Teachers' Perceptions on Post-Covid Attitudinal Changes Among Secondary and Higher Secondary Students and Its Implications for The Teaching–Learning Process

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ABSTRACT

The COVID-19 pandemic closed schools for long periods and moved teaching online almost overnight. This study examines how teachers in Kerala, perceive secondary and higher secondary school students' attitudes in the post-COVID classroom and how those perceptions relate to the teaching–learning process. Thirty-three teachers (26 handling higher secondary and 7 secondary classes, from the Science, Commerce, Humanities and Language streams) completed a researcher-developed Perception Scale covering six dimensions (33 scored items; Cronbach's α = .58 to .82, overall .92) and answered three open-ended questions. Descriptive statistics, multiple regression, one-way ANOVA and thematic analysis were used. Teachers reported the strongest change in academic orientation (M = 4.04), followed by technology dependence (M = 3.78), attention and learning behaviour (M = 3.75) and discipline and classroom conduct (M = 3.74). In an exploratory regression the six dimensions together accounted for 70.8% of the variance in the teaching–learning process score (adjusted R^2 = .641), and only academic orientation made a significant independent contribution (β = .587, p = .001). This held when items shared by predictors and outcome were removed (β = .481, p = .018). Perceptions did not differ by subject stream. Teachers who had taught through all three periods reported more change in academic orientation (η^2 = .48) than teachers who had taught only before or only after COVID-19, and more change in technology dependence (η^2 = .28) than teachers who had taught only before it, with weaker differences for attention and discipline and none for social and emotional behaviour or self-image. Open-ended comments pointed to digital dependence, weak attention and academic seriousness, and discipline problems, and teachers suggested more engaging teaching, counselling and mentoring, and clearer rules. The sample is small and non-random and all data are teacher reports, so the findings describe perceived change and associations, not measured change or causes. The paper closes with implications for student-centred teaching, formative assessment and teacher development.

Keywords: Post-COVID education; teachers' perceptions; student attitudes; technology dependence; teaching–learning process; Kerala.

INTRODUCTION

When schools shut during the COVID-19 pandemic, students lost the daily routine of the classroom and, for many, direct contact with their teachers. Learning shifted to screens, and the effects went beyond marks. Motivation, engagement, behaviour and attitudes towards school were all affected. Classrooms have since reopened, but it is not clear that students returned to earlier habits. Teachers describe difficulty in rebuilding attention, study routines, discipline and willingness to participate. Research from other settings points the same way: attitudes and emotions formed during the pandemic still colour how education is experienced (Banihashem et al., 2023), and students' perceptions differ when pre-COVID, COVID and post-COVID periods are compared (Agarwal et al., 2023).

Attitude matters in learning because it shapes how learners judge and respond to what happens in school. Allport (1935) described attitude as a mental state of readiness organised through experience. Eagly and Chaiken (1993) defined it as a tendency to evaluate something with some degree of favour or disfavour. In school, attitude shows up as effort, participation, commitment to study and the way students deal with teachers and peers. Fredricks et al. (2004) describe engagement as behavioural, emotional and cognitive, which makes their framework a natural fit for studying classroom behaviour after the pandemic.

Teachers see the same students day after day, so they are well placed to notice changes in classroom behaviour, especially those who taught before, during and after the closures. Their accounts are, however, observations and not direct measures of what students feel or believe. This study therefore treats the data as *teachers' perceptions* of students' attitudinal change, and the wording of the findings throughout the paper follows that limit. Six dimensions are examined: academic orientation, attention and learning behaviour, discipline and classroom conduct, social and emotional behaviour, technology dependence, and self-image orientation. The study asks the following questions.

RQ1. How strongly do school teachers in Kerala perceive change in each of the six dimensions?

RQ2. How far do the six perceived dimensions explain the teaching–learning process score?

RQ3. Do teachers' perceptions differ by subject stream and by the periods in which they taught?

RQ4. What changes and classroom challenges do teachers describe in their own words?

REVIEW OF RELATED LITERATURE AND THEORETICAL FRAMEWORK

2.1 Early research on pandemic disruption

Most early work on COVID-19 and education dealt with closures, learning loss, access and the sudden move online. Kuhfeld et al. (2020) projected sizeable achievement losses for school pupils, and Kapasia et al. (2020) showed how unequal access to learning resources was in India during lockdown, although their sample was of undergraduate and postgraduate students in West Bengal. Dhawan (2020) saw online learning as a way to keep education going but noted problems of interaction, engagement and distraction. Mishra et al. (2020) reported similar difficulties for teachers and learners in higher education. A good part of this evidence therefore comes from university settings, and it cannot be assumed to apply unchanged to Kerala's higher secondary students, who are younger and study under a different regime of examinations and school supervision.

2.2 Post-pandemic studies

Later studies look at what remained after reopening. Banihashem et al. (2023) surveyed teachers and students in blended higher education and found that attitudes and emotions were related to perceived teaching and learning performance. Agarwal et al. (2023) compared health-profession students before, during and after the pandemic and found significant differences on several aspects of the learning environment. Chatterjee et al. (2024) asked teachers about blended learning and engagement and noted how hard it is to hold students' interest once face-to-face teaching returns. The study closest to the present one in setting is that of Sulur Anbalagan et al. (2025), who worked with government high-school teachers and students in Nellore and identified academic disruption and recovery, changed student behaviour, weaker educational quality and teachers' emotional strain as main themes. Taken together these studies suggest that post-pandemic adjustment involves workload, wellbeing and motivation as much as technology, but they differ in level of education, country and method, so their findings are not directly comparable.

2.3 Evidence organised by dimension

The six dimensions used in this study are taken in the order in which the instrument presents them. The Indian studies reviewed below were selected because they deal with school students or school teachers, and they are used wherever possible in preference to evidence from universities.

Studies of academic orientation and learning behaviour give a mixed picture. Ponnusamy and Perumal (2023) found that most secondary students took part in academic activities only at an average level during the pandemic, and that boys and girls differed significantly. Mythili et al. (2024) surveyed 478 students of Classes X to XII in 42 schools across four districts of Himachal Pradesh. Social interaction, active participation and teacher feedback were not the same in online and face-to-face learning, although creative skills and several other learning measures were rated as similar. Reshu et al. (2025) looked at the period after reopening. Among 218 upper secondary students aged 15–18 in 2022–23, more than a third reported high academic stress, and fear of failure and uncertainty about the future affected close to half. This matters for academic orientation, since what teachers read as weaker seriousness about study may be tied up with examination pressure and not with motivation alone.

Teacher-based studies come closest to the design used here, although most were carried out during or soon after the closures. Krishnakumari et al. (2022) surveyed 234 teachers in Chennai, from schools and colleges, on students' behaviour in online classes and on the difficulties teachers met, and related behavioural change to teachers' performance. Kamal and Illiyan (2021) found that 200 Delhi school teachers held positive views of online teaching on the whole, but also reported technical problems and trouble with online examinations. In West Bengal, Choudhury and Sharma (2020) reported that only 43.15 per cent of 100 teachers had a positive attitude towards e-learning, with differences by locality, gender, type of school and subject taught. None of these teacher-based studies asked about students' attitudes after classes returned to the classroom in Kerala.

The evidence on technology is mostly about access and the quality of online learning, not about dependence on devices. Das (2021) studied 82 secondary students in Dibrugarh, Assam, and found their view of e-learning to be less than satisfactory. Ghosh and Bairagya (2022) collected the views of both students and teachers on online teaching in the Bolpur subdivision of West Bengal. Samiya and Biswal (2024) interviewed 25 students of Classes IX to XII and reported that students from poorer families lacked devices and resources, which harmed their studies and their mental health. Kulkarni and Patil (2025) surveyed changes in learning preferences, attitudes and lifestyle after the pandemic. Heavy reliance on mobile phones, which the teachers in the present study mention often, is therefore a point on which Indian school-level evidence is still limited.

For social and emotional behaviour, Basu (2020) studied higher secondary students in North 24 Parganas and described the stress and behavioural change that came with confinement and fear of the virus. Samiya and Biswal (2024) and Reshu et al. (2025), mentioned above, also point to stress and strain among adolescents. Self-image orientation, meaning concern with how peers see one and the need for validation, has received very little direct attention. The stress and fear-of-failure findings are the nearest evidence, and none of the studies reviewed measured self-image as such, so any comparison on this dimension has to be indirect.

THEORETICAL FRAMEWORK

Two theoretical perspectives guided the design. Engagement theory (Fredricks et al., 2004) informed the dimensions that concern what students do in class and how they feel about it. The Theory of Planned Behaviour (Ajzen, 1991) supplied the link between attitude and behaviour: if attitudes towards study change, intentions and conduct in the classroom are expected to change too. Table 1 shows how each dimension was linked to these perspectives. The assumed pattern is that teachers' perceptions of the six dimensions are related to their judgement of how the teaching–learning process is going, and that this relationship may differ with teachers' own experience.

Table 1: Link between the six dimensions and the theoretical framework

Dimension	Theoretical basis	What teachers were asked about
Academic orientation	Behavioural and cognitive engagement (Fredricks et al., 2004)	Seriousness about study, regular homework, studying for examinations, need for reminders, ready-made answers, reliance on guides (6 items)

Dimension	Theoretical basis	What teachers were asked about
Attention and learning behaviour	Behavioural and cognitive engagement	Difficulty keeping attention, distraction, repeated instructions, impatience, preference for short explanations, switching between tasks (6)
Discipline and classroom conduct	Behavioural engagement; attitude–behaviour link (Ajzen, 1991)	Following rules, moving or talking in class, casual behaviour towards teachers, need for monitoring (4)
Social and emotional behaviour	Emotional engagement	Participation in discussion, confidence in communication, discouragement, reassurance seeking, emotional sensitivity, avoiding answering (6)
Technology dependence	Attitude formed through experience (Allport, 1935)	Reliance on phones, preference for video explanations, reluctance to learn without digital support, comparing teachers with online content, difficulty with textbooks (5)
Self-image orientation	Evaluative component of attitude (Eagly & Chaiken, 1993)	Concern about appearance, checking mirrors, adjusting hair or dress, cosmetics, distraction by appearance, seeking peer approval (6)

2.5 Research gap

Existing work has mostly treated learning loss, technology, mental health or blended learning on their own. Few studies look at several attitudinal dimensions together, from teachers' point of view, at the higher secondary level, and in Kerala. The Indian studies reviewed in Section 2.3 deal largely with online learning, access, stress and teachers' attitudes to e-learning, and most were conducted during or soon after the closures. This study attempts to fill that gap and also checks whether perceptions differ by subject stream and by teachers' experience of the pandemic phases.

METHODOLOGY

3.1 Design

A descriptive cross-sectional survey was used because the aim was to record teachers' existing perceptions without intervening in classrooms. The main data were quantitative; open-ended responses were collected to add context. Because all data come from one survey of teachers at one point in time, the study can show associations and perceived differences but cannot show change over time within the same students or teachers.

3.2 Participants and sampling

The population was thirty three teachers of secondary and higher secondary classes in Kerala. Participants were recruited through school contacts, teacher groups, and WhatsApp circulation, to include all four subject streams and teachers with different lengths of service. Because recruitment was purposive and participation voluntary, the sample is not probability-based and does not represent all teachers in the state. Teachers also reported the period or periods in which they had handled classes (before COVID-19, during the COVID period, after COVID-19, or all three), and this self-reported teaching history defines the period groups. Table 2 gives its composition. Twenty-six of the 33 teachers (78.8%) handled higher secondary classes and seven (21.2%) handled secondary classes, so the findings concern school students at both stages, with the higher secondary stage in the majority.

Table 2: Composition of the sample

Category	n	%
Gender: Male	14	42.4
Gender: Female	19	57.6
Age: 30 or below	4	12.1
Age: 31–40	14	42.4
Age: 41–50	13	39.4
Age: Above 50	2	6.1
Stream: Science	10	30.3
Stream: Commerce	7	21.2
Stream: Humanities	5	15.2
Stream: Language	11	33.3
School type: Government	18	54.5
School type: Aided	5	15.2
School type: Private	10	30.3
Experience: Below 5 years	8	24.2
Experience: 5–10 years	12	36.4
Experience: 11–15 years	5	15.2
Experience: 16–20 years	3	9.1
Experience: Above 20 years	5	15.2
Classes handled: Secondary	7	21.2
Classes handled: Higher secondary	26	78.8
Period taught: Pre-COVID only	8	24.2
Period taught: COVID period only	1	3.0
Period taught: Post-COVID only	13	39.4
Period taught: All three periods	11	33.3
Total	33	100

Green (1991) suggests at least 50 + 8k cases to test a regression model with k predictors, which is 98 for six predictors. The present sample of 33 is well below this figure, and with 26 residual degrees of freedom the regression has little power and its estimates are unstable. The regression and the group comparisons are therefore treated as exploratory, and a non-significant result should not be read as evidence of no effect. The smallest stream group (Humanities) has five teachers, and in the period comparison the one teacher who handled classes only during the COVID period was left out.

3.3 Instrument

The Perception Scale was developed by the authors for this study. The questionnaire has 37 statements about students' behaviour, each rated from Strongly Agree (5) to Strongly Disagree (1). Thirty-three statements form the six dimension scores: academic orientation (6 items), attention and learning behaviour (6), discipline and classroom conduct (4), social and emotional behaviour (6), technology dependence (5) and self-image

orientation (6). A dimension score is the mean of its items. Four statements were not scored in any dimension: one on completing assigned work on time and three on social image, school as a social space, and the value of formal education. Items were drawn from a review of literature, discussion with teachers, and the authors' own classroom experience. Sample statements are "Students show reduced seriousness toward studies" and "Students follow classroom rules consistently". Nearly all scored statements describe behaviour that teachers would see as unfavourable, so a higher score means stronger agreement that the change has occurred. The exception, "Students follow classroom rules consistently", is positively worded and was reverse-scored before the discipline score was calculated. Without reversal, this item correlated negatively with the other three discipline items and α for the dimension was −.24; with reversal, α was .70.

The teaching–learning process (TLP) score used as the outcome in the regression is the mean of four statements: students prefer ready-made answers instead of attempting independently, have difficulty maintaining attention throughout the class, prefer short explanations rather than detailed teaching, and compare the teacher's explanation with online content (α = .56). These were taken as indicators of how the teaching–learning process is being affected. All four statements also belong to the academic orientation, attention, and technology dependence scores, which raises the association between those predictors and the outcome by construction. The regression was therefore repeated with the four items removed from the predictors (Section 4.3). The TLP score is a narrow indicator based on student behaviour as teachers see it, and it should not be read as a general measure of teaching quality or learning outcomes.

3.4 Validity and reliability

Content validity was examined by 10 experts, five professors of education and five practising teachers, who judged each item for relevance and clarity. Items were revised or removed on the basis of their feedback. A pilot study with 15 teachers who were not part of the final sample was used to check clarity and consistency. Cronbach's alpha for the final sample is given in Table 3. Five of the six dimensions reached .70 or above, and alpha for the 33 scored items together was .92. Attention and learning behaviour (α = .58) and the TLP score (α = .56) were weaker, so results that rely on them need extra caution. Alpha values from 33 respondents are also imprecise.

Table 3: Internal consistency of the Perception Scale (Cronbach's α)

Dimension / scale	Number of items	α
Academic orientation	6	.71
Attention and learning behaviour	6	.58
Discipline and classroom conduct	4	.70
Social and emotional behaviour	6	.75
Technology dependence	5	.72
Self-image orientation	6	.82
Teaching–learning process (outcome)	4	.56
Overall scale (33 scored items)	33	.92

Factor analysis was not feasible with 33 teachers, so the separateness of the six dimensions is not confirmed. Correlations between the dimension scores range from .34 to .73, which means that the dimensions overlap considerably (Section 4.2).

3.5 Data collection and ethics

The questionnaire was circulated through Google Forms during March and April 2025. Participation was voluntary, informed consent was obtained on the first page of the form, responses were anonymous, and the data were used only for academic purposes. The study was carried out as part of supervised academic project work.

3.6 Data analysis

Data were analysed using SPSS. Means and standard deviations described each dimension, and Cronbach's alpha checked internal consistency. Multiple regression with the six dimensions entered together tested their joint and independent association with the TLP score; tolerance and variance inflation factors checked multicollinearity, and a second model with the overlapping items removed served as a sensitivity check. One-way ANOVA compared subject streams and teaching-period groups, with eta-squared as the effect size (interpreted with Cohen's, 1988, benchmarks of .01, .06 and .14), Levene's test for equal variances, Welch's F as a check, and Games–Howell post-hoc tests for the period comparison. The single teacher who handled classes only during the COVID period was excluded from the period comparison. Because the sample is small, p-values are treated as indications and not as firm tests. Responses to the three open-ended questions were coded by the researcher following the steps of reflexive thematic analysis (Braun & Clarke, 2006); codes were generated inductively, grouped into themes, and checked against the data and reviewed by the supervisor. A response could carry more than one code, and counts show how many teachers mentioned a theme.

4. RESULTS

4.1 Descriptive statistics

Table 4 presents the descriptive results. Academic orientation had the highest mean (M = 4.04, SD = 0.46): teachers agreed most strongly with statements describing less seriousness about study, irregular homework, examination-driven learning and reliance on ready-made answers. Technology dependence (M = 3.78, SD = 0.59), attention and learning behaviour (M = 3.75, SD = 0.40) and discipline and classroom conduct (M = 3.74, SD = 0.57) came next and were close to one another. Social and emotional behaviour (M = 3.62, SD = 0.54) and self-image orientation (M = 3.61, SD = 0.63) had the lowest means. All six were above the scale midpoint of 3. Since the scores show agreement with items about change, they indicate how strongly change was perceived and not how large it was.

Table 4: Descriptive statistics of teachers' perceptions of attitudinal change (N = 33)

Dimension	Mean	SD	Rank
Academic orientation	4.04	0.46	1
Technology dependence	3.78	0.59	2
Attention and learning behaviour	3.75	0.40	3
Discipline and classroom conduct	3.74	0.57	4
Social and emotional behaviour	3.62	0.54	5
Self-image orientation	3.61	0.63	6

4.2 Multiple regression

Model 1 (Table 5) was statistically significant, $F(6, 26) = 10.52$, $p < .001$, $R^2 = .708$, adjusted $R^2 = .641$. The six dimensions together therefore accounted for about 71% of the variance in the TLP score in this sample, or about 64% after adjusting for the number of predictors. Academic orientation was the only significant predictor ($\beta = .587$, $p = .001$). Attention and learning behaviour ($\beta = .044$, $p = .782$), discipline and classroom conduct ($\beta = .108$, $p = .470$), social and emotional behaviour ($\beta = .006$, $p = .974$), technology dependence ($\beta = .082$, $p = .673$) and self-image orientation ($\beta = .169$, $p = .340$) did not make independent contributions. Tolerance values ranged from .30 to .52 and VIFs from 1.93 to 3.31, so collinearity was moderate and below the usual cut-offs. The confidence intervals are wide, as expected with so few cases.

Table 5: Multiple regression predicting the teaching–learning process score (Model 1, N = 33)

Predictor	*B*	*SE B*	*β*	*t*	*p*	95% CI for B	Tol.	VIF
Academic orientation	.556	.155	.587	3.59	.001	[.238, .874]	.420	2.38
Attention and learning behaviour	.048	.171	.044	0.28	.782	[-.304, .400]	.459	2.18
Discipline and classroom conduct	.082	.112	.108	0.73	.470	[-.148, .311]	.519	1.93
Social and emotional behaviour	.004	.139	.006	0.03	.974	[-.280, .289]	.371	2.70
Technology dependence	.061	.142	.082	0.43	.673	[-.232, .354]	.302	3.31
Self-image orientation	.116	.119	.169	0.97	.340	[-.129, .361]	.370	2.71

Note. $F(6, 26) = 10.52$, $p < .001$; $R^2 = .708$; adjusted $R^2 = .641$. Outcome: TLP score (mean of four items; see Section 3.3). Tol. = tolerance; VIF = variance inflation factor.

A high mean and a significant coefficient are different things. Technology dependence had the second-highest mean but made no unique contribution once the other dimensions were held constant. Correlations between the six dimension scores ranged from .34 to .73, and technology dependence correlated between .53 and .73 with each of the other five, so shared variance may hide separate effects; with only 26 residual degrees of freedom the model could not tell them apart. The TLP score correlated .80 with academic orientation and between .53 and .66 with the other five dimensions. Finally, predictors and outcome came from the same teachers at the same time, so the results describe association only. They do not show that a change in academic orientation produces a change in teaching and learning.

4.3 Sensitivity of the regression result

Four of the items in the TLP score also belong to the predictor scores (one in academic orientation, two in attention and learning behaviour and one in technology dependence), so part of the association in Model 1 is built in. Model 2 (Table 6) repeats the analysis with those four items removed from the predictors. It remained significant, $F(6, 26) = 7.42$, $p < .001$, $R^2 = .631$, adjusted $R^2 = .546$. Academic orientation was again the only significant predictor ($\beta = .481$, $p = .018$). Self-image orientation ($\beta = .316$, $p = .100$) and discipline and classroom conduct ($\beta = .225$, $p = .174$) were positive but did not reach significance. The fall in R^2 from .708 to .631 shows how much the overlap contributed. The result for academic orientation is therefore stable across both versions of the model, while the position of the other dimensions is unclear in a sample of this size. The scoring of the positively worded discipline item did not change this conclusion: with that item left unreversed, academic orientation was still the only significant predictor.

Table 6: Sensitivity analysis: regression with overlapping items removed from the predictors (Model 2, N = 33)

Predictor	*B*	*SE B*	*β*	*t*	*p*	95% CI for B	Tol.	VIF
Academic orientation	.441	.174	.481	2.54	.018	[.083, .798]	.394	2.54
Attention and learning behaviour	-.078	.132	-.091	-0.59	.558	[-.349, .192]	.602	1.66
Discipline and classroom conduct	.171	.122	.225	1.40	.174	[-.080, .421]	.548	1.82

Predictor	*B*	*SE B*	*β*	*t*	*p*	95% CI for B	Tol.	VIF
Social and emotional behaviour	.109	.153	.137	0.71	.483	[-.206, .424]	.383	2.61
Technology dependence	-.100	.146	-.138	-0.68	.500	[-.399, .200]	.348	2.87
Self-image orientation	.216	.126	.316	1.71	.100	[-.044, .476]	.415	2.41

Note. $F(6, 26) = 7.42$, $p < .001$; $R^2 = .631$; adjusted $R^2 = .546$. Items 11, 14, 18 and 33, which form the TLP score, were removed from the academic orientation, attention and technology dependence scores.

4.4 Differences by subject stream

Perceptions did not differ significantly between the Science (n = 10), Commerce (n = 7), Humanities (n = 5) and Language (n = 11) streams on any dimension (Table 7). Eta-squared values ranged from .004 to .052, which range from negligible to just below a medium effect by Cohen's (1988) benchmarks. Levene's test was not significant for any dimension and Welch's F led to the same conclusions. With groups this small the test has little power, so the result is best read as no clear evidence of stream differences and not as proof that none exist. Group means were close to one another (Appendix A).

Table 7: One-way ANOVA of perceptions by subject stream

Dimension	df	*F*	*p*	η^2
Academic orientation	3, 29	0.53	.668	.052
Attention and learning behaviour	3, 29	0.04	.990	.004
Discipline and classroom conduct	3, 29	0.26	.851	.027
Social and emotional behaviour	3, 29	0.30	.824	.030
Technology dependence	3, 29	0.39	.759	.039
Self-image orientation	3, 29	0.08	.971	.008

Note. η^2 is partial eta-squared from the ANOVA. Group means and standard deviations are in Appendix A.

4.5 Differences by the periods in which teachers taught

Teachers reported when they had handled classes: before COVID-19 only (n = 8), after COVID-19 only (n = 13), or in all three periods (n = 11). One teacher who handled classes only during the COVID period was left out, because a group of one cannot be compared. One-way ANOVA found significant differences for academic orientation ($\eta^2 = .48$), technology dependence ($\eta^2 = .28$), discipline and classroom conduct ($\eta^2 = .21$) and attention and learning behaviour ($\eta^2 = .19$), but not for social and emotional behaviour or self-image orientation (Table 8). Only the first two held up under both Welch's F and the Games–Howell post-hoc test, which allow for unequal variances and group sizes. Teachers who had taught through all three periods rated change in academic orientation higher (M = 4.42) than those who taught only after COVID-19 (M = 3.99, p = .009) or only before it (M = 3.60, p = .001). For technology dependence, the all-periods group (M = 4.18) differed from the pre-COVID group (M = 3.40, p = .023). The differences for attention and discipline were weaker: no pairwise comparison was significant, and Welch's F was significant for attention (p = .045) but not for discipline (p = .086).

Table 8: One-way ANOVA of perceptions by the periods in which teachers taught (n = 8, 13 and 11)

Dimension	df	*F*	*p*	η²	Post-hoc result
Academic orientation	2, 29	13.22	< .001	.477	All three > pre (p = .001); all three > post (p = .009)
Attention and learning behaviour	2, 29	3.41	.047	.190	None significant
Discipline and classroom conduct	2, 29	3.95	.030	.214	None significant
Social and emotional behaviour	2, 29	2.49	.101	.146	—
Technology dependence	2, 29	5.53	.009	.276	All three > pre (p = .023)
Self-image orientation	2, 29	1.49	.242	.093	—

Note. η² is partial eta-squared from the ANOVA. Post-hoc tests: Games–Howell, p < .05 shown. Welch's F was significant for attention (p = .045) but not for discipline (p = .086). Group means and standard deviations are in Appendix A.

These groups consist of different teachers with different careers. The comparison therefore tells us that teachers with different teaching histories perceive some dimensions differently. It does not show how the same teachers' views changed from one phase to the next, and the groups may also differ in age, years of service and workload, none of which was controlled. The result should not be read as evidence of change across historical phases.

4.6 Teachers' open-ended responses

All 33 teachers answered the first open-ended question (what changes they see in students), although two answers ("Change needed", "Reluctant") were too brief to code. Thirty-one teachers answered the second (what schools can do to improve student attitude) and 18 answered the third (any other suggestions); most replies to the third were "nil" or "no". Five themes were identified in answers to the first question, and are illustrated below with teachers' own words (T plus the order of the response; spelling corrected).

Dependence on digital devices and AI (14 teachers). "Over dependence on Digital and AI tools for learning. They disregard teachers often." (T1); "After covid they need digital devices to complete the task. Thinking process and all decreased." (T30)

Weaker attention (13 teachers). "Students are less serious about studies and struggle to maintain focus for even a short time." (T12); "Can concentrate on a particular topic only for a limited time." (T32)

Lower motivation and academic seriousness (10 teachers). "They always seek an easy way out." (T23); "They meant education only for a time being, never understood its seriousness." (T28)

Discipline and conduct (5 teachers). "They appear to value less the accepted rules of decorum of a class." (T4); "Students did not give respect to teachers." (T3)

Social and emotional concerns, including self-image (5 teachers). "After COVID, many students show reduced social interaction skills and shorter attention spans." (T17); one teacher also described students as "more conscious of their appearance, status" (T28).

Not every teacher saw only decline. Three teachers described the change as part of a wider shift in students and teaching. One wrote, "Students are much more globally connected and aware. Hence, the instructions must improve to reach their level of awareness." (T4). Another wrote, "We cannot live without digital devices, it's

part of the teaching-learning process but students should be given correct orientation about how to use them wisely." (T30). A third wrote, "Children will change generation by generation. We have to understand the difference and act accordingly." (T27)

When asked what schools can do, teachers most often named more engaging, activity-based and innovative teaching (9 teachers) and counselling, mentoring and supportive teacher–student relationships (8). Others asked for motivation, career guidance and value education (6), stricter rules or limits on mobile phone use (4), and a stronger role for parents and the PTA (2).

DISCUSSION

The most consistent result is that teachers perceived the strongest change in academic orientation, and that this was the only dimension to predict the TLP score independently, both in the full model and after the overlapping items were removed. This is consistent with engagement theory (Fredricks et al., 2004), in which students' commitment to study is central to how teaching and learning work, and with teachers' comments about declining seriousness and motivation. The result needs care. Academic orientation and the TLP score were rated by the same teachers, and the TLP score is made of four student-behaviour items, so the finding is closer to saying that teachers who report one kind of change also report others than to evidence about teaching quality. Common-method variance of this kind is a known risk in single-source surveys (Podsakoff et al., 2003) and may have raised the R^2.

Technology dependence was the second-highest rated dimension and the most frequent theme in teachers' comments (14 of 33). It also differed by the periods in which teachers taught, yet it added nothing independently to the TLP score. Three readings are possible, and the data cannot choose between them. First, teachers may see phone use as a cause of weaker attention and academic seriousness, so that its effect is already carried by those dimensions. Second, the dimensions overlap statistically, with technology dependence correlating .53 to .73 with the others, and the overlap hides its unique contribution. Third, technology dependence may be a widespread concern that does not vary enough across teachers to separate more favourable from less favourable views. Teachers' own comments add a fourth angle, since some described digital tools as a lasting part of teaching and learning that students need to be taught to use well.

The lack of difference between subject streams suggests that the concerns are general across this sample and not tied to one subject area, although groups of five to eleven teachers can only detect large differences. The differences by teaching history were clearest for academic orientation and technology dependence, where teachers who had taught through all three periods reported the most change. Such teachers have a longer baseline for comparison, yet they may also hold stronger expectations of how students should behave or remember the pre-COVID period more favourably. Group differences of this kind do not show that student attitudes changed by a given amount.

Other explanations for what teachers observed must also be kept in view. Students' behaviour is shaped by age and development, family circumstances, examination pressure, socio-economic differences, changes in assessment and curriculum policy, and the general growth of digital technology in daily life, all of which operate apart from the pandemic. The present design cannot separate these from the effect of school closures. The results should therefore be taken as teachers' interpretation of classroom conditions after COVID-19, in a form that will be useful for planning, not as proof that the pandemic is the cause.

The findings broadly agree with post-pandemic studies reporting changes in attitudes and perceptions of education (Agarwal et al., 2023; Banihashem et al., 2023) and with Indian evidence of altered student behaviour after reopening (Sulur Anbalagan et al., 2025). They add a Kerala school-teacher perspective and a multidimensional view of teachers' concerns, but the differences in level, population and method noted in Section 2 mean that the agreement is general and not precise.

Taken with Indian school-level studies, the results fit in some places and not in others. The high rating for academic orientation sits alongside reports of only average study engagement during the pandemic (Ponnusamy

& Perumal, 2023) and of high academic stress after reopening (Reshu et al., 2025). Teachers' concern about technology echoes the difficulties reported with online learning (Das, 2021; Kamal & Illiyan, 2021; Krishnakumari et al., 2022), but those studies were about teaching during closures, while the present one concerns classrooms after students returned. The lack of difference between subject streams stands against Choudhury and Sharma (2020), who found science teachers more favourable towards e-learning than arts teachers. The two studies measure different things, attitude to e-learning in one and perceived change in students in the other, so the contrast should not be pushed far. No study reviewed measured self-image orientation directly, and self-image did not stand out in the regression here, so no close comparison is possible.

6. Educational Implications

The following implications arise from the concerns that teachers reported and the measures they suggested, mainly more engaging teaching, counselling and mentoring, clear rules and career guidance. The study did not test any of these measures, so their effectiveness is a matter for later research.

Academic routines. Since academic orientation stood out, schools may consider restoring regular study routines, short-term goals, formative assessment and frequent feedback, so that students have more chances to participate and build consistent habits.

Attention and technology. Teachers reported reduced attention and heavy phone use. Questioning, group work, problem-based tasks and a deliberate, limited use of digital resources may help move students from passive to active learning.

Discipline and wellbeing. Clear expectations, steady routines, shared responsibility for classroom rules and good teacher–student relationships may help with conduct. Students' social and emotional needs call for supportive communication, peer interaction and referral where difficulties are noticed. A classroom climate that values effort, progress and individual strengths could ease the concern with peer approval reflected in self-image orientation.

Teacher development. In-service programmes could address post-pandemic classroom realities, with attention to student-centred teaching, classroom management, responsible use of educational technology and formative assessment.

7. LIMITATIONS

Several limitations should be noted. The sample is small (N = 33) and was recruited purposively, so it cannot represent teachers in Kerala, and the regression falls well short of the sample size usually advised for six predictors. The results are therefore exploratory, and non-significant findings may reflect low power. The design is cross-sectional, so change over time cannot be measured and causal claims cannot be made. All data are teacher self-reports, and student views were not collected. Predictors and outcome came from one source, and the outcome is a four-item score that overlaps with three predictors, which was only partly addressed by the sensitivity model; its reliability is low ($\alpha = .56$), as is that of the attention scale ($\alpha = .58$). The Perception Scale is new, its content validity rests on review by 10 experts (five professors of education and five practising teachers) who rated each item for relevance and clarity, and the six-dimension structure could not be tested by factor analysis. Removing the overlapping items shortened the attention and technology dependence scales in the sensitivity model, which may lower their reliability further. Seven of the 33 teachers handled secondary and not higher secondary classes. The period groups are unequal in size (8 pre-COVID only, 1 COVID only, 13 post-COVID only and 11 all three periods), and the single teacher in the COVID-only group could not be analysed. The groups were based on teachers' self-reported teaching history, which was not cross-checked against years of service, so the period comparisons should be read with caution. Finally, the pandemic cannot be separated from other influences on student behaviour. Later research could use longitudinal or repeated-measures designs, include students' own responses, and test the scale on larger and randomly selected samples.

CONCLUSION

This study examined how teachers in Kerala perceive post-COVID changes in students' attitudes across six dimensions and how these perceptions relate to the teaching–learning process. Among 33 teachers, the strongest change was perceived in academic orientation, followed by technology dependence, attention and learning behaviour and discipline. In an exploratory regression, academic orientation was the only dimension that predicted the teaching–learning process score independently, and this held when overlapping items were removed. Perceptions were similar across subject streams, and teachers who had taught through all three periods reported more change in academic orientation than teachers who had taught in only one period, and more change in technology dependence than teachers who had taught only before COVID-19. These findings describe teachers' perceptions and statistical associations in a small non-probability sample. They do not show that COVID-19 alone caused the changes or that students' attitudes have in fact deteriorated. They do give teachers' own account of what they now face in classrooms, and they point to the need for larger, longitudinal studies that include students' views.

Declaration on the Use of AI Tools

Generative AI tools were used in preparing this manuscript for language editing, grammar correction and formatting. All data, analysis and interpretation are the authors' own, and the authors have reviewed and take full responsibility for the final text.

Declarations

Ethics and consent: Participation was voluntary, informed consent was obtained on the first page of the online form, and responses were anonymous.

Appendices

Appendix A1: Means (SD) by subject stream

Dimension	Science (n = 10)	Commerce (n = 7)	Humanities (n = 5)	Language (n = 11)
Academic orientation	4.08 (0.47)	3.90 (0.66)	3.90 (0.25)	4.14 (0.39)
Attention and learning behaviour	3.78 (0.28)	3.74 (0.65)	3.73 (0.09)	3.73 (0.41)
Discipline and classroom conduct	3.73 (0.67)	3.64 (0.96)	3.65 (0.22)	3.86 (0.21)
Social and emotional behaviour	3.55 (0.46)	3.50 (0.71)	3.67 (0.47)	3.73 (0.58)
Technology dependence	3.88 (0.39)	3.66 (0.71)	3.60 (0.32)	3.85 (0.76)
Self-image orientation	3.60 (0.59)	3.55 (0.69)	3.73 (0.53)	3.61 (0.75)

Appendix A2: Means (SD) by the periods in which teachers taught (the COVID-only teacher is omitted)

Dimension	Pre-COVID only (n = 8)	Post-COVID only (n = 13)	All three periods (n = 11)
Academic orientation	3.60 (0.42)	3.99 (0.32)	4.42 (0.33)
Attention and learning behaviour	3.46 (0.33)	3.81 (0.35)	3.89 (0.42)
Discipline and classroom conduct	3.31 (0.65)	3.79 (0.44)	4.00 (0.54)

Dimension	Pre-COVID only (n = 8)	Post-COVID only (n = 13)	All three periods (n = 11)
Social and emotional behaviour	3.33 (0.52)	3.55 (0.46)	3.86 (0.60)
Technology dependence	3.40 (0.62)	3.71 (0.56)	4.18 (0.36)
Self-image orientation	3.40 (0.51)	3.51 (0.80)	3.86 (0.45)

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