



A Comparative Study of Online Learning and Traditional Learning Among Students

K Venkata Sainath Reddy¹, Krishna Rao, Professor²

¹ Department of Business Administration, KL Business School, KLEF, Vaddeswaram, Guntur, AP. Mail Id: venkatasainath9392@gmail.com

² BBA Department, KL Business School, KLEF

ABSTRACT :

This study compares online and traditional classroom learning from the students' perspective, using a cross-sectional survey of 125 respondents and twenty questionnaire items on preference, flexibility, understanding, concentration, interaction, doubt clarification, cost, satisfaction and blended learning. Percentages and bar charts profile the respondents and compare the two modes, while a paired-samples t-test, a Chi-square test and one-way ANOVA examine doubt clarification, the link between occupation and learning preference, and differences in satisfaction. The findings show that each mode has distinct strengths and that students see value in combining both, which supports a blended approach.

Keywords: Online Learning; Traditional Classroom Learning; Blended Learning; Student Perception; Learning Preference; Chi-Square; ANOVA; Paired t-test.

1. Introduction

Digital technologies have changed how, where and when students learn. Online learning offers access to teachers and content from any location and at flexible times, while traditional classroom learning offers face-to-face contact, structured routines and immediate interaction with teachers and peers. The rapid expansion of online education during and after the COVID-19 period has made it important to ask not only whether online learning works, but how students themselves experience it in comparison with the classroom.

Student perception matters because learners who feel they understand concepts, can clarify doubts, stay motivated and feel satisfied are more likely to persist and perform well. Neither mode is likely to be superior on every dimension: online learning may be stronger on convenience and cost, whereas classroom learning may be stronger on interaction and discipline. The present article therefore asks a practical question suitable for undergraduate research training: how do students compare online and traditional learning across key dimensions, and do preferences and satisfaction differ across groups of learners?

2. Review of Literature

Heinink, Witziers and Wetterling (2003) conducted a user-centred evaluation comparing e-learning, blended learning and classroom-based learning and found that most students preferred classroom-based learning over the other two approaches.

Bernard (2004) carried out a large meta-analysis of empirical studies comparing distance education with classroom instruction and reported wide variability in outcomes, indicating that results depend heavily on course design and instructional features rather than on delivery mode alone.

Means, Toyama, Murphy, Bakia and Jones (2010) reviewed evidence-based practices in online learning for the U.S. Department of Education and concluded that, on average, students in online conditions performed modestly better than those receiving face-to-face instruction, with blended approaches showing the strongest results.

Means, Toyama, Murphy and Baki (2013) extended this line of work in a meta-analytic review of online and blended learning and reinforced the importance of instructional design and learner support in determining effectiveness.

Manning-Ouellette and Black (2017) compared student learning in online and traditional versions of a leadership studies course and found that online students may engage more often in deeper learning on assignments than those in the traditional classroom.

Paul and Jefferson (2019) compared student performance in online and face-to-face versions of an environmental science course using records of 548 students (401 traditional and 147 online), illustrating how mode comparisons can be made with institutional data.

Aristovnik, Keržič, Ravšelj, Tomažević and Umek (2020) examined the impact of the COVID-19 pandemic on higher-education students from a global perspective, highlighting the sudden shift to online study and its effects on students' learning experience and well-being.

Dhawan (2020) presented a strengths, weaknesses, opportunities and challenges (SWOC) analysis of online learning during the COVID-19 crisis, noting its flexibility and scalability while identifying limited personal attention and technical difficulties as important problems.

3. Research Gap

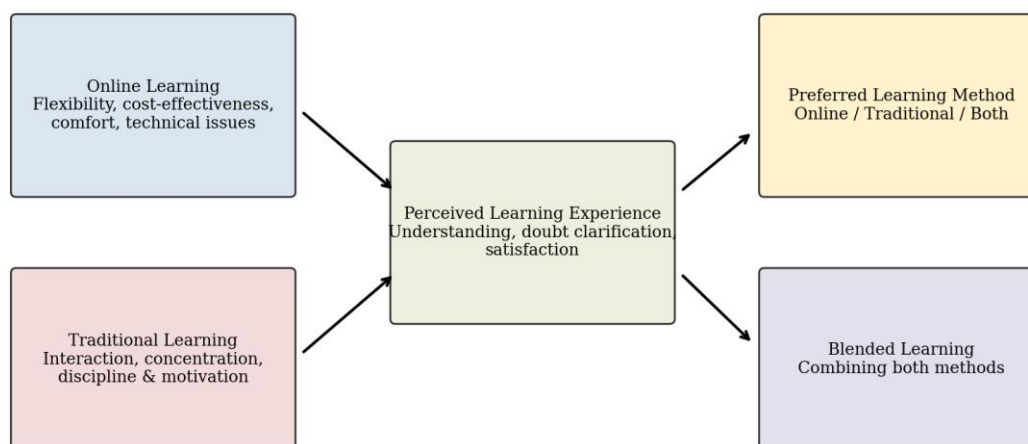
Existing research often compares learning outcomes such as grades or test scores in a single course or institution, while students' own side-by-side judgements of the two modes are examined less often. Many studies also treat online and traditional learning as competing alternatives and give less attention to students who see value in both. Finally, evidence from diverse learner groups, including school-level, undergraduate, postgraduate and professional learners, is limited. The present illustrative study addresses these gaps by comparing the two modes across multiple perceived dimensions in a mixed group of learners and by testing whether preference and satisfaction vary across groups.

4. Objectives of the Study

1. To describe the demographic profile and learning-mode preferences of the respondents.
2. To compare online and traditional learning on flexibility, understanding, concentration, interaction, environment, discipline and academic performance.
3. To test whether the ease of clarifying doubts differs between online and traditional classroom learning.
4. To examine whether occupational status is associated with the preferred learning method.
5. To test whether mean satisfaction with online learning differs across students preferring online, traditional or both methods.
6. To offer practical suggestions for designing effective online, traditional and blended learning.

5. Conceptual Framework of the Study

The framework assumes that distinct features of online learning (flexibility, cost-effectiveness, comfort and exposure to technical problems) and of traditional learning (interaction, concentration, discipline and motivation) jointly shape the learner's perceived learning experience, including understanding, doubt clarification and satisfaction. This experience, in turn, influences the preferred learning method and the extent to which students favour a blended combination of both modes.



6. Hypotheses of the Study

- H01: There is no significant difference in the perceived ease of clarifying doubts between online learning and traditional classroom learning.
- H11: There is a significant difference in the perceived ease of clarifying doubts between online learning and traditional classroom learning.
- H02: There is no significant association between occupational status (student / non-student) and preferred learning method.
- H12: There is a significant association between occupational status and preferred learning method.
- H03: There is no significant difference in mean satisfaction with online learning across students who prefer online, traditional or both learning methods.
- H13: There is a significant difference in mean satisfaction with online learning across the three preference groups.

7. Research Methodology

Research methodology refers to the systematic plan used to answer the research questions and test the hypotheses. In this study it covers the research approach, design, population, sample, sampling technique, data source, measurement, analytical tools.

7.1 Research Approach

A quantitative approach is adopted because the study converts student perceptions into numerical categories and scores and uses statistical techniques to examine patterns, associations and differences.

7.2 Research Design

The study follows a descriptive and analytical, cross-sectional design. The descriptive component profiles respondents and compares the two learning modes; the analytical component tests the hypotheses using a paired-samples t-test, a Chi-square test of independence and one-way ANOVA.

7.3 Population of the Study

The conceptual target population consists of learners who have experienced both online and traditional classroom learning, including school-level, undergraduate, postgraduate and professional-course students as well as working learners.

7.4 Sample of the Study

The illustrative sample consists of 125 respondent records. The sample size is adequate for demonstrating frequency analysis, paired comparison, Chi-square testing and one-way ANOVA.

7.5 Sampling Technique

A non-probability convenience-sampling approach is assumed for the demonstration. In a publishable field study, the researcher should define the sampling frame and, wherever feasible, use probability or stratified sampling to improve representativeness.

7.6 Sources and Instrument of Data Collection

A structured questionnaire with twenty items is assumed as the primary instrument. Q1–Q4 capture age group, gender, education level and occupation; Q5–Q11 and Q14, Q17 and Q19 capture learning preference, usage frequency and the method judged better on each dimension; Q12, Q13 and Q15 capture ease of clarifying doubts and technical problems; and Q16, Q18 and Q20 capture cost-effectiveness, satisfaction and attitude towards blended learning.

7.7 Variables and Measurement

Ordinal responses were coded from 1 to 5: ease of clarifying doubts (1 = Very difficult to 5 = Very easy), satisfaction with online learning (1 = Very dissatisfied to 5 = Very satisfied), and agreement statements (1 = Strongly disagree to 5 = Strongly agree). Preferred learning method is a nominal variable with three categories (online, traditional, both equally). Occupational status was recoded into Student and Non-student (employed, self-employed and other) for the Chi-square test. For an actual journal submission, multi-item validated scales should be used and reliability and validity should be reported.

7.8 Statistical Tools Used

Frequencies, percentages, means, medians and standard deviations are used for descriptive analysis, supported by bar charts. A paired-samples t-test (with the Wilcoxon signed-rank test as a robustness check) compares ease of clarifying doubts across modes; the Chi-square test of independence examines categorical association (with Cramér's V as effect size); and one-way ANOVA (with the Kruskal–Wallis test as a robustness check) compares mean satisfaction across groups. A 5% level of significance is used.

8. Data Analysis and Interpretation

8.1 Respondent Profile

Age Group	Frequency	Percentage
Below 18 years	7	5.6%
18–25 years	78	62.4%
26–35 years	28	22.4%
36–45 years	8	6.4%
Above 45 years	4	3.2%
Total	125	100.0%

Interpretation: The sample is dominated by young learners: 78 respondents (62.4%) are aged 18–25 years and a further 28 (22.4%) are aged 26–35, so the findings mainly reflect the perceptions of young adults.

Gender	Frequency	Percentage
Female	62	49.6%
Male	57	45.6%
Other	3	2.4%
Prefer not to say	3	2.4%
Total	125	100.0%

Interpretation: Female respondents (49.6%) and male respondents (45.6%) are almost equally represented, giving a gender-balanced sample.

Education Level	Frequency	Percentage
Higher Secondary	12	9.6%
Undergraduate	66	52.8%
Postgraduate	18	14.4%
Professional Course	16	12.8%
Other	13	10.4%
Total	125	100.0%

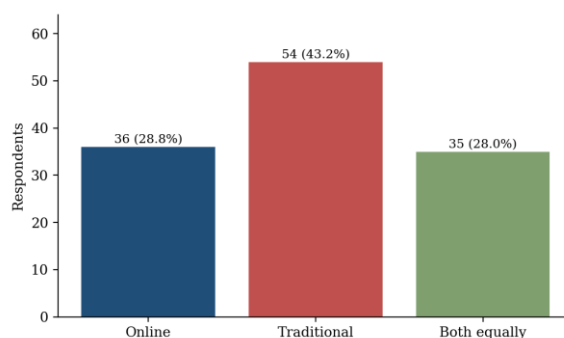
Interpretation: Undergraduate students form the largest group (52.8%), followed by postgraduate students (14.4%) and professional-course learners (12.8%).

Occupation	Frequency	Percentage
Student	79	63.2%
Employed	14	11.2%
Self-employed	16	12.8%
Other	16	12.8%
Total	125	100.0%

Interpretation: 63.2% of respondents are full-time students, while the remainder are employed, self-employed or in other occupations, which allows comparison of student and non-student learners.

8.2 Learning Preference and Usage

Preferred Learning Method	Frequency	Percentage
Online learning	36	28.8%
Traditional classroom learning	54	43.2%
Both equally	35	28.0%
Total	125	100.0%



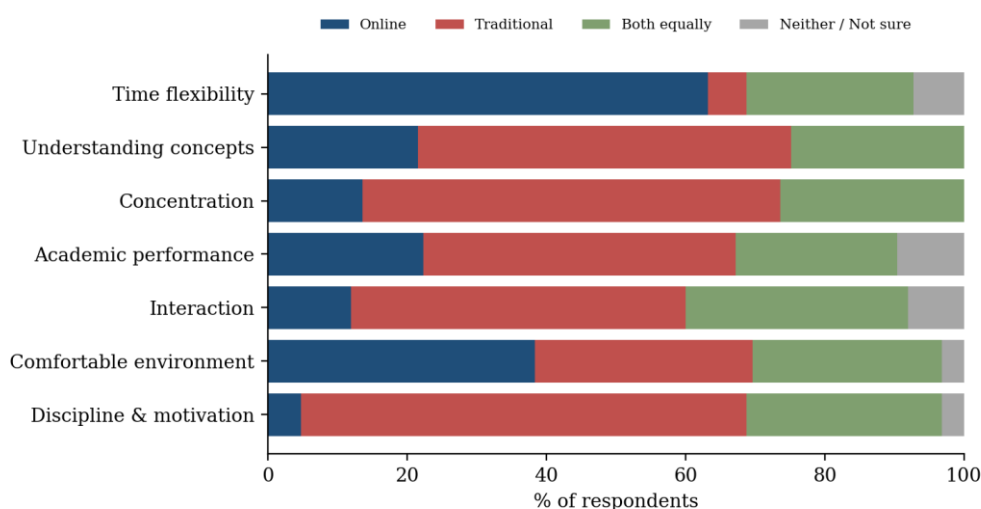
Interpretation: Traditional classroom learning is the most preferred method (43.2%), followed by online learning (28.8%) and those who value both equally (28.0%). Thus about 56.8% of respondents do not exclusively favour the classroom.

Frequency of Use	Online Learning (n)	Online (%)	Classroom (n)	Classroom (%)
Never	12	9.6%	3	2.4%
Rarely	23	18.4%	14	11.2%
Occasionally	43	34.4%	32	25.6%
Frequently	31	24.8%	39	31.2%
Very frequently	16	12.8%	37	29.6%
Total	125	100.0%	125	100.0%

Interpretation: Respondents attend traditional classes more often than they learn online: 60.8% attend classes frequently or very frequently, compared with 37.6% for online learning, while 28.0% use online learning never or only rarely.

8.3 Dimension-wise Comparison of the Two Modes

Dimension	Online	Traditional	Both equally	Neither / Not sure
Time flexibility	79 (63.2%)	7 (5.6%)	30 (24.0%)	9 (7.2%)
Understanding concepts	27 (21.6%)	67 (53.6%)	31 (24.8%)	0 (0.0%)
Concentration	17 (13.6%)	75 (60.0%)	33 (26.4%)	0 (0.0%)
Academic performance	28 (22.4%)	56 (44.8%)	29 (23.2%)	12 (9.6%)
Interaction	15 (12.0%)	60 (48.0%)	40 (32.0%)	10 (8.0%)
Comfortable environment	48 (38.4%)	39 (31.2%)	34 (27.2%)	4 (3.2%)
Discipline & motivation	6 (4.8%)	80 (64.0%)	35 (28.0%)	4 (3.2%)



Interpretation: Online learning clearly leads on time flexibility (63.2% versus 5.6% for the classroom) and is also named most often for a comfortable environment (38.4% versus 31.2%). Traditional classroom learning leads on every other dimension: discipline and motivation (64.0%), concentration (60.0%), understanding of concepts (53.6%), interaction (48.0%) and contribution to academic performance (44.8%).

8.4 Perceptions of Online Learning

Frequency of Technical Problems	Frequency	Percentage
Never	22	17.6%
Rarely	30	24.0%
Sometimes	52	41.6%
Often	20	16.0%
Always	1	0.8%
Total	125	100.0%

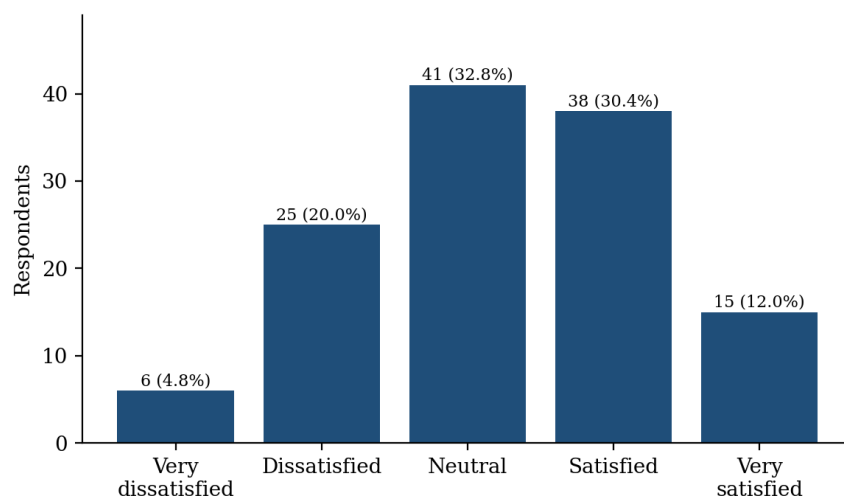
Interpretation: Technical problems are a recurring but not overwhelming issue: 41.6% experience them sometimes and 16.8% often or always, while

41.6% experience them never or rarely.

Statement: Online learning is more cost-effective	Frequency	Percentage
Strongly disagree	7	5.6%
Disagree	13	10.4%
Neutral	36	28.8%
Agree	43	34.4%
Strongly agree	26	20.8%
Total	125	100.0%

Interpretation: A majority (55.2%) agree or strongly agree that online learning is more cost-effective, while only 16.0% disagree, making cost saving one of the strongest perceived advantages of online learning.

Satisfaction with Online Learning	Frequency	Percentage
Very dissatisfied	6	4.8%
Dissatisfied	25	20.0%
Neutral	41	32.8%
Satisfied	38	30.4%
Very satisfied	15	12.0%
Total	125	100.0%



Interpretation: Satisfaction is moderate (mean = 3.25, SD = 1.06). 42.4% are satisfied or very satisfied, 32.8% are neutral and 24.8% are dissatisfied or very dissatisfied.

Statement: Combining both methods improves learning	Frequency	Percentage
Strongly disagree	0	0.0%
Disagree	14	11.2%
Neutral	9	7.2%
Agree	49	39.2%
Strongly agree	53	42.4%
Total	125	100.0%

Interpretation: 81.6% of respondents agree or strongly agree that combining online and classroom learning improves the learning experience (mean = 4.13), and only 11.2% disagree. This is the strongest consensus in the data.

8.5 Descriptive Statistics of Key Scores

Variable (1–5 scale)	Mean	Median	Std. Deviation	Minimum	Maximum
Ease of clarifying doubts – Online	2.848	3.00	1.198	1	5
Ease of clarifying doubts – Classroom	3.888	4.00	1.130	1	5
Satisfaction with online learning	3.248	3.00	1.060	1	5

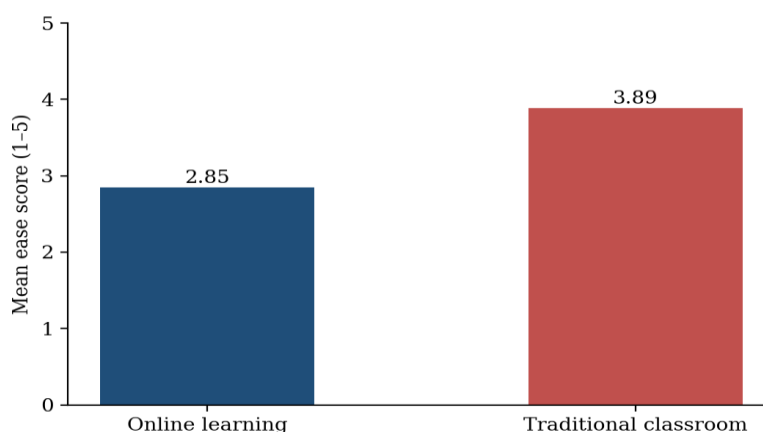
Online learning is cost-effective	3.544	4.00	1.104	1	5
Combining both methods is beneficial	4.128	4.00	0.967	2	5

Interpretation: Doubt clarification is rated higher for the classroom ($M = 3.888$) than for online learning ($M = 2.848$). Agreement with the blended-learning statement has the highest mean ($M = 4.128$), while satisfaction with online learning is moderate ($M = 3.248$).

8.6 Hypothesis Testing

Test 1: Ease of clarifying doubts – Online versus Classroom (Paired-samples t-test)

Statistic	Value
Mean ease – Online	2.848
Mean ease – Classroom	3.888
Mean difference (Online – Classroom)	-1.040
t-value (df = 124)	-7.184
p-value (two-tailed)	< 0.001
Effect size (Cohen's dz)	0.643
Wilcoxon signed-rank p-value	< 0.001
Decision at 5% level	Reject H01



Interpretation: The paired t-test gives $t(124) = -7.184$, $p < 0.001$. Because p is below 0.05, H_{01} is rejected. Respondents find it significantly harder to clarify doubts online than in the classroom, by about 1.04 scale points on average, a large effect ($dz = 0.64$). The non-parametric Wilcoxon test gives the same conclusion.

Test 2: Occupational status and preferred learning method (Chi-square test of independence)

Occupational Status	Online	Traditional	Both Equally	Row Total
Student	24	38	17	79
Non-student	12	16	18	46
Column Total	36	54	35	125

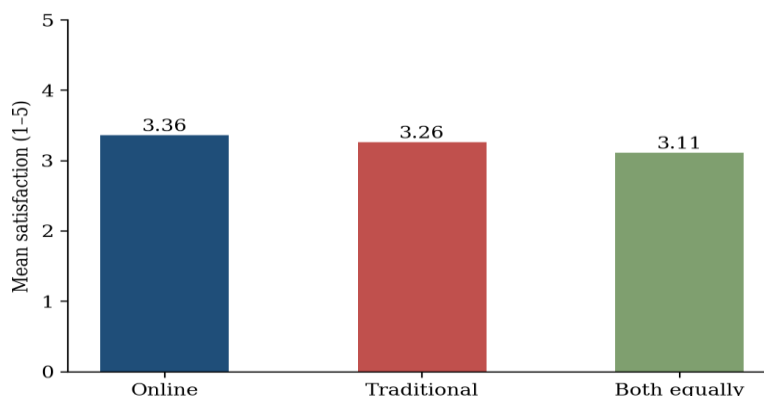
Statistic	Value
Chi-square (χ^2)	4.600
Degrees of freedom	2
p-value	0.1003
Cramér's V	0.192
Minimum expected count	12.9
Decision at 5% level	Fail to reject H02

Interpretation: The Chi-square statistic is $\chi^2 = 4.600$ with 2 degrees of freedom and $p = 0.1003$. Because p exceeds 0.05, H_{02} is not rejected: occupational status is not significantly associated with preferred learning method, and the association is weak ($V = 0.19$). Descriptively, 48.1% of students prefer the classroom compared with 34.8% of non-students, but this difference could be due to chance in a sample of this size.

Test 3: Satisfaction with online learning across preference groups (One-way ANOVA)

Preferred Method	N	Mean Satisfaction	Std. Deviation
Online	36	3.361	0.961
Traditional	54	3.259	0.935
Both equally	35	3.114	1.323

Source	Sum of Squares	df	Mean Square	F	p-value
Between Groups	1.093	2	0.547	0.482	0.618
Within Groups	138.219	122	1.133	—	—
Total	139.312	124	—	—	—



Interpretation: One-way ANOVA gives $F(2, 122) = 0.482$, $p = 0.618$. Because p exceeds 0.05, H_0 is not rejected. Mean satisfaction does not differ significantly between students who prefer online learning ($M = 3.36$), the classroom ($M = 3.26$) or both ($M = 3.11$). The Kruskal–Wallis test supports this result ($p = 0.707$).

9. Major Findings

- Traditional classroom learning is the most preferred method (43.2%), while 28.0% value both equally and 28.8% prefer online learning.
- Online learning is judged better for time flexibility (63.2%) and a comfortable environment (38.4%), and 55.2% agree that it is more cost-effective.
- Traditional classroom learning is judged better for discipline and motivation (64.0%), concentration (60.0%), understanding (53.6%), interaction (48.0%) and academic performance (44.8%).
- Doubts are significantly easier to clarify in the classroom ($M = 3.89$) than online ($M = 2.85$); the paired t-test is significant ($p < 0.001$).
- Occupational status is not significantly associated with preferred learning method ($p = 0.100$).
- Satisfaction with online learning is moderate ($M = 3.25$) and does not differ significantly across preference groups ($p = 0.618$).
- 81.6% agree that combining both methods improves the learning experience, supporting blended learning.

10. Suggestions

- Retain structured classroom interaction for concept-heavy topics, since students consistently link it with better understanding, concentration, discipline and motivation.
- Use online learning to extend flexibility and reduce cost, for example through recorded lectures, supplementary materials and remote access.
- Strengthen doubt-clearing in online courses through live question-and-answer sessions, discussion forums, chat support and scheduled teacher availability.
- Adopt a planned blended model that combines classroom and online components, since most respondents believe the combination improves learning.
- Improve technical reliability through stable platforms, low-bandwidth options and technical support, as technical problems still affect a sizeable minority.
- Build students' self-discipline online using deadlines, progress tracking, short assessments and feedback.
- Collect periodic student feedback on both modes and track satisfaction and performance to refine delivery over time.

11. Conclusion

This illustrative study compared online and traditional learning from the students' perspective and demonstrates a complete research process from objectives and hypotheses to analysis and recommendations. Students see the two modes as complementary rather than interchangeable: online learning is valued for flexibility, comfort and cost, while the classroom is valued for interaction, concentration, understanding and motivation. Doubt clarification was significantly easier in the classroom, whereas preference and satisfaction did not differ significantly by occupation or preference group. With 81.6% of respondents agreeing that combining both methods improves learning, the results favour a thoughtfully designed blended approach rather than a choice of one mode over the other.

12. Limitations and Scope for Future Research

The most important limitation is that the study relies on single-item, self-reported perceptions rather than validated multi-item scales, so the findings reflect students' opinions and not measured learning outcomes. The sample was drawn by convenience and is dominated by respondents aged 18–25, and some subgroups, such as postgraduate and professional-course learners, are small, which limits how far the results can be generalised. The study is also cross-sectional, so it cannot show how perceptions change over time.

Future research should collect data from a clearly defined population using probability or stratified sampling, and use validated multi-item scales with reliability and validity testing. It should compare actual learning outcomes, such as grades and course completion, alongside perceptions. Moderators such as age, education level, digital access, course type and learners' self-discipline could also be examined. Longitudinal and experimental designs could test whether a blended model improves performance and satisfaction.

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