ABSTRACT

Society faces a tremendous development in technology and communication spectrums that has its impact on school system. So the focus of the schools has changed to prepare students to face 21st century with a new skill sets. As ICT is believed to challenge students’ thinking and engage them in investigations for them to demonstrate a higher order of reasoning, teachers are expected to use ICT by adopting a ‘transmission’ view of teaching. Effective uses of ICT enable students to focus on reasoning rather than on answers, and enable them to develop significant strategies and connect ideas with the real world. Teachers can use ICT effectively in teaching only when they are trained on ICT-pedagogy integration. Therefore, teacher education plays a vital role in training pre-service teachers in ICT-pedagogy integration. There are several approaches for ICT integration in teacher education programmes recommended by national and international agencies, among which infused model is recommended for better ICT pedagogical integration.

The present study is about finding the effectiveness of ICT Infused Instructional Design (IIID) in methodology of teaching mathematics at secondary level on confidence in using ICT, knowledge on ICT, attitude towards ICT, ICT skills and techno pedagogical competency in teaching mathematics. A curriculum was developed by infusing ICT components in all ten units of “Content and Methods in Teaching Mathematics” course of B.Ed programme offered by Tamil Nadu Teacher Education University (TNTEU) by describing the instructional strategies to be followed by teacher educator to transact the content and learning activities for student teachers to practice. The ICT infused course content, instructional strategies and learning activities altogether is termed as ICT Infused Instructional Design (IIID) in methodology of teaching mathematics at secondary level. The study is quasi experimental in nature with pretest-posttest three group design. 58 students belonging to mathematics stream of three B.Ed colleges affiliated to TNTEU were taken for this study where one group was exposed to IIID in methodology of teaching
mathematics (infused model), second group to enhancement programmes on ICT (integrated model) and third group to bridge course on ICT (complementary model). Five tools namely ICT confidence scale, ICT knowledge scale, ICT attitude scale, observation schedule for ICT skills and observation schedule for techno-pedagogical competency in teaching mathematics were developed and validated to collect data for this study. Resources, software and hardware required for transacting the content were developed, downloaded or collected respectively and the interventions were implemented for one academic year.

The study revealed that the ICT infused instructional design in methodology of teaching mathematics (IIID-MTM) was effective than other two treatments in developing knowledge on ICT, confidence in using ICT, attitude towards ICT, ICT skills and techno-pedagogical competency in teaching mathematics (TPC-TM). The mean gain in knowledge on ICT, ICT confidence and attitude towards ICT was found to be higher in the group exposed to IIID-MTM than the other two groups. Adjusted means of the group exposed to IIID-MTM when pre test scores were taken as covariate was found to be higher than the other two groups with respect to knowledge on ICT, attitude towards ICT and confidence in using ICT. This shows that IIID-MTM is effective than bridge course and enhancements programmes on ICT. The elective course “computers in education” has not influenced student teachers ICT knowledge, confidence, attitude, skill and TPC-TM. It was found that the knowledge on ICT and attitude towards ICT predicts ICT skills, but knowledge on ICT was found to be contributing higher towards ICT skills than the attitude towards ICT. Though attitude towards ICT and ICT skills were found to be predictors of TPC-TM, attitude towards ICT was found to be contributing more than the ICT skills.

On the basis of these findings it is concluded that ICT infused instructional design in methodology of teaching mathematics is effective in developing confidence in using ICT, knowledge on ICT, attitude towards ICT, ICT skills and techno-pedagogical competency in teaching mathematics. The
findings of the research have several implications for the present teacher education programme. Teacher education curriculum need to be redesigned to infuse ICT throughout the curriculum that can bring change in preparedness of pre-service teachers to use ICT in teaching, thus meeting the demands of the school system.