Assessing the Influence of Online Teaching on Grades in Architecture Studio Classes: A Comparative Case Study

Aasem Alabdullatief[1,*], Jamil Binabid[1], and Mohammad Z. Alrajhi[1,2]

[1]Department of Architecture and Building Sciences, College of Architecture and Planning, King Saud University, Riyadh, Saudia Arabia
[2]The Design School, the Herberger Institute for Design and the Arts, Arizona State University, Tempe, United States
Email: aasem@ksu.edu.sa (A.A.); jbinabid@ksu.edu.sa (J.B.); mzalrajhi@ksu.edu.sa (M.Z.A.)
[*]Corresponding author
Manuscript received July 16, 2024; revised August 9, 2024; accepted September 29, 2024; published December 11, 2024

***Abstract*—In recent years, architectural education has undergone significant changes, necessitating a reassessment of teaching and evaluation methods. This study examines the impact of these shifts on students' grades in Architecture Studio Classes at King Saud University from 2019 to 2022 and analyses how these changes have affected grading practices. Using a mixed-methods approach, we combined quantitative analysis of grade trends with qualitative insights from surveys and focus group interviews involving instructors and students. Participants included instructors and students from various architecture design levels. The quantitative analysis showed fluctuating grades across design levels before, during and after the pandemic. For instance, the course 'Design 5' experienced shifts from predominantly B-range grades to peaks in A-range grades during certain semesters, while the course 'Design 7' maintained consistently high grades, indicating successful adaptation to online learning. Qualitative findings revealed diverse experiences during the transition to online education, with instructors facing challenges in maintaining standards and adapting assessments, leading to increased leniency and students reporting mixed experiences due to technical issues and varied instructor support. The study recommends robust support systems tailored to architectural education, including enhanced technical infrastructure, innovative teaching practices integrating digital tools and transparent grading criteria to address grade inflation. Ongoing evaluation of pedagogical strategies and investment in research is crucial to developing resilient educational frameworks for future disruptions, providing valuable insights for educational stakeholders.**

***Keywords*—architectural education, grading practices, design studio, mixed-methods research, educational transformation, online learning**

I. Introduction

Architectural education has traditionally relied on in-person, hands-on teaching methods. These methods emphasised physical studio work, face-to-face critiques and manual drafting, providing students with an immersive learning experience. However, with the advancement of technology, a significant shift towards modern learning approaches has occurred. Digital tools, virtual reality and online collaborative platforms offer greater flexibility and accessibility in architectural education. This transition has reshaped the learning environment, moving from the physical studio model to a more hybrid or fully virtual experience.

The COVID-19 pandemic accelerated this shift to modern learning methods, where institutions were forced to adopt online teaching to quickly maintain educational continuity. Although this move initially responded to the global health crisis, it revealed new opportunities and significant challenges in architectural education. On the positive side, online design studios introduced innovative teaching practices that enhanced interactivity and accessibility. However, replicating traditional studios' hands-on and collaborative nature proved difficult in virtual environments. This raised concerns about the long-term effects of online teaching on student learning outcomes, prompting the need for research into the effectiveness of these new methods.

One critical aspect of architectural education that has faced challenges during this transition is using grading rubrics. In design studios, grading rubrics are employed to ensure fairness and consistency in evaluating student performance. However, these rubrics often fail to capture the complexity and creativity of design projects [1]. Architectural design is inherently subjective, and although rubrics provide a structured framework for grading, they may not fully reflect the nuances of a project's quality [2, 3]. Additionally, the critique process, where students present their work to a jury or panel, can introduce further discrepancies in grading, because individual biases or interpretations of the design may influence assessments.

Closely related to grading is the issue of feedback in studio environments. Providing constructive and effective feedback is essential to student development, yet it is often met with resistance from students who struggle to accept criticism [1]. The collaborative and evolving nature of design studios further complicates the feedback process. In these settings, student performance is shaped by the quality of their work and their interactions with peers and instructors throughout the project's development [4, 5]. The transition to online design studios during the COVID-19 pandemic introduced additional challenges in delivering timely and meaningful feedback, increasing the difficulty of fostering the same level of engagement and mentorship as in traditional settings [6].

Another important but less-explored factor influencing grading in architectural education is the role of instructors' emotions. Emotions such as frustration, anxiety and joy can significantly affect how instructors grade student work [7, 8]. These emotions are influenced by various factors, including teaching experience, personal circumstances and classroom dynamics [9]. The emotional state of an instructor can impact not only the grades they assign but also their interactions with students during the feedback process. This effect is particularly relevant in the context of the COVID-19 era, where the pressures of online teaching and the lack of face-to-face interactions have heightened emotional stress for students and instructors. Understanding how these emotional factors affect grading practices is critical for improving the

overall learning experience in architectural education.

This study aims to evaluate the impact of online teaching on the grades of architecture studio students at King Saud University. By comparing students' performance in traditional in-person design studios with those in online settings, this research seeks to identify how modern educational methods, accelerated by the pandemic, have influenced student outcomes. The findings provide valuable insights for educators, administrators and policymakers, offering guidance on developing more effective teaching strategies that support students and instructors in a rapidly changing educational landscape.

II. Online Teaching in Higher Education

Integrating online teaching in higher education represents a paradigm shift in educational delivery, offering opportunities and challenges, particularly in disciplines like architecture. Online teaching allows flexibility in scheduling and accessibility, enabling students to engage with course materials and assignments at their own pace and from various locations [10]. This flexibility is particularly advantageous for architecture students who often balance studio work with other academic and practical commitments [2]. Online platforms also facilitate the integration of multimedia resources, virtual reality simulations and collaborative tools, enhancing the educational experience beyond traditional classroom settings [11].

However, the transition to online teaching in architecture also presents significant challenges. One major concern is the loss of physical studio space, which traditionally serves as a hub for creative collaboration and hands-on learning [2]. Online environments may struggle to replicate the tactile and immersive experiences crucial to architectural education, potentially impacting students' development of design skills and spatial awareness.

Remotely assessing and providing feedback on design projects can also be challenging because it requires innovative approaches to ensure the integrity and fairness of evaluations [12]. Technical issues such as internet connectivity and software compatibility further complicate the implementation of online teaching in architecture, requiring robust infrastructure and support systems [13]. Understanding these advantages and challenges is essential for evaluating the effectiveness of online teaching in architecture studio courses. This literature review will explore existing research and provide insights into how online teaching impacts student performance and educational outcomes in architectural education, ultimately aiming to address the main purpose of the study: to evaluate the impact of online teaching on the grades of architecture studio students at King Saud University.

A. Academic Impact of Online and Blended Learning in Architectural Design Studios

The COVID-19 pandemic prompted a sudden shift in architectural education, necessitating the transition to online teaching in design studios. This shift brought significant challenges, particularly in maintaining the quality of student performance and assessing academic outcomes. Although the design studio remains a crucial part of architectural education, facilitating hands-on learning and fostering creativity, understanding how the online format affects student achievement, particularly regarding grades, is increasingly needed. Several studies have begun to examine the impact of this shift on student grades. For instance, Rabboh [14] highlighted the importance of quantitative assessments of studio performance during the pandemic. Although this study focused primarily on student ratings of their experiences in online design studios, it underscored the need for objective measures of academic performance to complement these subjective assessments.

A more focused study by Lukman and Sahid [15] explored the implementation of online design studios in Iran and surveyed the effects of online teaching on student grades. Although students demonstrated adaptability to the online format, the researchers noted that the hybrid model, which combines online and offline learning, was preferred by students for its ability to mitigate the limitations of fully online studios. Their research also indicated a need to explore further the correlation between these formats and academic performance, specifically regarding how each method impacts students' grades.

Similarly, Yu *et al*. [16] investigated the effectiveness of online platforms, such as Blackboard Collaborate Ultra, in simulating face-to-face studio activities. Their study provided evidence that, although these platforms successfully maintained educational continuity, they could not fully replicate the hands-on and interactive aspects of traditional design studios. They also noted that the absence of physical studio environments, which are key to collaboration and immediate critique, may have had an adverse impact on student outcomes, particularly in complex, creative tasks that require peer and instructor feedback.

Bernard *et al*. [17] also conducted a meta-analysis examining the relationship between the quality of interaction in distance education and student achievement. Although not specific to architectural design studios, their findings reinforce the notion that interactive engagement is crucial for student success in virtual environments. The reduced interaction in online design studios could therefore negatively impact grades because interaction plays a pivotal role in refining student design projects through iterative feedback.

By contrast, some studies have reported positive outcomes from online and blended teaching methods. For example, Al Maani *et al*. [18] documented that student, despite the challenges of transitioning to online platforms, were able to achieve learning objectives in architecture courses. However, the study did not delve deeply into the relationship between online teaching and academic performance regarding grading outcomes, leaving an important gap in understanding how student grades are influenced in this context.

In summary, although current research has explored various facets of online design studios, additional targeted studies that examine how online teaching impacts student grades in architectural education are needed. Understanding this relationship is crucial for educators because they refine online and hybrid teaching methods to ensure that student learning outcomes, particularly grades, are not compromised in the evolving educational landscape.

B. Grade Inflation Phenomenon in Higher Education

Grade inflation, or the persistent increase in grade point averages without corresponding improvements in student performance, is a pervasive issue in higher education institutions worldwide [19, 20]. This phenomenon has multifaceted origins, driven by various factors elucidated in the literature.

Institutional Pressures: Institutional pressures to maintain high student satisfaction and retention rates are significant contributors, particularly in an increasingly competitive educational environment where institutional rankings and reputations are closely scrutinised [21, 22]. The need to attract and retain students, often influenced by student evaluations of teaching, may lead faculty to inflate grades to bolster positive feedback and maintain enrolments [22]. Institutions may also face external pressures from accreditation bodies and funding agencies, potentially indirectly encouraging grade inflation by emphasising high graduation rates and student success metrics. The competitive nature of higher education, where institutions vie for top spots in rankings and league tables, further exacerbates the pressure to maintain high grades.

Student Expectations and Entitlement: Grade inflation is also fuelled by student expectations and entitlement. Some students perceive themselves as deserving of high grades irrespective of actual performance, a trend reinforced by societal beliefs that equate academic success with future job prospects [23, 24]. This entitlement mindset is exacerbated by a consumer-oriented approach in higher education, where students are viewed as clients whose satisfaction often influences institutional decisions, including grading practices [25]. Students' expectations for high grades can pressure faculty to award higher marks, even when the quality of work does not merit such grades. This phenomenon is further compounded by the increasing cost of higher education, where students and their families expect a return on investment through high grades and successful career outcomes. The prevalence of social media and online platforms where students share their grades and academic achievements can also contribute to a competitive environment, fostering a sense of entitlement and expectation for high grades among peers.

Faculty-Related Factors: Faculty-related factors also play a pivotal role; instructors may inflate grades to maintain positive relationships with students or mitigate conflicts arising from lower assessments [20, 21]. Instructors may feel pressured to award higher grades to avoid negative evaluations from students, which can impact their career progression, tenure and promotion opportunities. Faculty members' desire to be perceived as supportive and approachable can also lead to grade inflation because they may believe that higher grades will result in better student–teacher relationships and classroom dynamics.

Faculty members may also face institutional pressures to conform to grading norms and expectations set by their departments or institutions, potentially influencing their grading practices. In some cases, instructors may also lack adequate training or support in implementing fair and consistent grading practices, leading to unintentional grade inflation.

Institutional Dynamics: Institutional dynamics further contribute to grade inflation, particularly through competitive pressures among schools and the utilisation of standardised tests for admissions. Schools may inflate grades to attract and retain high-achieving students, especially when such students are essential for bolstering institutional prestige and securing financial aid [26, 27]. Discipline-specific variations exist, with science and engineering-focused institutions traditionally maintaining stricter grading standards than those emphasising liberal arts education. Regional disparities also influence grading practices, with institutions in some geographic areas historically awarding lower grades than counterparts in other areas [27]. Using standardised testing and other metrics for admissions and funding can incentivise institutions to inflate grades to ensure their students perform well on these assessments. The pressure to maintain high academic standards and meet external benchmarks can lead to a culture where grade inflation becomes normalised.

Consequences of Grade Inflation: The consequences of grade inflation are profound and multifaceted. Beyond undermining the reliability of grades as indicators of academic achievement [28], grade inflation diminishes student motivation to excel and can distort perceptions of educational attainment [27]. Inflated grades may mislead graduate and professional school admissions committees about students' capabilities, potentially affecting career opportunities and long-term success [29]. Furthermore, grade inflation risks eroding the value of degrees conferred by higher education institutions, posing challenges to the credibility of educational standards [28]. The long-term implications of grade inflation include a potential devaluation of academic credentials, making it difficult for employers and academic institutions to distinguish between exceptional students and those who have benefited from inflated grades. This difficulty can lead to a loss of trust in the education system and a decrease in the overall quality of education.

Understanding the phenomenon of grade inflation in higher education is crucial for evaluating its impact on specific disciplines, such as architecture studio classes. The unique nature of architectural education, which relies heavily on subjective assessments and creative outputs, may be particularly susceptible to grade inflation. This study explores how these broader trends in grade inflation manifest within the context of architecture studio classes at King Saud University, providing insights into the specific challenges and implications for grading practices in this field. By examining the factors contributing to grade inflation in architecture studio classes, this research seeks to identify strategies to mitigate its effects and ensure that grades accurately reflect student performance and learning outcomes.

III. Assessment Methods in Design Studios

Assessment methods in design studios are integral to evaluating architecture students' multifaceted skills and competencies. Design studios are pivotal in architectural education, providing environments where students can cultivate their design creativity, technical proficiency and critical thinking skills [30]. The assessment process typically

involves evaluating design projects presented by students to faculty juries or panels, who assess the projects based on predefined criteria encompassing technical execution, conceptual innovation, problem-solving abilities and presentation skills [3].

Rubrics are commonly employed to provide structure and consistency in assessment. These rubrics outline specific criteria against which student projects are evaluated, helping instructors to offer constructive feedback and ensuring transparency in grading practices [1]. However, the subjective nature of design evaluation poses challenges because assessing the qualitative aspects of creativity and innovation can vary among assessors and may introduce biases [3]. The diverse nature of design projects also demands flexible assessment approaches that accommodate various design methodologies and interpretations. The physical environment of design studios also influences assessment practices. Factors such as studio layout, resource access and student collaborative dynamics contribute to the overall learning experience and impact the assessment process [4]. With advancements in digital technologies, there is a growing trend towards integrating digital tools into assessment methods. Digital platforms allow for the evaluation of virtual models, digital prototypes and collaborative projects, enabling more comprehensive assessments of students' spatial reasoning abilities and digital design skills [6].

In addition to project-based assessments, some design studios incorporate peer reviews and self-assessment strategies to promote reflective learning and peer collaboration [5]. These approaches foster a deeper understanding of design principles and encourage students to take ownership of their learning process and development as future architects.

A. Clarity of Requirements on Grading

Clarity in requirements within schools of architecture significantly influences students' academic performance, as evidenced by several studies. Oluwatayo *et al.* [31] explored architecture students' perceptions of their learning environment and its effects on their grades, noting that flexible scheduling, positive assessment practices and fairness positively correlate with overall academic achievement. This correlation underscores the role of adaptable educational practices in enhancing student outcomes. Flexible scheduling allows students to manage their time more effectively, balancing studio work with other academic and personal commitments. Positive assessment practices, which include constructive feedback and clear grading criteria, help students understand their strengths and areas for improvement, fostering a growth mindset. Fairness in assessments ensures that all students are evaluated equally, promoting a sense of justice and motivation to excel.

Similarly, Aluko *et al.* [32] utilised machine learning to predict academic success among architecture students. They highlighted that those subjects with clear, well-defined requirements—such as mathematics—significantly predict higher grades. This emphasises the pivotal impact of explicit expectations on student performance. Clear requirements give students a roadmap of what is expected, reducing ambiguity and anxiety. This clarity allows students to focus on meeting specific goals, leading to better academic outcomes. The use of machine learning in this study also underscores the potential of advanced technologies to identify key predictors of academic success, enabling educators to tailor their teaching strategies accordingly.

BrckaLorenz *et al.* [33] examined effective faculty practices and found that clear communication of course goals and requirements fosters greater student engagement and deeper learning approaches. This finding indicates that transparent pedagogical practices contribute to improved academic performance. When students understand the objectives of a course and the criteria for success, they are more likely to engage deeply with the material, ask questions and seek help when needed. This engagement leads to a more meaningful learning experience and higher academic achievement. Faculty members who communicate expectations also build trust with their students, creating a positive learning environment that encourages academic excellence.

Sen *et al.* [34] also explored learning approaches in architecture education, concluding that students employing deep learning strategies—marked by a comprehensive understanding of requirements and concepts—achieve high academic grades. This conclusion highlights the correlation between clarity in requirements and students' academic success. Deep learning strategies involve critical thinking, problem-solving and applying knowledge in new contexts. When students clearly understand what is expected of them, they are more likely to adopt these strategies, leading to a deeper comprehension of the subject matter and better academic performance.

In summary, the findings underscore the critical role of clarity in requirements within schools of architecture in shaping students' academic outcomes. Clear and well-defined expectations enhance student understanding and engagement, contributing to overall academic success. Architecture schools can effectively support their students' educational journey and achievement by prioritising transparent communication of requirements and fostering conducive learning environments. By doing so, they can ensure that students are well-prepared to meet the challenges of their academic and professional careers, ultimately contributing to the advancement of architecture.

B. Instructors' Impact on Grading

In university settings, instructor characteristics such as their position, qualifications and behaviours profoundly influence student grading outcomes. The quality of instructors has consistently been shown to play a pivotal role in student success metrics, including lower dropout rates and improved academic performance [35]. High-quality instructors are adept at fostering engaging learning environments and providing effective guidance, positively influencing students' understanding of course materials and their ability to achieve higher grades. For instance, instructors who demonstrate clarity in their explanations, responsiveness to student inquiries and a supportive teaching demeanour tend to enhance student learning experiences and subsequent grading outcomes [36]. These instructors often employ various teaching methods to cater to different learning styles, ensuring

that all students have the opportunity to succeed. Their ability to create an inclusive and motivating classroom atmosphere can significantly impact students' academic achievements.

The academic rank and terminal degrees held by instructors can have nuanced effects on grading practices. Research conducted at the US Air Force Academy revealed that instructors with higher academic ranks and terminal degrees sometimes correlate with lower current grades but higher future grades for students [37]. This dual impact suggests that although highly qualified instructors may initially challenge students with rigorous academic standards, they also equip them with valuable skills and knowledge that yield better long-term educational outcomes. Conversely, the tenure status of instructors also influences grading practices; instructors in less secure positions may feel pressured to inflate grades to maintain positive student evaluations or job security, contrasting with tenured faculty who may uphold stricter grading standards [38]. This dynamic emphasises the importance of supporting non-tenured faculty through professional development and institutional policies that encourage fair and consistent grading without fear of negative repercussions.

Gender dynamics between instructors and students can also affect grading outcomes. Research examining introductory physics courses found that instructor gender significantly influenced student course grades, suggesting that gender perceptions and interactions in the classroom may subtly influence student evaluations and subsequent grading [39]. For example, students may have different expectations and biases based on the gender of their instructor, which can affect how they perceive the instructor's teaching effectiveness and, consequently, their performance and grades. This underscores the importance of considering diverse perspectives and equitable treatment in educational settings to mitigate potential biases in grading. Addressing these biases requires ongoing training and awareness programs for faculty and students to foster an inclusive and equitable academic environment.

Additionally, student evaluations of instructors serve as a critical factor in grading outcomes. Studies consistently report significant correlations between favourable student evaluations and higher grades awarded by instructors [40]. These evaluations reflect students' perceptions of teaching quality, instructional effectiveness and interpersonal interactions, all of which can influence their academic performance and overall educational experience. Instructors who receive positive evaluations may feel encouraged to maintain or even inflate grades to continue receiving favourable feedback, whereas those with lower evaluations might feel pressured to adjust their grading practices to improve their ratings. This relationship underscores the need for institutions to develop comprehensive evaluation systems that balance student feedback with other measures of teaching effectiveness, ensuring that grading practices remain fair and objective.

In conclusion, the multifaceted impacts of instructor characteristics on student grading underscore the complexity of educational environments. Institutions must recognise and support instructors in fostering fair and effective grading practices, prioritising academic rigour, student engagement and equitable evaluation frameworks. By understanding and leveraging the diverse influences of instructor attributes, universities can enhance educational outcomes and promote a conducive learning environment for all students. This holistic approach not only benefits students but also supports instructors in their professional growth and development, ultimately contributing to the overall quality of education.

IV. Research Design

The research design for this study employed a mixed-methods approach to investigate the factors influencing grading practices among students at King Saud University (KSU). This methodological choice was selected to provide a comprehensive understanding of how grading decisions are made and perceived within KSU's educational environment, covering online and traditional learning modes. A case study method was implemented, focusing on gathering detailed data through in-depth interviews with students selected from diverse academic backgrounds and with varied experiences in online and traditional learning environments [41]. These interviews were designed to elicit students' perspectives on various aspects of grading, including their interactions with instructors, perceptions of fairness in assessment and experiences with grade fluctuations across different learning modes.

The qualitative approach involved thematic analysis of the interview data to identify recurring patterns, themes and insights regarding grading practices in online and traditional learning environments [42]. This analytical process sought to uncover specific contexts, challenges and rationales influencing grading outcomes from the student's standpoint. By focusing on individual cases within KSU and comparing experiences between online and traditional settings, the study aimed to provide nuanced insights into the factors shaping grading practices. This approach underscores the importance of understanding local contexts and perspectives in effectively addressing educational challenges related to grading practices.

Overall, the case study method within a qualitative framework provides a robust approach to exploring grading practices, contributing valuable insights that can inform educational policies and practices aimed at enhancing fairness and transparency in grading at KSU and similar academic institutions.

A. Case Study Method and Participants

Participants were selected from the men's section of the College of Architecture and Planning (CAP) for the case study at King Saud University. The selection criteria focused on two distinct groups within this setting. The selection process was carefully designed to ensure that instructors and students who participated were representative of the phenomena being investigated, particularly grade inflation and its fluctuations within upper-level design studios during the COVID-19 pandemic.

Instructors: Five instructors from the CAP at King Saud University were selected, each representing different design studio levels (Design 5, 6, 7 and 8). These instructors were chosen based on their teaching roles during the semesters under review (before, during and after the pandemic). Two

instructors from Design 7 were intentionally included because this studio exhibited consistent grading outcomes despite the pandemic's challenges, making it a critical case study for the research.

Students: The student participants were selected based on significant trends in grade inflation and fluctuation observed in their respective design studios. The quantitative analysis of grade records identified students whose grades showed notable variations during the pandemic semesters. These students provided valuable insights into the grade inflation phenomenon, helping to explore the underlying causes during the qualitative phase of the research.

To engage these participants, they were contacted via email, providing detailed information about the study, its objectives and their roles. Informed consent was obtained from all participants, who could participate or decline without repercussions. The instructors participated in qualitative surveys, while students were involved in focus group interviews conducted via Zoom. This structured approach ensured that the insights gathered were directly relevant to the research questions.

The first group comprised five instructors, each representing a different design studio, except for Design 7, where two instructors were chosen for the case study. These instructors were selected based on their extensive experience and diverse perspectives within the architecture program.

The second group consisted of students whose grades in their respective design studios exhibited notable grade inflation and fluctuation trends. These students were identified by carefully examining grading patterns and performance records across online and traditional learning modes. Tables 1 and 2 provide detailed demographic information about the recruited participants, highlighting their academic backgrounds, years of study and specific design studio affiliations.

This approach ensured a comprehensive exploration of grading practices from instructor and student perspectives within the unique context of the CAP at King Saud University.

Table 1. Demographic information of the participant instructors

Category	Instructor				
	1	2	3	4	5
Gender	Male	Male	Male	Male	Male
Years of Experience in Teaching Design Studios (before 2020)	23	15	10	25	27

Table 2. Demographic information of the participant students

Category	Student				
	1	2	3	4	5
Gender	Male	Male	Male	Male	Male
Observed Design Studio	Design 5	Design 6	Design 5	Design 6	Design 5
Semester	Fall 2020	Spring 2020	Fall 2020	Spring 2020	Fall 2020

The development of the data collection tool, particularly the interview questions, was grounded in the principles of explanatory sequential design and phenomenological research, providing a robust theoretical foundation for the study.

Explanatory Sequential Design: As outlined by Creswell and Clark [43], this mixed methods approach allowed for the cohesive integration of quantitative and qualitative research phases. The initial quantitative phase identified key trends and patterns in grade inflation, which directly informed the design of the qualitative phase. This approach ensured that the qualitative data collection was specifically tailored to explore and explain the phenomena identified earlier in the study.

Phenomenological Research: The qualitative phase was further informed by phenomenological principles, which focus on exploring participants' lived experiences and perceptions [44]. This approach was particularly relevant to the study because it enabled a deep exploration of how instructors and students experienced and interpreted the fluctuations in grade inflation within their educational environment during the pandemic. The phenomenological lens ensured that the interview questions captured the complexity and depth of these experiences, providing a more comprehensive understanding of the factors contributing to the observed phenomena.

Data Collection Tool: The interview questions were designed to explore the underlying reasons behind the grade trends observed during the quantitative analysis. Open-ended questions were employed to capture the nuanced perspectives of instructors and students, aligning with qualitative research principles and enhancing the validity and reliability of the findings.

The research design employed for this study involved the development of two distinct questionnaires tailored to the specific roles and perspectives of instructors and students within the CAP at King Saud University, Saudi Arabia. These questionnaires were carefully crafted with approximately 10 open-ended questions each, designed to capture a range of insights and perspectives related to grading practices within the context of architectural design studios. The qualitative surveys were structured so instructors could investigate their experiences and perceptions regarding the grading scenarios observed in their respective design studios. The questions helped to reveal factors influencing grading decisions, perceptions of grade inflation or fluctuation and any challenges encountered in maintaining grading consistency. These surveys were administered electronically to ensure ease of completion and data collection.

Conversely, the qualitative approach with students involved conducting focus group interviews via Zoom, an online platform chosen for its accessibility and ability to facilitate group discussions. The focus group sessions were designed to encourage students to share their personal experiences, viewpoints and interpretations regarding the observed trends in grade inflation and fluctuation within the design studios. The sessions were organised to accommodate the five participating students' schedules, each lasting approximately 45 minutes. The focus group interviews were divided into two sessions due to scheduling constraints to ensure comprehensive data was attained. The first session included three participants, while the remaining two students participated in the second session. This approach facilitated in-depth discussions and allowed for a more nuanced exploration of individual perspectives and experiences related to grading practices in architectural education.

After the data collection, all qualitative data obtained from

the surveys with instructors and the focus group interviews with students were meticulously recorded and transcribed. The next step involved coding the transcripts using an inductive approach, where themes and codes were derived directly from the data. This bottom–up methodology was chosen to maintain a data-driven analysis, allowing for exploring diverse perspectives without imposing preconceived notions or biases.

In addition to qualitative data collection through surveys and focus group interviews, quantitative data on students' grades in architectural design studios before and after implementing online teaching methods were gathered for comparative analysis. This quantitative component involved accessing historical grade records from the CAP at King Saud University. Specifically, grade data spanning several semesters before adopting online teaching methods were compiled and compared with grades obtained after the transition to online instruction. The objective was to quantitatively assess any discernible differences or trends in students' grades before and after the introduction of online teaching. This comparative analysis provided a complementary perspective to the qualitative findings, offering insights into the potential impact of the teaching modality shift on grading outcomes in architectural education. By triangulating qualitative insights with quantitative data, the study aimed to comprehensively understand how online methods may have influenced grading practices and student performance in architectural design studios at King Saud University.

The data collection process began by compiling grades from selected design studios, including coursework and final presentations. This data structured to facilitate several key analyses, starting with a general comparison of grade averages across Designs 5, 6, 7 and 8 was conducted. This analysis spanned two semesters before COVID-19, three semesters during COVID-19 and two semesters post-COVID-19 (Table 3). The objective was to identify grade peaks, fluctuations and trends across different levels of design studios to discern patterns that warranted further investigation. Secondly, instructor tracking was implemented to assess grading consistency across different design levels. A sample instructor from each level was tracked over six semesters: one semester pre-COVID-19, three semesters during COVID-19 and two semesters post-COVID-19. This analysis aimed to identify differences in grading practices among instructors and guide the selection of participants for the study's qualitative phase. Thirdly, student tracking focused on identifying significant grade changes during the COVID-19 semesters. This analysis aimed to pinpoint students whose grades exhibited notable variations or trends, potentially shedding light on grade inflation during the pandemic and guiding participant selection for the qualitative phase.

Table 3. Listing all semesters included in this study

Gregorian Year	Hijri Year	Semester	Months	Teaching method
2019	1440.2	2nd (2019 Spring)	Jan - May	Traditional (T)
2019	1441.1	1st (2019 Fall)	Aug - Dec	Traditional (T)
2020	1441.2	2nd (2020 Spring)	Jan - May	Switch to Online (S) Effective March
2020	1442.1	1st (2020 Fall)	Aug - Dec	Online (O)
2021	1442.2	2nd (2021 Spring)	Jan - May	Online (O)
2021	1443.1	1st (2021 Fall)	Aug - Dec	Traditional (T)
2022	1443.2	2nd (2022 Spring)	Jan - May	Traditional (T)
2022	1443.2	2nd (2022 Spring)	Jan - May	Traditional (T)

V. Results Analysis

The analysis of grade averages across advanced architecture studio courses highlights significant peaks and fluctuations, encompassing grades from final exams and semester assignments. During the COVID-19 period, particularly in 2020, notable peaks were observed, such as an average of 87.52 for Design 6 in Spring 2020 and 84.12 for Design 5 in Fall 2020 (Fig. 1).

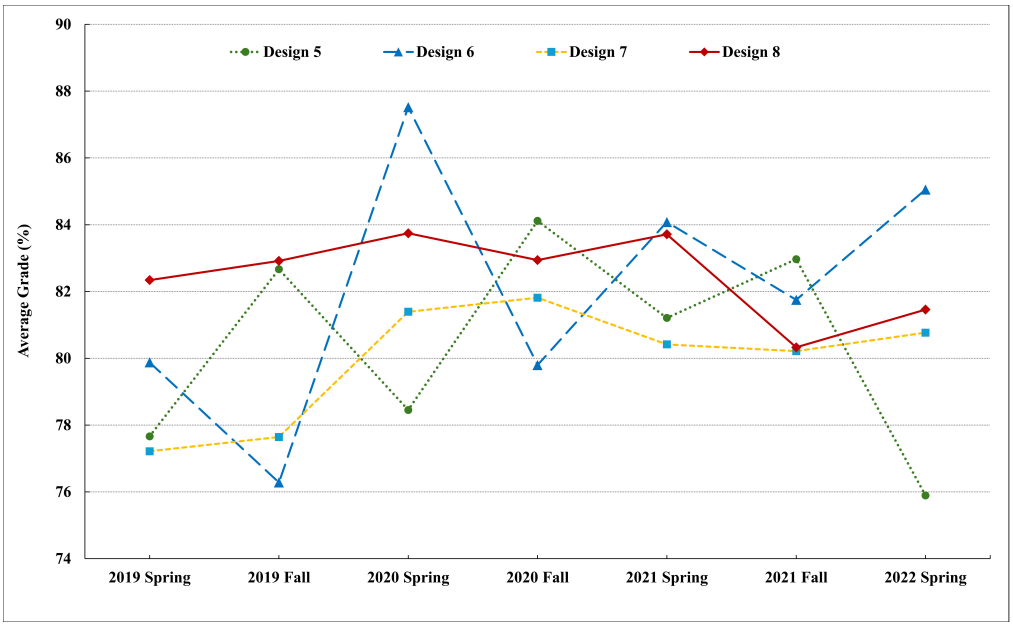

Fig. 1. Average grades for all sections (D5-D8).

The graph depicting average grades from Spring 2019 to Spring 2022 illustrates distinct trends: before the onset of COVID-19, grades exhibited varied patterns, with some courses showing improvement while others experienced declines. The initial impact of COVID-19 in 2020 resulted in widespread grade variations, reflecting the challenges associated with the abrupt transition to online learning modalities. In 2021, a trend of recovery and stabilisation became evident across most courses as instructors and students adapted to the new learning environment. However, by Spring 2022, Design 8 experienced a noticeable decline in grades, pointing to specific challenges faced in that semester, possibly related to the culmination of the academic program. Overall, the pandemic's influence on student performance is characterised by initial declines followed by a period of adaptation and varying degrees of recovery, highlighting the dynamic nature of educational outcomes during unprecedented disruptions.

The grade trends in the Design 5 architecture studio course from Spring 2019 to Spring 2022 exhibit significant fluctuations (Fig. 2 a)). Prior to the COVID-19 pandemic, most students achieved grades in the B range, with a slight decline observed by Fall 2019. The onset of the pandemic in Spring 2020 led to an increase in lower grades. However, by Fall 2020, a notable recovery occurred, with students achieving higher grades. Throughout 2021, top grades varied, but a decrease was found in the number of students receiving the lowest grades, indicating a level of adaptation to the new learning environment. By Spring 2022, a decline in top grades was observed, potentially indicative of ongoing challenges or pandemic-related fatigue. This pattern suggests an initial struggle with the transition to pandemic conditions, followed by a period of adaptation and varying degrees of recovery in student performance.

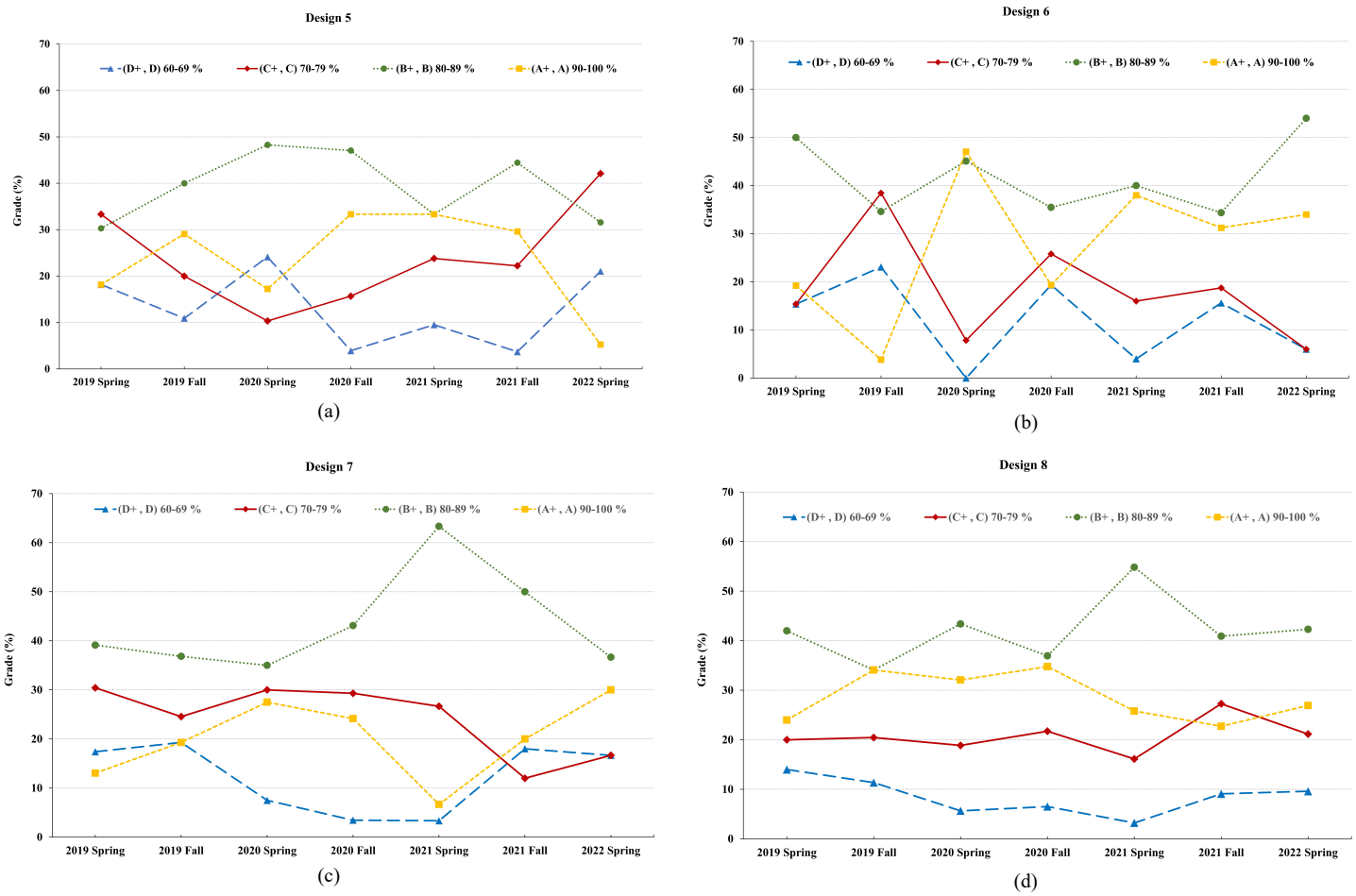

Fig. 2. Grades in percentages from grades D to A for Design 5, 6,7, and 8.

The grade trends for the Design 6 course from Spring 2019 to Spring 2022 demonstrate significant evolution (Fig. 2 b)). Before the COVID-19 pandemic, most students earned grades in the B range, which improved to the A range by Fall 2019. The onset of the pandemic in Spring 2020 led to an increase in lower grades. However, by Fall 2020, a recovery was evident, with higher grades becoming more common. In 2021, the number of A-range grades initially dipped but later stabilised, while the D range saw a peak and subsequent decrease, indicating academic recovery. By Spring 2022, a notable increase in A grades occurred, suggesting further adaptation and improved performance. Overall, although the pandemic initially disrupted student grades, subsequent semesters showed resilience and a positive trend in academic performance.

However, the grade trends in Designs 7 and 8 courses from 2019 to 2022 reflect diverse responses to the pandemic (Figs. 2 c) and 2 d)). In Design 7, grades were initially spread evenly, leaning towards the B range. However, in Spring 2020, a notable rise in A grades occurred, likely due to changes in course delivery at the pandemic's onset. Following this, grades were normalised with a peak in the B

range. The trend toward higher performance continued into 2022, suggesting effective adaptation to pandemic challenges and a consistent presence of higher grades, indicating successful adjustment to the new teaching and learning conditions. In Design 8, grades improved from the B to the A range pre-COVID-19. The onset of the pandemic in Spring 2020 led to a decrease in A grades, replaced by B and C grades. However, a recovery was observed by the Fall of 2020. In 2021, grades fluctuated, peaking in the A range by Fall. Spring 2022 saw a concerning decline in top grades, possibly indicating challenges related to the pandemic or graduation pressures. This pattern suggests an initial pandemic impact, followed by recovery and a recent downturn in student performance.

A. Student Tracking

The grade peaks observed during COVID-19, particularly in the Design 5 cohort in Fall 2020 and the Design 6 cohort in Spring 2020, are now highlighted. Figure 1 presents the averages of all sections for Design 5 through Design 8 from Fall 2019 to Spring 2022. For the Design 5 course, three students were selected based on their grade fluctuations, and for the Design 6 course, two additional students were chosen due to their significant grade spikes during the COVID-19 semester.

All nominated students participated in the focus group, providing insights on 'Architecture Students' Experience on Grading During COVID-19'. Their responses highlighted various viewpoints and concerns during online instruction and evaluation.

Regarding Grading Standards Awareness and Implementation, all students (S1, S2, S3, S4, S5) agreed that grading standards were communicated and implemented. However, S4 noted that some requirements, like physical models, were adjusted due to COVID-19 restrictions: 'The physical model was not required, and its grade was added to the 3D visualisation'.

Regarding Awareness of Grades Throughout the Semester, responses varied. S2 mentioned, 'Each faculty member has a system for grading and declaring grades throughout the studio', applicable in both real and virtual settings. S1 found the grading system consistent, and S2 added, 'Sometimes in the online studio [grading system] is clearer'. Emotional support was noted by S3, 'The instructor gave us support and asked us not to worry about grades'. S4 received grades late and considered withdrawing based on instructor comments. S5 was satisfied with his performance.

Additionally, for Professors' Performance in Evaluating Student Work, S1 and S2 felt COVID-19 did not significantly impact grading. S2 observed, 'Some professors were sharp on some course requirements', with S3 adding, 'Professors expected more during COVID-19'. Miscommunication was a concern for S2: 'When I consulted them, they evaluated my work, but I wanted comments only'. S4 highlighted the benefits of digital work: 'More work was performed, and more innovative ideas were created. Presenting slides on screen was easier than printing'.

Regarding Challenges During Online Study, most students did not face significant challenges. S2 mentioned difficulties with private space: 'Sometimes I faced disturbances and noise during online studios'. S4 noted minor technical issues: 'Sometimes sketching on Zoom whiteboard was challenging, but it did not affect grades'.

Finally, for Changes in Evaluation Methods, S1, S4 and S5 saw no significant changes. S3 felt online studios improved project quality: 'The online studio made the design project better'. However, S2 raised concerns about using freelancers: 'Students relied on freelancers for visualisation during COVID-19'. S2 also noted more external jurors in online critiques: 'We had more jurors during online juries, providing more helpful critiques'.

B. Instructor Tracking

Throughout six semesters, instructors from each level were tracked to compare grading consistency across different design levels. Five instructors were nominated based on their continuous teaching through all selected semesters, with Design 7 having two instructors due to its dual track-based projects. The summarised findings from the survey 'Architecture Instructors' Experience on Grading Students During the COVID-19 Period' reveal diverse perspectives and challenges the five educators face during online teaching and assessment.

As regards Assessment Experience Before and During COVID-19, instructors had varied views on the assessment experience before and during COVID-19. P1 noted a 'major change' without specifics. P2 criticised online learning, saying, 'Architecture cannot be online!' and found results average. P3 saw consistent assessment but reduced 'interaction in teaching'. P4 highlighted the psychological impact on students, while P5 saw no change due to rubric use, maintaining stability. These responses show the complexity of adapting to online learning, emphasising student-faculty interactions and clear assessment criteria.

Secondly, the discussion focused on Factors Impacting Grading During COVID-19. Instructors identified multiple factors affecting grading during COVID-19. P1 cited technical challenges and student enthusiasm. P2 mentioned leniency and psychological impacts, saying, 'We became strange people', and noted insufficient grade control. P3 highlighted interactivity, psychological and technical issues. P4 emphasised academic, technical, psychological and social challenges. P5's grading was unaffected due to effective rubric use. These responses reveal the multifaceted impact of the pandemic, with clear assessment criteria ensuring consistency.

Next, the instructors were asked about Technology's Role in Assessing Student Work, and responses varied regarding technology's benefits. P1's response, 'Great', was brief. P2 highlighted digital tools and global participation, while P3 and P4 emphasised the utility of Zoom. P5 focused on learning various virtual tools. These responses show technology's significant role in assessment, with some instructors adopting proactive approaches to digital tools.

Then, regarding Changes in Student Performance During COVID-19, instructors observed varied impacts on student performance. P1 noted weaker outcomes due to non-compliance. P2 mentioned increased laziness among professors and students. P3 saw underperformance due to limited interaction. P4 noted a general decline in performance. P5 identified issues such as lack of necessary hardware, skills,

network stability and communication challenges. These responses highlight compliance, motivation, interaction and technical challenges affecting student performance.

Finally, when discussing Grade Inflation During COVID-19, instructors attributed grade inflation during COVID-19 to several factors. P1 cited 'empathy' and leniency. P2 emphasised increased tolerance due to pandemic-related issues. P3 pointed to 'psychological factors'. P4 highlighted emotional support from professors. P5, however, did not notice grade inflation, attributing consistency to rubric use. These responses reflect the influence of empathy, tolerance, psychological factors and clear assessment criteria on grading during the pandemic.

VI. Discussion

The results of this study indicate that the transition to online teaching significantly impacted the grading practices in architecture studio classes at King Saud University. The quantitative analysis revealed fluctuating grades across different design levels, with notable variations before, during and after the pandemic. For instance, Design 5 experienced shifts from predominantly B-range grades to peaks in A-range grades during certain semesters, while Design 7 maintained consistently high grades, indicating successful adaptation to online learning. These findings align with previous research highlighting the challenges and opportunities associated with online architectural education during the COVID-19 pandemic [45, 46].

The qualitative insights from surveys and focus group interviews further elucidate the diverse experiences of instructors and students during this transition. Instructors reported difficulties in maintaining grading standards and adapting assessments to the online format, leading to increased leniency in grading. By contrast, students expressed mixed experiences, with some appreciating the flexibility of online learning while others faced technical issues and varied levels of instructor support. These observations are consistent with the literature on online learning, which underscores the importance of robust technical infrastructure and effective instructor support in ensuring successful online education [47–49].

The study's findings on grade inflation during the pandemic are also noteworthy. The increased leniency in grading observed in this study reflects broader trends in higher education, where institutions faced pressures to accommodate students' needs during unprecedented times. This phenomenon of grade inflation has been documented in various studies, highlighting the need for transparent grading criteria and consistent assessment practices to uphold academic standards [48, 49].

VII. Conclusion and Recommendations

This study examines the significant changes in architectural education at King Saud University, focusing on grading systems in Architecture Studio Classes. The analysis provides insights into how recent shifts have reshaped pedagogical approaches and student assessment. The emergency transition to online learning posed challenges and opportunities, altering traditional teaching and grading methods. Despite these challenges, instructors maintained their teaching styles while adapting to new circumstances.

The study highlights several key points: enhanced communication, technological adoption, resilience and adaptability. However, variations in grading trends, particularly grade inflation, reflect the complexities of online evaluation and its psychological impacts on academic performance. Instructors exhibited compassion and support towards students, which was essential during this period. Using well-developed rubrics proved critical in maintaining consistency and fairness in grading.

Based on the study's findings, several key recommendations can be made. First, there is a critical need for robust support systems in educational institutions, encompassing technical, psychological and academic assistance tailored to the unique requirements of architecture education. Adopting innovative and flexible teaching methods and integrating digital tools and virtual collaboration are imperative to address the dynamic nature of architectural studies. Additionally, transparent and consistent grading criteria are crucial. Developing clear rubrics adaptable to online and traditional formats is essential for evaluating student creativity, problem-solving abilities and technical skills. Regular assessments of pedagogical strategies and their impact on student performance are also vital. Implementing feedback mechanisms can lead to continuous improvement, and there is a pressing need for research into online architectural education to develop best practices and innovative approaches. Finally, creating a resilient educational framework that can withstand future disruptions is essential. This includes investing in technology-enhanced learning environments, fostering self-directed learning among students and preparing educators for potential shifts between traditional and online teaching scenarios.

In conclusion, the insights gained from this study provide a roadmap for navigating future educational challenges. Embracing adaptability, innovation and resilience will be key in shaping a robust and effective educational landscape. The journey through recent challenges has been a learning experience that will undoubtedly influence the future of architectural education for years to come.

Conflict of Interests

The authors declare no conflict of interest.

Author Contributions

Conceptualisation, A.A. and J.B.; Resources, A.A. and J.B.; Methodology, A.A. and M.Z.A.; Investigation, J.B., and M.Z.A.; Data curation, M.Z.A.; Formal Analysis, J.B. and M.Z.A.; Writing – original draft, A.A. and J.B.; Writing – review & editing, A.A. and M.Z.A. All authors have read and agreed to the published version of the manuscript.

References

[1] D. H. Kincade, W. D. Turner, O. J. Solis, and E. H. Dull, "Assessing millennials in college-level fashion design studios: A study of evidence-based practice," *International Journal of Art & Design Education*, vol. 38, no. 1, pp. 47–59, Feb. 2019. doi: https://doi.org/10.1111/jade.12167

[2] N. S. B. N. B. Shah, J. Nordin, M. H. A. Samad, and K. A. K. Hassan, "Impact of architectural design studio provision on students' creativity: An initial findings," in *Carving The Future Built Environment: Environmental, Economic and Social Resilience (European Proceedings of Multidisciplinary Sciences)*, P. A. J. Wahid, P. I. D. A. Aziz Abdul Samad, P. D. S. Sheikh Ahmad, and A. P. D. P. Pujinda, Eds., 2017, pp. 576–586. doi: 10.15405/epms.2019.12.57

[3] S. Safin, F. Détienne, J.-M. Burkhardt, A.-M. Hébert, and P. Leclercq, "The interplay between quality of collaboration, design project evolution and outcome in an architectural design studio," *CoDesign*, vol. 17, no. 4, pp. 392–409, Oct. 2021. doi: 10.1080/15710882.2019.1699935

[4] E. N. Shaqour, "Improving the architecture design studio internal environment at NUB," *Journal of Advanced Engineering Trends*, vol. 41, no. 2, pp. 31–39, 2021. doi: 10.21608/jaet.2020.51955.1073

[5] U. Hettithanthri and P. Hansen, "Design studio practice in the context of architectural education: a narrative literature review," *Int J Technol Des Educ*, vol. 32, no. 4, pp. 2343–2364, 2022. doi: 10.1007/s10798-021-09694-2

[6] G. Ozorhon and G. Lekesiz, "Re-considering the architectural design studio after pandemic: Tools, problems, potentials," *Journal of Design Studio*, vol. 3, no. 1, pp. 19–36, 2021. doi: 10.46474/jds.927181

[7] R. Pekrun, T. Goetz, W. Titz, and R. P. Perry, "Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research," *Educ Psychol*, vol. 37, no. 2, pp. 91–105, Jan. 2002. doi: 10.1207/S15326985EP3702_4

[8] S. Smith, J. Hill, K. Berlin, J. Choate, and L. McCendrick, "Emotions experienced by instructors delivering written feedback and dialogic feed-forward," *Teaching and Learning Inquiry*, vol. 11, pp. 1–21, 2023. doi: 10.20343/teachlearninqu.11.6

[9] B. Aral and E. Mede, "The impact of emotions on the well-being of the English preparatory program instructors," *Yükseköğretim ve Bilim Dergisi*, no. 3, pp. 574–582, 2018.

[10] I. E. Allen and J. Seaman, "Digital compass learning: Distance education enrollment report 2017," *Babson Survey Research Group*, 2017.

[11] S. Jaggars and T. R. Bailey, *Effectiveness of Fully Online Courses for College Students: Response to a Department of Education Meta-Analysis*, 2010.

[12] M. D. Dixson, "Creating effective student engagement in online courses: What do students find engaging?" *Journal of the Scholarship of Teaching and Learning*, vol. 10, no. 2, pp. 1–13, 2010.

[13] B. Means, Y. Toyama, R. Murphy, M. Bakia, and K. Jones, *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*, US Department of Education, 2009.

[14] E. H. Rabboh, "Examining the impact of students' ratings of architectural design studio on graduation project before and midst COVID-19," *International Design Journal*, vol. 11, no. 4, pp. 267–281, 2021. doi: 10.21608/idj.2021.180936

[15] A. L. Lukman and S. Sahid, "How well can architecture students comprehend the site as design context without performing on-site observation?" *International Journal of Built Environment and Scientific Research*, vol. 5, no. 2, pp. 63–74, 2021. doi: 10.24853/ijbesr.5.2.63-74

[16] R. Yu, M. J. Ostwald, N. Gu, H. Skates, and S. Feast, "Evaluating the effectiveness of online teaching in architecture courses," *Archit Sci Rev*, vol. 65, no. 2, pp. 89–100, Mar. 2022. doi: 10.1080/00038628.2021.1921689

[17] R. M. Bernard *et al.*, "A meta-analysis of three types of interaction treatments in distance education," *Rev Educ Res*, vol. 79, no. 3, pp. 1243–1289, Sep. 2009. doi: 10.3102/0034654309333844

[18] D. Maani, S. Alnusairat, and A. Al-Jokhadar, "Transforming learning for architecture: online design studio as the new norm for crises adaptation under COVID-19," *Open House International*, vol. 46, no. 3, pp. 348–358, Jan. 2021. doi: 10.1108/OHI-01-2021-0016

[19] F. Chowdhury, "Grade inflation: Causes, consequences and cure," *Journal of Education and Learning*, vol. 7, no. 6, pp. 86–92, 2018. doi: 10.5539/jel.v7n6p86

[20] L. G. Wariyo and R. A. Kelbago, "Applying grade inflation adjustment mechanism in an Ethiopian university: Differences in nominal and real grades," *Technium: Romanian Journal of Applied Sciences and Technology*, vol. 2, no. 7, pp. 77–93, Sep. 2020. doi: 10.47577/technium.v2i7.1646

[21] J. Tucker and B. Courts, "Grade inflation in the college classroom," *Foresight*, vol. 12, no. 1, pp. 45–53, Jan. 2010. doi: 10.1108/14636681011020155

[22] W. Wongsurawat, "Grade inflation and law school admissions," *Quality Assurance in Education*, vol. 16, no. 3, pp. 224–235, Jan. 2008. doi: 10.1108/09684880810886240

[23] M. King-Jones and A. Mitchell, "Grade inflation: A problem in nursing?" *Creat Nurs*, vol. 18, no. 2, pp. 74–77, May 2012. doi: 10.1891/1078-4535.18.2.74

[24] D. A. Loffredo and R. Harrington, "Age-related grade inflation expectancies in a university environment," *Educ Res Int*, vol. 2012, no. 1, p. 789470, Jan. 2012. doi: https://doi.org/10.1155/2012/789470

[25] N. Ghaddar and F. Moukallid, "American grade inflation demeaning overseas good students: experience at the American University of Beirut," in *Proc. 2001 Annual Conference*, 2001, pp. 6–150. doi: 10.18260/1-2--8900

[26] M. Nordin, G. Heckley, and U. Gerdtham, "The impact of grade inflation on higher education enrolment and earnings," *Econ Educ Rev*, vol. 73, 101936, 2019. doi: https://doi.org/10.1016/j.econedurev.2019.101936

[27] S. Rojstaczer and C. Healy, "Where a is ordinary: The evolution of american college and university grading, 1940–2009," *Teach Coll Rec*, vol. 114, no. 7, pp. 1–23, Jul. 2012. doi: 10.1177/016146811211400707

[28] B. C. Johnson and L. Pollino, "The voices of the new majority of professors: The adjuncts speak," *Scholar Chatter*, vol. 2, no. 2, 2021. doi: 10.47036/sc.2.2.1-11.2021

[29] E. Karadag, "Effect of COVID-19 pandemic on grade inflation in higher education in Turkey," *PLoS One*, vol. 16, no. 8, e0256688, Aug. 2021. https://doi.org/10.1371/journal.pone.0256688

[30] G. Atakan, "A comparative analysis of methods for triggering 'creative thinking' in design studios," *New Trends and Issues Proceedings on Humanities and Social Sciences*, vol. 2, no. 1, pp. 344–350, 2016. doi: 10.18844/prosoc.v2i1.317

[31] A. A. Oluwatayo, P. A. Aderonmu, and E. B. Aduwo, "Architecture students' perceptions of their learning environment and their academic performance," *Learn Environ Res*, vol. 18, no. 1, pp. 129–142, 2015. doi: 10.1007/s10984-015-9172-7

[32] R. O. Aluko, O. A. Adenuga, P. O. Kukoyi, A. A. Soyingbe, and J. O. Oyedeji, "Predicting the academic success of architecture students by pre-enrolment requirement: using machine-learning techniques," *Construction Economics and Building*, vol. 16, no. 4, pp. 86–98, Jan. 2016. https://search.informit.org/doi/10.3316/informit.503107301168255

[33] A. BrckaLorenz, T. Ribera, J. Kinzie, and E. R. Cole, "10: Examining effective faculty practice," *To Improve the Academy*, vol. 31, no. 1, pp. 148–159, Jun. 2012. doi: https://doi.org/10.1002/j.2334-4822.2012.tb00679.x

[34] G. Sen, A. Adeboye, and O. Alagbe, "The influence of architecture students' learning approaches on their academic performance in two Nigeria universities," *International Journal of Learning, Teaching and Educational Research*, vol. 20, no. 2, pp. 137–151, 2021.

[35] S. G. Winther-Larsen, "Quantifying professors' effect on student grades," EdArXiv, 2022. doi: 10.35542/osf.io/rdq8x

[36] M. Micari and S. Calkins, "Is it OK to ask? The impact of instructor openness to questions on student help-seeking and academic outcomes," *Active Learning in Higher Education*, vol. 22, no. 2, pp. 143–157, Dec. 2019. doi: 10.1177/1469787419846620

[37] J. Feld, N. Salamanca, and U. Zölitz, "Are professors worth it?: The value-added and costs of tutorial instructors," *Journal of Human Resources*, vol. 55, no. 3, pp. 836–863, 2020. doi: 10.3368/jhr.55.3.0417-8752r2

[38] M. Moore and R. Trahan, "Tenure status and grading practices," *Sociological Perspectives*, vol. 41, no. 4, pp. 775–781, Dec. 1998. doi: 10.2307/1389669

[39] A. Ozmetin, M. Dew, T. Erukhimova, and J. Perry, "Does instructor gender matter for student performance in introductory physics?" in *Proc. 2021 Physics Education Research Conference (PERC)*, 2021, pp. 321–326.

[40] S. D. Phipps, R. S. Kidd, and D. Al. Latif, "Relationships among student evaluations, instructor effectiveness, and academic performance," *Pharmacy Education*, vol. 6, no. 4, Jun. 2006.

[41] R. K. Yin, *Case Study Research and Applications: Design and Methods*, SAGE Publications, 2017.

[42] V. Braun and V. Clarke, "Using thematic analysis in psychology," *Qual Res Psychol*, vol. 3, no. 2, pp. 77–101, Jan. 2006. doi: 10.1191/1478088706qp063oa

[43] J. W. Creswell and V. L. P. Clark, *Designing and Conducting Mixed Methods Research*, Sage publications, 2017.

[44] C. Moustakas, *Phenomenological Research Methods*, Thousand Oaks, US: Sage Publication, 1994.

[45] S. Alnusairat, D. Al Maani, and A. Al-Jokhadar, "Architecture students' satisfaction with and perceptions of online design studios during COVID-19 lockdown: the case of Jordan universities," *Archnet-IJAR: International Journal of Architectural Research*, vol. 15, no. 1, pp. 219–236, Jan. 2021. doi: 10.1108/ARCH-09-2020-0195

[46] S. Ceylan, P. Şahin, S. Seçmen, M. E. Somer, and K. H. Süher, "An evaluation of online architectural design studios during COVID-19 outbreak," *Archnet-IJAR: International Journal of Architectural Research*, vol. 15, no. 1, pp. 203–218, Jan. 2021. doi: 10.1108/ARCH-10-2020-0230

[47] B. Mandasari, "The impact of online learning toward students' academic performance on business correspondence course," *EDUTEC: Journal of Education and Technology*, vol. 4, no. 1, pp. 98–110, 2020. doi: 10.29062/edu.v4i1.74

[48] R. Gopal, V. Singh, and A. Aggarwal, "Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19," *Educ Inf Technol (Dordr)*, vol. 26, no. 6, pp. 6923–6947, 2021. doi: 10.1007/s10639-021-10523-1

[49] D. Nambiar, "The impact of online learning during COVID-19: students' and teachers' perspective," *International Journal of Indian Psychology*, vol. 8, no. 2, Nov. 2022. doi: 10.25215/0802.094

Copyright © 2024 by the authors. This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited (CC BY 4.0).