and active observation. ▪ Implement peer-led research presentations where students share their findings, promoting knowledge exchange and understanding. ▪ Promote continuous learning by advising students to dedicate time to acquiring new skills and learning tools during summer break. ▪ Focus on developing design quality, ensuring that improved visual presentations do not overshadow essential skills. ▪ Guide students on the ethical use of AI tools and ensure their integration at the right stage of their learning. ▪ Encourage in-person attendance at scheduled and guest lectures, emphasizing the value of live interaction over accessible online content.	▪ Encourage students to ask questions in class and during feedback to clarify uncertainties. ▪ Advise students on strategies to practice self-discipline and manage distractions. ▪ Encourage student participation in formative assessments, even if ungraded, to enhance learning. ▪ Promote a learning approach that prioritizes understanding and application rather than just passing the course. ▪ Offer guidance on time management and effective study strategies, particularly for first-year students, to enhance learning and reduce academic stress. ▪ Reinforce the importance of attendance by incorporating in-class activities designed to enhance students' intrinsic motivation. ▪ Integrate mental health support and stress management training into the architectural curriculum to enhance student ability to manage program demands. ▪ Encourage a stronger work ethic, intrinsic motivation, and independence among students while acknowledging external pressures.

Ultimately, this study highlights the necessity for ongoing reflection and adaptation within architectural education. Continuous curricular, teaching, and administrative adjustments are essential to align with the dynamic needs of the field and the associated educational challenges. Such measures ensure a healthy learning environment that promotes high-quality learning and effectively prepares students for their professional careers.

5. Conclusion

This paper explored student workload in architectural education from different angles. Using a mixed-method approach, it presented estimates of the time students need to fulfill architectural study demands, comparing the perceptions of students and faculty on the intensity of workload and how different course categories rank in this regard. Next, it investigated factors influencing workload experience through in-depth interviews with architecture students and professors in Egypt. Students uncovered issues with the amount of workload, time management, course content, assessment, teaching methods, scheduling of classes, software skills, group work, learning environment, and mental and physical health. They explained the implications of these issues on their perception of workload and the quality of their learning, emphasizing the link between both. Professors validated many of these issues, proposing solutions for some concerns and highlighting areas requiring further research.

While the study provides valuable insights, its limitations should be considered when interpreting its findings. The survey results are indicative rather than definitive due to sample size constraints. Also, the limited number of interviewees makes the findings more exploratory, possibly reflecting some context-specific issues. Future research could expand the sample size and include more institutions. It could conduct a detailed analysis of the discipline-specific workload factors and incorporate a broader range of perspectives including administrative figures and psychological and behavioral experts. These efforts are vital for deeply understanding student workload in architectural education and identifying effective strategies for its moderation and optimization, ensuring quality learning that fosters intrinsic motivation and creativity, shaping innovative and resilient future architects.

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