Journal of Media Horizons
ISSN: 2710-4060 2710-4052 Volume 7, Issue 8, 2026

VIRTUAL TEACHING AND PERCEIVED SKILL DEVELOPMENT IN PAKISTANI HIGHER EDUCATION: SURVEY EVIDENCE FROM QUAID-I-AZAM UNIVERSITY

Jasim[*1], Muhammad Arslan[2], Saba Farah[3]

[*1,3]*School of Public Administration, Hohai University, Nanjing, China*
[2]*National University of Modern Languages, Islamabad, Pakistan.*

[*1]Jasimwazir123gmail.com, [2]malikarslan22248@gmail.com; [3]sabafarah1549@gmail.com

DOI: https://doi.org/10.5281/zenodo.24275452

Keywords
Virtual teaching; online learning; skill development; digital inequality; student perceptions; higher education; Pakistan

Article History
Received: 01 September 2026
Accepted: 28 October 2026
Published: 03 November 2026

Copyright @Author
Corresponding Author: * Jasim

Abstract
The rapid shift to virtual teaching during the COVID-19 pandemic raised a practical question that has received less attention than access or satisfaction: what do students believe they actually gained from emergency online instruction, and what stood in the way? This article examines how students at Quaid-i-Azam University (QAU), Islamabad, perceived the contribution of virtual teaching to their skill development and which problems they associated with virtual classes. Drawing on Online Collaborative Learning theory and the literature on digital inequality, the study analyzes a structured, close-ended questionnaire completed by 100 students from social, natural and biological science departments. Responses were analyzed descriptively in SPSS. Students' views were mixed. Most reported that virtual classes had developed their skills at least to some extent (63%), most clearly their ability to operate e-learning platforms (75%) and to learn independently (70%). However, only 17% to 26% reported development "to a great extent" on any single skill item, and 25% to 41% reported none. Students rated instructors' communication favorably (62% agreed), yet half disagreed that communication in virtual classes was easy, and a majority (54%) disagreed that virtual teaching helped them reach their academic goals. The pattern suggests that perceived gains were concentrated in technical and self-directed skills rather than in skills that depend on sustained interaction. Because the design is cross-sectional, self-reported and based on a small single-institution sample, the findings describe perceptions and should not be read as causal effects.

1. INTRODUCTION

Few changes in higher education have been as abrupt as the move from campus to screen in 2020. Universities that had treated online delivery as a supplement, or as the specialty of dedicated distance-education providers, were required to run entire semesters through video platforms and learning management systems, often within weeks. Hodges et al. (2020) argued that what followed should be called emergency remote teaching rather than online learning, because it was a temporary response to crisis and not a carefully designed mode of instruction. The distinction matters for any evaluation of what students gained or lost. Judging emergency provision against well-planned online programs, or against campus teaching delivered under normal conditions, would each produce a misleading comparison.

Students' own accounts offer a useful vantage point on this period. In a survey of 30,383 students in 62 countries, Aristovnik et al. (2020) found that students were most satisfied with the support provided by teaching staff, but that deficient computer skills and a perceived increase in workload prevented many from believing their performance had improved. Students from lower living standards and from

Africa or Asia were, on average, less satisfied with their academic life. The finding points to something sociologically important: the same technological shift can be experienced very differently depending on the resources, skills and institutional support that students bring to it.

Pakistan is a revealing case. Studies of Pakistani universities during the pandemic consistently describe a transition carried out under conditions of uneven infrastructure and limited preparation (Adnan & Anwar, 2020; Quraishi et al., 2020). Access to basic services in Pakistan is itself unevenly distributed, and evidence from Peshawar shows that documentation status and institutional barriers can exclude already marginal groups from provision (Iqbal et al., 2024). Adnan and Anwar (2020), surveying undergraduate and postgraduate students, reported that many could not reliably access the internet because of technical and financial constraints, and that student missed face-to-face contact with instructors and the socialization of the traditional classroom. Jamil and Muschert (2023) found that students from rural and remote areas struggled with internet access and with using laptops and virtual learning systems, whereas urban, middle- and upper-class students in private-sector universities were less directly affected. In this literature, virtual teaching is not simply a pedagogical choice; it is a setting in which existing inequalities in access and skill become visible.

Most of this work asks whether students could connect, whether they were satisfied, and what difficulties they faced. Fewer studies ask a more basic question about learning: what kinds of skills do students believe virtual teaching helped them develop, and which did it leave undeveloped? The question is not trivial. Universities are expected to prepare graduates not only to master content but to work with technology, study independently and communicate with others. If virtual teaching strengthens some of these capacities and leaves others untouched, the consequences for graduates, and for the equity of the degrees they receive, deserve attention.

Treating students' perceptions as evidence requires some justification, because perceptions are not measurements of competence. They are, however, sociologically meaningful in their own right. Students' judgments of what they learned shape their confidence, their willingness to persist and the way they later present their education to others, and perception surveys are often the only data a university can collect quickly in a crisis. They also allow comparison across areas: even when they cannot establish how much was learned, they can show where students believe the transition succeeded and where it fell short. The study uses them in this limited way, as indicators of how the transition was experienced and not as measures of skill itself.

From a sociological standpoint, the move online altered more than the delivery of lectures. It changed where students met, how they interacted with teachers and peers, and what resources they needed in order to take part at all. Skills acquired in that environment are bound up with the conditions under which they were acquired, which is one reason the study pairs a pedagogical theory with a sociological account of digital inequality.

This article uses "skill" in a working sense, drawn from the definition adopted in the original thesis on which the study is based: an ability acquired through sustained effort and applied to ideas (cognitive skills), to things (technical skills) or to people (interpersonal skills). The questionnaire concentrated on technical and self-directed learning skills and on the communicative conditions of virtual classes, and the analysis reflects that emphasis.

The study was conducted at Quaid-i-Azam University, a major public university in Islamabad, with students from social, natural and biological science departments. The setting offers two analytic advantages. First, the thesis reports that the university delivered its virtual classes through Microsoft Teams, so respondents shared a common platform and the study does not conflate differences between technologies with differences in experience. Second, the sample spans several broad disciplinary areas, allowing a first look at perceptions that are not confined to a single department. The setting also carries limits, which are discussed below: a single institution and a small sample cannot stand for Pakistani higher education as a whole.

The study pursues two objectives. It examines students' perceptions of the contribution of

virtual teaching to their skill development, and it identifies the problems students associated with virtual classes. The article makes three contributions. It documents how perceived skill gains are distributed across types of skill rather than treating "skill development" as a single outcome. It shows a gap between how students evaluated their instructors' communication and how they evaluated communication within the virtual class as a whole. And it interprets both patterns through Online Collaborative Learning theory and the digital inequality literature, while being explicit about what a small, descriptive, cross-sectional survey can and cannot establish.

2. Literature Review and Theoretical Framework

2.1 Emergency remote teaching and student perceptions

Research on online learning before 2020 generally treated it as a designed option that students chose, or at least anticipated. Earlier summaries of distance education suggested that learning outcomes could be comparable to those of classroom instruction (Moore & Thompson, 1997), and studies of student experience pointed to course design, instructor support, time management and comfort with technology as the factors shaping how students judged online courses (Song et al., 2004). Work on readiness likewise cautioned that students' preparedness for e-learning environments cannot be assumed to be uniform (Parkes et al., 2014).

The pandemic broke the conditions under which those findings were produced. Students did not choose online study, instructors had little time to redesign courses, and many participants had little or no prior experience of it. Dhawan (2020) described online learning as a lifeline that kept institutions running, while warning that connectivity problems, limited preparation and uneven digital skills constrained its value. Hodges et al. (2020) made the conceptual point explicit: emergency remote teaching differs from online learning in its purpose, its planning and its quality assurance, and evaluations that ignore the difference risk blaming online education for problems that belong to the emergency. Student perception studies conducted in this period should therefore be read as accounts of a particular, compromised experience. They tell us how students judged what they received; not what well-designed online education could achieve.

This reading also affects how earlier favorable findings should be treated. Evidence from distance education before 2020 came largely from students who had selected that mode, from courses designed for it, and from institutions with established support. Pakistani universities in 2020 had none of these advantages in the same degree, and their teachers, as Quraishi et al. (2020) argued, had little opportunity for systematic reflection before the shift. A comparison between the QAU findings and pre-pandemic benchmarks would therefore be unsafe in either direction.

2.2 Digital inequality and the Pakistani higher-education context

Sociological work on digital inequality has moved beyond a simple division between those who are online and those who are not. Hargittai (2002) described a "second-level" divide in which people with similar access differ in their online skills, and van Deursen and Helsper (2015) extended the argument to a third level, concerned with who benefits most from being online. Applied to higher education, this framework suggests three questions: whether students have devices and reliable connections, whether they have the skills to use them for study, and whether they can convert online participation into learning and credentials.

Pakistani studies speak mainly to the first two questions. Adnan and Anwar (2020) highlighted internet access problems, slow instructor response and the absence of classroom socialization. Nazir and Khan (2021), using interviews, identified barriers that included access to internet technology, power outages, faculty skills in teaching online and students' own skills with distance-learning tools, and reported that students in rural areas were more affected than those in urban areas. Malik et al. (2021), in a small questionnaire study, found that students lacked internet access and prior guidance on using online platforms, and that they had difficulty grasping concepts and communicating with teachers even where teachers supplied resources and feedback. Jamil and Muschert (2023) explicitly linked these patterns to first- and second-level digital divides and to the social position of students. Taken

together, this work establishes that the pandemic transition was socially patterned. What it says less about is the third question: what students believe they took away from the experience.

The evidence base is also uneven in method. Interview studies such as Nazir and Khan (2021) and Jamil and Muschert (2023) offer explanatory depth but are not designed to give distributions, while small questionnaire studies such as Malik et al. (2021) give distributions for narrow samples. Item-level questionnaire evidence from additional single institutions is therefore useful mainly as a piece of a cumulative picture, which is how the present study is offered.

2.3 Teaching presence, interaction and self-regulation

A second strand of research concerns the pedagogical conditions inside virtual classes. Studies of instructor presence have linked visible, responsive teaching to student satisfaction (Ladyshewsky, 2013), and research on engagement in online settings has emphasized that participation depends on how tasks and environments are designed and not merely on whether students log in (Herrington et al., 2003). Students' accounts in Pakistan echo these themes through complaints about delayed responses and weak interaction (Adnan & Anwar, 2020). A related literature stresses the self-regulation that online study demands. A systematic review by Broadbent and Poon (2015) found that strategies such as time management, metacognition, effort regulation and critical thinking were associated with academic outcomes in online higher education. Where students study at home, away from the routines and peer presence of the campus, these self-directed capacities become more consequential, and gaps in them are more visible.

2.4 Skills and perceived learning

Claims about skill development in online settings raise measurement issues that frame how the present results should be read. Much of the pandemic-era literature measures satisfaction, attitudes or perceived learning rather than demonstrated competence, and the relationship between these is imperfect. Students may report learning because they felt engaged, or fail to report it because they were frustrated with the delivery even when they learned. Aristovnik et al. (2020) framed their findings explicitly as perceived impacts, and the QAU study sits in the same tradition. Perceived skill development is nevertheless a legitimate object of study: it records which capacities students themselves recognize as growing, and it can be compared across types of skill, which is how the present study uses it.

The type of skill matters as well. Technical skills such as operating software are comparatively visible and can be acquired through repetition, so students can readily recognize them. Cognitive and interpersonal skills develop more slowly, are harder to self-assess and, on the OCL account, depend on interaction. A questionnaire that asks mainly about technical and self-directed skills, as this one did, is likely to find more perceived gain in those areas than in others. The discussion takes care not to confuse what was measured with what could have developed.

2.5 Theoretical framework

The thesis on which this article is based adopts Online Collaborative Learning (OCL) theory (Harasim, 2012), and this framework is retained because it connects directly to the communicative conditions that the questionnaire measured. OCL grows out of social constructivism and holds that knowledge is built through discourse among learners, with the teacher acting as a facilitator and a member of the learning community. Harasim describes three phases of knowledge construction: idea generating, in which participants express and compare initial views; idea organizing, in which ideas are sifted and evaluated; and intellectual convergence, in which participants reach shared understanding. Bates (2015) notes that the approach depends heavily on instructor involvement and is harder to scale than more transmission-oriented formats.

Two clarifications are needed. First, the questionnaire did not operationalize the three OCL phases. It asked about instructors' communication and teaching, the ease of communication in virtual classes, platform and independent-learning skills, and overall appraisals. OCL is therefore used as an interpretive lens, not as a tested model. Its value here is that it predicts where virtual teaching

should struggle: if learning and interpersonal skills grow through sustained, moderated discourse, then conditions that thin out interaction should limit the skills that depend on it, even if technical skills advance.

Second, OCL says little about why some students are better placed than others to take part in online discourse. For this reason the framework is paired with the digital inequality perspective outlined above. Together they allow the findings to be read on two levels: what the learning environment afforded, and who was positioned to use it. The thesis did not measure household income, device ownership, connection quality or residence, so the inequality perspective is used to contextualize the results and to frame the discussion, not to test claims about particular groups.

The framework suggests three clusters of questionnaire items that organize the analysis below: the teacher's role as facilitator (the communication, explanation and motivation items); the interactional environment (ease of communication, attendance and overall appraisal of delivery); and learners' skills (platform use, independent learning, technical skills and extra reading). The digital inequality perspective adds a question that cuts across these clusters, namely whether the capacities students reported are those they had to acquire, under pressure, in order to participate. These groupings are analytic conveniences imposed on the thesis questionnaire. They are not validated scales, and no reliability analysis supports them.

3. Research Gap, Objectives and Hypothesis

Existing studies of virtual teaching in Pakistan have documented barriers, satisfaction and attitudes, and the best of them have situated these in the country's digital divide. Three limitations remain. First, skill development is usually mentioned in passing, as a general expectation of education, rather than disaggregated into the kinds of skill students believe they developed. Second, the pedagogical conditions that OCL highlights, particularly the quality of communication within virtual classes, are seldom set alongside students' reports of skill gains. Third, much of the evidence comes from samples that span many institutions or from qualitative work with small groups; there are few compact, single-institution questionnaire studies that report item-level distributions in a form other researchers can compare. A study of QAU students addresses these gaps in a limited but concrete way by reporting perceived skill development by type, by pairing those reports with students' judgments of communication and academic progress, and by describing a single institution that used one platform.

A further gap is one of reporting. Many pandemic-era studies present percentages without item wording or composite indices without distributions, which makes it hard for other researchers to see what was asked and what was found. This article reports the full response distribution for each retained item and states where the source data were inconsistent, so that readers can judge the evidence for themselves and later studies can compare like with like. The claim is deliberately bounded: the contribution is a documented, item-level account of one institution's students, not a general account of virtual teaching in Pakistan.

The study pursues two objectives, stated here as research questions:

RQ1. How do students at QAU perceive the contribution of virtual teaching to their skill development?

RQ2. What problems do students associate with virtual classes?

The thesis also states a hypothesis (H1) that virtual teaching directly helps students' skill development in their academic activities, with a corresponding null hypothesis. Because the data are cross-sectional, self-reported and analyzed descriptively, the article treats H1 as a directional expectation about perceived contribution. A descriptive survey cannot isolate the contribution of virtual teaching from other influences, and the word "directly" cannot be assessed with these data. Section 5 therefore reports the distribution of responses relevant to H1 and does not claim a formal test.

4. Methodology

4.1 Research design and setting

The study used a quantitative, cross-sectional survey design. A questionnaire with close-ended items allowed students' perceptions to be recorded in a standardized form and summarized numerically, which suited the aim of describing how students judged virtual teaching and skill development across a defined group. The research setting was Quaid-i-Azam

University, Islamabad. According to the thesis, the university conducted its virtual classes through Microsoft Teams during the pandemic period.

A survey was appropriate for two reasons. The aim was to describe patterns in students' perceptions across a defined group, not to explore individual trajectories, and a standardized instrument makes item-level results comparable with other surveys of Pakistani students. The cost of this choice is depth. Close-ended items cannot capture why students answered as they did, and single items cannot capture complex constructs such as skill. The design is therefore best suited to the limited task this article sets itself, which is to describe the distribution of perceptions.

4.2 Population and sample

The unit of analysis was the individual student. The thesis defines the target population as male and female students aged above 18 to 30 years, drawn from departments in the social and natural sciences. The sample comprised 100 respondents. As Table 1 shows, 61 were male and 39 females; by department, 46 came from social sciences, 34 from natural sciences and 20 from biological sciences. The thesis reports that respondents were first confirmed to be students of the university in order to ensure the authenticity of the data. Two inconsistencies in the source need flagging. The age distribution reported in the thesis includes respondents in the 29 to 32 and 33 to 35 bands, which exceeds the stated population range of 18 to 30. And the thesis describes the departments as social and natural sciences while reporting a biological sciences group.

4.3 Sampling procedure

The thesis does not state how the 100 respondents were selected, and it does not report a sampling frame, response rate or inclusion and exclusion rules beyond student status. No sampling technique is therefore claimed here. Because the selection mechanism is unknown, the findings cannot be treated as representative of QAU students, and no inferential generalization is attempted.

4.4 Instrument and measures

Data were collected with a structured questionnaire containing close-ended questions. The thesis refers to items numbered up to 40, grouped by theme. One group concerned teachers' methods in managing online classes. A second concerned the virtual class environment, including communication with the teacher and attendance. A third addressed skill development, covering technical skills and the challenges students faced. The reported results include two response formats. Most items on teaching, communication and overall appraisal use a five-point agree-disagree scale (strongly agree to strongly disagree). The later items on skill development and learning supports use three response categories describing extent: to a great extent, to some extent and not at all. The thesis text describes some items as four-point and others as five-point scales, which does not match the formats shown in the results tables; the formats reported here are those visible in the tables. The article does not report the full questionnaire, the number of items in each scale, or any validation, pilot testing or reliability analysis, and the article does not claim any.

Two concepts structure the analysis. Virtual teaching refers to instruction delivered through online platforms, including live classes, video conferencing and recorded lectures. Skill development is treated, following the definition above, as students' perceived acquisition of abilities relevant to their studies, with emphasis on technical skills (for example operating the e-learning platform) and self-directed learning. Because respondents reported their own views, both are measured as perceptions.

4.5 Variables and analytic strategy

The thesis labels virtual teaching as the independent variable and skill development as the dependent variable, in line with H1. Given the cross-sectional, perception-based design, these labels are retained only as a way of organizing the questions and not as evidence of causal ordering. After data collection, the thesis states that incomplete questionnaires were removed and data were entered and analyzed in SPSS. The analysis consisted of frequency distributions and percentages for each item. Because the sample is 100 respondents, frequencies and percentages are numerically

identical. No cross-tabulations, correlation or regression analyses, significance tests or scale reliability coefficients are reported in the thesis, and none are presented here. For readability, the results combine "strongly agree" and "agree" and combine "disagree" and "strongly disagree" in the five-point items, and report the three response categories as they were given for the extent items. Descriptive reporting is a consequence of what the thesis did, and it also suits the sample: with 100 respondents split across gender, age and department, subgroup comparisons would rest on very small cells and would be unstable even if tests were run.

4.6 Data handling and ethics

Before analysis, every results table in the thesis was checked for internal consistency. Most tables sum to 100 respondents. A small number did not, or duplicated another table, or carried a narrative description that did not match the numbers beside it; these are listed in the verification notes accompanying this manuscript, and items that could not be reconciled were omitted from the tables below. The thesis does not report ethical approval, informed consent procedures, or arrangements for anonymity.

5. Results

5.1 Respondent profile

Table 1 summarizes the sample. Men made up a little under two-thirds of respondents (61%), and the largest group came from the social sciences (46%). Nearly half of respondents (49%) were aged 18 to 24, and 30% were aged 25 to 28; the remainder were older.

Table 1. Demographic characteristics of respondents (N = 100)

Characteristic	Category	n	%
Gender	Male	61	61.0
	Female	39	39.0
Age (years)	18–24	—	49.0
	25–28	—	30.0
	29–32	—	12.0
	33–35	—	9.0
Department	Social sciences	46	46.0
	Natural sciences	34	34.0
	Biological sciences	20	20.0

Note. Age percentages are as reported in the thesis. The thesis frequency column for age (5, 61, 12, 9) is inconsistent with those percentages and sums to 87, so counts are not shown. The thesis states a target age range of 18–30 years but reports respondents up to 35. Source data to be verified.

5.2 Teaching, communication and overall appraisal

Table 2 reports the five-point items on teaching, communication and overall appraisal. Responses on these items were divided, and the direction of opinion depended on what students were asked to evaluate.

Table 2. Students' perceptions of teaching, communication and overall appraisal (N = 100, %)

Item	Agree	Neutral	Disagree
Teaching and communication			
Instructors communicated well during online classes	62	13	25
Instructors' method of explaining lectures was good	45	28	27
Communication with classmates and instructors was easy in virtual classes	32	18	50
Appraisal of outcomes and delivery			
Virtual teaching helped me achieve my academic goals	34	12	54
Virtual classes met the standard of knowledge delivery	40	10	50
Virtual classes help maximize class attendance	46	11	43
Appraisal of the pandemic transition			
Study activities should resume during the pandemic	53	10	37
Virtual classes are the only way to resume academic activities	36	15	49

Note. Agree = strongly agree + agree; Disagree = strongly disagree + disagree. Percentages equal frequencies because N = 100. Item wording is paraphrased from the titles of the corresponding thesis tables.

Instructors' communication received the most favorable ratings: 62% agreed that instructors communicated well during online classes, and 25% disagreed. Evaluations of how instructors explained lectures were more guarded, with 45% agreeing, 28% neutral and 27% disagreeing.

Judgments about communication within virtual classes more generally were less positive. Only 32% agreed that communication with classmates and instructors was easy in virtual classes, while half (50%) disagreed. Appraisals of academic progress were also more negative than positive. A majority (54%) disagreed that virtual teaching helped them achieve their academic goals, against 34% who agreed, and half (50%) disagreed that virtual classes met the standard of knowledge delivery they expected, against 40% who agreed. Opinion on attendance was nearly even: 46% agreed that virtual classes helped maximize attendance and 43% disagreed.

Students were more willing to accept virtual teaching as a response to the pandemic than to endorse it as the only available route. A small majority (53%) agreed that study activities should resume during the pandemic and 37% disagreed. However, 49% disagreed that virtual classes were the only way to resume academic activities, and 36% agreed.

5.3 Perceived skill development and learning supports

Table 3 reports the extent items. It separates items that ask directly about skills from items that ask about the supports and effectiveness of virtual classes.

Table 3. Perceived skill development and learning supports (N = 100, %)

Item	To a great extent	To some extent	Not at all	Great + some
Skill development				
Virtual classes developed my skills in my studies	20	43	37	63
Virtual classes developed my technical skills†	17	43	40	60
Developed skills to operate the e-learning platform	26	49	25	75
Developed skills for learning individually	20	50	30	70
Virtual classes allowed development of extra reading skills	22	37	41	59
Learning supports and effectiveness				
Course objectives were clear	30	52	18	82
Teachers continuously motivated me to learn online	28	52	20	80
Saved lectures helped me to revisit and understand material	38	47	15	85
Remote learning was effective for students	26	53	21	79
Virtual teaching was effective in transferring knowledge	17	50	33	67

Note. Percentages equal frequencies because N = 100. Item wording is paraphrased from thesis table titles. †The thesis reports the same distribution for this item as for another item (virtual classes as an opportunity for students less engaged in face-to-face classes); one may be a duplication error. To be verified.

Regarding RQ1, a majority of respondents reported that virtual classes had developed their skills in their studies at least to some extent (63%), although 37% said they had not developed them at all. Skill gains were reported most often for operating the e-learning platform (75% to some or a great extent) and for learning individually (70%). The pattern for technical skills, as asked in a separate item, was less favorable: 60% reported development to some or a great extent and 40% reported none. Development of extra reading skills drew the weakest response among the skill items, with 41% reporting none.

Reports of strong development were uncommon. Across the five skill items, between 17% and 26% reported development to a great extent, and 25% to 41% reported none. In four of the five skill items the modal response was the middle category, "to some extent," which is a weak form of endorsement and should not be read as strong evidence of skill gain; on extra reading, the most common response was "not at all."

Students were more positive about the supports that virtual classis provided than about their own skill outcomes. Large majorities reported that recorded lectures helped them to some or a great extent (85%), that teachers motivated them to continue (80%), and that course objectives were clear (82%). Overall effectiveness of remote learning was endorsed by 79% to some or a great extent, but only 17% said virtual teaching transferred knowledge to a great extent and 33% said not at all.

Regarding H1, the data show that most respondents perceived some contribution of virtual teaching to their skills, with the clearest contributions in platform use and independent learning. The data do not show that virtual teaching directly produced these skills. They contain no comparison group, no baseline and no test of association.

5.4 Problems associated with virtual classes

RQ2 asked what problems students associated with virtual classes. The retained tables do not contain a direct measure of connectivity or other technical problems. The thesis narrative identifies poor internet quality as a major problem and refers to unequal access to devices and the internet, but no retained table quantifies either, and the thesis items on challenges produced tables that duplicate one another and could not be used. RQ2 is therefore answered through indicators of problems in the virtual class experience, not through a catalog of technical faults.

Four indicators stand out. First, half of respondents found communication in virtual classes difficult. Second, a majority doubted that virtual teaching helped them achieve academic goals, and half doubted that it delivered knowledge to the standard they expected. Third, a sizeable minority reported no skill development, particularly in extra reading (41%) and technical skills (40%). Fourth, almost half rejected the proposition that virtual classes were the only option, which suggests that acceptance of continuity did not amount to confidence in quality.

5.5 Summary of the pattern

Taken together, the retained items show a layered pattern. Supports and conditions of virtual classes were rated most favorably, with 79% to 85% reporting that recordings, teacher motivation, course clarity and overall remote learning helped to some or a great extent. Skill gains came next, with 59% to 75% reporting some or great development, although strong gains were uncommon. Judgments about academic outcomes and about the interactional quality of virtual classes were the least favorable, with majorities disagreeing that virtual teaching helped achieve academic goals, that it met the expected standard of delivery, or that communication in class was easy. The gradient from supports to skills to outcomes and interaction is the main empirical result of the study and structures the discussion that follows.

6. Discussion

6.1 Skill gains concentrated in technical and self-directed capacities

The most consistent result is that students perceived gains in what might be called the working skills of online study, operating the platform and learning independently, more often than gains in other areas. This pattern fits the circumstances. Emergency remote teaching compelled students to use a learning platform, submit work digitally and manage their own time, and these demands plausibly produce rapid, visible learning (Hodges et al., 2020). In the language of the digital inequality literature, students were being pushed to acquire second-level skills (Hargittai, 2002) under pressure, and many reported that they had done so at least to some extent.

Two cautions apply. The first is that perceived platform skill may reflect a low starting point; the questionnaire has no baseline, so a 75% rate of reported gain says little about whether students ended the semester skilled or merely less unskilled. Aristovnik et al. (2020) found that deficient computer skills limited students' sense of progress across 62 countries, and the QAU result is consistent with the idea that technical competence was a condition of participation that had to be acquired quickly. The second is that "to some extent" was the modal response in four of the five skill items. Students were willing to say they had learned something, but few were willing to say they had learned a great deal. That is a more modest conclusion than the headline percentages suggest, and it is more in line with the guarded appraisals in Table 2.

From an OCL perspective, the content of these gains' matters. Platform proficiency and independent study are prerequisites for taking part in online discourse, but they are not the collaborative and interpersonal skills that, on Harasim's (2012) account, develop through idea generating, idea organizing and convergence. The questionnaire did not measure collaborative skills, so this study cannot say whether they developed. What it can say is that the skills students most readily reported are those that a

virtual class can foster even when interaction is thin. The broader point, offered as an interpretation and not a finding, is that technical and self-directed capacities may be the easiest outputs of emergency remote teaching and socially mediated skills the hardest.

6.2 The communication gap

The second finding is a contrast. Students judged their instructors' communication favorably (62% agreed) yet found communication in virtual classes difficult (50% disagreed that it was easy). These results are compatible if instructors were communicative in the sense of delivering explanations, announcements and feedback, while the class as a whole offered little opportunity for students to talk to each other and to the instructor. The items differ in wording and scope, so the comparison is suggestive, and the two items are not measuring the same thing. But the contrast points to a distinction that OCL makes sharply: good teacher communication is not the same as discourse among learners.

Other Pakistani studies describe similar tensions. Adnan and Anwar (2020) reported complaints about response time and the absence of face-to-face interaction, and Malik et al. (2021) found students struggling to communicate with teachers even where teachers provided resources and feedback. The literature on instructor presence suggests that responsiveness matters for how students experience online courses (Ladyshewsky, 2013), and the QAU students' relatively positive view of instructor communication is consistent with instructors having made efforts in this respect. Yet instructor effort does not by itself create the conditions for peer discourse.

The comparison with Aristovnik et al. (2020) is instructive here. Their global sample was most satisfied with the support of teaching staff, and QAU respondents likewise rated teacher communication and motivation favorably. Support from teachers appears to have been the strongest feature of the experience in both cases. What the QAU data add is a reminder that strong support from teachers can coexist with doubts about outcomes. Large synchronous sessions, limited breakout activity and the mute-and-listen etiquette of video calls can reproduce lecture formats, and OCL, as Bates (2015) notes, relies heavily on instructor involvement and is harder to scale. The questionnaire did not record class size or activity design, so these explanations remain hypotheses for future work.

6.3 Continuity without confidence

The third finding concerns how students weighed virtual teaching overall. A small majority supported resuming study activities during the pandemic, and 46% thought virtual classes helped attendance, but most doubted that virtual teaching had helped them reach their academic goals or met the standard of knowledge delivery they expected, and almost half did not accept virtual classes as the only option. This ambivalence is easier to understand if students distinguished between the value of continuity and the value of the education delivered. Students may reasonably have wanted their academic year to continue while recognizing that what they received was not equivalent to campus teaching. This distinction is exactly the one Hodges et al. (2020) drew between emergency remote teaching and planned online learning, and it cautions against reading these appraisals as verdicts on online education in general.

The QAU results also differ in tone from the more categorical conclusions in some Pakistani studies. Adnan and Anwar (2020) concluded that online learning could not produce desired results in a country like Pakistan, largely because of access problems. QAU students were more ambivalent than that: many saw value, reported some skill gain and valued the supports, while doubting the quality of outcomes. One plausible reason is that QAU is a single, relatively well-established institution that used one platform. Another is that the questionnaire did not measure access, so the QAU data cannot speak to the problem that dominated the earlier study.

The scale format needs comment. Items using the three-category extent scale returned much more favorable results than the agree-disagree items (for example, 79% reported that remote learning was effective to some or a great extent, whereas 34% agreed that virtual teaching helped them achieve their academic goals). The difference is partly a matter of wording and partly of scale design: "to some extent" is an easy answer to give and a weak one to interpret.

Readers should therefore compare results within, not across, the two formats.

6.4 Alternative explanations and the status of the evidence

Several alternative readings of the results should be kept in view. Respondents may have answered in socially acceptable ways, for instance by crediting instructors or by saying they had learned something. Agreement and "to some extent" responses can reflect acquiescence rather than considered judgment, and the favorable ratings of supports may partly reflect this tendency. Differences between items may reflect wording and scale format as much as substance, as noted above. The mix of departments may have shaped results, for example if students in different fields used the platform differently, but department-level comparisons were not made. The unknown selection procedure means that students who found virtual classes easiest, or most difficult, may be over- or under-represented.

None of these possibilities invalidates the descriptive findings, but they bound the interpretations. The gradient from supports to skills to outcomes is a robust description of this sample's responses. The explanations offered for it, namely the second-level skill pressure, the limited peer discourse and the distinction between continuity and quality, are plausible readings consistent with the literature, and they remain to be tested with designs capable of testing them.

6.5 Implications for the hypothesis

H1 proposed that virtual teaching directly helps students' skill development. The descriptive evidence is consistent with a perceived, partial contribution: most respondents reported some skill development, and the contribution was clearest for technical and self-directed skills. The evidence does not support a stronger reading. Few reported large gains, a substantial minority reported none, and the design cannot separate the contribution of virtual teaching from maturation, other courses, home environment or prior experience. The accurate conclusion is that H1 is partly consistent with students' perceptions and has not been tested.

6.6 Sociological contribution

Three sociological points follow from the findings, each stated within the limits of the data.

First, skill acquisition under emergency remote teaching can be read as part of the second-level digital divide. Hargittai (2002) showed that online skills vary among people with similar access, and van Deursen and Helsper (2015) argued that the benefits of being online are unevenly distributed. The QAU results show that most students reported some gain in online skills, but they cannot show how those gains were distributed by gender, household resources, residence or prior experience, because those characteristics were not analyzed. The study therefore supports the claim that skill formation was a significant feature of the transition, and it leaves open the question of for whom. Studies that have examined social position directly, such as Jamil and Muschert (2023) and Nazir and Khan (2021), indicate that the answer is likely to be unequal.

Second, the communication gap suggests a change in the social form of university education. A campus is a place where students meet instructors and one another informally, and where peer talk contributes to learning and belonging. Adnan and Anwar (2020) identified the loss of this classroom socialization as a concern among Pakistani students. The QAU finding that communication within virtual classes was difficult, while instructor communication was valued, is consistent with a model in which teaching continues but the social ecology around it thins out. The study did not measure isolation or belonging, so this reading is an inference from the communication items.

Third, the study shifts attention from individual students' coping to institutional responsibility. Where students are required to acquire platform skills quickly, to study independently and to cope with limited interaction, the burden of adjustment falls on them unless institutions supply orientation, support and design. Qualitative work in Pakistan shows that when institutions do not accommodate students' circumstances, the cost of adjustment falls disproportionately on those with the fewest resources, and that this shapes how students narrate their own trajectories (Iqbal et al., 2025).

The findings do not show that QAU failed to supply these; they show that students' perceived gains and difficulties took a particular shape, which institutions can respond to.

7. Implications

The implications below follow from the pattern of results and are offered with the caution that the sample is small and from one institution.

For universities and teachers, the communication gap suggests that effort should go into structured student-to-student and student-to-instructor interaction, for example small-group tasks, moderated discussion and activities that require students to respond to each other, and not only into improving lecture delivery. This follows from the contrast between favorable ratings of instructors' communication and unfavorable ratings of communication within virtual classes. Since students valued recorded lectures (85% reported benefit to some or a great extent), recordings are a low-cost support worth retaining in any hybrid arrangement.

For teacher training, the moderately favorable but divided assessment of instructors' explanation of lectures (45% agreed, 27% disagreed) suggests that training should address facilitation and the design of interactive sessions as well as technical operation of the platform.

For student support, the weaker results for extra reading (41% reporting no development) and the 30% who reported no gain in learning individually point to the value of orientation programs that develop platform skills and self-regulation, which Broadbent and Poon (2015) link to success in online study.

For digital infrastructure and higher-education policy, the study does not provide direct evidence on access. The wider Pakistani evidence, however, suggests that device, connectivity and power-supply problems shaped students' experience (Jamil & Muschert, 2023; Nazir & Khan, 2021), and policymakers and universities should collect access data routinely before moving courses online. They should also assess skill development directly, using measures of what students can do and not only satisfaction and perception, since the two can diverge.

8. Limitations and Future Research

Several limitations qualify the findings. The sample is small (100) and drawn from a single university, and the thesis does not report how respondents were selected, so representativeness is unknown and the results cannot be generalized to QAU students or to Pakistani students more broadly. The design is cross-sectional, with no baseline and no comparison group, so the study cannot attribute any change in skills to virtual teaching. All data are self-reported perceptions, not assessments of skill, and respondents may have over- or under-stated their development. The analysis was descriptive only; no reliability analysis, subgroup comparison or significance test was reported, and so differences by gender, department or age cannot be assessed. The thesis tables contained inconsistencies, including frequencies that did not match percentages, duplicated distributions and mismatched narrative text, and items that could not be reconciled were omitted, which narrows the evidence on problems and challenges. Finally, the study took place during the COVID-19 emergency, when virtual teaching was an emergency response, so the findings may not apply to planned online or blended provision.

Future research could address these limitations in several ways. Studies with probability or well-documented quota samples across several Pakistani universities would permit generalization and institutional comparison. Pre- and post-measures, or comparisons with students taught on campus, would allow cautious inference about change. Validated scales and performance-based measures could replace single-item perceptions of skill, and should distinguish technical, cognitive and interpersonal skills. Measures of household resources, device ownership, connection quality and residence would allow the digital inequality argument to be tested directly. Mixed-methods designs, including interviews, would help explain why students perceived instructors' communication favorably while finding class communication difficult, and could measure the OCL phases directly through analysis of online discussion.

9. Conclusion

This article set out to examine how students at Quaid-i-Azam University perceived the contribution of virtual teaching to their skill development and what problems they associated with it. The evidence from 100 students shows a mixed and modest picture. Most respondents reported some skill development, most clearly in operating e-learning platforms and learning independently, but few reported substantial gains and a sizeable minority reported none. Students valued their instructors' communication and the supports provided, such as recorded lectures, yet found communication within virtual classes difficult and doubted that virtual teaching helped them reach their academic goals.

Read through Online Collaborative Learning theory and the digital inequality literature, the results suggest that emergency virtual teaching at QAU developed the technical and self-directed skills that online study requires more readily than skills that depend on sustained interaction. This is an interpretation of a small descriptive survey and not a demonstrated causal mechanism. The study contributes item-level evidence from a single institution that used one platform, disaggregates skill development by type, and highlights the gap between instructor communication and class interaction as a topic for research on online pedagogy and student experience.

Virtual teaching during the pandemic was neither a failure nor a success in students' eyes. They accepted it as a means of continuing their studies and gained some skills from it, while doubting that it delivered what campus teaching would have. Whether better-designed online and blended teaching can close that gap, and for which students, remains for studies with stronger designs to answer.

REFERENCES

Adnan, M., & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology, 2*(1), 45–51. https://doi.org/10.33902/jpsp.2020261309

Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. *Sustainability, 12*(20), Article 8438. https://doi.org/10.3390/su12208438

Bates, A. W. (2015). *Teaching in a digital age: Guidelines for designing teaching and learning*. Tony Bates Associates.

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies and academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education, 27*, 1–13.

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Hargittai, E. (2002). Second-level digital divide: Differences in people's online skills. *First Monday, 7*(4). https://doi.org/10.5210/fm.v7i4.942

Harasim, L. (2012). *Learning theory and online technologies*. Routledge.

Herrington, J., Oliver, R., & Reeves, T. C. (2003). Patterns of engagement in authentic online learning environments. *Australasian Journal of Educational Technology, 19*(1), 59–71.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, March 27). The difference between emergency remote teaching and online learning. *EDUCAUSE Review*. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Iqbal, K., Hongcheng, S., & Liang, H. (2024). A challenge in access to social services of undocumented Afghan immigrants in host society of Peshawar, Pakistan. Discover Global Society, 2(1), Article 81.

Iqbal, K., Hongcheng, S., & Liang, H. (2025). Conflict-induced displacement in Pakistan: A sociological study of lived experiences of involuntary migration among Afghan immigrants. Discover Social Science and Health, 5(1), Article 6.

Jamil, S., & Muschert, G. W. (2023). The COVID-19 pandemic and e-learning: The digital divide and educational crises in Pakistan's universities. *American Behavioral Scientist*. https://doi.org/10.1177/00027642231156779

Ladyshewsky, R. K. (2013). Instructor presence in online courses and student satisfaction. *International Journal for the Scholarship of Teaching and Learning, 7*(1).

Malik, F., Ajmal, F., & Jumani, Z. (2021). The effects of COVID-19 on education in Pakistan: Students' perspective. *International Journal of Distance Education and E-Learning, 6*(1), 217–234. https://doi.org/10.36261/ijdeel.v6i1.1431

Moore, M. G., & Thompson, M. M. (1997). *The effects of distance learning* (Rev. ed., ACSDE Research Monograph No. 15). American Center for the Study of Distance Education, Pennsylvania State University.

Nazir, M. A., & Khan, M. R. (2021). Exploring the barriers to online learning during the COVID-19 pandemic: A case of Pakistani students from HEIs. *GiST Education and Learning Research Journal, 23*.

Parkes, M., Stein, S., & Reading, C. (2014). Student preparedness for university e-learning environments. *The Internet and Higher Education, 25*, 1–10.

Quraishi, N. H., Asif, M., Sheeraz, M., & Amer, K. (2020). Novel coronavirus (COVID-19) and its impact on education at tertiary level: Challenges and solutions for Pakistani universities. *Journal of Education & Social Sciences, 8*(2), 11–27. https://doi.org/10.20547/jess0822008204

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. *The Internet and Higher Education, 7*(1), 59–70.

van Deursen, A. J. A. M., & Helsper, E. J. (2015). The third-level digital divide: Who benefits most from being online? In L. Robinson, S. R. Cotten, J. Schulz, T. M. Hale, & A. Williams (Eds.), *Communication and information technologies annual* (Studies in Media and Communications, Vol. 10, pp. 29–52). Emerald.

IEER Institute for Excellence in Education & Research