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Professional Development of Teachers and Effective Technology Use

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PROLOGUE

The knowledge domain of teacher cognition is infinite and vast. It involves knowledge of general and personal pedagogy, personal beliefs and practical experience, knowledge of learners and learning, subject matter knowledge and knowledge of general educational goals, purposes and values. As such, teaching becomes an extremely complex cognitive and affective activity. Teachers, at the initial period, with their limited knowledge and unexplored beliefs often struggle to translate theoretical knowledge into meaningful classroom practices. It is an accepted fact that technology helps in improving teaching and producing effective learning in our pupils. And therefore, whether technology should be used in schools should no longer be an issue in education. Rather it is indispensable to ensure that technology is used effectively to create new opportunities for learning and to promote student achievement. In the present context, educational technology requires the knowledge and ability on the part of teachers to integrate technology in their teaching, align it with student learning goals, and use it for all practical purposes to make teaching-learning meaningful and effective. If we believe that teacher quality is the factor that matters most for student learning, Professional Development for Teachers becomes the key issue in using technology to improve the quality of learning in the classroom. Professional development from this point of view refers to "activities to enhance professional career growth." Such activities may include individual development and in-service education. But considering the meaning of professional development in the technological age, it is impertinent to look for a broader definition of professional development that includes the use of technology to foster teacher growth as well, because without teacher improvement there can't be desired pupil achievement.

Professional development in this context goes beyond the term 'training.' It includes every formal and informal means that go a long way in helping teachers not only learn new skills but also develop new insights into pedagogy and their own teaching. It helps them to explore new resources which will provide them strength and necessary support to encounter the challenges that come with putting into practice their evolving understanding about the use of technology. Current technologies offer resources to meet these challenges and provide teachers with a cluster of supports that help them continue to grow in their professional skills, understandings, and interests and become better and more productive teachers than ever before.

It goes without saying that in order to improve student learning, teachers have to implement their technology knowledge and experience effectively in the classroom. But one of the most serious obstacles to fully integrating technology into the curriculum is the lack of professional development for technology use. Traditional short-term training sessions or 2-3 days workshops have not been effective enough in making teachers comfortable with using technology and integrate it efficiently into their lesson plans. It is for this reason that a well-planned and well-structured, teacher education programme that is tied to the school's curriculum goals, designed with built-in evaluation, and follow-up support is essential if teachers are to use technology appropriately to promote learning for all students in their classrooms.

This paper briefly outlines the teacher knowledge domain, analyzes the working conditions to see how knowledge and beliefs impact classroom practices and describes the struggles faced by potential teachers.

PROFESSIONAL DEVELOPMENT AND SCHOOL TECHNOLOGY PLAN

Professional development for technology use should be an integral part of every teacher education programme, not merely an add-on. It should be a vital component of the overall school-improvement plan as well to ensure that professional development is considered an essential factor in using technology to improve teaching and learning.

The technology plan, with specific professional development components, should be worked out by a technology expert committee or team. The team should ensure that the professional development component of the technology plan meets high standards for effective teacher development. To realize this objective the important things that they will have to think about are:

- What should be the level of technology competence of teachers?
- What should be the yardstick to determine the level of teacher's competency?
- Who will administer the test for determining the level of technology competence in teachers?
- Do instructional and technological goals have, in any way, an effect on professional growth and development, if so, how and to what extent?
- What is expected from the employees as a result of their professional development?
- Who will design, administer and co-ordinate the professional development program?
- What is the current level of schools' technology use in each district?
- What should be the formal and informal needs assessments to determine priorities for professional development activities?

Finally, the professional development component of any technology plan should include a fair and equitable system for determining each individual teacher's level of technology competency and their needs for professional development. Such assessment provides information that can be used for future planning and development of strategies for training teachers at different skill levels. These objectives being realized, the technology planning team can take a step forward to establish professional development goals for using technology to promote effective teaching-learning activity.

PROFESSIONAL DEVELOPMENT FOR TECHNOLOGY USE: ITS COMPONENTS

Studies have revealed that professional development for technology use should contain certain essential components. These components include the following:

Direct Connection to Student Learning: The ultimate goal of teacher education is to boost up professional development to improve student learning. A study conducted by the Institute of languages and Social Sciences, Assam found that 78 percent of surveyed teachers referred to improved student achievement as the most important reason for participating in professional development activities. I feel every school should be resourceful and capable to provide teachers with abundant opportunities to become confident in using technology. This confidence will enable them to

- implement new teaching techniques and reinforce instruction
- help students develop higher mental abilities
- help students develop problem-solving skills
- help students work collaboratively
- encourage students to take active participation in classroom activities,
- cope to students varied learning styles and special needs, and
- provide fitting reinforcement and proper feedback
- open the door to extensively wide range of information for future career

Proactive Technology Use: Modern professional development believes and emphasizes on applied technology. Initially, teachers need to acquire core technology skills and competencies. But during these initial experiences, teachers should also be thinking in terms of how the technology can enhance student learning and how it can be used in different content areas. Proactive technology use at school and at home provides ample scope for teachers to develop confidence in their skills and arrive at a comfort level with the technology. When teachers become productive in this way, they can explore into similar uses, which can invariably facilitate the students in their projects.

Varied Learning Experiences: In order to be able to incorporate technology effectively in their teaching, teachers need to be equipped with a range of professional development experiences quite different from traditional workshops and short-term training sessions. Professional development for effective technology use can come in a variety of forms, such as mentoring, ongoing workshops, intensive special courses, structured and controlled observations. All these forms will prove effective with practical classroom experiences, adequate support, appropriate feedback, and long-term follow-up actions. Research indicates that teachers learn and incorporate new information best when it is

presented over a long time frame instead of a short and single session as in traditional short-term workshops.

Curriculum-Specific Applications: If the aim of technology use is to produce improvements in student achievement, professional development activities should make teachers' learning curriculum-based and make them well-equipped in specific curriculum areas. This will help teachers integrate technology effectively into the content.

Expanded Roles for Teachers: Technology encourages teachers to take on new and expanded roles, both inside and outside the classroom. Within the classroom, technology supports student-centered instruction. The teacher assumes the role of a facilitator while students work collaboratively. Outside the classroom, technology supports teacher collaboration. Instead of working in isolation, teachers can work together on school-wide programs. They can help find solutions to problems, act as peer advisors to provide information and feedback, and collect data for future research and teacher development projects.

Active Teacher Participation: If technology is to be used fairly and equitably for all students, it should be mandatory for all teachers to be integrated in the professional development program. Possible incentives which will motivate teachers to be actively involved in teacher development programs can be:

- a judicious package,
- timely bonuses
- a reward for knowledge and skill well applied.
- a special reward for innovative ideas for using technology in instruction.

Unending Pursuit for Development and Progress: Teachers need continued practice to become competent and feel comfortable with technology use and to be able to implement every little change. A course in professional development to be effective and bring substantial change in school practice must be conducted over a long time frame, may be four to five years and in some cases longer. My conviction is that teachers must be prepared to be involved in professional development throughout their careers – even if they have just one day for retirement. I don't know whether teachers are permitted to do so in India.

Adequate Time: Teachers need sufficient time and follow-up support to master new content and strategies and to integrate them into their practice. For any professional development activity, teachers need time to plan, practice skills and try out new ideas in their practice sessions by integrating technology in appropriate situations. The only thing is the school administration may be required to make some adjustments in the school time-table. Schools may use a variety of creative ideas and strategies to provide professional development time for all teachers.

Adequate Resources: The overall technology plan and its professional development component cannot flourish unless the school is well equipped with technical equipments necessary to meet the learning goals identified and provide for ongoing maintenance and upgrading. Teachers and students will ultimately be in need of access to multiple technologies like CD-ROM, satellite, and full-motion video that will enhance the curriculum and expand learning opportunities. The technology used for professional development in teacher training institutes should be the same as the technology used in the classrooms and the educational technology that is implemented today must allow for increased capabilities in the future. To make this happen there should be added facilities for a networked computer on every teacher's desk to allow telecommunications support for teachers and provide easy access to programs and files.

Technical Assistance and Support: Access to on-site technical support is an additional component of effective professional development for technology. When teachers are trying to use technology in their classrooms and they encounter difficulties, they need immediate help and support. Technology that is not easily accessed and implemented will not be used. Teachers will return to more traditional ways of teaching if the problems they encounter cannot be solved quickly and efficiently. Just-in-time support, assistance, and proper feedback are indispensable to be successful in the use of new technologies.

Administrative Support: Administrators must have a clear vision of technology to support and make student learning effective. They should also have a clear understanding of the roles that the school workforce must play in achieving that vision. They can also participate in professional development activities so they are personally aware of how technology is used and what problems are experienced by the faculty. It is also important for each administrator to have a networked computer ready on his or her desk for use. In fact, professional development in technology use for teachers will not be successful unless the principal is personally involved in the course of action.

Continuous Financial Support: Deciding upon the financial support for ongoing technology needs and professional development can be difficult. Planners should be able to determine in advance all the costs that might be involved in operating networks and computers in schools and teacher education for that matter. The costs of using technology to improve teaching and learning should become a regular item in school budgets. These costs should not be considered as a one-time investment but an ongoing expenditure.

Evaluation en suite: Teacher education for professional development should constantly evaluate and ensure that each activity is effectively meeting the needs of both the teachers and the taught and providing them with new learning experiences. Evaluation in its authentic form should be integrated into the professional development program during the planning process itself to assess teachers' needs. *Evaluation* should be continuous and comprehensive in the sense that it helps provide appropriate feedback and determine changes to make it more valuable to participating educators. It also allows participants to judge the overall merit of the activity and provides decision makers the information they need to plan for the future.

The ultimate goal of evaluation is, therefore, to determine

- whether professional development has, in any way, promoted the using of technology to improve both teacher proficiency and student achievement.
- whether the specific learning goals for students using technology have been met or whether the pre-determined objectives have been achieved.
- whether technology has, in any way, improved the quality of teaching- learning operation.

But it is not easy to assess the impact of professional development on student achievement at one go. It is the most problematic part of the evaluation process because there are other activities as well which need to be attended to and which have an equal amount of impact on the whole process of student achievement and school-improvement.

IMPLEMENTATION PROBLEMS

In many schools, technology is not easily accessible by teachers. For effective use computers must be located in every classroom but it hasn't so far been possible in Indian conditions. It is true that computers are installed in some institutions as per government schemes but Internet connections may be limited to only selected computers. To promote teachers' use of technology, the administration should ensure that adequate numbers of computers with Internet connections are made available to teachers.

Very often school climate may not be supportive of the changes which tend to happen as a result of ongoing professional development in technology. School management committees may demand rapid changes. They are not aware of the fact that integrating technology into teaching and learning is a slow, time-consuming process that requires substantial levels of support and encouragement for teachers. This process may take three to five years for the 'haves' and even longer for the 'have-nots'. It is this ignorance which often becomes a serious impediment in the process of systematic implementation of school technology plans. Some argue that technology shifts the focus more to the means of delivery i.e., hardware, software, and networks instead of the content. Some even squabble that departments should not allocate money and time for teachers to receive professional training in technology use, they should rather learn about technology on their own if they are at all interested.

OPERATIONAL STRATAGEM

To be able to implement technology effectively in the classroom and improve students' achievement, teachers need a well-planned professional development program for technology use. Such a program gives teachers the skills they need to incorporate the strengths of technology into their lesson planning and produce effective learning. Fulfilment of the following requirements can possibly provide answers to the above questions and help ensure the success of professional development for effective technology use:

1. Professional development should go beyond the term 'training' in all teacher training programs.
2. Professional development should help teachers explore new resources which will provide them strength and necessary support to encounter the challenges that come with putting into practice their evolving understanding about the use of technology.
3. Professional development should be an integral part of the overall school-improvement plan.
4. Professional development should contain all the necessary components of a well-planned and well-structured, ongoing professional development program.

5. Professional development program should be designed with built-in evaluation and follow-up support for teachers to be able to use technology appropriately and promote effective learning in their classrooms.
6. There should be a support system to look into the follow-up activities and provide necessary feedback.

CONCLUSION

However, it is not quite easy to assess the impact of professional development on student achievement at one go. It is the most problematic part of the evaluation process because there are other activities as well which need to be attended to and which have an equal amount of impact on the whole process of student achievement and school-improvement.

Moreover, in situations where access to technology is not equitable, the possibility of a strong opposition to the use of technology in the classroom by computer illiterates cannot be denied. But it is indispensable to provide access to technology as well as professional development for all teachers to make certain that the school is making effective use of available technology and other resources. To be able to implement technology effectively in the classroom and improve students' achievement, teachers need a well-planned professional development program for technology use. Such a program gives teachers the skills they need to incorporate the strengths of technology into their lesson planning and produce effective learning.

Normally, schools depute one or two individuals only to attend short-term professional development program for technology use. Administrators should have a vision and creativity to depute teachers for long-term programmers as well and also make provisions to make enough time available for thorough and continuous professional development in their own institutions. The more use of technology, the more efficient and resourceful the teachers become.