IMPROVING STUDENT TEACHERS' PERCEPTIONS ON TECHNOLOGY INTEGRATION USING A BLENDED LEARNING PROGRAMME

By

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ABSTRACT

This study examined student teachers' perceptions about Technology Integration (Blended Learning in this study) before and after their exposure to a Blended Learning Experimental Programme designed for the study for eight weeks. EDMODO (an open access Learning Management System) was used as the teaching learning platform for the implementation of Blended Learning Programme. Data were collected from 29 student teachers from a college of teacher education located in Puducherry state of India. The scale for assessing their perception was constructed and validated. The overall results indicated that student teachers changed their perceptions of Blended Learning in terms of their general perception, interactivity in classroom, knowledge creation, content knowledge, technology benefits, and overall satisfaction, positively, after undergoing the experiment. The factor perceptions of technology benefit turned out to be the predictor of the overall satisfaction of respondents on Technology Integration. From these results, the authors recommend that stakeholders of education work closely with teachers to address their perceptions about using technology in classrooms and then helping them to change it positively so as to improve quality of teaching and learning process. Student teachers need to be trained to integrate technology in teaching. Improving their perception is the first step towards it. The teacher education administration may provide personal support and resources required for such a change. This study also offers recommendations for involving teacher educators in educational software designing for strengthening the pedagogical components in such programmes keeping the teacher perceptions and expectations in mind, not focusing solely on the technology benefits as the results of the study shows.

Keywords: Technology Integration, Blended Learning, Student Teachers' Perception, Interactivity, Knowledge Creation.

INTRODUCTION

The unprecedented growth in new technologies that can be used in teaching and learning has brought remarkable changes in the quality of teaching and learning in recent years. As the teacher plays the major role in the management of learning in classrooms, efforts should be taken for equipping teachers to use these new technologies in classrooms. Developing trends in the society and education are interrelated. These trends decide what a child should learn, how to learn, and who will set the trends. It becomes imperative for education as a social system to bring about these changes and transfer these changes to the younger generation. It is the teachers who can conveniently be the vehicles for such a transfer, since their reach to the students is the highest. Thus, it becomes very important that the student teachers are trained to be the change setters for improving the quality of education provided. National Policy on Education (1986) stated that "the status of the teachers reflects the social cultural ethos of a society it is said that no people can raise above the level of its teacher" therefore the strength of an educational system mostly depends on the quality of its teachers. Teachers are nurtured in the teacher education institutions. Therefore,

teacher education programmes provided in these institutions should be tailored to enable the new teachers to use new trends in education. Blended learning programme used in this study is such a new trend in education. Blended Learning is defined as a hybrid of classroom and online learning without the complete loss of face-to-face contact. This learning approach is flexible and integrates innovative and technological advances of online learning with active participation of students in conventional learning environment.

While it is important to develop teacher education programs that practices new technologies in the field of education to meet the needs and expectation of the digital learners, it is also important to have trained teachers to use these technologies. Though funding, equipment, lack of time, and knowledge are known obstacles to successful technology integration (Hardy, 1998; Lam, 2000; Simonsen and Dick, 1997), a critical component in meeting teachers' technology needs is responding to teachers' perceptions or beliefs toward using technologies in teaching. Teachers' perception on the effectiveness of blending technology in regular classrooms may thus bring an impact on its use and in turn improve the effectiveness of learning. In fact, teachers' beliefs are essential in considering how a teacher teaches, thinks, and learns (Richardson, 1996). Understanding and improving upon teachers' perceptions towards use of technology in teaching plays an essential role in successful technology integration in teaching and learning.

This paper focuses on understanding the perceptions of student teachers towards Blended Learning Programme and studying the improvement made on their perceptions by using a Blended Learning Programme as an experiment. The Blended Learning Programme in this study is designed by integrating both face-to-face and online teaching learning techniques. The perceptions of student teachers on technology integration in classrooms using blending methods were assessed using a questionnaire over the components: general perception, interactivity, knowledge creation, technology benefit, content, and overall satisfaction. Blended Learning Programme was then exposed to an intact class of 29 student teachers as the experimental group. The perception was again assessed as a post-test after the programme.

1. Literature Review

Humbert and Vignare (2005) share the results of a case study research of the first year of pilot to introduce blended learning to the Rochester Institute of Technology. The results are positive. Students seem to like blended learning and believe faculty are offering more instructional strategies and resources using blended learning. Students also view positively the increased and improved student to student communication.

Akkoyunlu and Soylu (2008) examined students' views on blended learning environment. This study was conducted on 64 students who belong to computer education and instructional technology and found that students enjoyed taking part in the blended learning environment. It also reveals that students' achievement levels and the frequency of their participation in online learning forum affected their views about blended learning environment. The study reveals that the dimension of face-to-face interaction had the highest score and the results demonstrated the importance of interaction and communication for the success of online learning. The respondents revealed that they perceive blended learning as highly satisfying.

Ertmer, Gopalakrishnan, and Ross (2001) conducted a case-study research designed to revisit the question, how do the pedagogical beliefs and classroom technology practices of teachers, recognized for their technology uses, align? Twelve K-12 classroom teachers were purposefully selected based on their award-winning technology practices, supported by evidence from personal and/or classroom websites. Follow-up interviews were conducted to examine the correspondence between teachers' classroom practices and their pedagogical beliefs. Results suggest close alignment; that is student-centred beliefs undergirded student-centred practices (authenticity, student choice, collaboration). Moreover, teachers with student-centred

beliefs tended to enact student-centred curricula despite technological, administrative, or assessment barriers.

Sreekala, Marie, and Arulthirumurugan (2015) conducted a study on understanding the perceptions of master students of education on using Blended Learning method in teaching. This study proposed a paradigm shift by adopting blended learning approach by using facebook as the online learning platform and discussed different ways of blending online learning with face-to-face instruction in higher education institutions. The results of the study showed that students exhibited positive perception after using blended learning method.

Sugar, Crawley, and Fine (2004) examined teachers' beliefs about technology adoption as a reasoned, deliberate, intentional decision-making process, as reflected in Ajzen's (1985) Theory of Planned Behavior. Qualitative and quantitative data were collected from teachers. Overall results indicated that technology adoption decisions were influenced by teachers' individual attitudes towards technology adoption, which were formed from specific underlying personal beliefs about the consequences of adoption. External support from key persons and contextual resources (e.g., funding) were insignificant factors affecting teachers' technology adoption decisions. They recommend that school administrators work closely with teachers to address their beliefs and concerns about technology adoption and provide an influential level of personal support and resources.

Qasem and Viswanathappa (2016) conducted a study to analyse in-service science teachers' perceptions towards integrating ICT in instructional design by training them using the blended learning approach. The study was conducted on a sample of 60 science teachers of secondary schools in Yemen. A questionnaire was used to understand the in-service teachers' perceptions towards integrating ICT in instructional design, which included 25 items. The findings show that, there was a significant difference in teacher perceptions towards integrating ICT, especially in the group who were trained through the blended learning approach.

Norton, McRobbie, and Cooper (2000) investigated the reasons why in spite of availability of technology, the secondary school teachers rarely used computers in their teaching. The results of the study indicate that individual teachers' resistance was related to their beliefs concerning math teaching and learning and the existing pedagogies, including their views on examinations, concerns about time constraints and preferences for particular text resources. It was also found that teachers with transmission/absorption images of teaching and learning and teacher centered, content-focused pedagogy had a restricted image of the potential of computers in mathematics teaching and learning. By contrast, one teacher with images of teaching consistent with social constructivist learning theory and a learner-focused pedagogy had a broader image of the potential of computers in mathematics teaching. These findings have implications for professional development related to the integrated use of computers in mathematics teaching.

Levin and Wadmany (2006) conducted an exploratory, longitudinal study that analyzes and interprets the evolution of teachers' beliefs regarding learning, teaching, and technology, and their instructional practices, in the context of integrating technology-based information-rich tasks in six 4^{th}–6^{th} grade classrooms. The study used multiple research tools, interviews, questionnaires, and observations, focusing on both teachers' beliefs and classroom practices. The findings reveal that following multi-year experiences in technology-based classrooms, teachers' educational beliefs had changed quite substantively, demonstrating multiple views rather than pure beliefs. The study argues that teachers' beliefs form a mosaic of complementary visions, even conflicting ones. It also shows that it is easier to change classroom practices than educational beliefs.

Ertmer, Ottenbreit-Leftwich, and York (2006) conducted a study among 25 winners of state wide technology teacher awards in order to identify factors that enabled teachers to overcome internal and external barriers in teaching and still be exemplary technology-using teachers who achieve meaningful technology use in learner-centred,

constructive environments. In addition, they also explored teachers' perceptions of the relative value of both intrinsic and extrinsic factors that were perceived to play key roles in their success. The findings of this study highlight the factors and methods that exemplary technology-using teachers perceive, have enabled them to overcome barriers to meaningful technology use.

2. Discussion on the Literature Review

The studies reviewed in the above section indicate that the teachers and students believe that technology integrated teaching can be much more effective than the traditional teaching. In the study of Akkoyunlu and Soylu (2008) students perceived high satisfaction on the Blended Learning Programme they were exposed to. A critical component in meeting teachers' technology needs according to the studies reviewed is responding to teachers' beliefs toward technologies. In fact, teachers' beliefs are essential in considering how a teacher teaches, thinks, and learns (Richardson, 1996). Teachers' technology perceptions depend largely on their thinking about teaching. Resistance to adopting new technologies stem from teachers' existing teaching beliefs (Norton, McRobbie, and Cooper, 2000). For technology adoption to be successful, teachers must be willing to change their role in the classroom (Hardy, 1998). When technology is used as a tool, the teacher becomes a facilitator and students take on a proactive role in learning (Sugar, Crawley, and Fine, 2004). Ertmer, Gopalakrishnan, and Ross (2001) interestingly noted in their study that the strongest barriers preventing teachers from using technology were their existing attitudes and beliefs toward technology, as well as their current levels of knowledge and skills. Successful integration of technology into teaching depends on transforming teachers' belief and philosophy concurrently (Windschitl and Sahl, 2002). Thus, it can be concluded from the review that understanding teachers' perception and readiness toward blending technology with face to face learning play an essential role in successful technology integration. It is thus vital to work on the perceptions of student teachers before training them to use Blended Learning methods of teaching and learning. Nevertheless, most of the studies reviewed have relied upon surveys and on self-reported data from teachers. There are not many studies available on the perception of teachers on technology integration based on their actual classroom experiences. This study seeks to fill this gap.

3. Significance of Blended Teaching Learning Methods

Students in present day classrooms are interested and well equipped to interact and learn anytime and anywhere because of the availability of internet and computer mediated educational tools. Blended Learning Programmes thus increase the options for greater quality and quantity of human interaction in a learning environment. It integrates both conventional method of teaching and technologies which support social interactions. A community of learners can interact at anytime and anywhere because of the benefits that computer-mediated educational tools provide. Thus, teaching can be shifted from teacher centred method to student centered method which provides an integration of technologies and interactions, resulting in a socially supported and constructive learning experience. This, an essential goal of teacher education, could be attained when students think critically, reflect, and analyze their own learning process. This in turn ensure maximum learning benefits. The Blended Teaching Learning methodology designed in this study in order to shift the teacher perceptions provide space for such an innovation in teacher education practices.

4. Stating the Present Study

The present study aims to examine the perceptions of student teachers towards blended learning programme before and after exposing them to the designed experiment. The study also intended to understand, if they could improve their perceptions after the exposure to the designed experiment. The perception was thus assessed twice, before, and after the experiment. The purpose of the initial assessment of perception was to understand their attitude towards integrating technology in education with no training. The student teachers were then exposed to the designed blended learning programme. The assessment was again made after the experiment.

5. Methodology

5.1 Assessing Perception of Blended Learning

The students were asked to rate their perception by using a 5-point Likert Scale (Strongly disagree-1, Disagree- 2, Neutral- 3, Agree -4, Strongly agree - 5). Students perception about their learning experience through blended learning programme is assessed through various factors like general perception, interactivity, knowledge creation, content used, technology benefit, and overall satisfaction. Interactivity refers to students' perception of their social interaction, belongingness, and group dynamics during blended learning programme. Students' perception of their learning activity during Blended Learning programme is referred as knowledge creation in learning environment. Students' perception towards the meaningful integration of technology in conventional classroom is referred as technology benefit in blended learning programme and their satisfaction towards the program is termed as overall satisfaction.

5.2 Teaching Learning Platform

EDMODO (an open access learning management system) was used as the teaching learning platform for the implementation of blended learning programme. It is a free and safe platform for teachers and students to connect and work together. This platform enables teacher to conveniently blend different learning activities using constructivist practices. Teacher and students can continue their discussions, respond to the posts frequently, update information on assignments and events, create online quizzes, and receive award badges for their performance and progress. This medium is interactive, teacher, and students can leave comments, ask questions, and find out information upload and download photos and videos related to the content. The traditional teaching methods were also integrated on this platform.

5.3 Sample

An intact class of 29 student teachers of a college of education in Puducherry state of India formed the sample size for this study. Purposive sampling technique was employed in selecting the college of teacher education.

5.4 Design of the Experiment

The quasi experimental approach is used for designing the blended learning experiment. An Intact group was selected as the experimental group rather than random assignment for the participants, since assigning participants randomly to the groups would have disturbed the routine class schedule.

6. Objectives of the Study

- To study the perception of student teachers towards Blended Learning Programme before and after implementation of Blended Learning Programme with respect to the dimensions: General Perception, Interactivity, Knowledge Creation, Content, Technology Benefit, and Overall Satisfaction.
- To find out the predictors of the overall satisfaction of student teachers on blending technologies.

7. Hypotheses Tested in the Study

There will be a significant difference in the pre-test and post-test scores of student teachers in experimental group in their perception about Blended Learning Programme in terms of following dimensions.

i) General

ii) Interactivity

iii) Knowledge Creation

iv) Content

v) Technology Benefit

vi) Satisfaction

8. Descriptive Analysis

The mean and standard deviation scores of the respondents on all the dimensions of perceptions of technology integration both over the pre-test and the post-test are presented in Table 1.

The mean values presented in Table 1 shows an increase in the perception levels of student teachers from pre-test to post -test after an exposure to the experiment.

8.1 Wilcoxon Signed Rank Test of Variable Perception for Experimental Group

The Wilcoxon Signed Rank Test is a non-parametric test used to find the significance of difference between pre-

Test Type	Dimensions	N	Mean	SD
Pre-test	General	29	48.89	19.85
	Interactivity	29	48.21	17.27
	Knowledge Creation	29	41.25	13.51
	Content	29	46.55	16.82
	Technology Benefit	29	46.35	13.47
	Satisfaction	29	51.57	15.33
	General	29	53.89	18.48
	Interactivity	29	55.83	16.7
Post-test	Knowledge Creation	29	57.78	17.24
	Content	29	50.83	14.69
	Technology Benefit	29	57.29	14.67
	Satisfaction	29	52.31	16.24

Table 1. Descriptive Statistics for Perception Scores of Experimental Groups

test and post-test scores for experimental group students. In this test the scores obtained from two groups are ranked. Two different rank scores are obtained in this test and they are negative score differences and positive score differences. The test statistic 't' is the smaller of two sums and the difference scores of 0 are rejected since a rank cannot be assigned.

9. Statistical Analysis

9.1 Hypothesis 1

The following hypothesis was formulated to find the significant difference between pretest and posttest perception scores of experimental group.

H1: There will be a significant difference in the pretest and posttest scores of student teachers in experimental group in their perception about Blended Learning Programme.

The null hypothesis states that there is no significance difference between pretest and post test scores of experimental group in their perception towards blended learning programme. The hypothesis is tested and the results are presented in Table 2.

Test	Group	Rank	N	Mean Rank	Sum Rank	Z Value	Sig p
Posttest–Pretest	Experimental Group	Negative Ranks	0[a]	0	0		
		Positive Ranks	29[b]	15	435	4.7	0.00
		Ties	0[c]				
		Total	29				

a. Posttest <Pretest b. Posttest >Pretest c. Posttest = Pretest

Table 2. Results of Perception Scores in Pretest and Posttest of Experimental Group

The results of the Wilcoxon Signed Rank Test for perception scores in experimental group can be summarised as: The levels of perception for all the 29 respondents participated in the experiment is positive, which means for all of them levels of perception raised from pre-tests to post test and as the p value indicates this increase is significant.

The test statistic T (lowest of two types of ranks) $=0$, $p<0.05$. The test statistic Z is 4.703 and its associated p-value is 0.000 which is less than (0.05). Therefore the null hypothesis is rejected. Hence, it can be concluded that the experimental group has remarkable improvement in the perception scores in the post-test. The scores of pre-test and post-test of experimental group are shown diagrammatically in radar chart in Figure 1.

The scores of pre-test and posttest of experimental group are shown diagrammatically in radar chart. The scores are marked from 0 to 250 starting from the central point to outer line of the web. The number of students are distributed from 1 to 29 around the circle. From the graphical representation, it is found that posttest scores of perception are high when compared to pre-test scores.

A box plot graphical representation is presented in Figure 2 in order to compare the perception scores of pre-test and post-test of experimental group.

Box plot graphical representation is used to compare the perception scores of pretest and posttest of experimental group. It diagrammatically indicates there is a significant difference between the perception scores of pretest and posttest scores of experimental group at 0.00 level. This

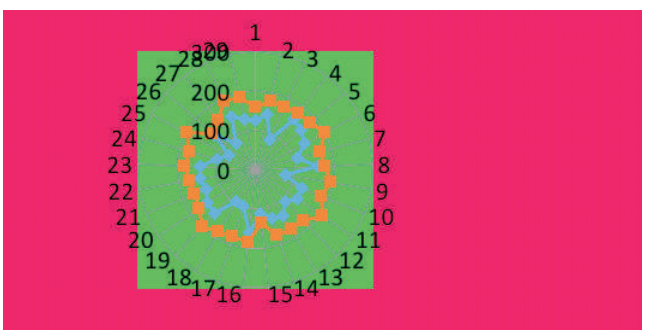
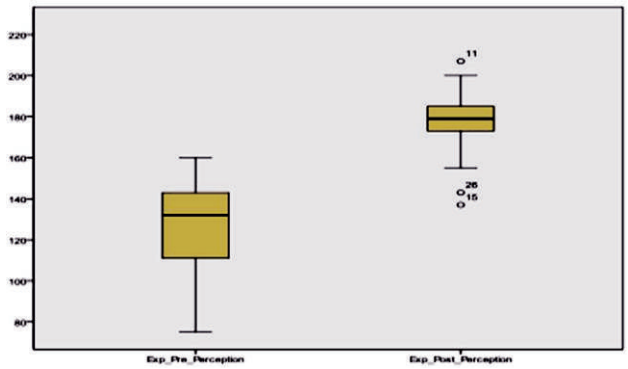


Figure 1. Radar chart of Pre-test and Post-test Perception Scores of Experimental Group



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

Figure 2. Box Plot of Pre-test and Post-test Perception Scores of Experimental Group

result indicates that experimental group student's perception towards blended learning programme is high in the post test.

H2: There will be a significant mean difference in the pretest and posttest scores of student teachers in experimental group in their perception about Blended Learning Programme in terms of following dimensions.

i) General perception

ii) Interactivity

iii) Knowledge Creation

iv) Content

v) Technology Benefit

vi) Satisfaction

The hypothesis is tested and the results of pretest and posttest perception scores of experimental group are calculated and presented in Table 3.

The results of the Wilcoxon Signed Rank Test for perception scores in experimental group separately for each dimension indicates a mixed result. The results can be summarised as: The levels of general perception for 24 respondents participated in the experiment is positive, which means for all of them levels of perception raised from pre-tests to post test and as the p value in Table 3 indicates, this increase is significant. It can also be noted that there were 5 respondents who had their general perception level decreased. The test statistic T=7.6, $p<0.05$. The test statistic Z is 3.88 and its associated p-value is 0.000 which is less than (0.05). Therefore the null

Experimental Group (Posttest –Pretest)	Rank	N	Mean Rank	Sum Rank
General	Negative Ranks	5[a]	7.60	38.00
	Positive Ranks	24[b]	16.54	397.00
	Ties	0[c]		
	Total	29		
Interactivity	Negative Ranks	4[d]	3.75	15.00
	Positive Ranks	24[e]	16.29	391.00
	Ties	1[f]		
	Total	29		
Knowledge creation	Negative Ranks	2[g]	6.50	13.00
	Positive Ranks	22[h]	13.05	287.00
	Ties	5[i]		
	Total	29		
Content	Negative Ranks	0[j]	.00	.00
	Positive Ranks	28[k]	14.50	406.00
	Ties	1l		
	Total	29		
Technology Benefit	Negative Ranks	2[m]	1.50	3.00
	Positive Ranks	27[n]	16.00	432.00
	Ties	0[o]		
	Total	29		
Overall Satisfaction	Negative Ranks	1[p]	1.50	1.50
	Positive Ranks	28[q]	15.48	433.50
	Ties	0[r]		
	Total	29		

Table 3. Pre-test and Post-test Perception Scores of Experimental Group

hypothesis is rejected. Hence, it can be concluded that the experimental group has remarkable improvement in their general perception scores in the post-test. The levels of interactivity for 24 respondents participated in the experiment is positive, and there were 4 respondents who had their interactivity level decreased. There is also one tie, a respondent who did not show any significant improvement after the experiment. The test statistic T= 3.75, $p<0.05$. The test statistic Z is 4.28 and its associated p-value is 0.000 which is less than (0.05). The levels of knowledge creation for 22 respondents participated in the experiment is positive, and there were 2 respondents who had their level of knowledge creation decreased. There are also 5 ties, the designed programme has thus to be relooked into since 5 people did not perceive that a technology integration could improve knowledge creation in them. The test statistic T= 6.50, $p<0.05$. The test statistic Z is 3.91 and its associated p-value is 0.000 which is less than (0.05). In the case of perception in terms

of content 28 respondents believed that blended learning method can improve content knowledge in students. There was none with a negative score, and there was one tie. The test statistic T= 0, p<0.05. The test statistic Z is 4.65 and its associated p-value is 0.000 which is less than (0.05). In the case of perception in terms of technology benefit 27 respondents believed that blended learning method will help them using more technology in classroom. There were still 2 respondents who stopped believing this after the experiment. The test statistic T= 1.5, p<0.05. The test statistic Z is 4.62 and its associated p-value is 0.000 which is less than (0.05).

Finally, 28 respondents reported an overall satisfaction over blended learning method. There was again one respondent who had a negative score. The test statistic T= 1.5, p<0.05. The test statistic Z is 4.62 and its associated p-value is 0.000 which is less than (0.05).

The Test statistics results of Perception scores of Experimental group is presented in Table 4.

The test statistic (Z) values are (3.887), (4.286), (3.918), (4.625), (4.642), and (4.673) with respect to dimensions general, interactivity, knowledge creation, course content, technology benefit, and overall satisfaction and associated probability value for each dimension is less than (0.05). Hence, there is a statistical evidence that the scores of the students for various dimensions are effectively improved in the post test as compared to the pre-test significantly. Therefore the null hypothesis is rejected.

A Graphical representation of the perceptions scores of experimental group is presented in Figure 3.

9.2 Factors Predicting the Perception of an Overall Satisfaction of using Blended Learning

Linear Regression was employed in order to understand

Test Statistics	Z	Sig.p
General	3.88	0.00
Interactivity	4.28	0.00
Knowledge Creation	3.91	0.00
Content	4.65	0.00
Technology Benefit	4.62	0.00
Satisfaction	4.73	0.00

Table 4. Test statistics of Perception Scores of Experimental Group

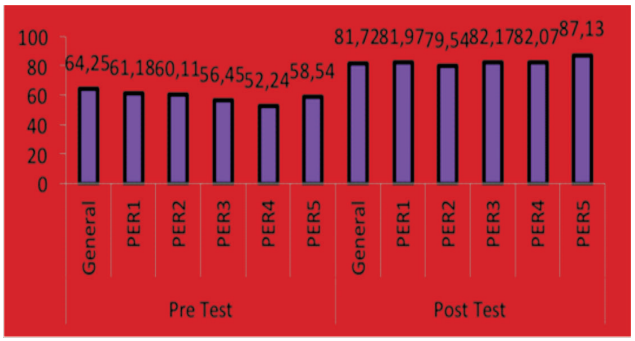


Figure 3. Graphical Representation of Experimental Group

the predictive capacity of independent variables on the perception of an overall satisfaction of using Blended Learning. The results from regression are presented in Table 5.

Dependent Variable: Overall Satisfaction

The F value as shown in the table below is 64.067, which is significant at p<.001. From this, the authors can conclude that the regression model results in significantly better prediction of the dependant variable.

The beta coefficient values of the predictor variables with the t values and the corresponding significance values are presented in Table 6.

Dependent Variable: Overall Satisfaction

The observed significance value (.000, less than .05) shows that, there is only one predictor in this model. The

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4267.226	5	853.44	64.067	.000
2	Residual	626.094	47	13.321		
	Total	4893.321	52			

Table 5. ANOVA

	B	Std.Error	Beta	t	Sig
1(Constant)	-5.653	2.297		-2.461	.018
General Perception	.189	.199	.118	.949	.347
Interactivity	.091	.173	.062	.523	.603
Knowledge Creation	.201	.181	.112	1.110	.273
Content	.277	.165	.196	1.678	.100
Technology Benefit	.735	.136	.519	5.385	.000

Table 6. Coefficients

results reflect a genuine effect over this predictor. The variable technology benefits solely predicts the perception of an overall satisfaction of Blended Learning significantly. The B value is found 0.735, this means for every unit increase in the predictor variable (if the perception of technology benefit is increased by 1), then the model predicts that the perception of the student teachers on the overall satisfaction of technology integration will raise by .735 times. A regression model to explain the significant scores of all the predictors of overall satisfaction on blended learning is presented in Figure 4.

10. Limitations and Suggestions for Future Research

This study was conducted on a small sample of 29 students drawn from a teacher education college in Puducherry. If the study was conducted on a wider sample taking the sample from other colleges and regions as well, it would have given generalizable results and the scope for comparing the results with that of other regions also. Future research should draw from a larger sample, in order to increase the generalizability of the results. The scale of perception used in this study can be standardised using factorial analysis to understand the loading of different items to factors. As shown by the results, there seem to be discrepancies in few items (eg, knowledge creation where there were ties and negative scores). In addition, a qualitative study would have provided a better understanding of the results.

11. Discussion and Implications

Based on the literature, for many teachers, technology integration is still a distant goal, many of them are not comfortable with using technology and many others have a very strong perception that technology is not required for teaching. Blended Learning methodology is thus planned as an innovative teaching where teachers can still do a lot of traditional teaching that they are good at and at the same time they can be trained to use as much as technology as possible, if it enhances the learning outcomes and thus the quality if teaching. Teachers typically encounter a variety of barriers (i.e., time, resources) that make the integration of technology difficult (Ertmer et al., 1999). Teachers normally come across a variety of barriers, on a daily basis, even then, there are many teachers who utilise the facilities available in their working places for better creating a better learning environment. Based on past researches, it is also found that their beliefs and perceptions on a technology has a great impact on their technology integration. Levin and Wadmany (2006) in a study demonstrates that spending three years in a technology rich learning environment produces substantive change in teachers' educational beliefs and classroom practices. The findings of the present study on improving teacher perceptions support the view that teachers' beliefs can be changed (Fullan, 1991; Leung, Watters, and Ginns, 2005; Tillema, 1995), even though they are often thought of as permanent and difficult to alter (Pajares, 1992). This study also demonstrates that perception of technology is an individual process, unique to each teacher. It indicates that teachers respond differently to similar technology innovations related to blended learning as shown in the ties in the results of analysis. This probably implies that the diversified experiences of teachers need to be cared for and that it is difficult to meaningfully change their perceptions about teaching and learning processes. The finding of this study is a clear indication that if teachers perceive technology as useful for their teaching and student learning they can overcome all other internal and external barriers of teaching. By just possessing a computer system and an internet connection they could make their classes much more active and participating than their normal traditional classroom.

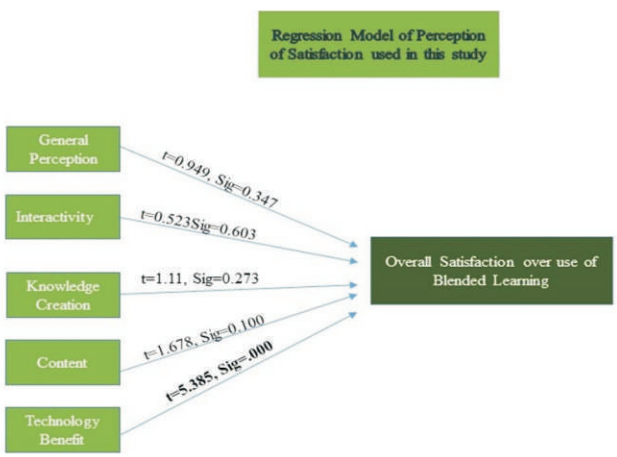


Figure 4. Regression Model of Perception of Satisfaction

One major implication of this study is the realisation that the importance of coexistence of contrasting views of learning and teaching when it comes to use of technology. Individual teachers differ in their perceptions of technology use for teaching. The authors may not regard such differences as awkward reactions of few teachers, but view them as complementary. This study was undertaken with an understanding that mere use of technology oriented learning tasks is not enough to ensure successful integration of technology into teaching. We need to understand and bring a change upon the perceptions of teachers who ultimately determine how technologies are utilized in the classroom. Teachers should move from viewing technology as a technical tool to seeing it as an important teaching technique that can empower the student, teachers, and the learning environment. It should also be noted from the study that we need not simply rely on teachers' explicit expressions of perceptions, these may be just their feelings of insecurity on use of technology or difficulty to shed long-held beliefs. There can also be other ways of understanding what teachers perceive, like classroom observation. Teacher's actual classroom practices cannot be predicted from a teacher's expressed beliefs about learning and teaching (Levin and Wadmany, 2006). Finally, blended learning programme will only be successful whenever it is based on a pedagogical concept. The blended learning programme designed for this study improved the student teachers' perception towards blended learning approach probably since it combines self-paced learning, live online learning, and face-to-face classroom learning effectively.

Conclusions

One major goal of the present study was to identify better ways of preparing preservice teachers ready for a classroom blending technology with face to face learning. Based on the results of this study, it appears that more attention needs to be given to the teacher perceptions about blending technology during preservice education. For instance, in this study the only factor that the student teachers perceived to be contributing towards their satisfaction of blended learning was technology benefits, though all other factors were significantly improved after a training, they were not predictors of their overall satisfaction. This probably is due to a belief among teachers that blended learning is useful mainly as a technology benefit, or it helps in using more and more technology in classrooms. They may also tend be believing that technology cannot help in knowledge creation and content knowledge. There were respondents who had negative ranks in the perception dimensions of interactivity and knowledge creation components though they were very few. Though there is an important role that teachers' internal beliefs or perceptions play in use of technology, it should also be supported by important extrinsic factors like professional development, technology support, awareness building, and training that enable future teachers to put their learning into practice. Helping teachers to positively shape their personal perceptions about the benefits of blended learning should be a major component of preservice education. Furthermore, the results of this study highlight important ways in which administrators can support their teachers' efforts of blending technology with traditional teaching by training them and proving technology support. The authors have future plans to collaborate with teacher training centres to develop specific technology integration programmes and assist them in the design of blended learning programs for their teachers.

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