CHAPTER - V

SUMMARY AND DISCUSSION

5.1. INTRODUCTION

We live in an age of information and technology. With the fast pace, Information and Communication Technology (ICT) is getting introduced in the field of education. With the array of instructional media now available, teachers have more ways to individualise and personalize instruction through computer and related software, video disc technology and telecommunication and various instructional application systems. It is a challenge for teachers to ensure ICT does not remain only as an additional to the existing subject area but become an integral part of the learning experiences of all learners. Hence it is important to take positive steps for building a more meaningful interface between modern developments in the field of information and communication technology and teacher education programmes.

The National Policy on ICT at School Education (Draft, 2009) aims at promoting universal, equitable, open and free access to state of the art ICT and ICT enabled tools and resources to all students and teachers. As a strategy of implementation of the policy, government intends to introduce a programme of ICT literacy across all secondary schools in the States, both government and private within the XI plan period.

It is intended to provide schools with a wide range of such teaching learning materials, which will catalyse transformation of classrooms into SMART classrooms. A wide range of appropriate software applications, digital content, tools and resources will be made available through the proposed digital repositories. Teachers would be participating in selection and critical evaluation of digital content and resources. They will also be encouraged to develop their own digital resources, sharing them with colleagues through the digital repositories. Initially the teachers may use the Computer laboratory for teaching-learning but progressively more classrooms will be equipped with appropriate ICTs, making way for SMART classes.
Findings of studies of innovation in educational contexts around the world show that many educational innovations ultimately fail because too little effort or too few resources are devoted to preparing teachers for the innovation (UNESCO, 2002).

According to Hasselbring et al. (2000), schools will be equipped with the best hardware and software in the near future, but it is unlikely that teachers and students will use them effectively, if teachers are not trained. Therefore, it is logical to require pre-service teachers to incorporate technology into the lessons they prepare to teach (Johnson et al. 2000) as teacher education programmes help them to prepare for their future classrooms.

In India, ICT has been made a compulsory component of teacher education programme, particularly at secondary level (NCTE, 2006). NCTE has signed an MOU with INTEL Technology India Pvt. Ltd., Bangalore on 20th December 2006 to train teacher educators to make ICT an integral part of teacher education programme (GOI, 2007).

The University of Mysore introduced a compulsory course ‘Computer Education’ in the academic year 2005-06 to ensure the ICT as a component of teacher education programme. To facilitate the effective implementation of the course, the University trained teacher educators of affiliated B.Ed. colleges with the support of INTEL and provided learning materials to student teachers.

5.2. NEED AND SIGNIFICANCE

It is necessary that effectiveness of any teacher education programmes needs to be deeply analysed (NCERT, 2006). In most of the studies, the outcome of the programmes has been studied on the basis of only ‘perceptions’, which are generally not seriously responded to. But what are required are rigorous systematic studies about the curriculum, the courses, the practices, and the work culture of the institutions should be the concern of the research (NCERT, 2006). The sixth survey of Educational Research emphasized the need of status study of computer literacy among teachers (NCERT, 2006).

In the context of introduction of computer education course in B.Ed. programme, it is necessary to know its effectiveness. In a world of constrained
resources, it is no surprise that measuring effectiveness should be one of the priorities. Without demonstrated effectiveness, why would anyone invest in technology? It is also important to know the factors that influence the process, which result in the desired outcome of the computer education course. It is reported that factors beyond the teacher’s control influence ICT uptake; e.g. institutional culture, leadership, the curriculum and assessment. Hence it is necessary to study which presage factors influence the outcome of a course.

It would be meaningful if the factors involved in the process of teacher education which would have made impact on outcome of computer education programme are categorized as a) institutional factors, b) teacher educator related factors and c) student teacher related factors. The institutional factors that might impact on the outcome include institutional infrastructure, accessibility of these infrastructure to the learners, and institutional strategies to make best use of the available facilities to the extent to which ICT would be integrated in the curriculum. These factors are collectively termed as institutional e-maturity (BECTA, 2006). The teacher educator factor that might influence the outcome is teacher educators’ computer competency (computer knowledge, attitude towards computer use, and computer skills). Student teachers’ computer competency and computer self-efficacy at the entry level also would have an impact on the outcome of the course. These set of factors would influence on student teachers learning outcomes which in turn influence the outcomes of the course independently and also interactively. It would be necessary to know and understand such impact in a teacher education programme so that the status could be understood and further decision regarding improvements in the course could be thought of. If student teachers exit level outcomes are predicted on the basis of these presage variables and entry level abilities, it would be useful to focus on possible successes and failures.

5.3. THE PRESENT STUDY

Considering the above mentioned rationale, it was felt that a study which appraises the effectiveness of computer education course of B Ed programme is needed. A study, in which the factors influencing the effectiveness of the computer education course are explored, to give an idea about what preconditions are required to get effective outcome. The study will give a
feedback about the course in the formative stage; will help in taking key
decisions regarding the improvement of the course, which in turn is helpful to
the administrators, teacher educators and student teachers of B.Ed. Colleges.
The identified predictors could be used to predict the computer competency
and computer self-efficacy of the student teachers in advance. The study can
also help to add some knowledge base to the quality improvement of the
teacher education at secondary level.

The title of the present study is

“A Study of Factors Influencing Effectiveness of Computer Education
Course in B.Ed. Programme”

The study was envisaged as a study of factors that influences
effectiveness of Computer Education course. The study takes three major
factors namely institutional, teacher educator related and student teacher
related factors in to consideration. The e-maturity of B.Ed. Colleges, an
institutional factor, was studied. The teacher educators’ computer
competency, a teacher educator related factor, was assessed. Effectiveness of
the course in terms of student teachers’ computer competency and computer
self-efficacy was studied. The factors influencing effectiveness of the computer
education course were explored. The predictors of computer competency and
computer self-efficacy of the student teachers were determined.

5.4. OPERATIONAL DEFINITIONS

E-maturity: E-maturity is the degree to which an organization makes
strategic and effective use of ICT to improve educational outcome (BECTA
2006). In this study e-maturity of an institution refers to overall index
obtained in e-maturity scale developed for the study.

Computer Competency: A competency is a set of attributes covering
knowledge, skill and attitude for enabling one to effectively perform the
activities of a given occupation or a function to the standard expected in
employment (UNESCO 2005). Computer competency hence includes computer
knowledge, computer skill and attitude towards computer use. In the present
study computer competency refers to performance in computer knowledge
test, computer skill test and response to attitude towards computer use scale
developed for the study.
Computer Self-efficacy: Computer self-efficacy refers to a judgment of one’s capability to use a computer (Compeau & Higgins, 1995). In the present study computer self-efficacy refers to overall confidence shown in identified areas of computer use in computer efficacy scale developed for the study.

5.5. Objectives

Following were the objectives of the study:

1. To study the e-maturity of the B. Ed. Colleges to carry out the Computer Education Course.
2. To study computer competency of the teacher educators teaching Computer Education course in B. Ed. Programme.
3. To study the effectiveness of the Computer Education course of B.Ed. programme in terms of Student Teachers’ computer competency and computer self-efficacy.
4. To study the influence of gender and subject background of student teachers on computer competency and computer self-efficacy of the student teachers.
5. To study the influence of institutional e-maturity, teacher educator’s computer competency and their interaction on computer competency of student teachers.
6. To study the influence of institutional e-maturity, teacher educator’s computer competency and their interaction on computer self-efficacy of student teachers.
7. To study the total and individual contribution of institutional e-maturity, teacher educators computer competency, and student teachers computer competency in predicting student teachers computer competency.

5.6. Hypotheses

Following hypotheses were formulated in the study:

1. There is a significant difference between computer competency of student teachers at pre-test and post-test stages.
2. There is a significant difference between computer self-efficacy of the student teachers at pre-test and post-test stages.
3. There is no significant difference between computer competency of science and humanities student teachers.
4. There is no significant difference between computer competency of male and female student teachers.

5. There is no significant difference between computer self-efficacy of science and humanities student teachers.

6. There is no significant difference between computer self-efficacy of male and female student teachers.

7. There is no significant influence of institutional e-maturity, teacher educator’s computer competency, and their interaction on computer competency of student teachers.

8. There is no significant influence of institutional e-maturity, teacher educator’s computer competency, and their interaction on computer self-efficacy of student teachers.

5.7. VARIABLES

Dependent variables
- Student teachers’ computer competency
  - computer knowledge
  - computer skills
  - attitude towards computer use
- Student teachers’ computer self-efficacy

Independent variables
- Institutional e-maturity
- Teacher Educators’ computer competency
  - computer knowledge
  - computer skills
  - attitude towards computer use

Moderator Variables
- Student teachers’ gender
- Student teachers’ subject background
5.8. DESIGN

This study explored the influence of student teacher related factors, teacher educator related factors and institutional related factor on effectiveness of Computer Education course of B.Ed. programme. Here an attempt was made to explore the relationship of selected presage and context variables with the product variables related to computer education course. Since the study attempts to relate presage and product variables, measurement of the variables were done at two phases, once at the beginning of the course and again at the end of the course.

As the organised observations were made at two stages, this method resembles a pre-test post-test single group design, a type of pre-experimental design. But an experimental design needs to have an experimental intervention manipulated by the researcher. In the present research context, the computer education course on which study was centred, existed even before the study was taken up and the researcher had no control over it for any manipulation. Hence it is not an experimental study.

One of the purposes with which a survey study is taken up is to understand the relationship among the variables apart from describe the status. The present study is was taken up to understand the relation of
selected student teacher variables with institutional variable and teacher educator variables apart from understanding the status of institutions and teacher educators in selected variables. Hence it is a survey study.

5.9. Sample:

B. Ed. Colleges affiliated to the University of Mysore was the population of the study at institutional level. Teacher educators teaching ‘Computer Education’ course in the affiliated B.Ed. colleges were the teacher educator population of the study. Student teachers studying in the affiliated B. Ed. Colleges were the student teacher population of the study.

Multistage sampling was adopted to select the sample for the study. University of Mysore had 32 B Ed colleges under its jurisdiction (year 2007-08). E-maturity of all these institutions was assessed. 16 B.Ed. colleges were selected randomly for the further study.

Stratified random technique was employed to select the student teachers from the selected 16 teacher education institutions. From each of these selected colleges, 50 student teachers, 25 each from Science and 25 from Humanities background, were randomly selected. Though the intended student teacher sample size was 800, since the number of student teachers with science background was less than 25 in some of the colleges, the sample size was 694. But due to few absentees during post-test stage, the sample size of the student teachers remained 578.

The teacher educators who were teaching the Computer Education course in these selected colleges constituted the teacher educator sample.
A schematic representation of the sampling procedure adopted in the study is given in the following figure.

5.10. **TOOLS:**

The study involved assessment of student teachers’ computer knowledge, attitude towards computer use, computer skill and computer self-efficacy, teacher educators’ computer knowledge, attitude towards computer use and computer skill and institutional e-maturity. Following tools were developed validated for assessing these variables.

2. Student teachers’ attitude towards computer use scale.
3. Computer skill test for student teachers.
5. Computer Knowledge test for teacher educators.
6. Teacher educators’ attitude towards computer use scale.
7. Computer skill test for teacher educators.
8. Institutional e-maturity scale.
5.11. **Statistical Techniques Employed:**

Following statistical techniques were employed to achieve the objectives of the study:

Descriptive statistics were used to study the institutional e-maturity of the teacher education institutions and to study the computer competency of the teacher educators.

To study the effectiveness of the computer education course on computer competency and computer self-efficacy of the student teachers, paired t-test was used.

Analysis of covariance technique was employed to study the factors influencing student teachers’ computer competency and computer self-efficacy.

In order to set prediction equation of student teachers’ computer competency and computer self-efficacy, multiple regression analysis was used.

5.12. **Major Findings:**

1.1 E-maturity of the B. Ed. Colleges affiliated to University of Mysore was found to be moderate.

1.2 The B.Ed. colleges have highest index value in ‘e-learning resources’ component wherein least index score is in ‘use across curriculum’ component. The index values in other components are in the following descending order: workforce skills, student access and management strategies.

1.3 Private aided colleges have higher e-maturity scores when compared to government and unaided colleges.

1.4 Private aided colleges have higher ‘e-learning resource’ index when compared to unaided colleges and government which happens to be the component in which all the three types of colleges have the highest index values.

1.5 The least index scores for government college is in ‘workforce skill’ component wherein the least index value for private aided and private unaided colleges is in ‘use across curriculum’ component.
2.1 Teacher educators have moderate computer knowledge. Teacher educators scored the highest in ‘Spread sheet’ component of computer knowledge, whereas the least score is in ‘WWW’ component of computer knowledge.

2.2 Teacher educators are perceived to have high computer skills. The highest score of the computer skill of the teacher educators was obtained in ‘Spread sheet’ component and the least score in ‘computer in teaching and learning’ component.

2.3 Teacher educators have a highly positive attitude towards computer use.

3.1 There is an improvement in the computer knowledge score of student teachers from pre-test to post-test stage. Change in student teachers’ computer knowledge is the highest in ‘WWW’ component and least in ‘basic computer operations’ component.

3.2 There is an improvement in the computer skill of student teachers from pre-test to post-test stage. Change in student teachers’ computer skill is the highest in ‘Word-processing’ component and least in ‘WWW’ component.

3.3 Student teachers have positive attitude towards computer use at pre-test and post-test stage, but there is no change in the attitude towards computer use of the student teachers from pre-test stage to post-test stage.

3.4 There is an improvement in the computer self-efficacy of the student teachers on completing the computer education course.

4.1 Student teachers of science stream have higher computer knowledge and computer skills when compared to their counterparts from humanities stream. But no such difference in attitude towards computer use was found.

4.2 Female student teachers have higher computer knowledge and attitude towards computer use in comparison with their male counterparts.

4.3 There is no difference in the computer skill of male and female student teachers.

4.4 There is a difference in computer self-efficacy of science and humanities student teachers in favour of science student teachers.
4.5 There is no difference in computer self-efficacy of male and female student teachers.

5.1 Institutional e-maturity and teacher educator’s computer knowledge have influence on the computer knowledge of the student teachers. But there is no interaction effect of institutional e-maturity and teacher educator’s computer knowledge on computer knowledge of student teachers.

5.2 Institutional e-maturity has an influence on the computer skill of the student teachers. But teacher educators’ computer skill has no influence on student teachers’ computer skills. Also there is no interaction effect of institutional e-maturity and teacher educator’s computer skill on computer skill of student teachers.

5.3 Institutional e-maturity has no influence on student teachers’ attitude towards computer use, but teacher educator’s attitude towards computer use has influence on student teachers’ attitude towards computer use. There exists interaction effect of institutional e-maturity and teacher educator’s attitude towards computer use on student teachers’ attitude towards computer use.

5.4 Institutional e-maturity and teacher educator’s computer knowledge have no influence on the computer self-efficacy of the student teachers. Also there is no interaction effect of e-maturity and teacher educator’s computer knowledge on the computer self-efficacy of the student teachers.

6.1 Student teachers’ pre-computer knowledge, institutional e-maturity and teacher educators’ computer knowledge are together predicting student teachers’ computer knowledge. The regression equation is

\[ \text{Student teachers’ computer knowledge} = (-0.023) \text{ institutional e-maturity} + (-0.007) \text{ teacher educator’s computer knowledge} + (0.416) \text{ student teachers’ pre-computer knowledge} + 8.509. \]

\[ Y = -0.023 X_1 - 0.007 X_2 + 0.416 X_3 + 8.509 \]

Further among the components of ‘e-maturity’, the ‘e-learning resource index’ and ‘student teachers’ access index’ have no negative contributions towards prediction of student teachers’ computer knowledge. But ‘management strategies’, ‘workforce skill’ and ‘integration across
curriculum’ indices have contributed negatively in predicting of student teachers’ computer knowledge.

6.2 Student teachers’ pre-computer skill, teacher educators’ computer skill and institutional e-maturity are predicting computer skill of the student teachers. Following is the multiple regression equation:

\[ \text{Student teachers’ computer Skill} = (0.005) \text{ institutional e-maturity} + (0.035) \text{ teacher educator’s computer skill} + (0.512) \text{ student teachers’ pre-computer skill} + 23.198. \]

\[ Y = 0.005 X_1 + 0.035 X_2 + 0.512 X_3 + 23.198. \]

6.3 Student teachers’ pre-attitude towards computer use, teacher educator’s attitude towards computer use and institutional e-maturity are predictors of student teachers’ attitude towards computer use. Following is the multiple regression equation:

\[ \text{Student teachers’ attitude towards computer use} = (0.070) \text{ institutional e-maturity} + (0.113) \text{ teacher educator’s attitude towards computer use} + (0.478) \text{ Student teachers’ pre-attitude towards computer use} + 32.287. \]

\[ Y = 0.070 X_1 + 0.113 X_2 + 0.478 X_3 + 32.287. \]

7. Student teachers’ pre-computer self-efficacy, teacher educator’s computer knowledge, institutional e-maturity are significantly predicting student teachers’ computer self-efficacy.

\[ \text{Student teachers’ computer self-efficacy} = (0.028) \text{ institutional e-maturity} + (0.161) \text{ teacher educator’s computer knowledge} + (0.457) \text{ Student teachers’ Pre-computer self-efficacy} + 32.633. \]

\[ Y = 0.028 X_1 + 0.161 X_2 + 0.457 X_3 + 32.633. \]

5.13. DISCUSSION

5.13.1. E-maturity of B.Ed. colleges:

The finding of the study shows that, the teacher education institutions have moderate e-maturity index. There was further analysis of indices of the individual components of e-maturity. Highest index obtained in ‘e-learning resources’ component reveals that teacher education institutions have
infrastructure of expected level. The least index scored in ‘integration across curriculum’ component reflects the under utility of the available resources. Low scores in ‘management strategies’ component indicates absence of proper action at the institutional level to upgrade the available resources and lack of planning in making the facilities available to the student teachers for learning.

The comparison of e-maturity index across the institutions of different management gives another picture. Private aided colleges are found to be better than private unaided institutions and the government institution in terms of overall e-maturity index as well as individual components of e-maturity. The government institution has got the lowest index in overall and individual components of e-maturity. E-learning resources have been found to be available in all types of institutions, as are getting the highest index in this component. But ‘use across curriculum’ component gets the least index among aided and unaided institutions. It was found that the teacher educators are not trained to integrate computers in teaching. But the government institution scored the least index in ‘workforce skills’ component. Lack of trained teaching and technical staff might be a reason for this.

5.13.2. **Teacher educators’ computer competency:**

The computer knowledge of the teacher educators was found to be moderate. Further, the study of the teacher educators’ computer knowledge also tells us that the teacher educators have the highest percentage of scores in ‘Spreadsheet’ component and the least in ‘WWW’ component of computer knowledge. The highest scores in ‘Spreadsheet’ component might be because of the usage of Spreadsheet for administrative purposes like marks entry and consolidation. The low score in ‘WWW’ reveal that the teachers use the internet to the least extent. A relatively higher score in ‘e-mail’ component tells us that internet is being used for personal purposes rather than instructional purposes like searching e-content.

Teacher educators’ perception of computer skill gives a different picture. The teacher educators were perceived to possess high computer skills. The high scores may be due to overestimation of the computer skill possessed by the teacher educators. Teacher educators have perceived to have the highest percentage in ‘Spreadsheet’ component of computer skill. It was also reported in the study earlier that the teacher educators had scored the highest in the
same component of computer knowledge. This indicates that the teacher educators are having a greater familiarity in working on ‘Spreadsheet’ in comparison with other software packages like word processing and database management. The lowest scores in ‘computers in teaching and learning’ component confirm the limited exposure of the teacher educators to using the computer for instructional purposes.

Teacher educators have a very high positive attitude towards computer use.

5.13.3. **Effectiveness of computer education course:**

In the present study, the effectiveness of the Computer Education course has been studied without having a comparable group. Hence the findings need to be understood in this background without over generalising them.

The computer knowledge of the student teachers rose on completion of Computer Education course. This means that Computer Education course of B.Ed. programme is effective in bringing about changes in the computer knowledge among the student teachers. Improvement is observed among all the six components of computer knowledge. But then, the total computer knowledge is low. This might be because of moderate e-maturity of the institutions and moderate computer knowledge of the teacher educators, both of which are influencing student teachers’ computer knowledge. With higher institutional e-maturity and teacher educators with higher computer knowledge, student teachers also might attain higher computer knowledge.

There is an increase in student teachers’ computer skill on completion of the computer education course. Improvement was observed among all the seven components of computer skills.

Student teachers have highly positive attitude towards computer use. But no change in the attitude of student teachers towards computer use was observed. This finding is in concurrence with literature findings. This might be due to the fact that the student teachers had very high positive attitude towards computer use at the beginning of the course itself.

Computer self-efficacy of the student teachers increased on completion of the course. Hence it can be concluded that the course is effective.
5.13.4. **Influence of subject background and gender on student teachers’ computer competency and computer self-efficacy:**

There was a difference between the computer knowledge scores of science and humanities student teachers in favour of science student teachers. Difference in the computer skill and computer self-efficacy of science and humanities student teachers was also identified in favour of science student teachers. This shows that student teachers with different subject backgrounds attain different levels in computer knowledge, computer skill and computer self-efficacy. This might be due to the fact that computer related content falls under the domain of science, learning of which is familiar to science student teachers when compared to humanities student teachers. But no significant difference in science and humanities student teachers’ attitude towards computer use could be noticed.

Female student teachers have higher computer knowledge and attitude towards computer use when compared to their male counterparts. Many research findings contradict this finding, as they showed the difference in computer knowledge (Markauskaite, 2006; Chen, 2005) and in attitude towards computer use (Carter, 2004; Shah & Agarwal, 1994; Staehr, Martin & Byrne, 2001) in favour of male. But a changing trend in this regard was identified in recent research findings. The recent studies showed no gender difference in attitude towards computer use (Teo, 2008; Adebowale, Adediwura & Bada, 2009). Finding of the present study is in continuation of the identified trend.

Even though the results indicated that female student teachers have higher computer knowledge than male, no such difference was found in computer skill and computer self-efficacy of male and female. This shows that higher computer knowledge need not accompany higher computer skill and computer self-efficacy.

In general, subject background has been a significant factor influencing student teachers’ computer competency except ‘attitude towards computer use’. It was also found to be a significant factor influencing student teachers’ computer self-efficacy. Gender has been a factor influencing student teachers’ computer knowledge and attitude towards computer use.
5.13.5. Influence of e-maturity and teacher educators’ computer competency on student teachers’ computer competency and computer self-efficacy:

Student teachers’ computer knowledge has been influenced by both institutional e-maturity and teacher educators’ computer knowledge. But there was no interaction effect. When student teachers are taught by a teacher educator with higher computer knowledge, it is natural to expect the student teachers to attain higher computer knowledge. Similarly when students study in an institution with high e-maturity, then they are more likely to get better opportunities to gain higher computer knowledge.

On the other hand, student teachers’ computer skill is influenced by institutional e-maturity. As the skills would be developed when student teachers get more hands on experience, which in turn is provided by institutions with high e-maturity, such a result could be expected. But student teachers’ computer skill is not influenced by teacher educators’ computer skills. However the teacher educator is skilled, unless and until the student teachers are provided with opportunity to have more hands on experience, they would not develop computer skills. This might be the reason for no influence of teacher educators’ computer skill on student teachers’ computer skill.

Further, student teachers’ attitude towards computer use is influenced by teacher educators’ attitude towards computer use. Teacher educators, while teaching, might express his/her likings and disliking, by which the student teachers would be directly influenced. But institutional e-maturity has no influence on student teachers’ attitude towards computer use. This shows that institution alone cannot influence student teachers’ attitude towards computer use unless a teacher component mediates with an appropriate attitude. It is also found that teacher educator’s high positive attitude towards computer use and low institutional e-maturity result in highly positive attitude of student teachers towards computer use.

Computer self-efficacy has been influenced neither by institutional e-maturity, nor by teacher educators’ computer knowledge. No interaction effect could be observed. Influence of external factors on internally controlled self-efficacy (Bandura, 1986), being negligible, might be the reason for such a result.
5.13.6. **Prediction of student teachers’ computer competency and computer self-efficacy:**

Student teachers’ pre-computer competency has been a major predictor of their computer competency. Their pre-computer self-efficacy has been the major predictor of computer self-efficacy of student teachers. Though, teacher educators’ computer competency and institutional e-maturity have also been identified as significant predictors of student teachers’ computer competency and computer self-efficacy, their contribution towards the prediction is very less. This is a clear indication that there is less contribution towards student teachers’ learning from teacher educators and institution and more from student teachers themselves. Additionally, the course is not able to diminish the difference in the computer competency and computer self-efficacy rather the difference has sustained even after the course.

Institutional e-maturity was found to have a negative contribution in predicting student teachers’ computer knowledge. When further analysis was done it was revealed that ‘management strategies’ and ‘integration across the curriculum’ contributed towards this negative effect. It should be remembered that the institutions have very low score in these two components of institutional e-maturity and this perhaps resulted in the negative contribution. Further research is required to understand the relation between institutional e-maturity and student teachers computer competency and computer self-efficacy.

5.14. **Implications:**

The present study has been taken up in the context of ICT being a compulsory component of teacher education programme. The findings of the research have several implications to the ‘computer education’ course in specific as well as teacher education programme in general.

The teacher education institutions fare low in terms of e-maturity index. The integration of ICT across curriculum has been least. This has implications for the training of the teacher educators. The teacher educators need to be trained not only in basic ICT skills but also in terms of integrating ICT in all components of curriculum and different aspects of institutional administration. Teacher educators need to be exposed to internet and its potential for instructional uses.
Teacher educators have highly positive attitude towards computer use. This needed to be sustained.

Though the computer education has significantly improved computer competency of the student teachers, the level of attainments are not very high. Hence the implementation of the course needs to be relooked into. The practices of the teacher education institutions should focus at enabling the student teachers to integrate the technology in teaching learning process effectively. Institutions may follow workshop modes to achieve this. Institutions need to implement the practice of prescribing minimum number of ICT integrated lesson, either during practice-in-teaching sessions or in simulated settings.

Student teachers’ pre-computer competency is found to be the major predictors of their computer competency at the end of the course. Hence they need to be given a choice of selecting a basic or an advanced course in ICT as per their requirements. Curriculum should provide for such a flexible choice.

5.15. **Delimitation:**

The study restricts to B.Ed. colleges affiliated to University of Mysore.

5.16. **Suggestion for further research:**

This research would suggest the following for further study:

1. Present study has taken self-assessment of computer skill of student teachers and teacher educators. Similar study could be taken up with different mode of measurements of computer skills, namely performance test and teacher educators’ perception of student teachers’ computer skills.

2. A study could be undertaken by revising the components of e-maturity. In the present study, the five components of e-maturity had teacher related issues and student related issues presented together. An effort could be made to come out with components separate for students and teachers and see its impact on outcome variables of the course.

3. A study can be taken up to know to what extent the student teachers are competent enough to integrate the technology and pedagogy as a result of the course.
4. An attempt to arrive at a computer competency index from the scores of computer knowledge, computer skill and attitude towards computer use could be made.

5. Study could be undertaken to understand to what extent the student teachers who underwent computer education course actually use computers for instructional purposes.

6. This study is taken up when the computer knowledge course was compulsory course in B.Ed. programme. It could be verified whether similar results would obtained when computer education course is offered as an optional course.

7. Case study could be undertaken to understand the process of implementation of computer education course in B.Ed. colleges.

8. Study could be taken up to identify promoters and constraints for effective implementation of computer education in B. Ed. Course.

9. Study could be undertaken to understand the stages of ICT implementation at B. Ed. Colleges.

10. In the present study, the variance of the criterion variables explained in terms of the predictor variables was about 50%. Study could also be carried out to understand the unexplained variance.

**5.17. CONCLUSION**

The findings of this study throw light on status of the teacher education institutions to carry out ICT based courses. The teacher educator’s computer competency was also made known. The study found out the effectiveness of the computer education course on computer competency and computer self-efficacy of student teachers. The study also identified the factors influencing the outcomes of computer education course of B.Ed. programme.

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