Research Article

Student Teachers Perception towards the Self-Blend Model of the Blended Learning Approach

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Abstract

Recognizing the Self-Blend Model (SBM), this paper is an attempt to report improved student teachers' perception through implementing the Blended Learning Approach (BLA). ODM allows students to work at far-flung places and materials are primarily delivered through the online platform with the assistance of teachers. Students are allowed to interact with teachers in the regular classroom and on online platforms too if they have doubts. The online learning management EDMODO (ED-LMS) was used and the intervention lasted for eight weeks. 54 student teachers were used as samples for the study and the methodology used was the experimental method (Awad Soliman Keshta, Ismail Ibrahim Harb 2013). A quantitative analysis non-parametric test was used to analyze the student teachers' perception towards SBM by Blended Learning Approach (BLA). The perception scale was comprised of the following dimensions Gen (general), II (Improved interactivity), KD (knowledge design), MU (Material Used), TA (technology assistance), and PS (predominant satisfaction). The student teachers showed approving perception in the direction of the use of BLA for the SBM. The experimental group students of College XXX1 of Education showed higher positive performance than the control group students of College XXX2 of Education from Pondicherry, India. The result of the study shows that student teachers developed a positive perception of BLA. Hence the study recommends that stakeholders implement BLA in the teaching and learning process.

Keywords: Perception, Self-Blend Model, Blended Learning Approach

Introduction

According to UNESCO, 1998 report teacher is the source of revamping the world with new innovative technologies that enhance pupil-based learning rather than teacher-focused method. In pupil-based learning interactive learning and active learning is practicable. To meet the demands of the learning community of the present generation it is necessary to integrate powerful pedagogical practices. The powerful pedagogical practices include the integration of new technical knowledge in the field of education to enhance the learning process which is a continuous process. Technology undergoes continual changes every day according to the needs of society. Therefore, new changes appear in society as well as in the education system also. Designing and implementing educational programs through information and communication technology is widely accepted for successful reforms in the field of education. At the same time, a teacher cannot be substituted by any newer electronic gadgets. Electronic gadgets can play a supplementary role

along with the teacher to enhance the learning experiences. The teacher can even teach more effectively without using technology in a conventional classroom. Nowadays students are called "digital natives" because they think and process information differently, and they learn (Prensky, 2001). So it is necessary to effectively integrate the technology into the conventional classroom which will help to develop and design an innovative teaching method called the Blended Learning approach (BLA) it includes the Blend model (SBM) which has the advantage over a single way of teaching (Cabero Almenara & Marin-Diaz, 2018). In this current science study, the subject was used to teach student teachers using various technological tools to bring out their improved pedagogical performance (Charles R Graham, 2006). To encourage independent learning in science, the inquiry aspect of science should be related to the structure of scientific knowledge and the investigative strategies of science. The teaching-learning process in the teaching of science has to be designed in such a way that student teachers should recognize conflicts and inconsistencies in their thinking (Bellefeuille, 2006). This study analyses the perception of student teachers towards learning by SBM. So student teachers should connect the relationship between the new science and technology about everyday living with the immediate surroundings so that students will develop engrossment towards safety sustainability. The inclusion of technology-enhanced learning with the assistance of teachers. This can be attained through BLA without a complete loss of direct participation and online learning.

Literature Review

Literature related to the Blended Learning Approach (BLA) and Perception towards the Blended Learning Approach was collected and tabulated below.

Table-1 : Studies related to BLA and Perception towards BLA

Area	Author and year	Study Area	Findings
Blended Learning Approach (BLA)	Riffell and Sibley (2003)	Hybrid course formats to increase attendance in undergraduate environmental science courses	This research mainly focuses on increasing students' enrollment and attendance for natural science courses. In this study, the researcher taught science courses by a hybrid method which contains traditional passive lecture classes and online assignments simultaneously. The result reveals that the completion of assignment rate is high through online mode compared to passive lectures. The study also shows that student attendance was effective in the BLA method.
	Robinson (2004)	Interpreting the teaching and designing experience of teachers in the BL course	The study recognized that when faculties experienced BLA three major benefits of BLA were noted classroom time was effectively used; the barriers of students were easily resolved; both teachers and students easily met their needs. The study also observed a positive correlation between BLA and university administration support.

	Lim and Morris (2009)	BL Environments impact on learning outcomes.	The researcher examined how students' learning in a Blended Learning environment is influenced by learning styles, instructional design, and learning involvement. The findings of the research reveal that the Blended Instruction method improved pedagogical practices in learning communities, the study also reveals that students perform effectively when the presence of a teacher was included.
Perception Towards BLA	Leh (2002)	Action research based on hybrid courses.	The students who studied in a hybrid course acquired knowledge in a better manner, online discussion messages were used as data in this study along with interviews and surveys. To analyze the data both quantitative and qualitative methods are used. The study shows that students and teachers both were highly motivated.
	Humbert and Vignarein (2005)	Case study for students learning through BLA.	Students' perception of towards BLA is viewed positively in this study. The study reveals that students are more comfortable learning through BLA and are satisfied with the teacher's performance.
	Judy Drennan & Jessica K (2005)	Students' attitudes towards flexible OL in management education.	Students' satisfaction with the direction of online learning was examined in this study, the technology acceptance model was developed to collect data from the students to identify the positive perception of technology as an innovative learning style. This study is closely related to the present study. The result of the study suggests that students' satisfaction is influenced by positive perceptions towards technology and self-learning mode.
	Buket and Meryem (2006)	Students' views on BLA	The performance of students of ICT conducted in this study was satisfactory and they enjoyed taking part in the BLA. Their performance and participation in BLA affected their views about BLA.
	Delialioglu and Yilderum (2007)	Interactive learning in BL Environment and perception of students.	It shows that the presence of the internet will enhance the student's performance in hybrid learning. Also, meta-cognition and the inclusion of collaborative learning will bring an authentic learning environment.
	Robert G. Farmer (2009)	Use of wiki as an effective online learning tool.	The use of an online tool called wiki was used as a collaborative learning tool in this study. The effectiveness of knowledge creation was evaluated and also interactivity was analyzed.

	Dhanya Krishnan (2011)	Effect of BL on Science Process skills and science achievement.	The study revealed that Blended Learning is more effective than the conventional method in enhancing science process skills and science achievement among secondary school students.
	Sreekala, Maria JAM, Arul T.S (2015)	Transforming pedagogy through the social learning platform	The researchers examined the BLA on M.Ed. students of Pondicherry University, India, and reveals that students' perception towards integrating technology in the classroom is benefited more when compared to the traditional teaching method.

Student Teachers Perception

Learning experiences acquired by student teachers through BLA were evaluated through factors like II (Improved Interactive), KD (Knowledge design), MU (Material Used), TA (Technology Assistance), and PS (Predominant Satisfaction). II refers to the learning experience gained by students' teachers as the interaction between student and student and between Students and teachers also includes social interaction. Learning activities undergone by student teachers are referred to as KD. TA refers to the significant usage of technology integration during the learning process in BLA. The student teachers benefited and gained learning experiences in BLA are referred to as PS. Therefore, in this study, the term perception refers to the improved learning experiences attained by student teachers Riffell and Sibley (2003).

Self-Blend Model

Self The blend Model (SBM) provides an opportunity for student teachers to gain knowledge beyond the classroom teaching-learning process. They should attend traditional classes and also select related courses by an online method which will enhance their learning. According to Trust et al., 2016 this method is different from the online driver model as the students can learn from remote places and their learning materials will be distributed online mode also the contents will be clarified by the teachers to students if they have any trouble learning.

Purpose of the Study

The objective proposed for this study is

- The perception towards BLA was studied in both experimental and control group student teachers earlier and subsequent execution of BLA with dimension Gen (general), II (Improved interactivity), KD (knowledge design), MU (Material Used), TA (technology assistance), and PS (predominant satisfaction).

Hypotheses framed are

The pre-test and post-test scores of students' perceptions in the experiment group will be significant in their mean difference.

The pre-test and post-test scores of students' perceptions in the control group will be significant in their mean difference.

Methodologies and Techniques Research Design

For quantitative research analysis, a quasi-experimental design was used. The experimental and control groups were taken as intact groups for this study. In this study, two groups are not randomly selected and routine class

schedules will be distributed to the two groups. BLA and student teachers' perceptions of BLA were the variables used. BLA was used as an experimental method to teach science and the conventional method was used for the control group. The same teacher taught both the experimental and control groups for about two months. Student Teachers of Teacher Education Colleges from Pondicherry were the population of the study.

Perception Scale on BLA

A Perception scale on BLA was constructed and validated by the researcher for the present study. This tool was developed by (Robert G. Farmer, 2009) and modified appropriately for use in the present study to seek student teachers' perception of BLA. The dimension of the tools is retained as such. The number of questions and the wording of some of the items under each dimension were changed. The perception scale on BLA was developed to understand the perception of student teachers' on BLA. It described the design and validation of a perception scale to meet the assessment need in education. Hence in the present study, the researcher constructed and validated a perception scale to seek perception towards BLA. The dimension of the perception scale was explained below.

- Some items related to the general usage of computers and integrating technology for BLA were used as dimension G (General),
- II (Improved Interactivity) refers to the perception of students towards interaction between teacher and students and peer to peer.
- KD (Knowledge design) refers to the students learning activity during BLA,
- U (Material Used) refers to the student's perception of the material used in BLA,
- TA (Technology Assistance) is the use of technology during the course and
- PS (Predominant Satisfaction) refers to the student's participatory level and how much they are convinced with learning through BLA.

A total of 50 items were present in the perception scale and each item was assigned a five-point scale in the limits of 1- 5 viz., Strongly disagree (1), Disagree (2), Neutral (3), Agree (4) and Strongly agree (5). Content validity was established by experts from Pondicherry University and Teacher Education Institution who were exposed to online learning platforms. Based on their suggestions, seven items were deleted and 43 items were retained in the perception scale. This scale was administered to student teachers of teacher education institutions to check the average time taken for the test and its reliability. Since the average time taken by the student teachers to complete the perception scale is 30 minutes, the duration was fixed to be 30 minutes. 't' value for each item in the perception scale was calculated and presented in Table 2 below.

Table-2 : The t-value for each item in the perception scale

Item Number	t-value	Significance	Item Number	t-value	Significance
	5.674	0.01		5.835	0.01
	7.536	0.01		9.014	0.01

	7.815	0.01		7.1	0.01
	5.95	0.01		9.466	0.01
	4.337	0.01		6.81	0.01
	3.56	0.01		8.128	0.01
	6.527	0.01		7.991	0.01
	9.033	0.01		11.825	0.01
	6.625	0.01		7.535	0.01
	4.365	0.01		6.039	0.01
	4.572	0.01		5.744	0.01
	6.171	0.01		6.414	0.01
	7.132	0.01		7.599	0.01
	6.901	0.01		6.941	0.01
	5.183	0.01		8.144	0.01
	3.991	0.01		7.713	0.01
	7.427	0.01		8.158	0.01
	5.777	0.01		7.677	0.01
	6.603	0.01		8.795	0.01
	4.624	0.01		10.314	0.01
	7.246	0.01		7.99	0.01
	6.967	0.01			

Table 2 represents the t- t-value for each perception item from items 1 to 43 and each value is significant at 0.01 level (p-value is 0). Hence the items are significant and restored for the study.

Reliability

The reliability of the developed tool was found to be 0.972 which was tested using Cronbach's Alpha coefficient the perception scale was an excellent measure of reliability and a total of 43 items were restored.

Validity

The tool with 50 items was presented to a panel of experts which included teacher educators and internal and external doctoral committee members. The panel of experts was requested to give suggestions and comments on the structure and appropriateness of items. The panel scrutinized the tool and expressed satisfaction with the content of the tool. Based on their suggestions, seven items were deleted and 43 items were retained in the perception scale. Some of the items were restructured and refined based on the suggestions of the experts. Hence face validity and content validity were established by experts.

Implementation

The constructed Perception scale was administered as a pre-test to

assess their perception of BLA for the experimental group and the same tool was administered to the control group to assess their perception of BLA. The duration of the test was 2 hours. All the necessary directions were given to the students before administering the test. The scores obtained are termed pre-test scores of student teachers in the experimental and control groups.

The intervention was carried out for thirty-one classes each comprising one hour. The intervention was carried out for two months. The schedule and time allotment for BLA and conventional learning are given below.

Table-3 : BLA schedule

SCHEDULE	FACE-TO-FACE ACTIVITIES	ONLINE LEARNING ACTIVITIES
Week 1 (5 Hours) **Unit – 7 - FACIL EQUIPMENT AND MATERIALS FOR TEACHING SCIENCE** Structure and design of general science laboratory-physics and chemistry laboratory-Organization and maintenance of laboratory	3-hours Lecture. Introduction to Edmodo learning platform and common Mail Id. Structure and design of general science laboratory.	2-hour Online activity. Demonstration (To sign up for Edmodo), Discussion
Week 2 (5 Hours) **Unit – 7:** Preparation of Indents-Stock – registers to be maintained, storage of chemicals, and apparatus organization of practical work.	3-hours Lecture. Indent preparation, Stock registers, storage of chemical apparatus.	2-hour Online activity. Audio-visual presentation. Reflection and review of Week 1 face-to-face lecture.
Week 3 (6 Hours) **Unit –7:** Improvisation of apparatus and use of science kits- Discipline in the laboratory – Accidents and First-aid.	3- Hours Lecture.	2-hour Online activity. Brainstorming method, Discussion, Demonstration, and Quizzes.
Week 4 (5 Hours) **Unit-9: EVALUATION IN SCIENCE** Purpose of evaluation – achievement tests .written and practical construction and use of tests- diagnostic test remedial teaching.	2-hours Lecture. Purpose of evaluation – achievement tests written and practical construction and use of tests. Diagnostic test remedial teaching.	3-hour Online activity. Audio-visual presentation (CD, Powerpoint presentation, Flip chart, and web-based training) on Standardized and teacher-made tests. Reflection and review of Week 3 activity.
Week 5 (4 Hours) **Unit-9:** Written and practical construction of a good test and use of tests, diagnostic test-remedial teaching	2-hours Lecture. Written and practical construction of a good test and use of tests. diagnostic test- remedial teaching	2-hour online activity. Discussion group, Audio-visual presentation, Reflection on week 4 activities. Reflection and review of Week 4 face-to-face lecture.

Week 6 (4 Hours) **Unit 10: SCIENCE PEDAGOGUE** Science Teacher – academic qualifications, professional growth- special qualities required of a science teacher Education of science teachers- in–service training	3-hour Lecture. Science Teacher – academic qualifications, professional growth, special qualities required of a science teacher Education of science teachers– in-service training	2-hour online activity. Mobile teaching. Audio-visual presentation for the science teacher. Demonstration and Discussion. Reflection and review of Week 7 face-to-face lecture.
Week 8 (2 Hours) **Unit-10:** Evaluation of a science teacher – self-evaluation – evaluation by the pupils	1-hour Lecture. Evaluation of a science teacher – self-evaluation – evaluation by pupils	1-hour online activity. Discussion and quizzes. Reflection and review of Week 5 face-to-face lecture.

To execute the BLA and to teach science ED-LMS was used. The teaching-learning process will be safe and secure for teachers and students on this platform. The mostly constructivist approach of learning different activities is possible in this online platform (Anders, 2018). Students and teachers can post files, videos, photos, and links on the platform; it is a secure platform due to the secret code given by the teacher to the students. Teachers can even fix assignments. Quizzes online and assessments were also made and badges were also awarded to the students based on their progress.

Figure-1 : Snap Shot of Online Interaction between students and Teacher

The figure-1 shows the teaching-learning interaction in online mode for both teacher and students. Improved interactivity used will be one of the main components of BLA. It provides an opportunity for all the participants to interact with the teacher in a safe and secure platform and the teacher's interaction with the students regarding the next class she is going to take. The teacher doing blended teaching is bound to be constantly in touch with the students and other stakeholders related to teaching (Snodin, 2013). Before starting the class, the teacher gives a gist of what she is going to teach, what activities are to be done, and what her expectations are from the students

to attend a scheduled class. After and before teachers upload reading materials for the students in ED-LMS.

Immediately after the intervention post-test was administered on the perception of the experimental and control group students. The scale for the pre-test and post-test remains the same. The test administered is scored and named as post-test scores of perceptions of Blended Learning.

Data Analysis and Discussions

Non–Parametric Tests of Variable Perception

Non-parametric tests distribution-free statistics and used for small samples. Hence the sample size was small in this study Wilcoxon Signed rank test equivalent to the paired sample t-test and Mann Whitney U test which is equivalent to the independent sample t-test are used. Wilcoxon signed-rank test is found to be more powerful when compared to paired sample t-tests for small samples. In this study, the investigator used these tests because of a small sample and it satisfies the following assumption.

1. Small sample size
2. Ordinal level of measurement.
3. Rank ordering of data
4. Unequal variances across groups

2. Non-Parametric Test for Experimenta Group

To find out the remarkable difference between the pre-test and post-test for both the experimental and control groups, Wilcoxon Signed Rank (WSR) Test is used. In this type of analysis, the results of the two groups are ranked as positive rank and negative rank. The rank cannot be assigned for the smaller of two sums and rejected if the difference scores of 0.

Hypothesis 1

To find out the remarkable difference between the pre-test and post-test both alternate and null hypotheses were formulated for the experimental group.

H01: The pre-test and post-test scores of students' perceptions in the experiment group will have no significance in their mean difference for BLA using SBM.

H1: The pre-test and post-test scores of students' perceptions in the experiment group will have significance in their mean difference for BLA using SBM.

The null hypothesis indicated that pre-test and post-test scores of students' perceptions in the experiment group will have no significance in their mean difference for BLA using SBM and is tested and findings are tabulated in Table-4.

Table-4 : Experimental group Perception Scores

Test	Group	Rank	N	Mean Rank	Sum Rank	z Value	Significance p
Pre-test - Post-test	Experimental group	Negative	0[a]	0	0	4.7	0.00
		Positive	29[b]	15	435		
		Ties	0[c]				
		Total	29				

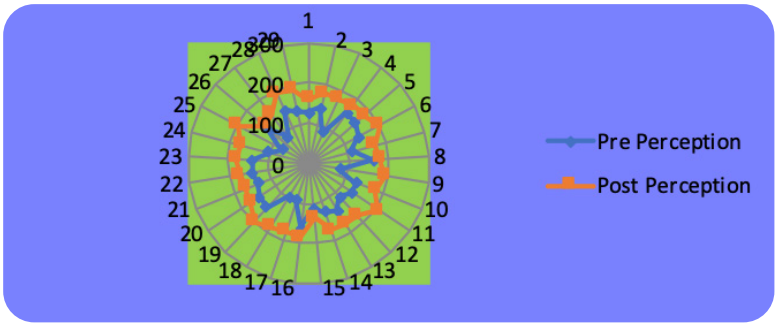
(a. Post-test < Pre-test. b. Post-test > Pre-test. c. Post-test = pre-test)

The value of test statistics (Z) according to the WSR test for perception scores in the experimental group is 4.703 and its associated p-value is (0.000) which is less than (0.05). Consequently, the null hypothesis is rejected. Therefore, the study concludes that the performance of the experimental group was improved in the post-test when compared to the pre-test.

Discussion

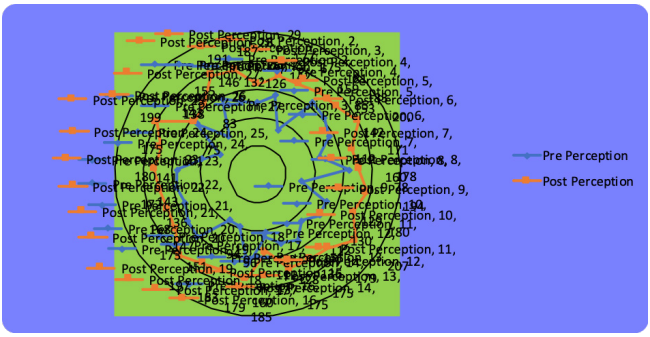
From this study, it is shown that the incorporation of innovative technology like BLA using SBM has improved the performance of the students. The experimental group which underwent treatment for BLA has shown remarkable improvement in the perception towards BLA when compared to the control group which was taught through the conventional method. Many research findings support that the perception towards BLA for teaching and learning purposes is high when compared to the conventional method. The result of this study is closely related to Robert G. Farmer (2009) implemented study on the use of an online tool called wiki was used as a collaborative learning tool in this study, the effectiveness of knowledge creation was evaluated and also interactivity was also analyzed. The study reveals that the learning outcomes of the students were increased based on their interactivity and perception towards online collaborative learning tools.

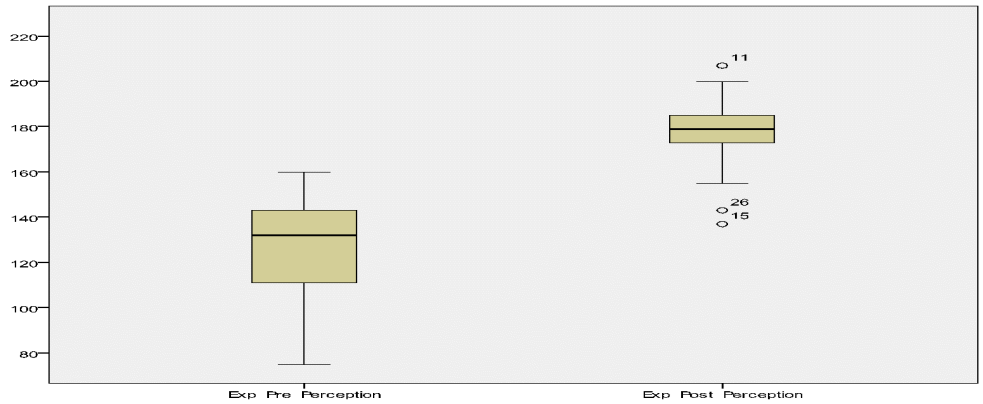
Figure-2 : Radar chart of experimental group perception scores



From the graphical representation using a radar chart, the scores are represented from 0 to 250 and the number of students was also distributed around the circle from 1 to 29 from the graph it is clear that the scores of post-test are high when compared to the pre-test. Therefore, from the radar chart, it is concluded that the performance of the experimental group was improved in the post-test perception when compared to the pre-test perception.

Figure-3 : Box Plot of experimental group perception scores





(X-axis = Experimental group pre-perception and post-perception Y- axis = Perception scores)

The box plot diagram representation was used to compare the mean scores of the pre-test and post-test groups of the experimental group. From fig. 3 it is also represented that the perceptions of students towards BLA were high in the post-test when compared to the pre-test.

Non- Parametric Test for Control Group

Hypothesis 2

To find out the remarkable difference between the pre-test and post-test both alternate and null hypotheses were formulated for the control group.

H02: The pre-test and post-test scores of students' perceptions in the control group will have no significance in their mean difference for BLA using SBM.

H2: The pre-test and post-test scores of students' perceptions in the control group will have significance in their mean difference for BLA using SBM.

The null hypothesis indicated that pre-test and post-test scores of students' perceptions in the control group will have no significance in their mean difference for BLA using SBM and is tested and findings are tabulated in table-5.

Table-5 : Control group Perception Scores

Test	Group	Rank	N	Mean rank	Sum rank	z value	Significance p
Post-test-Pre-test	Control group	Negative	10[a]	8.8	88	1.77	0.07
		Positive	14[b]	15.14	214		
		Ties	0[c]				
		Total	24				

(a. Post-test < Pre-test. b. Post-test > Pre-test. c. Post-test = pre-test)

The value of test statistics (Z) according to the WSR test for perception scores in the control group is -1.77 and its associated p-value is (0.07) which is greater than (0.05). Consequently, the null hypothesis is accepted. Therefore, the study concludes that the performance of the control group does not have a remarkable improvement in the post-test when compared to the pre-test.

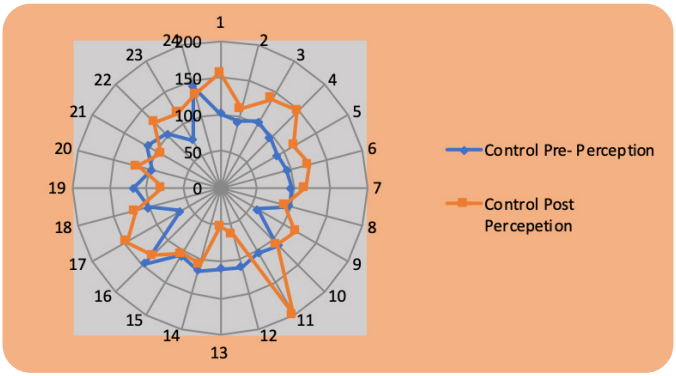
Discussion

For the control group, only conventional

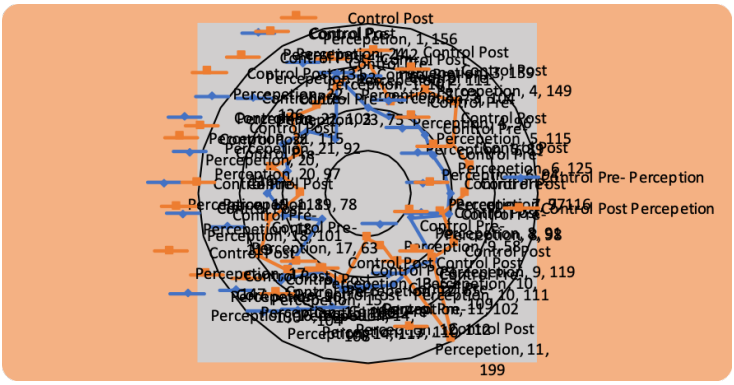
classroom teaching was used for the teaching and learning process. It is shown that the student's perception towards BLA is not improved in the post-test when compared to the pre-test (Z = -1.77 and p= 0.07 greater than 0.05). Hence, it is concluded that the control group does not have a remarkable improvement in the perception scores in the post-test as compared to the pre-test. This result is supported by Riffell and Sibley (2003).

The result reveals that the completion of assignment rate is high through online mode when compared to passive lectures. Further, the study also reveals that student attendance was effective in the BLA method.

Figure-4 : Radar Chart of Control group perception scores.



The perception scores of the pre-test and post-test of the control group are shown diagrammatically in the radar chart. The scores are marked from 0 to 200 starting from the central point to the outer line of the web. The number of students is distributed from 1 to 24 around the circle. From fig. 4 it is shown that the student's perception towards BLA is not improved in the post-test when compared to the pre-test. The radar graphical representation shows that there is no significant difference between pre-test and post-test perception scores.



Delimitations

If the study would have been conducted for the wider samples of different regions it would have given generalized results which would have given scope for comparison with other results. The study is confined to a few topics in the teaching of physical science at B.Ed. level. The same study can be extended to other topics in the teaching of physical science and other subjects at

different levels like schools and other higher education institutions also (Thai et al., 2017). As Blended Learning Programme describes learning events or activities in two different situations in which e-learning is integrated into traditional forms of teaching, it allows the utilization of many methods and resources that are derived from multiple information sources. The teacher adopts the material and method according to the situation. Therefore, it unstructured learning environment, which characterizes BLA and it allows students to learn in the way that best suits them. So the attempt to study is objective in nature.

Recommendation and Educational Implications

From the study, it is revealed that the integration of SBM improved the Perception rate of the student teachers in the experimental group. Moreover, in the present scenario, the learning communities are well-developed to learn more comfortable with the integration of technology into their day-to-day life. Therefore, the teachers in the classroom should prefer different learning strategies like small group interaction, discussion, debate, video conferencing, mobile learning, mobile apps, and reflective practices to make learning more interesting. NEP 2020 also suggests using a Blended learning approach as the blend of online and face-to-face learning will ensure active engagement of students and teachers in the learning process.

Conclusion

The study concludes that statistical analyses carried out for the experimental group revealed that BLA using SBM is more effective than the conventional method of teaching for improving student teachers' perception of the teaching of physical science. In this method, the role of the teacher was transferred from teacher-specified practice to learner-specified practice. The incorporation of appropriate and suitable technology in the conventional classroom empowered every student teacher as an active participant in learning (García-Martín & García-Sánchez, 2013). Therefore, educational institutions should look beyond the traditional boundaries of classroom teaching by integrating all possible pedagogical practices with new technologies to maximize educational achievement. The study concludes that the technologies used in classrooms by teachers by not effectively integrating them with pedagogical practices may not bring out the expected results of teaching. The technology used in BLA provides more information to the students. Information acquired through online resources cannot fully replace the teacher and their relationships in the teaching and training process. Teaching is only replaced by learning through active engagement and interaction. Therefore, BLA using SBM is intended to allow them to develop their basic cognitive concepts as well as their practical skills in the teaching and training process.

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