Implementing Blended Learning Approach For Enhancement Of Scientific Attitude Of Undergraduate Students

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COVID-19 has changed the teaching-learning scenario all around the globe as educational institutions are functioning in a hybrid mode. Blended Learning or Hybrid Learning approach has been a great boon during the pandemic. The blended learning approach mixes online teaching with traditional offline teaching methods to get the best of both approaches. Scientific attitude is a requirement of today's multicultural society for a peaceful and meaningful living. The present research determines the scientific attitude of undergraduate students in blended learning situations. A module of one week duration for the course 'Assessment of Learning' was prepared and implemented for the students of Integrated BA-B.Ed. programme using the Blended Learning approach. The findings indicate a significant enhancement in the scientific attitude of undergraduate students after implementing the blended learning approach. The present research recommends the blended learning approach in the classroom to maximize learning outcomes. The results also provide an idea to implement flexible teaching methods to cater to the diverse learning needs of learners.

Keywords: Blended Learning Approach, Hybrid Learning, Blended Lessons, Scientific Attitude

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INTRODUCTION

The outbreak of pandemic has forced the instructional planners and designers to actively involve 21st century students in the teaching learning process. A teacher in the current times should not only have mastery of the content, but also have necessary pedagogical skills to integrate technology in teaching. Learning can become more effective, attractive and can retain for longer time by utilizing the benefits of technology. The National Policy on Education, 1986 and revised policy in 1992 have laid great emphasis on the application of Educational Technology in all aspects and stages of education. It is high time to include technology in the field of education (Shivam & Singh, 2015). New Education Policy 2020 also aims to integrate technology in the field of education to improve practices in the classroom, support training of teachers, strengthen access of education for disadvantaged groups and combine educational planning, administration and management. One of the innovative ways is hybrid learning/blended learning whereby dynamic digital tools such as e-learning or online learning components are blended with traditional classroom practices. The blended learning approach is a mixture of online teaching with traditional teaching methods to get the maximum advantage of both the methods. There is integration of face-to-face and online instructions in blended learning (Graham, 2013). There is integrated amalgamation of conventional face-to-face learning with web-based e-learning in blended learning in which a vast variety of multimedia, pedagogical strategies and aids are utilized.

The integration of latest mobile technologies with online resources is proving highly effective in the time of the pandemic. Educational institutions all over the globe are redesigning because of COVID-19 and blended learning is becoming a new normal. Schools are opening in a hybrid mode, with students attending school part time and remaining time in online mode. Blended learning can prove to be a successful practical solution to solve the educational challenges post COVID-19 (Hani et al., 2022). Blended learning is economical in the sense that it reduces time and efforts of both students and teachers and hence facilitates implementation of the educational processes, the assessment of learners' performance, and enrichment of the overall attainment of educational objectives while providing a flexible learning environment. Variety of modern communication technologies like computers, networks and internet portals are used in blended learning which increases interaction in the classroom. The social interaction in the blended learning provides scope for clarification of doubts. It also reduces time, efforts and cost involved and thus enables overall improvement of the educational process.

Scientific attitude is a cognitive concept. It is composed of a series of mental tendencies that render an individual stable to face a problematic situation. It is a

desire to attain accurate knowledge and attain confidence in finding a solution to the problems through use of verified knowledge. The scientific attitude recognizes three cardinal principles: firstly, truth is- what it is searching for; secondly, no ways should be missed that might help to find truth and thirdly, what seem to be the truth at one time, may later under the advance of new facts prove to be something less than the truth. The major components of scientific attitude include rationality, curiosity, open-mindedness, aversion to superstitions, objectivity intellectual honesty and suspended judgments (Rao, 1996). Scientific attitude is a cognitive concept which is needed by every individual and not restricted to science subject only. Scientific attitude is need of today's multicultural world. The present era is the world of technological advancements. The teachers and students need to have a positive scientific attitude so that they make themselves more objective and freer from superstitious beliefs and irrational thinking. They should have consistent scientific attitude so that technological advancements could be beneficial for the progress of the nation and welfare of the whole mankind. Scientific attitude allows students to build their curiosity. Teachers should try to promote the scientific attitude among students by arranging a variety of activities for them (Budiharti & Waras, 2018). Scientific attitude can be developed by practice and observation of scientific phenomenon and processes (Singh, & Bai, 2019). Through active participation and free expression of thoughts scientific attitude can be developed in students as they provide them opportunities of exploration and expression. Scientific attitude can be developed through use of technological tools in teaching learning process (Mathew, 2015). Scientific attitude can be developed in the students in the classroom learning situations by providing them the opportunities of creativity, innovations and problem solving (Ahuja, 2017). Diverse learning tasks and environment should be provided to the learners for bringing about the change in the attitude of learners (Godshalk et al., 2004). Blended learning provides a blend of diverse learning activities which can be used to develop scientific attitude of learners. Psychology and its different cognitive principles can be applied for developing scientific thought and scientific attitude (Feist, 2011). Newcombe et al. (2009) summarized four major areas in which psychology can make and has made contributions: early understanding of math, understanding of science, social and motivational factors behind scientific and mathematical interest, and assessing math and science learning. In the present study researchers prepared blended learning module in some topics of psychology for undergraduate students and then after the intervention by this module, its effect was analysed on the development of scientific attitude.

REVIEW OF RELATED LITERATURE

Kumar (2010) analysed the impact of strategies in blended learning on learning retention and attitude of secondary school students. The findings of this study revealed that blended learning leads to immediate learning of students and also leads to better retention of learning even after a gap of two weeks of teaching. The students were also found to develop positive attitude towards English language when taught using blended learning. On the other hand, Simsek and Kabapnar (2010) investigated the effectiveness of "Inquiry-Based Learning" (IBL) for conceptual understanding, scientific attitude, and science process skill in fifth-grade students. There were 20 students in the sample. Students received an eight-week intervention programme based on the IBL principle. The scientific attitude scale, conceptual and science process skills tests were used to determine the success of the given programme. The use of IBL improved students' conceptual understanding and science process skills, according to data analysis. The given intervention, however, had no effect on scientific attitude.

Krishnan (2011) examined the impact of blended learning on higher order thinking and skill of learning science among secondary school students. The experimental group has improved their higher order thinking skills like critical thinking, problem solving skills as blended learning provides experiential learning to students which ultimately develops their higher order thinking skills. The multiple modes of delivery in blended learning help students in exploration and clarify their doubt which leads to the development of science process skills and also improves their achievement in science etc. It was predicted in this study that blended learning has great scope in optimizing the learning of science at secondary level. Usta (2011) studied the attitude of students at higher education level towards computer and internet in web-based learning environment. The study revealed that there was no differentiation of scores of experimental group and control group. Thus, it can be interpreted that there was no impact of web-based learning on attitude towards internet and computer. This might be because students' attitude towards web-based learning is already high because of availability and access to web and its applications.

Kingra and Kaur (2012) in their study found that computer assisted instructional strategies and activity oriented instructional strategies have positive impact on scientific attitude and creativity of secondary school students. It was suggested through this study that computer mediated instructions could be used to teach important concepts in different subjects more effectively. Kiviniemi (2014) explored outcomes of graduate level public

health course students when blended learning approach was applied. The majority of students have improved their performance in blended learning situation. It was predicted through this study that blended learning strategies can prove to be effective in optimizing the learning and of students and also enhance their performance specifically in health science courses.

Nair (2014) in their experimental study on blended learning strategy revealed that blended learning strategy was significantly superior to direct instruction method with respect to post-test achievement score of students at secondary level in biology. The study also showed that blended learning strategy is superior to direct instruction method in improving and promoting environmental and social attitude of students. However, while designing blended learning several factors must be considered which includes nature of content, objectives, learners' needs, teacher's experience, availability of online resources etc. Meanwhile Zhonggen and Zhejiang (2015) analysed blended learning over two decades. Since the conception of online learning in 21st century, many research studied have been done on blended learning. In this study definitions, advantages and problems of blended learning has been briefed based on review of over thirty journals. It has been said that there are deficiencies in both conventional method and online learning when they are used alone. It has been recommended to implement innovative pedagogy in the form of blended learning in educational and non-educational institutions.

Balaji (2017) investigated the role of science teachers in developing students' scientific attitudes in secondary school. The random sampling technique was used to select 50 Science teachers for the study. Each respondent was given an opinion questionnaire. According to the findings of the study, science teachers play an important role in developing students' scientific attitudes. Field trips and laboratory work were effective methods for instilling a scientific mindset in students. It was established that the teacher should not be superstitious and should train students to apply what they learn in the classroom to real-life situations and to correlate science to other subjects. The teacher must be an evidence seeker, emphasizing the use of technology and in-service training programmes to foster a scientific mindset.

Balentyne and Varga (2017) designed a self-paced blended course in mathematics of eight grade and then explored attitudes and achievement of students. It was revealed that the students who have positive attitude towards a specific subject are more successful in self-paced blended course. Self-paced blended course provides the opportunities to students to choose different courses in one class thus it has been emphasized that blended mode of learning expands the learning opportunities of students especially those rural and

financially weaker areas.

Budiharti and Waras (2018) prepared blended learning course for secondary students using I-Spring Suite 8 applications. This was then implemented to analyse the behaviour change in scientific attitude of students. It was revealed that skills like critical thinking, discovery, creativity, open mindedness, cooperation and perseverance are developed in blended learning environment supported by media applications like I-Spring Suite 8. It was recommended that blended learning must be adapted while considering various factors like learning material, time available and also availability of personal computers etc. Similarly, Kaleka and Nur (2018) conducted experimentation on the basis of scientific approach so as to improve science process skill and scientific attitude of grade X students of MAN Ende. There is improvement in scientific attitude of students. It was highlighted that the success of students' learning depends on several factors which includes learning methods and approaches.

Azukas (2019) promoted personalized learning of students by cultivating a blended community of practice. In the blended community of practice various skills of students like planning, risk taking, confidence, sharing with others, implementation etc., are improved. Teachers also showed improvement in various competencies like skill of using technology, facilitation and problem solving. Online learning improves personalized learning as integration of technology helps in facilitating cooperation and carrying out interdisciplinary work. Mutiani et al. (2020) suggested that scientific paper writing by MAN 2 Model Banjarmasin in the subject social science leads to improvement in the authors' scientific attitude. Different activities like writing of ideas, narratives and focus on social themes have been suggested. It has been emphasized that scientific attitude is not confined to a certain subject and can be improved by implementing scientific ways of teaching or writing. It has also been found that scientific attitude is not essentially required among the students studying science only. Rather students from other disciplinary background should also have a desirable level of scientific attitude to perform in any academic situation.

Saboowala and Mishra (2021) examined blended learning as a new normal pedagogy in post COVID time. In this study it was suggested that education system need to create technology dependent learning environment in post COVID time. So, there is a need of paradigm shift in teaching learning process to enhance learning experiences of teachers as well as students. In this regard, Tika and Agustina (2021) reported that outcomes of elementary school students in science learning and scientific attitude have been improved using

project-based learning model in blended learning than in conventional method. Project Based Learning through blended learning is fun and provides opportunities to the students to ask questions, to train their cooperative & communication skills and also develops problem solving skills.

It has been observed through the review of the literature that a number of research studies have been done on blended learning. Blended learning has a significant impact on various domains of teaching and learning like science learning and scientific attitude (Tika & Agustina, 2021; Budiharti & Waras, 2018); higher order thinking skills and skill of learning science (Krishnan, 2011); skill of using technology (Azukas, 2019) etc. Blended learning is need of the present times and should be implemented by the teachers so as to connect to the whole educational community through technological advances (Saboowala & Mishra, 2021). Learning of Humanities and Social Sciences leads to promotion of self-knowledge and critical participation in social life. Blended learning acts as an effective strategy to promote learning of humanities and social sciences as reflected by Makeeva and Lopukhova (2017).

Baliya et al. (2022) reported in their study that blended learning increases the competencies of using technology in teachers and students and thus should be implemented by teachers to provide them the opportunity to learn at anytime and anywhere. It has also been reflected that the scientific attitude is demand of today's technological world so as to build individual with rational thinking and metacognition. It has been reported by Bensley and Lilienfeld (2017) that with the development of psychology there is decrease in perceiving misconceptions and thus increase in critical thinking skills and dispositions and ultimately development of scientific attitude. Review also reflects that the most of studies have been conducted to see the effect of blended learning approach on secondary school students and limited number of studies have been done by taking undergraduate students as main subjects of study. Therefore, the present study has been specifically taken to see the effect of blended learning approach on undergraduate students.

RATIONALE OF THE PRESENT STUDY

In the past the regulation of learning was primarily teacher controlled. But in the present times due to the technological advancements there is paradigm shift in the teaching and learning process. Today's students are digital natives who are confronted with the internet and web-based technology and in the future these students do not conceive as passive learners without interaction (Sanadi et al., 2018). The aim of education is to make students capable of becoming a responsible, productive and skilled member of the society. The

teacher should provide such opportunities and experiences to the learners which develop their innate capacities to create, to question, to investigate and to become independent thinkers. In the fast-moving global economy, the prime focus of educational institutions is to produce such learners who can deal with unlimited stream of profound information and who confront with the paradoxical problems very strategically. There is a need to pay emphasis on those modes of learning which can develop the higher order thinking skills of learners who are active learners. A paradigm shift in the present teaching learning process is needed to mould creative problem solvers who could strategically confront ambiguous paradoxical and bifurcated problems. The emergence of pandemic also forced educators to develop innovative methods of teaching to continue learning at this time (Singh et al., 2021). Schools should empower learners to become more creative and responsible so that they can acquire productive skills and higher order thinking skills.

Scientific attitude is the need of present world of scientific advancements and technological revolution where the learners are confronted with newer technologies every new day (Punia & Bala, 2009). Scientific attitude develops curiosity, creativity, decision making abilities and make them objective thinkers. Scientific attitude is a disposition to act in a particular manner or a display of feelings and/or thoughts. Students' engagement in science learning and future career choices have been highly influenced by positive scientific attitude and this can be done if teachers are actively involving in providing interesting teaching material to the students in the form of videos and with attractive pictures as in blended learning (Tika & Agustina, 2021). There is need to adopt those methods of teaching which develops scientific attitude of learners. In the present world of industrial revolution and flexibility there is need to develop 21st century skills among students which can be done by enhancing their HOTS and scientific attitude. HOTS and scientific attitude can be improved by utilizing variety of learning media and learning models (Ilmi et al., 2020). Scientific attitude is needed in every sphere of education so as to instil a spirit of art, inquiry, experimentation and creativity in students.

The present research stems from the need to implement new methods of teaching which are effective and improve the active engagement of students in teaching and learning environment. Blended learning is considered as an innovative teaching strategy which combines both conventional and online classroom where technology is integrated to enhance learning outcomes (Zhonggen & Zhejiang, 2015; Saboowala & Mishra, 2021). The integration of technology with teaching plays a major role in transforming the educational system from a teacher centred into rich student-centred interactive environment. The present research also emerges from the need to diversify the

teaching methods in the time of COVID-19. COVID-19 pandemic consequently redesigned the scenario of teaching and made us realize the importance of technology in teaching learning process. Students and teachers faced diverse challenges giving rise to methods of teaching that avoid social interaction and at the same time provides quality education. The COVID-19 pandemic has transformed the whole system of education in India. Acknowledging the current scenario, the University Grants Commission (UGC) has prepared a concept note on blended mode in universities and colleges. UGC in this draft has agreed upon 40% teaching in online mode and 60% in offline mode.

The research evidences indicate that the blended learning strategies have a positive impact on different domains of students' learning (Kumar, 2010; Usta, 2011). Blended learning has also found to develop attitude of students as indicated by review studies (Nair, 2014; Budiharti & Waras, 2018). Review of related literature reflects that there is paucity of studies done to see the impact of blended learning on scientific attitude of students. Besides, very few research studies have been done in the Indian context. Various research studies have highlighted the need to improve scientific attitude of students through the application of student centric methods. Thus, in the present research the researcher attempted to implement the blended learning approach to enhance the scientific attitude of undergraduate students. The present research would be vital and relevant for the curriculum designers to understand the importance of blended learning and accordingly effectively and efficiently implement blended learning in the current scenario of pandemic. This study may also provide evidence in terms of effectiveness of implementing blended learning approach in various teaching learning situations. The study will also contribute to the existing body of literature related to blended learning and scientific attitude.

OBJECTIVES OF THE STUDY

Following are the objectives of the study:
- To study the scientific attitude of undergraduate students.
- To see the effect of blended learning approach on scientific attitude of under graduate students.
- To suggest educational implications based on the results of the study.

HYPOTHESIS OF THE STUDY

On the basis of review of literature, the investigators formulated the following hypothesis:

- There will be no significant difference in scores of scientific attitudes of

experimental group on pre-test and post-test.

RESEARCH METHODOLOGY

Research Design

For the present study the investigators followed the experimental research method. The single group pre-test/post-test design was used. Pre-test/post-test design is treated to be pre-experimental design because of the less control over threats to the external and internal validity. Although pre-test/post-test design has certain limitations but use of certain strategies like randomization, appropriate statistical design, avoiding internal and external bias could overcome those limitations and results could be associated with the outcomes of the study (Stratton, 2019). The investigator tried to manage some of the threats to internal and external validity by consulting experts and also took some precautions during sampling and accordingly adopted appropriate statistical technique.

Population and Sample of the Study

For the present research the students of Integrated B.A. B.Ed. students form the population of study. The present study was conducted on students pursuing Integrated B.A.-B.Ed. Programme from Central University of Jammu which was selected purposively because of their relevance with the topic of research as these students are already exposed to the blended learning approach. The original sample consists of 28 students of Integrated B.A-B.Ed. Sem-V which was selected randomly out of 140 students. However, only 16 students sustained throughout the experimental procedure.

Research Procedure

For the experimental intervention in the present research, the researcher first of all prepared a blended learning module on the course 'Assessment of Learning'. This module comprises of four topics viz: Difference between Measurement, Assessment and Evaluation; Assessment of Learning, Assessment for Learning, Assessment as Learning; Formative and Summative Evaluation, Norm Referenced and Criterion Referenced Tests. These topics were prepared by using various sources like pdfs, PowerPoint Presentations, Video Clippings, rightly blended with face-to-face discussion. The pdfs of different topics like measurement, evaluation, assessment etc. were uploaded on WhatsApp group as the learning proceeded in face-face situation. The PowerPoint presentations and video clippings related to the content were used in the classroom teaching. Meanwhile demonstrations, debates and

discussions were used both in the classroom as well as in the WhatsApp group online in the blended learning situation. There were online threaded discussions on various curricular issues. Students also interacted with their fellow mates in the online platform. Furthermore, assessment of students was also done in blended mode which include quiz in Kahoot and WhatsApp group and also oral test in offline mode.

The research methodology consists of three phases:

Phase I: In the first phase pre-test on scientific attitude was administered to the sample of the study.

Phase II: In the second phase the blended learning approach was implemented on the sample where the prepared blended learning module was transacted by the researcher. This module was implemented for the duration of one week on the group.

The whole procedure of experimentation is given in Table 1.

Table 1

Research Procedure during the Experimental Intervention.

Day	Topic	Time Duration	Blended Learning Approach
Day 1	Pre-test on Scientific Attitude	45 Minutes	_____
Day 2	Concept of Assessment and Measurement	45 Minutes	Discussion -cum-Demonstration in Face-to-Face Mode.
Day 3	Concept of Evaluation Difference between Assessment, Measurement and Evaluation	45 Minutes	Video clipping was used for demonstration of difference between assessment, measurement and evaluation.
Day 4	Evaluation of Students	45 Minutes	Use of Kahoot for evaluation.
Day 5	Assessment for learning, Assessment as learning and assessment of learning	45 Minutes	Use of Ppt in Face -to-Face mode.
Day 6	Concept of Formative and Summative Evaluation and Difference between them.	45 Minutes	Discussion in Face -to-Face mode
Day 7	Evaluation	45 Minutes	Online Assessment on WhatsApp group
Day 8	Norm Referenced Test	45 Minutes	Use of online video
Day 9	Criterion Referenced Test	45 Minutes	Use of ppt in face -to-face mode
Day 10	Post Test on Scientific Attitude	45 Minutes	_____ -___

Phase III: In the last phase of experimentation, the post-test on scientific attitude was administered to the group.

The whole experimentation lasted for 10 days. After the experimentation was over, the obtained data was analysed to conclude the findings. t-test was used to compare the mean of experimental group in pre-test and post-test situation so as to analyse and interpret the results.

TOOL USED

For the present study the scientific attitude scale by Srivastava (2014) was used. There are a total of 36 items in the scale. The scale is 3-point scale where the items ranged from agree to disagree. The scoring pattern is 2 to 0 from agree to disagree. The scale has a reliability coefficient of 0.86 for students and validity coefficient of 0.90 for students.

ANALYSIS AND INTERPRETATION

Objective 1: To study the scientific attitude of undergraduate students.

Table 2

Level of Scientific Attitude on Pre-Test and Post-Test.

Experimental Phase	Level of Scientific Attitude	N	Percentage
Pre-Test	Moderate	9	56%
	High	7	44%
Post-Test	High	4	25%
	Very High	12	75%

From Table 2 it can be interpreted that in the pre-test situation 56% students have moderate level of scientific attitude and 44% of students have high level of scientific attitude. It can also be interpreted that in the post-test 25% have high level of scientific attitude and 75% have very high level of scientific attitude. Thus, it can be said that blended learning module increases the level of scientific attitude in the post-test situation.

Table 3

Result of t-Test for Correlated Data of Experimental Group on Pre-Test and Post-Test of Scientific Attitude.

Group	Experimental Phase	N	Mean	SD	r	t
Experimental Group	Pre-Test	16	46.25	5.44	-0.16	3.26**
	Post-Test	16	52.25	3.78		

**Sig at 0.01 Level

From Table 3, it can be interpreted that the mean of pre-test scores was

46.25 whereas for post-test mean came out to be 52.25. Thus, there is a significant enhancement in the scientific attitude of the sample on post-test.

It is evident from the Table 3, that the calculated 't' value for experimental group under pre-test and post-test situation is 3.26 which is more than 2.60 (Table value of t at df 15) at 0.01 level of significance. Hence the hypothesis stating, "There will be no significant difference in scores of scientific attitudes of experimental group on pre-test and post-test" is rejected at the said level. Thus, it can be inferred that there is a significant difference in scores of scientific attitudes of experimental group on pre-test and post-test.

FINDINGS AND DISCUSSION

On the basis of statistical analysis of data, the study revealed that there is a significant difference in scores of scientific attitudes of experimental group on pre-test and post-test situation. Hence, we can say that there is significant enhancement in the scientific attitude of under graduate students after implementation of blended learning approach. The present study highlighted that blended learning approach leads to enhancement in the scientific attitude of undergraduate students. However not much work has been done in connection with scientific attitude and blended learning, the investigator could find some relevant studies. The result of the study is in line with the study conducted by Budiharti and Waras (2018) who reported development of scientific attitude of students in blended learning environment. The blended learning approach increases students' involvement through peer-peer interactions and effectively puts content into practice and consequently have positive effect on learning of students (Demirer & Sahin, 2013). The results are also in tune with the study carried out by Kingra and Kaur (2012) who reported development of scientific attitude of students by using computer assisted instructions.

It has been established that blended learning is an innovative approach of teaching which provides flexible means of teaching and learning and therefore can be customized according to the needs and abilities of students. In the present time of technological advancements attention needs to be given towards development of 21st century skills which can be developed through innovation in teaching. The situation of pandemic also demands flexible approach to teaching as suggested by Saboowala and Mishra (2021) who reported blended learning as new normal pedagogy. The results of the study are in agreement with the study of Ilmi et al. (2020) who reported significant improvement in HOTS and scientific attitude by using learning media and technology. However, the results are in contrast to the study conducted by Usta (2011) who reported that there was no impact of web-based learning on attitude

towards internet and computer. Simsek and Kabapnar (2010) also reported that there is no effect of inquiry-based learning on scientific attitude of students. The results of the study could be attributed to the fact that blended learning provides a variety of learning experiences to the students in both offline and online mode which ultimately leads to the enhancement of their scientific attitude.

EDUCATIONAL IMPLICATIONS

There is great need to provide innovation in the teaching learning process at this time of pandemic. The current scientific and technological development also raises this demand. The present study provides one of such method which can be utilized to cater teaching learning needs of present era. The present research dispensed an innovative model of teaching in the form of blended learning where technology can be effectively utilized in teaching and learning process so as to complement conventional teaching. An outcome of the study is that the students after implementation of blended learning strategies show a significant enhancement in the scientific attitude of students. The reason of such an outcome may be that blended learning strategies provide flexible learning activities which keep them engaged and interested in learning and develop a positive attitude towards science and scientific developments.

It has also been implicated through the study that the universities and other educational institutions should effectively implement blended learning as it offers high potential in improving teaching learning process and catering to the needs of contemporary learners of digital world (Kintu et al.,2017). Undergraduate students have their own experiences, and they can contribute in teaching learning process by sharing their experiences and ideas. Blended learning approach provides a common platform for learners where they can share their knowledge and ideas and become active contributors in learning (Demirer & Sahin, 2013). The study may deliberate conversations in educational sector to evolve innovative pedagogical approaches in the time of pandemic where hybrid mode of learning has become essential aspect of education. However, there is need to conduct more research for examining success of blended learning approach on different populations.

CONCLUSIONS

Blended learning strategies have the potential to completely transform the

whole scenario of teaching and learning. The aim of the study was to implement blended learning approach on under graduate students for the enhancement of scientific attitude. The results of the study showed significant enhancement in the scientific attitude of students after implementation of the blended learning approach. It has been manifested that blended learning approach has high potential to transform the teaching learning process by acting as an innovative pedagogical approach. Despite circumstances, the learning needs have to be addressed with the help of appropriate technological involvement along with the effective pedagogical approach with respect to the nature of the content to be taught to the learners (Thappa & Baliya, 2020; Thappa & Baliya, 2021). It is also the need of the present times as educational institutions are opening in a hybrid mode where face-to-face teaching can be perfectly blended with online learning as also recommended by Al-Amin et al. (2021). It has also been suggested that colleges and universities should continuously emphasize the importance of blended learning and should continuously strive towards its inclusion in various teaching learning scenarios.

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