An Empirical Analysis of the Determinants of Learner Centeredness using Ordinal Logistic Regression

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Abstract

As part of quality improvement initiatives of the National Education Policy, the government made radical changes in the instructional style in the classrooms and provided training to the teachers in implementing activity oriented and learner centred curriculum. However, teacher's apprehension about the effectiveness of Learner Centred Strategies (LCS), the increase in workload due to the vast syllabus, high teacher-student ratio, overall reluctance to change one's own teaching style; particularly as one acquires more experience and ineffectiveness of the training provided for implementing LCS are all probable issues which influences adoption of learner centred strategies. This study examines the extent to which various learner centred strategies (LCS) have been implemented in schools and identifies the determinants of learner centeredness in classrooms. Ordinal logistic regression is used to predict the dependent variable with ordered multiple categories and other independent variables including type of school, teaching experience, teacher-student ratio, basic entry quality of the students, vast syllabus, training effectiveness and the subject taught by a teacher. Data on the intensity of use of various LCS was collected from 300 teachers using a pre-tested structured interview schedule. The hypotheses were tested using one sample t test. The study found that the use of LCS was slightly above average and that out of the various factors, the subject taught by a teacher and the teacher-student ratio were found to be highly significant in influencing the extent of use of various LCS.

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Introduction

Improvements and upgradation of teaching-learning atmosphere is inevitable for quality education. As part of the quality improvement programmes initiated by the government, drastic changes were made in the methodology of teaching as well as in the evaluation of the students (Government of Kerala, 2003–04). The learner centred pedagogy was introduced in the higher secondary classes in Kerala in the year 2005 (Government of Kerala 2003–04) and before this period, the teachers followed only the lecture method and there were only class tests done at least 2 times in a year together with an annual examination at the end of the academic year. The evaluation system was converted to include a continuous and comprehensive internal evaluation system (CCE) (SCERT, 2005). This new system of teaching and learning is student centred. In order to achieve the benefits of this quality upgradation strategy fully, it should be implemented as envisaged. It is also important to identify the problems faced by teachers in the adoption of an activity oriented curriculum. This study examines the extent to which various learner centred strategies (LCS) have been implemented and how various factors like ownership of schools, teaching experience, teacher-student ratio, basic entry quality of the students, vast syllabus, training effectiveness and the subject taught by the teacher determines the adoption of LCS.

Significance of the Study

The education policies have long-term implications in the development of intelligent human resources for the country. India has contributed to one of the finest manpower resources in the world. The education system has to be streamlined in ways which enable classrooms to produce learners who are able to make informed decisions in their personal lives, in their workplaces and in society (King and Kitchener, 2004).

Training teachers in the new pedagogy was indispensable as this generation of teachers have been exposed to only a teacher centred learning process. Training intended to equip the teachers in creating an atmosphere for discovery learning in classrooms, learning through debate and problem solving, cooperative learning and scaffolding; by using tools like group discussions, debates, seminars, projects, case study, collections etc (SCERT, 2005). These learner centred strategies intend to improve the students' verbal intelligence, logical and mathematical intelligence, visual and spatial intelligence, interpersonal intelligence and intra personal intelligence (Gardner and Hatch, 1989; Brown, 2008). It is important to discuss controversial issues happening in the society through these learner activities and encourage students to indulge in different lines

of reasoning for appreciating multiple perspectives. Strategies like debates and group discussions enable students to analyse other's point of view and critically evaluate the adequacy of their arguments through evidence given, and to develop and defend their own point of view.

The evaluation of the students is conducted continuously based on the TQM principle of continual improvement. For evaluation purposes, question papers emphasise on assessing the skills in "analysis and interpretation" instead of "knowledge (memory recall) and understanding levels" (Bloom, 1969). Teachers' source books were also provided for each subject which contain numerous student-centred teaching models.

Planning towards achieving an excellent education system gets evaluated through the effectiveness of its implementation in the classrooms by the teachers. There were apprehensions among the teachers with regard to the heaviness of the syllabus, high student-teacher ratio and the potential increase in the workload. This study examines two important dimensions. Primarily it measures the extent of learner centeredness in the classrooms. Further, it identifies the factors influencing the adoption of learner centered strategies in the classroom by the teachers.

Literature Review

Wright in her article "Student centred learning in higher education" reviewed the differences in methods and practices of teacher centred and student centred teaching at the college level. The balance of power in the classroom, the function of the course content, the role of the teacher versus the role of the student, responsibility of learning and the evaluation process are the variables used to study learner centeredness. The study gives suggestions on how to implement the learner centred approach and also reports many instances of innovations used by teachers towards better student centeredness (Gloria Brown Wright, 2011). Similar study of Knight and Wood experimented whether student learning improves when an interactive classroom format was used instead of lecture method. Brown in her study indicated how learning could be enhanced by involving students in their own learning as in peer teaching. The experiment on interactive classrooms was conducted by Knight and wood in two successive semesters using a lecture method in one semester and in the next semester they increased student participation and introduced cooperative problem solving; frequent class assessments were also done while continuing the lecture method. The study compared marks obtained by students during pre and post periods of the experiment and found that learning gains and student understanding

about the concepts were higher in the course which was more interactive (Brown, 2008; Knight and Wood, 2005). Just-in-Time Teaching (JiTT) is an innovative method that enables faculty to increase interactivity in the classroom and engage students in learning. The paper establishes the effectiveness of JiTT (Novak, 2011; Novak et al., 1999). Another experimental study on learner centred strategy was conducted in an upper-level mathematics course where the students presented the material to the class instead of the instructor. The study found that the students were able to learn Mathematics better and learned other trans-disciplinary skills such as how to give presentations, feedback to their peers, learn from feedback and how to trust their peers. It was satisfying for the instructors also as they had more personal contact with the students (Alsardary and Blumberg, 2009). A study on the factors influencing the adoption of learner centred approaches by teachers found that 14 per cent of the respondents used learner centred teaching approaches and 8 per cent rejected it. Between these extremes, many others used learner centred teaching components that fit with their personal teaching style and that naturally suit their discipline. (Blumberg, 2015). Another model developed by Blumberg described the complementary relationship among constructivist learner centred teaching, critical reflection, and social media which would develop teacher performance. It supported the use of learner centeredness which invariably took the focus from simple knowledge dissemination by a teacher to more meaningful ways of learning by the students (Blumberg, 2015). Studies also found that the same faculty member might use more learner centred practices in one course and more instructor-centred practices in another, depending on the course level, instructional format, and enrollment (Blumberg, 2016) and in another study she gave valuable suggestions in using LCT as a means to optimise student learning. She also suggested that lack of training and conceptual understanding about running a learner centred classroom are some of the problems in the implementation of LCS (Blumberg, 2015). An experimental study on the primary trait analysis in a learner centred mathematics course involved a student-to-student instruction process which developed a scoring rubric for the primary traits such as conceptual knowledge, procedural knowledge, application of understanding, and mathematical communication skills, and it was found that students had improvement in all the four traits, with the least improvement in mathematical communication skills (Alsardary et al., 2011). 'Learner centred Teaching Practices: Implementing Project Based Learning in Early Childhood' is a study later published as a book describing how teachers could implement project based learning

as an effective teaching practice for a learner centred classroom. The book explains how varied learning experiences could be delivered in the classrooms and discusses how it is beneficial to the students as they learn to be involved in every phase of a project by questioning, investigating, problem-solving, revising work and sharing their learning in the group (Lev et al., 2020). Studies on the effectiveness of various methods of instruction that enhance students' understanding of basic concepts in science reported that most of the learning methods like game based learning, project based learning and storytelling were all very effective (Blonder and Sakhnini, 2012). (Carmen M. Cain, 2020) investigated how secondary educators were using LCTS in their instruction and what support they needed to use such strategies. The thesis is based on the Dreyfus and Dreyfus model of skill acquisition. This study examined the classroom practices of secondary teachers and the support they needed to use LCTS by collecting data through individual interviews of 12 randomly selected secondary education teachers from a midwestern high school in the United States. The study revealed an important theme; student ownership; which means students take ownership of their learning. The study found that the use of LCTS increased student engagement, improved academic achievement and that as a result positive social change occurs (Carmen M. Cain, 2020; Garreck, 2013).

Literature review on different aspects of learner centred classrooms were found, but those which study the factors that impact its implementation were few. Teacher's apprehension about the effectiveness of LCS, the increase in workload due to vast syllabus, high teacher-student ratio prevalent in countries like India, overall reluctance to change one's own teaching style as one acquires more experience, ineffectiveness of the training provided for implementing LCS are all important issues which influences application of learner centred strategies. So, the following research questions need to be addressed.

1. Are the teachers still continuing the traditional lecture method? If not, to what extent the suggested learner centred strategies have been used by them and which of these strategies are the most used?
2. If the teachers are more or less continuing with the traditional teacher centred methods, what factors might have influenced them in abstaining from the adoption of learner centred strategies in classrooms?

Based on these research questions, the following hypotheses were framed for the study.

Hypotheses

Hypothesis 1: Extent of use of learner centred strategies in schools in Kerala is moderate.

Hypothesis 2: Type of school does not influence the use of learner centred strategies.

Hypothesis 3: Subject taught by the teacher does not influence the use of learner centred strategies.

Hypothesis 4: Teacher-student ratio does not influence the use of learner centred strategies.

Hypothesis 5: Vast syllabus does not influence the use of learner centred strategies.

Hypothesis 6: Basic entry quality of the students does not influence the use of learner centred strategies.

Hypothesis 7: Effectiveness of training does not influence the use of learner centred strategies.

Specific Objectives

1. Examine the extent of use of learner centred strategies in the higher secondary schools in Kerala.
2. Examine how factors like type of schools, teaching experience, teacher-student ratio, basic entry quality of students, vast syllabus, training effectiveness and the subject taught by the teacher determine the extent of adoption of LCS.

Methods

Population and Sample

The population of the study comprises the teachers belonging to the government, aided (an aided school is privately owned receiving grants from the government) and unaided higher secondary schools under the Directorate of Higher Secondary Education, Ministry of Education, Government of Kerala. There are 819 (39.4 per cent) government higher secondary schools, 846 (40.7 per cent) aided and 414 (19.9 per cent) unaided and technical higher secondary schools in the state totaling to 2079 (Directorate of Higher Secondary Education, 2010). 1.5 per cent (30) schools were selected as sample through a multi-stage sampling process including 13 government, 11 aided and 6 unaided schools proportionately, from the northern, southern and central parts of the State of Kerala. From each school 10 teachers were selected and thus data was collected from 300 teachers.

Data Collection and Tools of Analysis

The primary data was collected using a pre-tested structured interview schedule where the extent of use of the learners centred strategies (LCS) were plotted on a five-point Likert-type scale ranging from 5 (always used) to 1 (never used). The various LCS suggested through training were debates, group discussion, assignments, seminar, role plays, collections, case studies, project, class tests, brainstorming, field trips and lectures. The intensity of using the lecture method brings down learner centeredness, so it was given values from 1 (always used) to 5 (never).

Descriptive statistics is computed for identifying the nature of the

data. The method of ordinal logistic regression is applied to examine the relationship between various factors and the extent of use of LCS. The summated mean score measuring the extent of use of LCS is the dependent variable (DV) and is coded as 1 = 'Low Use', 2 = 'Medium Use' and 3='High Use'. Statistical software like SPSS and STATA is used. The independent variables are coded as follows.

1. Types of schools are government, aided and unaided. Two dummy variables were created representing aided and unaided schools with government as the base category.
2. The subjects taught by the teacher are grouped as Humanities, Social Sciences and Science. Two dummy variables were created representing Science and Social-Science with Humanities as the base category.
3. Four Dummy variables for 'Years of experience' representing 5 to 10 years, 10 to 15 years, 15 to 20 years and 20 years and above and 'below 5 years' is taken as the base category.
4. The problem of vast syllabus (vs) was coded as 0 = not a problem and 1 = Is a problem.
5. The problem of high teacher student ratio (tsr) was coded as 0 = not a problem and 1 = Is a problem.
6. The problem of poor basic entry quality (beq) of the students coded as 0 = low basic entry quality; so lcs is not possible and 1= lcs is possible due to satisfactory basic entry quality of the student.
7. The summated mean of the training effectiveness (*te)* based on the opinion of teachers was measured using a construct containing the variables regularity, adequacy of trainers, timing (whether training is given well in advance of the beginning of an academic year), relevance of contents, teacher participation in the training program, supervision by the authorities to ensure quality of training).

Results

Extent of Use of Learning and Evaluation Strategies

The SPSS output on reliability statistics examined over 12 variables under the construct Use of Learner centred strategies was found satisfactory with a Cronbach's Alpha of 0.817. Table 1 shows the results of one sample t test performed to know the extent of use of LCS. It revealed that mean in all the cases except *collections* and *debate*, were significant than the central value of the scale of measurement (3). The mean of strategies like field trip, case study, role play and brain storming were found to be significantly less than the central value (3). The overall learner centeredness in the classroom is measured by the summated mean score of the construct containing the 12 strategies and is found to be highly significant (mean=3.34 p=0.000) depicting an above moderate use of learner centred activities.

Table 1
Extent of use of Learning Strategies: One Sample t-Test

Learning Strategy	Mean	Test Value = 3					
		T	Df	Sig. (2–tailed)	Mean Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Seminar	3.88	13.313	299	0.000*	0.883	0.75	1.01
Assignment	4.06	15.967	299	0.000*	1.063	0.93	1.19
Class test	4.32	23.828	299	0.000*	1.320	1.21	1.43
Project	3.72	9.929	299	0.000*	0.723	0.58	0.87
Collections	3.16	1.914	299	0.057	0.163	0.00	0.33
Field trip	2.06	–12.016	299	0.000*	–0.940	–1.09	–0.79
Lecture	3.99	13.190	299	0.000*	0.987	0.84	1.13
Case study	2.44	–6.788	299	0.000*	–0.563	–0.73	–0.40
Group Discussions	3.29	3.349	299	0.001*	0.287	0.12	0.46
Role Play	2.44	–6.461	299	0.000*	–0.560	–0.73	–0.39
Brainstorming	2.32	–8.109	299	0.000*	–0.683	–0.85	–0.52
Debate	3.01	0.147	299	0.884	0.013	–0.17	0.19
Overall learner centredness	3.3385	6.993	299	0.000*	0.33848	0.2432	0.4337

*Source: Primary Data; * Level of Significance 5 %.*

Determinants of Adoption of Learner Centred Strategies

The introduction of LCS in the schools of Kerala in 2005 was on a large scale throughout the state. The higher secondary directorate under which the higher secondary schools were functioning along with the SCERT provided training to all the HSSTs in implementing the activity oriented curriculum. Cluster meetings in line with the quality circles as propounded by the total quality management principles were used as viable platforms where intensive workshops and lectures were given to the teachers. However, this fundamental change in the role of a teacher in the classroom raised apprehensions regarding the effectiveness of the new educational plan. This study tries to probe into the probable reasons which would have prevented the teachers in fully implementing LCS.

The use of learner centred strategies (LCS) is taken as the dependent variable and the type of school,

experience of the teacher, vast and heavy syllabus, basic entry quality of students, teacher-student ratio, effectiveness of training in LCS provided to teachers and the subject handled by the teacher as factors probable to influence teachers in abstaining from adopting LCS in classrooms are taken into the model as independent variables.

Ordinal logistic regression is used to predict the dependent variable (DV) with ordered multiple categories with the independent variables (IV) including type of school, teaching experience, teacher-student ratio, basic entry quality of the students, vast syllabus, training effectiveness and the subject taught by a teacher. The data was analysed using the statistical software STATA. The results of the analysis are given in the subsequent paragraphs.

Based on the LR test, it is inferred that the model containing a full set of predictors represents a significant improvement in fit relative to a null model (LR chi square (24) = 38.89, p< 0.0001) and that at least one population slope is non zero. McFadden's pseudo R2 is 0.1210 as an index of the proportionate improvement in model fit relative to the null model, showing a 12.10 per cent improvement in fit relative to the null model.

Table 2
Stata Output: Ordinal Logistic Regression Model of the Use of Learner Centred Strategies

Dimensions of the study	Lcs Mean (DV)	Coef.	RRR	Std. Err.	Z	P>|z|	[95% Conf. Interval]
Years of Experience	Five to ten	–0.8095247	0.4450695	0.4864669	–1.66	0.096	–1.762982.1439328
	Ten to fifteen	–0.88741	0.4117207	0.5280129	–1.68	0.093	–1.922296.1474763
	Fifteen to twenty	–1.636732	0.194615	0.8123675	–2.01	**0.044***	–3.228943 – 0.0445208
	Twenty and above	–1.029854	0.357059	1.205176	–0.85	0.393	–3.391956 1.332247
Subject Taught	Social-Science	–1.948027	0.142555	0.4984141	–3.91	**0.000***	–2.924901 – 0.9711535
	Science	–1.816734	0.1625558	0.4530573	–4.01	**0.000***	–2.70471 – 0.9287581
Type of School	Aided	–0.355121	0.7010886	0.3784876	–0.94	0.348	–1.096943.386701
	Unaided	–0.7582596	0.4684811	0.4144987	–1.83	0.067	–1.570662
Vast Syllabus	Vs	0.5768966	1.780504	0.411731	1.40	0.161	–0.2300814 1.383875

Teacher-Student ratio	Tsr	–1.621777	0.1975473	0.7022452	–2.31	**0.021***	–2.998153 – 0.2454022
Basic Entry Quality	Beq	0.2077538	1.23091	0.3060636	0.68	0.497	–0.3921199.8076275
Effectiveness of training	Te	–0.0477631	0.9533596	0.1318526	–0.36	0.717	–0.3061895.2106632
	/cut1 | – 4.872966 1.026518 – 6.884903 – 2.861028 /cut2 | 3.051857 1.286812.5297525 5.573962						

*Source: Stata Output; * Level of Significance 5%*

Table 2 shows the odds ratios and the coefficients explaining the influence of the independent variables on the use of LCS. Work experience, subject taught and teacher-student ratio are the significant determinants

Experience of teachers between 15 to 20 years is showing significant effect on the use of LCS. One unit increase in experience in years, ie., when experience in years changes from 0 (below 5 years) to 1 (between 15 to 20 years), there is 1.64 points decrease in the log odds of being in a higher level of use of lcs, given that all of the other variables in the model are held constant. The predicted odds of use of LCS for teachers having experience between 15 to 20 years are 0.19 times lesser than teachers having experience less than 5 years which is the base category (Table 2).
The independent variable tsr is statistically significant. The predictor tsr is coded as 0 for not a problem and 1 for is a problem. This means, for one unit increase in tsr ie., tsr changing from 0 (not a problem) to 1 (is a problem), there is a 1.62 decrease in the log odds of being in the higher level of use of lcs by a teacher, given all of the other variables in the model are held constant. If teacher student ratio increases then the odds of using LCS decreases by 0.197 times (Table 2). The marginal effect of increase in tsr indicates an increase in the probability of low use of LCS by 14.6 per cent (Table 3).

For one unit increase in subjects taught, i.e., subject changing from humanities (0) to social science (1), there is 1.95 points decrease in the log odds of being in the higher level of use of LCS. Similarly, when there is a change from humanities (0) to science (1), there is 1.82 points decrease in the log odds of being in the higher level of use of LCS. The odds ratio indicates that the odds of using LCS by a Social-Science teacher is 0.143 times lesser and that by a science teacher is 0.163 times lesser than by a humanities teacher (Table 2). The marginal effect of change from Humanities to Social Science

indicates an increase in the probability of low use (lcsmean=1) by 35.7 per cent. Similarly, when the subject taught changes from Humanities to Science, the probablity of low use (lcsmean =1) increases by 28 per cent (Table 3).

However, contrary to the expectation, factors like training effectiveness, basic entry quality of students and vast syllabus were not found to be significant in determining the use of LCS.

Table 3
Ordinal Logistic Regression—Marginal Effects of the Factors on Learner Centred Strategies

Dimensions of the study	Variable	dy/dx	Std.Err.	z	P> |z|	95% C.I.
Years of Experience	Five to ten*	0.1127829	0.06836	1.65	0.099	–0.021199.246764
	Ten to fifteen*	0.1385833	0.09158	1.51	0.130	–0.04091.318077
	Fifteen to twenty*	0.3292536	0.19626	1.68	0.093	–0.055403.71391
	Twenty above*	0.1881762	0.26996	0.70	0.486	–0.340943.717296
Subject Taught	Social-science*	0.3576312	0.0986	3.63	**0.000***	0.164377.550886
	Science*	0.279247	0.06863	4.07	**0.000***	0.144727.413767
Type of School	Aided*	0.0503264	0.05527	0.91	0.363	–0.058004.158657
	Unaided*	0.120442	0.07415	1.62	0.104	–0.024896.26578
Vast Syllabus	vs*	–0.0872742	0.06744	–1.29	0.196	–0.21946.044911
Teacher-Student ratio	tsr*	0.1464133	0.0385	3.80	**0.000***	0.07096.221867
Basic Entry Quality	beq*	–0.0286354	0.0424	–0.68	0.499	–0.111729.054459
Effectiveness of training	te*	0.0065538	0.01808	0.36	0.717	–0.02889.041998

Marginal effects after ologit, * Level of Significance 5%

y= Pr (lcsmean=1) (predict)0.16416584; * dy/dx is for discrete change of dummy variable from 0 to 1

Discussion on Findings

The overall learner centeredness as measured by the summated mean score of the construct containing the 12 strategies (3.34) show a more than moderate use of learner centred activities. Moderate is defined operationally in this study as a condition where the *Mean* is equal to the central value of the scale of measurement; here as Five-point likert scale is used for data collection and so the central value of the scale is 3. Intensive use of these activities results in more learner centeredness in the classrooms (Sharkey and Weimer, 2003). All strategies except collections and debate were used but it is interesting to note that the average mean score of class test, assignment and lecture is the highest. This means that more rigorous strategies like debates, case studies, brainstorming etc. were sparingly used. When the new learner centred curriculum was introduced, it created a lot of apprehension among teachers, as they perceived these strategies to be time consuming and ineffective. So, it was believed widely that teachers were still continuing the lecture method which is teacher centred and engaging in some learner centred activities for namesake, especially because doing at least four was mandatory. As the mean score is 3.34 and the maximum score of the scale is 5, it can be inferred that there is a huge gap to cover, to be completely learner centred.

Adoption of LCS based on Type of School

The government, aided and unaided higher secondary schools in Kerala follow the same state curriculum. However, government and aided school teachers enjoy higher benefits like salary, pension and job security and have more professional freedom than unaided teachers. However, there is no significant change in the level of use of LCS depending on the type of school the teacher belongs to. Therefore, the hypothesis that "type of school does not influence the use of learner centred strategies", is accepted.

Subjects Taught by a Teacher

Considering the nature of the subject, appropriate strategies are used like 'role play' for languages. Some of the tools like seminar, projects and assignments are evaluated by further dividing them into sub skills such as literature review, relevance, depth and structure of content, clarity of analysis and interpretation etc. and such strategies are used more in Social Sciences. Class tests, collections, debate, group discussions, were common to all types of subjects (SCERT, 2005). It is reasonable to believe that the extent of use of LCS could vary depending on the subject handled by the teacher. The probability of use of LCS by a Science and Social Science teacher is less than a teacher teaching Humanities. The hypothesis

that "subject taught by the teacher does not influence the use of learner centred strategies" is not accepted.

Teacher-student Ratio in the Schools, Vast Syllabus and Basic Entry Quality of the Students

The teacher-student ratio in the higher secondary schools is 1:60. It was instructed by the higher secondary directorate that at least 4 of the learning strategies suggested, should be conducted by a teacher. A teacher has to handle at least 3 subjects and 4 strategies/subjects creating a workload of 720 evaluations. It was also observed in an earlier study that vast syllabus, high teacher student ratio and low basic entry quality of the students were problems faced in the implementation of learner centred curriculum (Sreeja Sukumar and Santhosh Kumar, 2015). This study found that the teacher student ratio is a significant factor influencing the use of LCS, when *tsr* increases the likelihood for the use of LCS decreases. Therefore, the hypothesis that 'Teacher-student ratio does not influence the use of learner centred strategies by the teachers' not accepted.

However, the vast syllabus and basic entry quality of the students does not significantly influence the use of LCS. So, the hypotheses 'vast syllabus does not influence the use of learner centred strategies' and that 'Basic entry quality of the students does not influence the use of learner centred strategies', are accepted. There is no significant relationship between 'effectiveness of training and use of LCS. So, the hypothesis that effectiveness of training does not influence the use of learner centred strategies is accepted.'

Teachers having experience between 15 to 20 years are less likely to use LCS than teachers having experience less than 5 years. However, experience above 20 years is not significant. As teachers gain experience, they may be reluctant to change their comfortable methods of teaching. Further, research on attitudes of teachers towards changes in curriculum would provide more insight into the problem.

Conclusion

It can be reasonably concluded that, if the extent of usage of the different learning and evaluation strategies are high, then, there is a high level of activity oriented learning going on in the school education in Kerala evidencing existence of learner centeredness. However, overall learner centeredness in the classrooms is statistically found to be at slightly above moderate level. The mean score of assignments, class tests and lecturing which are predominantly present in the traditional teacher centred system are the highest and hence, substantial use of these traditional methods

should be suspected. The whole concept of quality improvements made in the higher secondary schools is based on the principles of total quality management, which of course advocates continual improvement (Kaizen Approach). Therefore, the teachers should be sensitised to the importance of activity oriented curriculum and motivated to increase the adoption of learner centered strategies.

The study interestingly found that an increase in the experience of teachers have impacted the adoption of LCS. The teachers who have experience between 15 to 20 years were found to be less likely to use LCS compared with teachers who have only experience below 5 years. This definitely shows the reluctance of the teachers to change to new methods of teaching and come out of their comfort zone.

The teacher student ratio which acts as a determining factor in the use of LCS is also statistically significant. The effective and efficient implementation of LCS is possible only when the current teacher student ratio of 1:60 is reduced and only then the students can receive correct feedback on their performance. Statistically significant relation is also found between the subject handled by a teacher and the use of various learner centred strategies. The characteristic differences in the volume and content of the subjects taught and the high teacher student ratio are two major factors influencing the use of LCS.

As the effectiveness of learner centred strategies cannot be overlooked, these problems should invariably be solved and efforts to be taken to initiate a scientific redesigning of the syllabus to ward off excess portions by excluding concepts that should be covered in a tertiary level and the portions that have already been covered in the secondary education. Appropriate policy decisions to increase teacher workforce and continued training and motivation are indispensable to create learner-focused activity oriented classrooms, leading to substantial improvement in the quality of education.

References

Alsardary, S., and P. Blumberg. 2009. Interactive, learner-centered methods of teaching mathematics. *PRIMUS*. Vol. 19, No. 4. pp. 401–416. https://doi.org/10.1080/10511970701678596

Alsardary, S., L. Pontiggia, M. Hamid, and P. Blumberg. 2011. Primary trait analysis to assess a learner-centered, upper-level mathematics course. *PRIMUS*. Vol. 21, No. 4. pp. 303–315. https://doi.org/10.1080/10511970903043755

Blonder, R., and S. Sakhnini. 2012. Teaching two basic nanotechnology concepts in secondary school by using a variety of teaching methods. Chem. Educ. Res. Pract. Vol. 13, No. 4. pp. 500–516. https://doi.org/10.1039/c2rp20026k

Bloom, B. S. 1969. *Taxonomy of Educational Objectives: The Classification of Educational Goals*.

Blumberg, P. 2015. Factors that influence faculty adoption of learning-centered approaches. *Innovative Higher Education*. Vol. 41, No. 4. pp. 303–315. https://doi.org/10.1007/s10755–015–9346–3

———. 2015. How critical reflection benefits faculty as they implement learner-centered teaching. *New Directions for Teaching and Learning, 2015.* Vol. 144. pp. 87–97. https://doi.org/10.1002/tl.20165

———. 2016. Assessing implementation of learner-centered teaching while providing faculty development. *College Teaching*. Vol. 64, No. 4. pp. 194–203. https://doi.org/10.1080/87567555.2016.1200528

Brown, J. K. 2008. Student-centered instruction: Involving students in their own education. *Music Educators Journal*. Vol. 94, No. 5. pp. 30–35. https://doi.org/10.1177/00274321080940050108

Carmen M. Cain. 2020. *Understanding the Use of Learner-Centered Teaching Strategies by Secondary Educators* [Doctoral dissertation]. https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=10137andcontext=dissertations

Directorate of Higher Secondary Education. 2010. September. Higher Secondary Education portal. Retrieved August 2010. https://www.dhsekerala.gov.in/

Education for the New Age: *Report of the Kerala State School Education Commission.* Government of Kerala. 2003–04. Department of Higher Secondary Education. Government of Kerala, Thiruvananthapuram Accessed on September 16, 2012 from www.kerala.gov.in.

Gardner, H., and T. Hatch. 1989. Multiple Intelligences go to School: Educational implications of the theory of multiple intelligences. *Educational Researcher*. Vol. 18, No. 8. pp. 4. https://doi.org/10.2307/1176460

Garreck, W. 2013. Learner-centered teaching: Putting the research on learning into practice. *Canadian Journal of University Continuing Education*. Vol. 38. pp. 1. https://doi.org/10.21225/d57c7q

Gloria Brown Wright. 2011. *Student-Centered Learning in Higher Education*. IJTLHE. https://www.isetl.org/ijtlhe

King, P. M., and K. S. Kitchener. 2004. Reflective judgment: Theory and research on the development of epistemic assumptions through adulthood. *Educational Psychologist*. Vol. 39, No. 1. pp. 5–18. https://doi.org/10.1207/s15326985ep3901_2

Knight, J. K., and W. B. Wood. 2005. Teaching more by lecturing less. *Cell Biology Education*. Vol. 4, No. 4. pp. 298–310. https://doi.org/10.1187/05–06–0082

Lev, S., A. Clark, and E. Starkey. 2020. Learner-centered teaching practices. *Implementing Project Based Learning in Early Childhood*. pp. 31–48. https://doi.org/10.4324/9780429243332–3

Novak, G. M. 2011. Just-in-time teaching. *New Directions for Teaching and Learning*. Vol. 128. pp. 63–73. https://doi.org/10.1002/tl.469

Novak, G. M., E. T. Patterson, A. D. Gavrin, W. Christian, and K. Forinash. 1999. *Just in time Teaching. American Journal of Physics*. Vol. 67, No. 10. pp. 937–938. https://doi.org/10.1119/1.19159

Scert. 2005. *Teachers Source Book*. Department of Education, Government of Kerala. Thiruvananthapuram.

Sharkey, S., and M. Weimer. 2003. Learner-centered teaching: Five key changes to practice. *Teaching Sociology*. Vol. 31, No. 2. pp. 251. https://doi.org/10.2307/3211318

Sreeja Sukumar, K., and S. Santhosh Kumar. 2015. Problems faced in the implementation of total quality management in higher secondary schools in Kerala, India. *Journal of Social and Economic Development*. Vol. 17, No. 2. pp. 275–297. https://doi.org/10.1007/s40847–015–0012–5