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FOREWORD

Science plays a major role in the Socio-Economic Development of a society. There is now a significant body of knowledge about teaching a learning science. Teachers can make science teaching easier or more difficult for the students by the way the messages are put together, and the way student’s questions are elicited and answered. Good science education in schools is a fundamental preparation for scientific literacy in later life. But despite its importance, science education in schools is suffering from a number of directions. One of the most critical problems is the shortage of well-qualified and well-trained science teachers. Developing a good teacher is the domain of professional development.

In science education, professional development for science teachers has great significance. Given the increasing impact of science and technology in contemporary society, making science relevant to the lives of all students emerged as a key aspect of science education during the previous two decades of the 20th century. Several science education efforts around the world during that time reflected this common concern for science education that is relevant to the lives of all students. Achieving such reform that effectively addressed this common concern is a complicated task and cannot be accomplished simply by introducing new curricular materials or technological gadgetry into the classrooms. With the realization of the importance of ongoing professional development of in-service science teachers, department of science Education has designed a course for the professional development for science teachers. This course will provide a new perspective of professional development for science teachers.

This course will be helpful for pre-service as well as in service science teachers. In this course Science teachers will learn to create a suitable learning environment and employ strategies that encourage active questioning and identification of problems and issues of the students. This course has been designed carefully for providing sustained professional development opportunities that actively involve science teachers in the teaching learning process. It is hoped that science teachers will find this course very useful for the professional development.

Prof. Dr. Shahid Siddiqui
Vice Chancellor
ACKNOWLEDGEMENTS

The Allama Iqbal Open University and the author both are grateful to the scholars and publishers for using/adopting their books, web material and reports as reference materials for the development of the course of General Science.

It may be pointed out for general information of all whose work has been quoted in the course that Allama Iqbal Open University is a non-commercial educational organization in Pakistan which is providing educational facilities to underprivileged remote rural areas through distance education mode.

Great stress has been placed in making this course to facilitate prosperous, in-service and pre-service teachers for Teaching Science. There are many activities included in the course for the better understanding and engagement of the students. The university and the department would like gratefully to acknowledge the expertise provided by various experts in developing and improving the outlines and course books.

My special thanks to Prof. Khadim Ali Hashmi and Farkhunda Rasheed Choudhary for their contributions for the development of this study guide.

I am also thankful to the editor of Editing Cell for the editing of all the units of this course and Print Production Unit for finalizing the composing and designing process of the this study Guide.

Finally, I am indebted to all staff of Department of Science Education for helping in correspondence.

Prof. Dr. Tanveer-Uz-Zaman
Chairman/Dean
INTRODUCTION

Over the past decades science education has gone through major transformation. There is an increasing realization that teachers are not only one of the “variables” that needs to be changed to improve the education system, but they are the most significant change agents. Almost everybody now believes the assertion that teachers make a difference in the lives of their students. Several researches have revealed that there is direct impact of teacher’s performance on the student achievement. Since teachers have the most direct, sustained contact with students and considerable control over what is taught and the climate for learning, improving teachers’ knowledge, skills and dispositions through professional development is a critical step in improving student achievement. Double role of the teacher as a subject and object of change has made the teacher’ professional development a growing and challenging field which has received major attention during the past few decades. Therefore there is need to train teachers professionally, for the teaching process.

The present course focuses on science teachers’ professional development as an emerging field. It provides review of concept, requirements, issues, and current approaches in professional development of science teachers.

This course has been designed keeping in view the significance of professional development of science teachers. Science teachers need to learn and create a suitable environment and employ strategies that encourage active questioning and identification of issues and answers by students. They need to be able to encourage students to challenge the information presented and discuss its personal relevance. These abilities can be acquired by carefully designed, sustained, professional development opportunities that actively involve science teachers in the teaching learning process.

However, the course is meant to remain open ended. Any suggestions or criticism improvements will be welcome. There will be a periodic revision for the course and all suggestions/recommendations and improvements will be incorporated.

Prof. Dr. Tanveer-Uz-Zaman
Course Development Coordinator
OBJECTIVES OF THE COURSE

It is hoped that after the completion of this course, you will be able to:

1. Explain the concept of professional development in general and science teachers’ professional development in particular.

2. Enumerate the standards of science teachers’ professional development.

3. Describe the factors influencing professional development.

4. Identify critical issues in developing science teachers’ professional development program in Pakistan.

5. Analyze the current approaches used for professional development of science teachers and design professional development program for science teachers in Pakistan.
Unit–1

CONCEPTUALIZING SCIENCE TEACHERS’ PROFESSIONAL DEVELOPMENT

Written by: Prof. Khadim Ali Hashmi
Reviewed by: Prof. Dr. Tanveer-Uz-Zaman
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Introduction

The primary purpose of professional development is to prepare and support teachers by giving them the knowledge and skills they need to help all students achieve high standards of learning. Effective professional development produces changes in teachers’ instructional practice, which can be linked to improvements in student achievement. The time teachers spend learning and are engaged with other teachers is just as important as the time they spend teaching students. Studies have found that student performance improves when their teachers attend high quality professional development programs and transfer new concepts and strategies to their daily classroom practice.

Successful professional development programs have clear, specific goals and objectives; actively involve participants; and consist of multiple training sessions over an extended period of time. Professional development programs should reflect the best available research and practices and be evaluated on the basis of their impact on teacher effectiveness and student performance. Other features of successful professional development include aligning the program with student content standards and curriculum; broadening teachers’ content knowledge and pedagogic foundation; promoting collegiality and collaborative exchange; and providing teachers with ample opportunities to engage in follow-up activities that will better enable them to transfer the newly acquired strategies to their classroom practice.

Objectives

After studying this unit, you will be able to:

● Describe the concept of professional development in general and science teachers’ professional development in particular, with particular reference to Pakistan;
● Describe and work with the images of learning and development;
● Define and discuss educational standards in general and those for Science Education in Pakistan in particular;
● Use educational standards as foundations for professional development;
● Develop science teaching standards for classroom activity;
● Describe the systems of Professional Development world-wide and develop one for Pakistan;
● Discuss different models of Professional Development used the world over and develop one for Pakistani situation.
1.1 Professional Development: Theoretical Perspective

Concept of Professional Development
Carlos Marcelo (2009)\(^1\) has summarized the concept of professional development in the following terms: Professional development has variously been defined. Referring to the work of Bolam & McMahon, 2004; Terigi, 2007, Marcelo has given alternate terms for it, e.g., ‘permanent training’, ‘continued training’, ‘in-service training’, ‘human resources development’, ‘lifelong learning’, ‘recycling’ or ‘skill building’ courses. He concludes by saying that the term professional development lends itself best to the conception of the teacher as an educational professional. On the other hand, the concept “development” has a connotation related to evolution and continuity which, goes beyond the traditional overlapping of initial and continued teacher education.

Rudduck\(^2\) referred to professional development of the teacher as “the teacher’s ability to maintain the curiosity of the class; to identify significant interests in the teaching and learning processes; to value and seek dialogue with experienced colleagues as a source of support in the analysis of situations” (1991, p. 129).

Some Definitions of Professional Development: Professional development refers to classes and less formal activities, such as being mentored, that teachers do to increase their skills. Non-educators often refer to professional development as “teacher training”--a term many educators feel has an unprofessional connotation and therefore dislike. “In-service” and “staff development” are widely used synonyms for professional development activities for teachers. If the teachers have not yet started their regular teaching career it is called “pre-service”. “Workshops” and “institutes” are also common descriptive synonyms used for professional development, institutes generally being a week or more in length.

Professional development of science teachers is described in the National Science Education Standards\(^3\):

Professional development for teachers should be analogous to professional development for other professionals. Becoming an effective science teacher is a continuous process that stretches from pre-service experiences in undergraduate years to the end of a professional career. Science has a rapidly changing knowledge base and expanding relevance to societal issues, and teachers will need ongoing opportunities to build their understanding and ability. Teachers also must have opportunities to develop understanding of how students with diverse interests, abilities, and experiences make

\(^1\)Carlos Marcelo (2009) Professional Development of Teachers: Past and Future, *sisifo / educational sciences journal* · no. 8 · jan/apr 09; pp. 5-20; issn 1646 -6500


\(^3\)the National Science Education Standards
sense of scientific ideas and what a teacher does to support and guide all students. And teachers require the opportunity to study and engage in research on science teaching and learning, and to share with colleagues what they have learned. (p. 55)

The National Science Teachers Association (NSTA) of the USA considers it critical that all students have sufficient knowledge of and skills in science. Studies suggest that high-quality teaching can make a significant difference in student learning. NSTA believes a high-quality science teacher workforce requires meaningful, ongoing professional development. To achieve this goal, schools and school systems must devote time and resources to effective professional development for teachers of science and science educators to support learning throughout their careers.

There is broad agreement in the field, and increasingly empirical evidence as well, about what constitutes quality professional development for science educators. Key principles, synthesized by the National Institute for Science Education, include reflecting the research on effective classroom learning and teaching; building content and pedagogical content knowledge and skills and examining practice; using research-based methods that mirror those needed in the classroom; facilitating the development of professional learning communities; supporting teacher leadership; integrating professional development with local and state priorities and systems; and continuously evaluating effectiveness.

NSTA strongly believes that we must move forward with professional development programs based on the best information currently available. The science education community should continue to encourage and conduct systematic research about effective professional development to add to our knowledge base for particular purposes in various contexts. (NSTA Position Paper, 2013)

From this perspective, the professional development of teachers may be interpreted as an attitude based on constant questioning and the search for solutions. We will now go on to present some definitions of the concept of professional development of teachers, formulated by well known authors:

a. “The professional development of teachers goes beyond a merely informative stage; it implies adaptation to change with a view to changing teaching and learning activities, altering teacher attitudes and improving the academic results of students. The professional development of teachers is concerned with individual, professional and organizational needs” (Heideman, 1990, p. 4);

b. “The professional development of teachers is a broad area which includes any activity or process intent on improving dexterity, attitudes, understanding or involvement in current or future roles” (Fullan, 1990, p. 3);

c. “It (Professional Development) is defined as the entire process that improves knowledge, dexterity or teacher attitudes” (Sparks & Loucks - Horsley, 1990, pp. 234 - 235);
d. “It (Professional Development) implies the improvement of control skills of the actual working conditions, a progression of professional status within the teaching career” (Oldroyd & Hall, 1991, p. 3);

e. “The professional development of teachers includes all the experiences of natural learning as well as the more planned and conscious ones which try, both directly and indirectly, to benefit individuals, groups or schools and which contribute to improving the quality of education in the classroom. It is the process by which teachers, whether alone or accompanied, review, renew and further their commitment as agents of change, with moral teaching aims. Moreover, they acquire and develop knowledge, competencies and emotional intelligence that are essential to professional thinking, planning and practice with children, adolescents and colleagues throughout each stage of their teaching lives” (Day, 1999, p. 4);

f. (Professional Development) refers to “Work opportunities that encourage creative and reflective skills in the teachers, thus, enabling them to improve their practices” (Bredeson, 2002, p. 663);

g. “The professional development of teachers is the professional growth the teacher acquires as a result of his/her experience and systematic analysis of his/her own practice” (Villegas- Reimers, 2003).

In Pakistan, the terms pre-service training and in-service training were used from the beginning. The teachers’ qualifications were thus termed B.T. (Bachelor of Teaching), etc. the term training was later replaced by “education” and the resulting qualifications were renamed Bachelor of Education, Master of Education, etc.

As may be observed, both the most recent as well as the most ancient definitions interpret professional development as a process, which can be either individual or collective, but which should be contextualized in the teacher’s workplace, the school, and contributes to the development of the afore mentioned professional competencies by means of a variety of formal and informal experiences.

NSTA has given following principles of Professional Development in Science Education:

The professional development programs should incorporate the following guiding principles:

- Professional development programs should be based on student learning needs and should help science educators address difficulties students have with subject-matter knowledge and skills.
- Professional development programs should be based on the needs of science educators—of both individuals and members of collaborative groups—who are involved in the program. Ongoing professional development initiatives should be assessed and refined to meet teachers’ changing needs.
- To best serve all students as they learn science, professional development should engage science educators in transformative learning experiences that confront deeply held beliefs, knowledge, and habits of practice.
• Professional development should be integrated and coordinated with other initiatives in schools and embedded in curriculum, instruction, and assessment practices.
• Professional development programs should maintain a sustained focus over time, providing opportunity for continuous improvement.
• Professional development should actively involve teachers in observing, analyzing, and applying feedback to teaching practices.
• Professional development should concentrate on specific issues of science content and pedagogy that are derived from research and exemplary practice. Programs should connect issues of instruction and student learning of knowledge and skills to the actual context of classrooms.
• Professional development should promote collaboration among teachers in the same school, grade, or subject.

“After a consideration of the context of the Government primary schools in Pakistan and document analysis of reform initiatives in Karachi, teacher professionalism was conceptualized in terms of four dimensions. These are teacher efficacy, teacher practice, teacher collaboration and teacher leadership”.

“These dimensions of professionalism define teachers as: Professionals who are committed and efficacious, possess specialized knowledge and expertise, collaborate with colleagues and use professional discretion, and have the potential to develop an active and reflective teaching profession” (Rizvi, 2003, quoted in Rizvi & Elliott, 2007).
Kang, Cha and Ha (2013) have related Professional development to increased teacher knowledge, change in instruction and improved student learning.

Figure: 1 (Source: Ho Soo Kang, Jungju Cha and Bong-Woon Ha. in Creative Education, 2013, Vol. 4, No. 4A, pp. 11-18)

4 Meher Rizvi & Bob Elliott (2007): Enhancing and sustaining teacher professionalism in Pakistan, Teachers and Teaching: Theory and Practice, 13:1, 5-19 To link to this article: http://dx.doi.org/10.1080/13540600601106021
**SAQ 1:** Develop a working definition of ‘Professional Development’ in the context of Pakistani situation.

**SAQ 2:** Now read the paper by Carlos Marcelo (2009) and available material on the professional development of teachers/science teachers in Pakistan during the period 1947 to-date and develop an outline of historical development of Professional Development of Science Teachers in Pakistan, giving strategies used during this period and propose a suitable system for the future.


**1.2 Images of Learning and Development**

“Images of learning and development” here mean anecdotes or vignettes of classroom and professional development experiences to illustrate the vision of teaching and learning in the light of professional development of science and mathematics teachers. These strategies should not mean to replicate, but to give an idea in to what is intended to make the classroom activities and teachers’ professional development look like. Now please read: Ref. 1.2.


**SAQ:** After going through reference 1.2, you should form groups of 2-3 persons and pool your own experiences and develop similar vignettes in the context of Pakistani situation in primary, elementary or secondary education level depending upon your own field of work.

**1.3 Educational Standards: Foundations for Professional Development**

**Educational Standards:** Educational Standards have been delineated by international and some national education agencies the world over. In this context the National Educational Policy 2009 of Pakistan has stated the following facts in paragraph 29, page 6:

**Setting Standards for Education**

The Ministry of Education (MoE) in collaboration with UNESCO is implementing Strengthening Teacher Education in Pakistan (STEP) project with financial support of USAID. Under STEP Project, ‘Professional Standards for Teachers’ were developed. Although, the professional standards are aimed at primary level beginning teachers, these standards can be adapted and used for secondary level teachers and teacher educators.
The standards of professional knowledge, skills and dispositions are designed to: define competencies, skills and attributes deemed to be essential for teachers; guide the detailed development of pre and in-service programmes of teacher education; establish policies, procedures and systems for accrediting teacher education programmes and institutions offering them; assure public about the quality of their educators and education outputs and outcomes.

The Professional Standards for Teachers were officially adopted in the National Steering Committee Meeting held on 7th November, 2008.

**Professional Standards for Initial Preparation of Teachers in Pakistan**

Standard 1: Subject matter knowledge  
Standard 2: Human growth and development  
Standard 3: Knowledge of Islamic ethical values/social life skills  
Standard 4: Instructional planning and strategies  
Standard 5: Assessment  
Standard 6: Learning environment  
Standard 7: Effective communication and proficient use of information communication technologies  
Standard 8: Collaboration and partnership  
Standard 9: Continuous professional development and code of conduct  
Standard 10: Teaching of English as second/foreign language (ESL/EFL)

**Composition of Professional Standards**  
Each standard has 3 parts:  
a. Knowledge and Understanding (Content) – What teacher knows  
b. Dispositions – Behaviours, attitudes and values  
c. Performances (Skills) – What teacher can do and should be able to do

Now please read Ref. 1.3.1 for details of Professional Standards in Pakistan.


For comparison, we have taken the example of Educational Standards set by the British educational system. The Foundations for Professional Development the Government of UK have delineated ‘Educational Standards’ for teachers. These are for the teacher in his/her teaching role, and for his/her personal and professional conduct. The standards demand from the teacher the following conduct.

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5These can be found on the GOV.UK website:  
Part One: Teaching

A teacher must:
1. Set high expectations which inspire, motivate and challenge pupils
2. Promote good progress and outcomes by pupils
3. Demonstrate good subject and curriculum knowledge
4. Plan and teach well structured lessons
5. Adapt teaching to respond to the strengths and needs of all pupils
6. Make accurate and productive use of assessment
7. Manage behaviour effectively to ensure a good and safe learning environment
8. Fulfill wider professional responsibilities

Part Two: Personal and Professional Conduct

- A teacher is expected to demonstrate consistently high standards of personal and professional conduct.
- Teachers uphold public trust in the profession and maintain high standards of ethics and behaviour, within and outside school.
- Teachers must have proper and professional regard for the ethos, policies and practices of the school in which they teach, and maintain high standards in their own attendance and punctuality.
- Teachers must have an understanding of, and always act within, the statutory frameworks which set out their professional duties and responsibilities.

Now please read Ref. 1.3.2.

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SAQ: The learners, in groups of 2-3 persons, should develop education standards for the level (Elementary or Secondary) of their own expertise and present for discussion to the whole group for comments and suggestions for improvements.

1.4 Teaching Standards

Although students are not clients of Professional Development directly, but they are ultimate beneficiary of the teaching learning process. Main goal of professional development is improved student learning. Also the student performance will not improve unless staff and organizational performance improves.

Ref. 1.4 has summarized questions, data sources, and resources to use to investigate students’ needs and to inform professional development design. Now please read it.

SAQ: Compare and contrast the educational standards of Pakistan with those of the United Kingdom and develop your own standards for the level you are teaching.

1.5 Systems and Models of Professional Development:

The US commissioned Position Paper describes following In-Service Training Models being used in Pakistan.

Models of INSET
1. **Cascade or Generational Model:** This is the most popular model in use. A first generation of teachers is trained or educated in a particular topic or aspect of teaching to pass on to a second and third generation/tiers of teacher trainers and go up to three or four generations/tiers. The outreach of the model is extensive but the transmission of content and methodology by the time it reaches the teachers and actual classrooms may be considerable diluted and altered.

2. **Mentor model:** This is a process by which a colleague who is a critical listener/observer asks questions, makes observations and offers suggestions that help to produce different decisions. Coaching is a learned skill and mentors themselves need training. The mentor model is derived from the apprentice model where the mentor is a master teacher to be emulated.

3. **Reflective Model:** This model builds on teachers personal classroom experiences. Teachers show commitment to serve the interest of students by reflecting on their well being. When teachers become reflective practitioners they move beyond a knowledge base of discrete skills to a stage where they integrate and modify skills to fit specific contexts. They eventually move to a stage where skills are internalized, enabling them to invent new strategies. They therefore develop the necessary sense of self-sufficiency to create personal solutions to problems.

Now please read Ref. 1.5.1.


SAQ: Develop a reflective professional development approach for Elementary Education in Pakistan.

4. **Whole School Improvement or School Based Model:** This “whole school dimension” includes staff development, school infrastructure, emphasis on high expectations, careful attention to consistency of teaching and discussion of pedagogy. It pervades the “culture of school” and mobilizes the local community as support. (Hopkins). WSIP as a school-based management paradigm under the

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*From: Teacher Education to Professional Development. A (Draft) Position Paper (2004)*
school improvement and school effectiveness discourse is driven by eclectic approaches to processes, outputs and outcomes considered as the primary focus to which inputs serve as a critical but secondary focus.

5. **Cluster Based Professional Development Model:** This model works with a cluster of schools in a specific geographical location served by a group of or a professional development or resource centre. There are several examples of these are in Pakistan especially in the northern areas, and emergent ones in NWFP, Balochistan, Sindh, Punjab, Northern Areas supported by GTZ, US AID/ESRA, UNICEF, DfID as well as more established ones in India, Sri Lanka, China, South Africa, Uganda etc.

6. **In-service training placements outside Pakistan:** Whilst this is not a specific model per se, it is a modality of training which is on the increase within projects such as those supported by ADB, DfID, US AID (ESRA, AED), US Government (Congressional Grants/Plymouth State University [PSU]). Placements in institutions abroad, focuses on subject based exposure training as well as training for administrators and other specialized courses. In the past several hundred teachers and trainers have been sent abroad for courses ranging in duration from 4 weeks to 4 months. A predominant number of teachers/trainers have been from the elementary school level and some from the secondary level (PSU). This trend of placements abroad is expected to increase in Pakistan and can be seen as an opportunity to tailor make such capacity building initiatives to the specific requirements of pedagogy, leadership, assessment systems, leadership and management at the elementary and secondary levels in Pakistan. There is a concern that the returned trainees may not be able to form a critical mass or an active network due to low interaction and culture of low cooperation between different partners, thus undermining the opportunity to enhance dissemination of quality teacher education and practice.

Now read the reference 1.5.2


**Effects of Professional Development on Science Teaching Practices**

How far professional development programmes of science teachers are influencing the beliefs of the teachers and their classroom practices? Marcelo has discussed this point at length reference 1.1. Supovitz and Turner (2000), reference 1.5.3, have discussed the effect of professional development on science teaching practices and classroom culture. Ref.1.5.3 has given a model that depicts relationship between professional development and student achievement. Comment on the same and discuss how far this model applies to Pakistani situation.
SAQ 3: After going through these two papers, please survey the prevailing situation in Pakistan with reference to the professional development programmes, organised by the Directorate of Staff Development, Lahore; Bureaux of Curriculum and Extension Wing, Jamshoro, Abbottabad and Quetta, Universities and other institutions engaged in the professional development of teachers, and their effect on classroom practices and compare the same with the international trends. Develop your own model for relationship between professional development and its effect upon classroom practices.

Reference 1.5.4 has traced the history of reforms in the in-service education of teachers and new guidelines for professional development of teachers. A model has been described as an exemplar of such guidelines. This model has been used successfully in the USA and other countries. Characteristics of the model, research related to its effectiveness and its implementations are given. The model is a continuous process as against one-time activity of most of the inset.

SAQ: Having gone through the Unit, please develop a summary of the Unit. Give critical analysis of the views of the authors of the literature quoted with reference to the practices adopted in Pakistan.
Bibliography


- Department for Education (UK) (2013). Teachers’ Standards effective from 1 September 2012 Updated: 14 October 2013


Unit–2

PLANNING AND DESIGNING PROFESSIONAL DEVELOPMENT

Written by: Prof. Khadim Ali Hashmi
Reviewed by: Prof. Dr. Tanveer-Uz-Zaman
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Introduction

Once the need for a project is understood and authorization to proceed is secured, the planning team faces the task of planning a specific project that addresses that need. Effort spent in planning a project well will pay off in its ultimate effectiveness.

Planning and Implementing a Project like conducting a successful needs assessment depends on taking a systematic approach, project design benefits from careful attention to the planning process. The time involved in planning an education project usually depends on the project’s complexity and the number of stakeholders involved.

The following steps of planning and implementing an education project break down a complex process into manageable steps. These steps simply provide a generalized overview. At each step, determining how extensive a process should be undertaken depends on the nature of the project. Obviously, a project for Early Professional Development will be very different from that for Continuous Professional Development.

These steps should be adapted to meet the specific needs and resources of the project.
1. (Re)assess need and capability;
2. Establish the planning team;
3. Develop goals and objectives;
4. Develop a logic model;
5. Select and characterize the target group;
6. Establish programme format and delivery system;
7. Ensure quality instructional staff;
8. Ensure quality instructional materials and strategies;
9. Assemble materials, resources, and facilities;
10. Plan for emergencies;
11. Promote and disseminate project; and
12. Implement the project.

In this Unit, different aspects of planning and designing professional development programmes will be discussed. We shall start with planning and designing Early Professional Development (EPD), and Planning for Continuous Professional Development (CPD).

Without financial resources no activity can be carried out. Therefore the planning of a project is dependent upon the availability of financial resources. The financial aspect of resources for EPD and CPD are explored next in the Unit.
Objectives

After studying this unit, you will be able to:

- Plan and design early professional models for Pakistani Science Teachers;
- Differentiate between pre-service and in-service (continuous) professional development and develop their own models for continuous professional development for the different levels of science teachers;
- Discuss and develop financial strategies for professional development programmes already developed;
- Suggest ways and means for obtaining financial resources for the professional development programs developed.

2.1 Planning and Designing Early Professional Development (EPD)

Organization of EPD: Early Professional Development has been considered in two ways: (1) Professional Development of teachers of Early Childhood Education; and (2) Professional Development of teachers during the initial period of their entry to the teaching system. In this programme we shall consider the second aspect i.e. Professional Development of science teachers during the initial period of their entry to the teaching system.

In Pakistan Initial Teacher Education (also known as pre-service teacher training) takes place largely or exclusively in institutions of Higher Education (Colleges of Education or University Departments of Education). It is usually organized according to two basic models: (i) Consecutive Model; and (ii) Concurrent Model.

In the 'consecutive' model, a teacher first obtains a qualification in one or more subjects (often an undergraduate Bachelor's degree), and then studies for a further period of an academic session to gain an additional qualification in teaching [this may take the form of a Bachelor of Education in one year or Master of Arts (Education) degree in two years].

In the alternative 'concurrent' model, a student simultaneously studies both one or more academic subjects, and the ways of teaching that subject, leading to a B.S.Ed. degree (12+3 year model) to qualify as a teacher of that subject.

In some countries, it is possible for a person to receive training as a teacher by working in a school under the responsibility of an accredited experienced teacher. In the United States, approximately one-third of new teachers come through alternative routes to teacher certification. However, many alternative pathways are affiliated with schools of education, where candidates still enrol in university-based coursework. A supplemental component of university-based coursework is community-based teacher education, where teacher candidates immerse themselves in communities that will allow them to apply teaching theory to practice.
In the United Kingdom, initial teacher education is conducted in which most of the time the trainee teacher spends in an approved school and his/her progress is monitored by a university teacher and a mentor from the school.

**Curriculum:** The question of what knowledge, attitudes, behaviours and skills teachers should possess is the subject of much debate in many cultures. This is understandable, as teachers are entrusted with the transmission to learners of society's beliefs, attitudes and deontology, as well as of information, advice and wisdom, and with facilitating learners' acquisition of the key knowledge, attitudes and behaviours that they will need to be active in society and the economy.

In Pakistan teacher education is geared toward developing national ideology, based on Islamic Education. Generally, Teacher Education curricula comprise of four major areas:

- **foundational knowledge** in education-related aspects of philosophy of education (including ideology), history of education, educational psychology, and sociology of education.
- **skills** in assessing student learning.
- **content-area, methods knowledge and skills**—often also including ways of teaching and assessing a specific subject, in which case this area may overlap with the first ("foundational") area. There is increasing debate about this aspect; because it is no longer possible to know in advance what kinds of knowledge and skill pupils will need when they enter adult life, it becomes harder to know what kinds of knowledge and skill teachers should have. Increasingly, emphasis is placed upon 'transversal' or 'horizontal' skills (such as 'learning to learn' or 'social competences', which cut across traditional subject boundaries, and therefore call into question traditional ways of designing the Teacher Education Curriculum (and traditional school curricula and ways of working in the classroom).
- **practice at classroom teaching** or at some other form of educational practice—usually supervised and supported in some way, though not always. Practice can take the form of field observations, student teaching, or (U.S.) internship.

**Supervised field experiences:** Supervised field experiences are arranged as field observations, student teaching and internship.

- **field observations**—include observation and limited participation within a classroom under the supervision of the classroom teacher
- **student teaching**—includes a number of weeks teaching in an assigned classroom under the supervision of the classroom teacher and a supervisor (e.g. from the university or college of education)
- **internship**—teaching candidate is supervised within his or her own classroom

These three areas reflect the organization of most teacher education programmness in most countries of the world—courses, modules, and other activities are often organized to belong to one of the three major areas of teacher education. The organization makes the programmes more rational or logical in structure. The conventional organization has sometimes also been criticized, however, as artificial and unrepresentative of how
teachers actually experience their work. Problems of practice frequently (perhaps usually) concern foundational issues, curriculum, and practical knowledge simultaneously, and separating them during teacher education may therefore not be helpful. However, the question of necessary training components is highly debated as continuing increases in attrition rates by new teachers and struggling learners is evident in some countries. Additionally, with the increasing demands of the "teacher" research is beginning to suggest that teachers must not only be trained to increase learning experiences for their students, but how to also be a leader in an increasingly challenging field. The debate of how best to prepare teachers for teaching in today's demanding environments has been and will continue to be an important focus of the teacher-educationists.

Induction of beginning teachers: Teaching involves the use of a wide body of knowledge about the subject being taught, and another set of knowledge about the most effective ways to teach that subject to different kinds of learner; it therefore requires teachers to undertake a complex set of tasks every minute. Many teachers experience their first years in the profession as stressful.

A number of countries and states have put in place comprehensive systems of support to help beginning teachers during their first years in the profession. Elements of such a programme can include:

- mentoring: the allocation to each beginning teacher of an experienced teacher, specifically trained as a mentor; the mentor may provide emotional and professional support and guidance.
- peer network: for mutual support but also for peer learning.
- input from educational experts (e.g. to help the beginning teacher relate what he/she learned in college/university department of education with classroom reality)
- support for the process of self-reflection that all teachers engage in (e.g. through the keeping of a journal).

2.1.1 Planning Early Professional Development of Science Teachers

In Pakistan Early Professional Development (EPD) of science teachers is done for secondary level teachers. The teachers of lower classes are usually not specialized in any one discipline. They are supposed to be generalists and are usually trained in teaching languages, social sciences and science and mathematics. The secondary level teachers are usually trained for teaching two (sometimes more than two) science subjects or one science (say physics) plus mathematics.

In South Africa the initial professional development of teachers has been visualized in five different modes. According to a report of Centre for Education Policy Development (CEPD) 2009, (Ref. 2.1): the B Ed degree was available in five modes of delivery. These cover both contact and distance learning as well as part-time by a combination of contact and distance learning, including the option of a learner ship. Two other options make provision for mentored school-based practice together with distance learning (to first time recruits and practicing teachers) (p. 53).
Now please read Reference 2.1.1.

| 2.1.1 | Centre for Education Policy Development (2009) | **Choices in the design, delivery and management of initial professional teacher education in South Africa: Increasing diversity, quality and success:** Centre for Education Policy Development, Box 31892, Braamfontein 2017, SA |

SAQ: Please compare the practices of planning EPD employed in South Africa with those of Pakistan and discuss critically the strengths and weaknesses of the two systems.

2.1.1.1 Designing Early Professional Development of Science Teachers

Teacher retention has long been recognised as a significant problem in many education systems, while retaining early career teachers is particularly problematic. Although a variety of interventions have been suggested to support beginning teachers, too little attention has been paid to the importance of enhancing their knowledge about pedagogy in the early years of teaching. The paper by Kate Ferguson-Patrick examines data from an action research study that explored the impact of cooperative learning pedagogy on the professional learning of early career teachers. It focuses on the experiences of two early career teachers, one in her first year of teaching and the other in her third year, who participated in professional development on cooperative learning. Classroom observations and teacher interviews were analysed to explore the teachers’ implementation of the cooperative learning strategy, their understanding of the practice and its impact on their attitude to teaching. The paper argues that a focus on pedagogy was significant in enhancing these early career teachers’ professional accomplishment, as well as maintaining their enthusiasm in the early years of teaching with implications for retaining quality teachers in the profession.

Now please read the reference 2.1.2

| 2.1.2 | Ferguson-Patrick, Kate (2011) | **Professional development of early career teachers: A pedagogical focus on cooperative learning, Issues in Educational Research, 21(2), 2011. 109** |

Need for a comprehensive plan for professional development: Committee of Alberta’s education partners (2005) have produced a Guide to Comprehensive Professional Development Planning. The following note is adapted from that guide. The primary purpose of public schooling is to promote student learning. Research has shown student learning is enhanced when DSD/GCET/District/Divisional staff have access to effective professional development. Professional development should focus on enhancing professional practice and leadership capacity at the school, district and provincial levels.

In the Punjab the DSD and in other Provinces the Bureaux of Curriculum and Extension Wings develop an annual education plan that takes provincial priorities into account. The education plan includes the specific goals set by the Provincial Education Department,
the methods to achieve those goals and the evaluation measures that will determine if the goals have been achieved. A comprehensive plan for professional development will assist in achieving these goals and measures.

Many factors affect the development of a comprehensive PD plan. It is important to note while some of the professional development needs of staff, school and the province will overlap, each will have unique needs. To be effective professional development must be integral to the day-to-day operation of a school. Since resources are limited, PD must be well planned in consultation with all stake-holders to ensure resources are used efficiently. Research tells us change occurs over time. Therefore, for PD to be effective it must be systemically planned, systemic, supported, and sustained. A comprehensive PD plan mindful of these factors should result in school improvement and enhanced student learning.

Developing a Shared Vision for Professional Development: An effective comprehensive plan for professional development should be based on a shared vision developed in a collaborative process carried out by the education stake-holders involved in the implementation and delivery of the plan. Those education stake-holders may include:

**Provincial Level**
- Provincial Education Department and its allied departments
- School principals
- Teachers

Figure 3: Adapted from: Alberta (2005): A Guide to Comprehensive Professional Development Planning
• Support staff
• NGOs
• Educational institutions working in the field of teachers’ Professional Development/Education
• Teachers’ Unions/Associations
• Post-secondary institutions (Colleges, Universities)
• Other organizations as appropriate

School Level
• School administration
• Teachers
• Support staff
• Parent-Teacher Association
• Divisional/District administration
• Others as appropriate

An effective PD planning process begins with a review of the literature on quality professional development, discussions about provincial and school needs, and the role of various education stakeholders.

After this background research, the PD planning committee will then be ready to develop a shared vision for professional development that includes core belief statements, including statements as to the purpose of professional development, a vision for effective professional development at the provincial and school levels, and operational guidelines to support the development and implementation of the plan.

This collaborative approach fosters commitment to a plan that should provide a range of ongoing and related activities. Taking the time to develop a shared vision for professional development will help meet the needs of all parties and address unique contextual issues of the classroom, school and the province.

PD Planning Based on Your Evidence: From the time you begin to develop your comprehensive PD plan through to completion of the action plan, data or evidence should inform each step. Data is the information (both quantitative and qualitative) used as a basis for reasoning, discussion or calculation. In education we use a wide range of data to study trends, identify issues, measure the results of initiatives, target interventions and verify assumptions. By collecting and analyzing data in the planning and implementation phases of the PD plan, you can use resources wisely, support the development of professional practice and measure the results of the plan. Thomas Guskey, author of Evaluating Professional Development, identifies three major purposes of data in the PD design process: planning, formative evaluation and summative evaluation.
1. **Planning:** Data collected for planning helps you examine local contextual variables, identify PD priorities and decide on and articulate your ultimate goal.
   - What are the provincial priorities?
   - How well are your students learning?
   - What are your system needs?
   - What are your school needs?
   - What are your staff needs?

2. **Formative Evaluation:** During the planning phase you will identify potential sources of data that can be collected to affirm the plan, determine what changes are necessary to achieve success and decide if you are on the right track.
   - What indicators show the program is proceeding as planned?
   - What indicators show progress?
   - Are any adjustments necessary?

3. **Summative Evaluation:** In evaluating and reporting on your PD program you will need to determine how well you have achieved your goals.
   - How well did the program meet its goals?
   - How well did the program meet participants’ needs?
   - What are the indicators of improved practice and enhanced student learning?

**Evidence-Based PD Planning Cycle:** The model below (source: Alberta Education, 2005) represents a systematic planning process that combines the art and science of PD program development. The art is the creativity and imagination necessary to produce an innovative and effective PD program; the science is necessary to systematically develop a program that meets participant, school and provincial needs, achieves its goals and can be evaluated using data. In many ways this model is similar to the professional inquiry and action research processes. It can be used to plan for one professional development activity or to develop a multi-year curriculum implementation plan. It may take a few months to complete the cycle, or, in the case of a large-scale change, a few years.
Effective professional development requires thoughtful planning over time in a cyclical and recursive process. At both the provincial and school level there may be multiple PD plans in different stages of implementation at any given time. For example, implementation of two curricula, training for new technology and a school improvement initiative could all be under way in one school simultaneously.

**Steps in the Evidence-Based PD Planning Process**

**STEP 1: Conduct Environmental Scan and Participant Needs Assessment:** Input data collected in the first step provides insight into student learning and critical information for instruction including provincial initiatives, programs of study, available resources, student and teacher demographics and other contextual variables. Data for the environmental scan and participant needs assessment can be collected from such sources as existing documents and reports (including student learning and achievement data) and through such processes as participant surveys and focus groups. The following questions will help you through this step of the plan.

- What are the provincial priorities?
- What are the province’s needs and priorities?
- What are the school’s needs and priorities?
- Are there unique contextual issues that need to be considered?
- What do you know about student learning?
- What are the individual professional development needs or goals of staff?
Analyze Input Data: Analyze data from different perspectives:
- What trends or themes emerge from the aggregated data?
- What unique needs emerge from desegregation of data?

STEP 2: Develop PD Program Goals
At this step, the committee should establish priorities based on analysis of the input data and develop a manageable number of goals.
- What are the top priorities from the analysis of the data?
- Have the goals been developed as SMART goals? (specific, measurable, achievable, realistic, and time-targeted)
- Do you have the resources to effectively address the goals?

Explore the Alternatives: Before deciding on what action to take, reviewing the literature and contacting PD stakeholders will assist in identifying the best approaches and practices to achieve the goals.
- What can we learn from the literature about how to achieve the goals?
- How have others approached these goals?
- What activities have been planned by other PD stakeholders to address these goals?

STEP 3: Identify Possible PD Strategies: After scanning the environment, assessing participants’ needs and developing goals, the committee is ready to develop focused, comprehensive, ongoing PD programs. A PD program includes the set of strategies and activities to address a single goal. Consider the following questions prior to selecting PD strategies.
- How can the planning committee capitalize on similarities and reduce overlap with the other PD partners’ programs?
- Which delivery models best address your goals and meet participants’ needs?
- What resources must be designated to successfully achieve the goals?
- How will professional development be ongoing and sustained?
- How will the impact of your PD plan be measured?

Determine Data Sources Consistent with Goals and Strategies: An important step at this stage is to identify evidence required to determine successful program implementation and outcomes. Effective implementation requires gathering data on the following five questions related to evaluation, as specified by Guskey (2000).
- What is the overall response of participants to the program?
- What did participants learn from the program?
- What organizational resources were provided to support the desired change?
- Are participants applying the new knowledge and skills?
- Did the program influence practice and, therefore, student learning?
STEP 4: Finalize Action Plan and Measures: The committee is now ready to finalize the comprehensive PD and action plan. The plan should be detailed enough to serve as a guide for implementation and evaluation.

- Does the plan contain evidence-based goals and strategies, timelines, evaluation strategies, data sources and the necessary resources?
- Are there any reporting requirements for the PD plan?

Plan Approval and Communication: Once the plan has been finalized it may need to be approved by the principal or superintendent and/or the board and should be communicated in a timely manner to stakeholders.

- Does the plan need approval?
- How will you communicate the plan to stakeholders?

STEP 5: Implement Action Plan: The success of your plan relies on careful attention to details during implementation.

- What strategies are in place to support your committee?
- How will you maintain communication with participants?
- How will your committee maintain communication with PD providers?
- How will your committee recognize and celebrate success along the way?

Monitor and Collect Process/Outcome Data: Collecting formative data to monitor implementation of the plan is critical to success.

- What is the overall response of participants to the program?
- What did participants learn from the program?
- What organizational resources were provided to support the desired change?
- Were the resources adequate and appropriate?

STEP 6: Revise Action Plan as Required: Based on the evidence collected about the PD program or new emerging needs, the action plan may need to be revised.

- What does the formative evaluation data indicate?
- Should the program strategies be adjusted?
- How will the program changes be communicated to stakeholders?

Monitor and Collect Process/Outcome Data: As strategies are completed, your committee will collect evidence of program success.

- Are participants applying their new knowledge and skills?
- Is the program influencing practice and student learning?

STEP 7: Undertake Summative Evaluation: Although your committee has been collecting evidence throughout the implementation of the program, summative data allows for the completion of this PD planning cycle.

- Did the program meet its goals? (eg, student learning)
- Did the program meet participants’ needs? (eg, enhanced practice)
**Final Report and Recommendations:** The final report should include an overview of the program, a judgment of the program’s success and recommendations for future PD planning. This report should meet reporting requirements and be shared with stakeholders.

- Did you celebrate what worked well?
- Did you examine what didn’t work and why?
- Did you identify what should be done next?

**Professional Development Strategies and Activities:** When designing a comprehensive professional development program, PD planning committees need to consider a broad range of activities. Planning and selection of activities should balance the needs of the individual, the school and the jurisdiction. The following are some examples of PD activities that can be combined to create an ongoing program.

<table>
<thead>
<tr>
<th>Action research</th>
<th>Mentoring a colleague</th>
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<tbody>
<tr>
<td>Book study</td>
<td>Online curriculum network</td>
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<td>Classroom/school visitation</td>
<td>Online PD programs</td>
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<td>Collaborative curriculum development</td>
<td>Peer coaching</td>
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<td>Conference audio tapes</td>
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<td>Conferences</td>
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<td>Curriculum mapping</td>
<td>Professional organizations</td>
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<td>Professional portfolios</td>
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<td>Data analysis</td>
<td>Selecting curriculum resources</td>
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<td>Examining student work</td>
<td>Self-reflection</td>
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<td>Focused conversations</td>
<td>Specialist council memberships</td>
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<td>Hosting a student teacher</td>
<td>Study groups</td>
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<tr>
<td>Individual professional growth plans</td>
<td>Summer institutes</td>
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<tr>
<td>Integrated curriculum planning</td>
<td>Teachers’ convention</td>
</tr>
<tr>
<td>Internet research</td>
<td>Video conferencing</td>
</tr>
<tr>
<td>Journaling</td>
<td>Viewing educational videos</td>
</tr>
<tr>
<td>Lesson study</td>
<td>Workshops</td>
</tr>
</tbody>
</table>

**SAQ:** Please go through the references: 2.1.3 and 2.1.4. Also please read any survey of literature for Pakistani Context and prepare a summary of the research findings on the subject. Develop a Professional Development model for the level and area of your own field of work.

| 2.1.4 | Villegas-Reimers, E. | Teacher professional development: an international review of literature; 133010e pdf |
The following Checklist for planning professional development program has been taken from Reference 2.1.5:

**Teacher Professional Development Planning Checklist**

1. **Need for the professional development**
   - ______ Careful analysis of student data and identification of student learning needs
   - ______ Clear statement of what teachers need to know and be able to do to address the student learning needs
   - ______ Description of teacher knowledge and skills necessary to address student learning needs is explicitly grounded in research and/or evidence from successful practice

2. **Participants**
   - ______ Description of who will participate in the professional development

3. **Professional learning outcomes and related indicators which address the need for the activity**
   - ______ Outcomes defined in terms of participants’ mastery and/or application of new professional knowledge and skills
   - ______ Each outcome explicitly addresses the need for the activity and is accompanied by at least one indicator that is measurable and observable
   - ______ Expectations for when each of the outcomes (and related indicators) will be achieved
   - ______ Clear indication of which school, district, or state goals, objectives, and priorities are addressed by each of the outcomes

4. **Learning activities, follow-up, role of principals, other school leaders, and school-based professional development staff, and relationship to other professional development**
   - ______ Description of the professional learning activities and follow-up that will ensure that participants achieve the intended outcomes on the projected timeline
   - ______ Description of strategies to ensure full participation in all of the professional learning activities
   - ______ Clear expectations for how principals, other school leaders, and school-based professional development staff support teacher participation
   - ______ Description of the links between the professional development and other professional development

5. **Evaluation Plan**
   - ______ Explanation of how each evaluation question will be addressed and how the evaluation will focus on each of the intended outcomes and related indicators, including data-collection instruments and strategies for data analysis and reporting
   - ______ Timeline and assignment for conducting the evaluation and reporting the results
6. **Budget**

   ______ Budget is complete

   ______ Resources are sufficient to ensure that the professional learning activities, related follow-up, and evaluation will take place as planned


**SAQ:** Develop a plan of professional development for teachers of your area and evaluate your own plan, using the checklist given above.

### 2.2 Planning for Continuous Professional Development (CPD)

Most of what has been said above, also applies to the Planning for Continuous Professional Development. Reference 2.2.1 describes a research study “Teachers’ Perception of Continuous Professional Education, Research Report RR429”. It is suggested that after going through References 2.2 and 2.2.1, you should undertake a small scale research study in which the above mentioned research is replicated and develop your own model for Professional Development of science teachers of elementary, secondary or higher secondary level teachers of your own geographical area.

| 2.2 | Montalbo, V., Benedettii, R., Mariottii, E., Mariotti, M.A., and Porri, A. (2012) | Attempts of Transforming Teacher Practice Through Professional Development (1212.1042 pdf). (Vera Montalbano, Department of Physics, University of Siena, via Roma 56, 53100 Siena, Italy. E-mail: Montalbano@unisi.it). |

#### 2.2.1 Teachers’ Perception of Continuous Professional Development

In a study conducted by David Hustler, et al (2003) ‘Teachers’ Perception of Continuous Professional Education’ (Ref. 2.2) the researchers found that overall teachers had a traditional view of CPD. Overwhelmingly, teachers thought of courses, conferences and workshops as CPD and were unlikely to consider personal research and on-line learning as part of their professional development. Within phases of education, secondary school teachers were more likely to consider personal research and on-line learning as part of their professional development than primary or special schoolteachers. CPD coordinators and those with no paid responsibilities were more likely to think of CPD as INSET days than other teachers. However, overall, the results showed a consistency with little variation between gender, age, phase of education or responsibilities of teachers. It should be noted that the case study material pointed to several examples of more extended and less traditional perceptions of what counted as CPD.

When the data concerning agreement or disagreement with a set of statements concerning views of CPD were examined, the results indicated that overall, the older, male, secondary school teacher was more likely to be inclined towards a negative view of CPD. The data relating to individual statements indicated that most teachers felt that school
CPD needs were taking precedence over their individual needs. Most teachers also felt that too many training days were driven by national agendas. However, on both counts this was less prominent for under 25’s. Just over half of the teachers in the sample felt that needs identified in their performance reviews had been met through CPD (once again there was a higher proportion of the under 25’s) and a large proportion felt that they were given a real opportunity to improve their skills within the school.

Slightly less than half the teachers in the sample felt that they had a part in setting the agenda for the school INSET days, although this figure was skewed by the younger and less experienced teachers who were much less likely to feel that they were involved. Just under half of the teachers in the sample felt that CPD providers thought of it mainly as a commercial activity. The under 25s responses indicated that although they felt they had little control over setting the agenda for school INSET they were much more likely than older teachers to feel that national priorities and school needs were not overriding their individual needs. This is in direct contrast to the over 55s who were much more likely to feel that school and national needs were taking priority.

Overall the responses to the questions would seem to point to the contradictory notions of CPD held by some teachers. Although generally most teachers felt that CPD was more likely to meet school needs than their individual needs they also felt that they were given a real opportunity to improve their skills. This is likely to be because teachers’ individual interpretations of the meaning of CPD may be quite narrow. Clearly professional development is taking place, but this also possibly points to ways in which a variety of forms of professional opportunity are not conceptualised as CPD. Please read Ref. 2.2.1 now.

<table>
<thead>
<tr>
<th>2.2.1</th>
<th>Hustler, D., McNamara, O., Jarvis, J., Londra, M. and Campbell, A. (June 2003)</th>
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2.2.1.1 Professional Learning Continuum from Initial Preparation Through The Early Years Of Teaching

Feiman-Nemser, Sharon (2001) has speculated on what professional learning continuum from initial preparation through the early years of teaching could be like. From a review of literature, the author has proposed a framework for thinking about a curriculum for teacher learning over time. The paper also considers the fit (or misfit) between conventional approaches to teacher preparation, induction and professional development and the challenges of learning to teach in reform-minded ways and offers examples of promising programmes and practices at each of these stages. The paper is also organised around three questions:

(a) What are the central tasks of teacher preparation, new teacher induction, and early professional development?

(b) How well do conventional arrangements address these central tasks?
What are some promising programmes and practices at each stage in the learning to teach continuum that promote standards-based teaching and enable teachers to become active participants in school reform?

Please see Ref. 2.2.2.


SAQ: In the light of Ref. 2.2.2, assess how far professional learning continuum can be discerned. Discuss the same critically.

### 2.3 Financial Aspects of Professional Development Programs

While planning for professional development, available resources, of time, money and materials must be insured to undertake the enterprise. These resources are very often scarce and this scarcity is a barrier to the successful implementation of professional development activities.

Loucks-Horsley, et al (2003, pp. 71, 73-74) have briefly discussed and summarized the issue in Table 3.7. Please read Reference 2.3.1 now.


### 2.4 Seeking Resources for EPD and CPD

Ahmed, Mah-E-Rukh (2012) has reviewed the Education Policies of Pakistan and has given the following picture of financial lay out for education sector in Pakistan. Financial pressure could affect teacher education programmes and the whole higher education (Furlong et al., 2000). It could also affect the investment process in education and students’ enrolment in courses even the nature and quality of those courses (Tisber, 1995). Pakistan operates some kind of per capita formula funding but the detailed mechanism involved certainly in provision for the adequate preparation of trainee teachers is different. For example, in Pakistan EPD providers do not have control over the bulk of their budget and therefore this is a less influential dimension though not insignificant. The budgetary allocations for teacher education institutes are insufficient to meet the requirements of a dynamic system of quality teacher education. At Pakistan only 2.3 per cent of GNP was being spent on education. Every education policy showed inadequate allocations of funds for teacher education and the capacity to utilize the allotted funds has been far lesser. The recurring budget consists of the salary and non-
salary component where the salary takes up the major share (about 90%) of the total recurrent budget. The policy makers informed the researcher that development budget is almost entirely financed through foreign aid. The funding is generated mostly through donor determined priorities and since the whole sector is uncoordinated, there are issues of overlap and excessive emphasis that distorts priorities for the education sector.

Overall the bulk of revenue is collected at the federal level which is distributed to the provinces through the National Finance Commission. At the domestic level, resources are generated through revenues raised at various levels (MoE, 2006) and due to severe capacity constraints the most serious flaw is the under-utilization of funds (MoE, 2007)\(^7\).

With the devolution of powers to the provinces and of district governments, the situation has considerably changed. Ref. 2.3.2 (pp.29 - 31) gives an analysis of the current practices of financial aspects of Teacher Education and Professional Development in all the four provinces of Pakistan. Please read the relevant pages of this reference now.

| 2.3.2 | UNESCO, USAID, 2006 | Strategic Framework for Teacher Education And Professional Development: SECTION IV Financial Governance of TPD (pp. 29-31) |

**SAQ:** Develop a scenario of current practices of financial aspects of Professional Development of Science Teachers in Pakistan and suggest improvements in the present system.

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Bibliography

- Centre for Education Policy Development (2009), Choices in the design, delivery and management of initial professional teacher education in South Africa: Increasing diversity, quality and success; Centre for Education Policy Development, Box 31892, Braamfontein 2017, SA


- Villegas-Reimers, E. Teacher professional development: an international review of literature; 133010e pdf
Unit–3

KNOWLEDGE AND BELIEFS SUPPORTING EFFECTIVE PROFESSIONAL DEVELOPMENT

Written by: Prof. Khadim Ali Hashmi
Reviewed by: Prof. Dr. Tanveer-Uz-Zaman
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Introduction

Dear students, the previous unit introduced and described the components of a comprehensive framework for designing and implementing professional development. One of the first and very important inputs into the design process is the knowledge base on key topics related to professional development for science and mathematics teachers. The knowledge base refers to two different kinds of information—knowledge and beliefs. Knowledge refers to information that is sure, solid, dependable, and supported by research. It is distinct from opinions or points of view that may not be supported by evidence.

Skilled professional developers, like skilled artists, come to the task of designing professional development with knowledge that has evolved over many years of research and experience. Much is known about effective professional development for mathematics and science education, and more is being learned every day. Taking advantage of this knowledge can help planners jump-start their efforts, put them on solid footing, and avoid unnecessary and costly mistakes.

Five distinct, but related knowledge bases support professional development. These include learner and learning, teachers and teaching, nature of science and mathematics, professional development, and the change process. In this unit we shall discuss these five bases that support effective professional development.

Objectives

After studying this unit, you will be able to:

- Describe the nature of learners and learning;
- Discuss the nature of teachers and teaching;
- Describe and discuss nature of science and mathematics;
- Discuss different aspects of professional development as it applies to the nature of teachers, teaching and learning, and nature of science and mathematics;
- Discuss different aspects and effects of change process vis a vis professional developments
3.1 Learner and Learning

Learning is the act of acquiring new, or modifying and reinforcing, existing knowledge, behaviors, skills, values, or preferences and may involve synthesizing different types of information. The ability to learn is possessed by humans, animals and some machines.

Learning is not compulsory; it is contextual. It does not happen all at once, but builds upon and is shaped by what we already know. To that end, learning may be viewed as a process, rather than a collection of factual and procedural knowledge. Learning produces changes in the organism and the changes produced are relatively permanent.

Human learning may occur as part of education, personal development, schooling, or training. It may be goal-oriented and may be aided by motivation. The study of how learning occurs is part of educational psychology, neuropsychology, learning theory, and pedagogy. Learning may occur as a result of habituation or classical conditioning, seen in many animal species, or as a result of more complex activities such as play, seen only in relatively intelligent animals. Learning may occur consciously or without conscious awareness. Learning that an aversive event can't be avoided nor escaped is called learned helplessness. There is evidence for human behavioral learning prenatally, in which habituation has been observed as early as 32 weeks into gestation, indicating that the central nervous system is sufficiently developed and primed for learning and memory to occur very early on in development.

Play has been approached by several theorists as the first form of learning. Children experiment with the world, learn the rules, and learn to interact through play. Lev Vygotsky agrees that play is pivotal for children's development, since they make meaning of their environment through play. 85 percent of brain development occurs during the first five years of a child's life.

Types of learning: The following different types of learning have been identified:

<table>
<thead>
<tr>
<th>a)</th>
<th>Non-associative learning</th>
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<tbody>
<tr>
<td>b)</td>
<td>E-learning and augmented learning</td>
</tr>
<tr>
<td>c)</td>
<td>Habituation</td>
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<td>d)</td>
<td>Rote learning</td>
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<td>e)</td>
<td>Sensitisation</td>
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<td>f)</td>
<td>Meaningful learning</td>
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<td>g)</td>
<td>Associative learning</td>
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<tr>
<td>h)</td>
<td>Informal learning</td>
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<tr>
<td>i)</td>
<td>Operant conditioning</td>
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<td>j)</td>
<td>Formal learning</td>
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<td>k)</td>
<td>Classical conditioning</td>
</tr>
<tr>
<td>l)</td>
<td>Nonformal learning</td>
</tr>
<tr>
<td>m)</td>
<td>Play</td>
</tr>
<tr>
<td>n)</td>
<td>Nonformal learning and combined approaches</td>
</tr>
<tr>
<td>o)</td>
<td>Enculturation</td>
</tr>
<tr>
<td>p)</td>
<td>Tangential learning</td>
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<tr>
<td>q)</td>
<td>Episodic learning</td>
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<tr>
<td>r)</td>
<td>Dialogic learning</td>
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<tr>
<td>s)</td>
<td>Multimedia learning</td>
</tr>
</tbody>
</table>
Reference 3.1 has discussed Learners and Learning in the following words: All professional development programs need to consider the knowledge base on learners and learning as a major input to their designs. This is critical on at least two levels. First, when teachers have learning experiences that help them understand how children best learn mathematics and science, they are better able to provide such experiences to their students. On another level, we need professional development designs that reflect how people learn so that the adult learners are supported to learning a sustained and in-depth way.

This source discusses the topic under the following headings:
- What learners already know influences their learning.
- Learners acquire new knowledge by constructing it for themselves.
- The construction of knowledge is a process of change that includes addition, creation, modification, refinement, restructuring, and rejection.
- Learning happens through diverse experiences.
- All students regardless of race, culture, and gender are capable of understanding and doing science and mathematics.

Now please read Ref. 3.1.1, and 3.1.2.

|-------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

SAQ: After having read Ref. 3.1.1, and 3.1.2, develop your concept of learner and learning based upon your own experiences of Pakistani educational system.

3.2 Teachers and Teaching

Teaching is the act of organizing and shaping learning experiences for students. This is a complex activity in its nature. In recent years, higher standards for student learning have caused educators to re-examine the teaching routines common in the school system. Researches indicate that with the existing practices, the students cannot reach desired high standards.

Reference 3.2 has discussed “Teachers and Teaching” under the following headings:
- The purpose of teaching is to facilitate learning.
- Teaching is a profession requiring specialised knowledge.
- The practice of teaching is complex and demanding.
Now please read Ref. 3.2 and make a brief on Teachers and Teaching in your own context.


**SAQ:** Having read Ref. 3.2, make a brief on Teachers and Teaching in your own context (i.e. the level, elementary, secondary or higher education, in your province/district).

### 3.3 Nature of Science and Mathematics

The “Nature of Science and mathematics” has briefly been discussed in Ref. 3.3.1. Under the following headings:

- Mathematics and Science are dynamic disciplines that continue to produce new knowledge.
- Science is practices through active engagement and inquiry into phenomena in the world.
- Mathematics involves complex reasoning, problem solving, and communication.

However, a slightly extended description of Nature of Science is discussed in Chapter 1.(Ref. 3.3.2) and the Nature of Mathematics in Chapter 2 (Ref.3.3.3) of “Science for All Americans Online” American Association for the Advancement of Science; 1989, 1990. In which a simple straightforward exposition of the Nature of Science and Mathematics is presented. Now, please read References 3.3.1; 3.3.2; and 3.3.3.

| 3.3.2 | Project 2061 (1990) | “Science for All Americans Online” American Association for the Advancement of Science; 1989, 1990. Chapter 1 |
| 3.3.3 | Project 2061 (1990) | “Science for All Americans Online” American Association for the Advancement of Science; 1989, 1990. Chapter 2 |

**SAQ:** Write a brief note on Nature of Science and Mathematics.
3.4 Professional Development

Over the past about four decades knowledge base on professional development of teachers has grown considerably. In order for the students to learn challenging concepts of science and mathematics, the learning process has now been linked to quality professional development and teacher expertise.

Professional development can no longer just be about exposing teachers to a concept or providing basic knowledge about a teaching methodology. Instead, professional development in an era of accountability requires a change in a teacher’s practice that leads to increases in student learning.

Reference 3.4 has listed following factors for effective professional development:

Effective Professional Development:
- Is driven by a well defined image of effective classroom learning and teaching;
- Provides opportunities for teachers to build their content and pedagogical content knowledge and examine practice;
- Is research based and engages teachers as adult learners in the learning approaches they will use with their students;
- Provides opportunities for teachers to collaborate with colleagues and other experts to improve their practice;
- Supports teachers to serve in leadership roles;
- Links with other parts of the educational system; and
- Has a design based on student learning data and is continuously evaluated and improved.

The same reference asserts that there is need for teacher learning programmes to engage teachers in strategies that produce “transformative” learning, that is, “changes in deeply held beliefs, knowledge, and habits of practice.” The authors go on to list five requirements for transformative learning experiences.

Alison Gulambusein (2013) has given the following 5 Principles for effective professional development (Ref. 3.4.1):

**Principle 1:** The duration of professional development must be significant and ongoing to allow time for teachers to learn a new strategy and grapple with the implementation problem.

**Principle 2:** There must be support for a teacher during the implementation stage that addresses the specific challenges of changing classroom practice.

**Principle 3:** Teachers’ initial exposure to a concept should not be passive, but rather should engage teachers through varied approaches so they can participate actively in making sense of a new practice.

**Principle 4:** Modeling has been found to be highly effective in helping teachers understand a new practice.
Principle 5: The content presented to teachers shouldn’t be generic, but instead specific to the discipline (for middle school and high school teachers) or grade-level (for elementary school teachers).

Please now read Ref. 3.4 and 3.4.1

| 3.4.1 | Gulamhussein, A. (2013) | Teaching the Teachers: Effective Professional Development in an Era of High Stakes Accountability; Center for Public Education |

SAQ: Define professional development. Discuss the practices employed for the professional development of science teachers in Pakistan. Suggest ways and means to improve the same.

3.5 The Change Process

There is vast literature that guides professional developers about how effective change can take place in educational systems. Reference 3.5 has listed following Change Processes in this context:

- Change is a process that takes time and persistence.
- At different stages in the change process, individuals need different kinds of support and assistance.
- Change efforts are effective when the change to be made is clearly defined and communicated, support and assistance are available, and leaders and policies support the change.
- Most systems resist change.
- Organizations that are continually improving, analyse data, set goals, take actions, assess their results, and make adjustments.
- Change requires communication about complex topics in organizations that are, for the most part, large and structured.

Now please read Ref. 3.5.

SAQ: Define and describe the process of change so far as it is undertaken in the field of education and in the professional development of teachers. Discuss what forces resist change, suggest measures to counter their effect.
Bibliography

- Gulamhussein, A. (2013) *Teaching the Teachers: Effective Professional Development in an Era of High Stakes Accountability*; Center for Public Education


Unit–4

CONTEXT FACTORS INFLUENCING PROFESSIONAL DEVELOPMENT

Written by: Prof. Khadim Ali Hashmi
Reviewed by: Prof. Dr. Tanveer-Uz-Zaman
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Introduction

There is no single recipe of professional development for all situations. It has to be tailored to fit the context in which teachers teach and their students learn. A programme that is a great success in one place may fail in another. What makes the difference is the context in which the programme operates. In the right school context, even the flawed professional development activities (even a single session workshop) can serve as a catalyst for professional growth. Conversely, in the wrong school context, even programmes with solid content and training strategies are unlikely to be effective. What is the context for professional development? How can professional developers design programmes that both suit and positively impact their local context? What contextual factors do they consider?

This unit on context reiterates the importance of using student learning and other data to understand students and student learning, teachers and teacher learning, and other dimensions of context. Professional developers design with the best possible understanding of the multiple dimensions of their local contest, beginning with the students themselves. Professional Development needs to be tailored to fit the context in which teachers teach and students learn.

Objectives

After studying this unit, you will be able to:

- Define and discuss different aspects of Standards and Learning Results at international and Pakistan levels;
- Identify and describe Teachers and Teachers’ Learning Needs;
- Relate the areas of Curriculum, Instruction, Assessment Practices and Learning Environment to Professional Development;
- Appreciate the need of Organizational Culture in the arena of Professional Development;
- Discuss the National and Provincial Policies regarding Professional Development of Science and Mathematics teachers and discuss their relative merits and limitations;
- Identify available sources for PD and suggest to harness the same; and
- Considers PTA and Community’s role in furthering the cause of PD and suggests ways and means of involving parents and community in PD.
4.1 Students, Standards and Learning Results

According to Loucks-Horley, et al. “although students are not the clients of professional development, they are its ultimate beneficiaries. The goal of professional development is improvement of student learning.” They go on to say that student performance is dependent upon improvement of staff and organizational performance. In a tabular form, this source gives “Students, Standards, and Learning Results” (Table: 3.1, p.57). This reference poses following five questions, lists data sources, and related references. (i) Who are our students? (ii) What standards are in place for students’ learning? (iii) How are students performing in relation to standards? (iv) What gaps in achievement exist among racial, socio-economic, language, or gender groups? (v) What specific goals for improving student learning and closing achievement gaps in mathematics and science does the school or programme have?

Now please read Ref. 4.1.


SAQ: Describe how far the students are beneficiaries of the professional development activities. Also give the standards for student learning as given in the Educational Policies of Pakistan. How far these standards are being achieved? Suggest ways and means to improve student learning.

4.2 Teachers and Teachers’ Learning Needs

It has been confirmed by research studies that there is close link between teacher knowledge in mathematics and science and student performance in these disciplines. Reference 4.2.1 poses these 8 questions about teachers and teachers’ learning needs and gives lists sources and resources for each question in tabular form; (i) Who are the teachers? (ii) How well prepared are teachers to teach challenging science and mathematics content? (iii) How are new teachers inducted and supported? (iv) What goals do teachers have for their learning? (v) What are their beliefs, perceptions, concerns related to professional development programme? (vi) What are their strengths in mathematics and science content and pedagogy? (vii) What specific goals is the professional development programmes targeting for teachers and students? (viii) What have been their experiences implementing new programmes?
Ref. 4.2.1 may now be read.


In Ref.4.2.2, Linda Darling-Hammond has described teacher’s learning as support to student and has given how teachers can be prepared as well rounded educators. Please read this reference now.


SAQ: In the light of References 4.2.1 and 4.2.2 develop an outline of what are teachers’ learning needs and how these are related to students’ learning needs.

### 4.3 Curriculum, Instruction, Assessment Practices and Learning Environment

In order to make the professional development programme effective, and to improve the classroom teaching, the professional developers must take into consideration the Curriculum i.e., what is being taught; Instruction –how is it being taught; Assessment Practices – how learning is measured; and Learning Environment – the physical facilities and arrangements as well as the culture within the classroom.

Loucks-Horsley, et al (2003, pp. 61-62, 63-65) have discussed these issues and have summarized the relevant issues and questions in Ref. 4.3, which may now be read.


Martin L. Maehr (1990) has studied the effects of the school psychological environment on student motivation and the indirect effects of school leadership on student motivation. Path analysis of a comprehensive data set of over 16,000 fourth-, sixth-, eighth-, and tenth-grade students from 880 public schools was used to develop a causal model based on a psychometric approach. The model identifies a causal chain of factors leading from school goal stresses through motivation to achievement for grades 6, 8, and 10. Findings point to the importance of the school psychological environment at the tenth-grade level, especially for nonwhite students, the significance of ethnicity in motivation, and the crucial role of the family at the fourth-grade level. A conclusion is that school leaders can
and do influence the psychological environment of their schools. Please read Ref. 4.3.2 now.

| 4.3.2 | Maehr, Martin L. (1990) | The "Psychological Environment" of the School: A Focus for School Leadership. The National Center for School Leadership; University of Illinois at Urbana-Champaign College of Education In collaboration with The University of Michigan, MetriTech, Inc. |

**SAQ:** In the light of references 4.3.1 and 4.3.2, review the conditions prevailing in your own institution with respect to curriculum, instruction, assessment, and school environment and suggest any improvements that you consider to be required for improvement in student learning through professional development of teachers.

### 4.4 Organisational Culture

Organizational culture encompasses values and behaviors that contribute to the unique social and psychological environment of an institution. Organizational culture represents the collective values, beliefs and principles of organizational members and is a product of such factors as history, type of employees, management style, and local and national culture. Culture includes the system’s vision, values, norms, systems, symbols, language, assumptions, beliefs, and habits. Organizational culture is a set of shared assumptions that guide what happens in institutions by defining appropriate behavior for various situations. It is also the pattern of such collective behaviors and assumptions that are taught to new members as a way of perceiving and, even, thinking and feeling. Thus, organizational culture affects the way people and groups interact with each other, with clients, and with stakeholders. In addition, organizational culture may affect how much employees identify with an institution or the system.

Organizations often have very differing cultures as well as subcultures. Although an institution may have its "own unique culture", in larger organizations, like the district or province, there are sometimes co-existing or conflicting subcultures because each subculture is linked to a different cultural background.

Organisational structure has been discussed in Ref. 4.4 by Loucks-Horsley, (2003, pp. 65 - 71), which may now be read.

Ref. 4.4.2 is a research study on school culture and organization. Please read it now.

### 4.4.2


**SAQ:** In the light of references 4.4.1 and 4.4.2, describe the culture and organization of your own institution and compare and contrast the same with that of the US school culture and organization.

### 4.5 National and Local Policies

In Pakistan educational policy has been the province of the Federal Government, these policies have been implemented at the provincial and local levels. With the 18th Constitutional Amendment this sector has been transferred to the Provinces. It has to be seen how provincial governments are going to cope with the issues. However, in the American context, Loucks-Horsley, (2003, pp. 69-71) has given some details. These may now be read in Ref. 4.5.1.

### 4.5.1


Ref. 4.5.2 Towards Universal Primary Education, and Beyond! gives a survey of the education policies of Pakistan and gives salient features of the Education Policy 2009. Please read it now.

### 4.5.2

| March 29, 2009 | Towards Universal Primary Education, and Beyond! Read Pakistan Blog |

Reference 4.5.3 is reproduction of the National Education Policy 2009, which may be referred to for details of the education policy and programme in Pakistan.

### 4.5.3


**SAQ:** In the light of international trends give critical analysis of the Education Policies of Pakistan.
4.6 Available Resources

The financial status of any country could be very influential in shaping the quality of the education system provided. Financial pressure could affect teacher education programmes and the whole higher education. It could also affect the investment process in education and students’ enrolment in courses even the nature and quality of those courses. Therefore professional development cannot be planned and implemented without availability of adequate resources, especially time, money and materials. In Pakistan, these are provided by the state. Funds are provided in the national, provincial or even in local budgets. Later local community and NGOs were involved in Professional development and other developmental projects in the educational system.

In the context of Initial Teacher Education, Mah-E-Rukh Ahmed (2012) has stated that: “Pakistan operates some kind of per capita formula funding but the detailed mechanism involved certainly in provision for the adequate preparation of trainee teachers is different. For example, in Pakistan Initial Teacher Education providers do not have control over the bulk of their budget and therefore this is a less influential dimension though not insignificant. The budgetary allocations for teacher education institutes are insufficient to meet the requirements of a dynamic system of quality teacher education. At Pakistan only 2.3 per cent of GNP was being spent on education. Every education policy showed inadequate allocations of funds for teacher education and the capacity to utilize the allotted funds has been far lesser. The recurring budget consists of the salary and non-salary component where the salary takes up the major share (about 90%) of the total recurrent budget. The policy makers informed the researcher that development budget is almost entirely financed through foreign aid. The funding is generated mostly through donor determined priorities and since the whole sector is uncoordinated, there are issues of overlap and excessive emphasis that distorts priorities for the education sector. Overall the bulk of revenue is collected at the federal level which is distributed to the provinces through the National Finance Commission. At the domestic level, resources are generated through revenues raised at various levels (MoE, 2006) and due to severe capacity constraints the most serious flaw is the under-utilization of funds (MoE, 2007).”


Loucks-Horsley, (2003, pp. 71-74) has briefly discussed the problem of Resources available for professional development. This may now be read in Ref. 4.6.2

SAQ: After going through Ref. 4.6.1 and 4.6.2, and in the light of the budget of your province, develop a report on resources available for professional development of science and mathematics teachers in your province/area.

4.7 Parents and Community

Professional development is a necessary ingredient for improved student achievement. Parents and the community are partners in the education of their children and can support professional development in several ways: Volunteer to serve on the school committee; Form a parents’ group and focus on educational needs of the community and professional development as a topic; Active participation and presence in the school activities. This, in turn, can motivate teachers to work on their instructional practice and deepen their skills; Volunteer their expertise and skills in the classroom; Raise voice for greater financial investment in education.

This topic has also been discussed in Loucks-Horsley, (2003, pp. 75-77), which may be read now.

|-----|------------------------------------------------------------------------------|

SAQ: Review the participation of the parents and community of your area and suggest steps to increase their participation in the educational uplift of their children.
Bibliography


- Maehr, Martin L. (1990), *The "Psychological Environment" of the School: A Focus for School Leadership*. The National Center for School Leadership; University of Illinois at Urbana-Champaign College of Education In collaboration with The University of Michigan, MetriTech, Inc.


- March 29, 2009, Towards Universal Primary Education, and Beyond! *Read Pakistan Blog*

CRITICAL ISSUES TO CONSIDER IN DESIGNING PROFESSIONAL DEVELOPMENT PROGRAMMES

Written by: Prof. Khadim Ali Hashmi
Reviewed by: Prof. Dr. Tanveer-Uz-Zaman
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Introduction

In the public sector schools, it is easy to draw teachers from the schools for professional development. However, since no substitute teachers are made available, the students’ time is wasted. The issue is not only finding time but also how to utilize the available time. We shall discuss the identification of suitable time for professional development, ensuring equity, developing professional culture and finding ways and means for eliciting public support for professional development of science teachers.

In a diverse society like Pakistan, where schools even in the public sector are diverse in facilities, teachers’ qualifications, students’ cultural background, available facilities, the equitable access to professional development opportunities cannot be ensured. As an example, in a single science teacher school, the head would not be willing to release his/her science teacher for a couple of weeks.

The culture of a school contributes to the learning of every one in it. If the culture of the school is not supportive to professional development, the teacher cannot use new techniques and knowledge in his/her instruction. It is therefore imperative that a professional culture should be encouraged in the schools.

Unless public support is available, efforts to develop professional personnel cannot succeed. It is therefore of utmost importance that the public should be made aware of the programmes of professional development and be made conscious of the need for adequate funds for education.

In this Unit such issues will be considered that are critical in designing professional development programmes: these include finding time for professional development; ensuring equity; building professional culture; and garnering public support.

Objectives

After studying this unit, you will be able to:
- Suggest proper time for professional development activities;
- Discuss and suggest ways and means for ensuring equity;
- Describe what is professional culture and suggest alternate ways of building such culture;
- Suggest ways and means of eliciting public support for professional development of science teachers.
5.1 Finding Time for Professional Development

Reform requires that teachers learn new roles and ways of teaching. That translates into a long-term developmental process requiring teachers to focus on changing their own practice. The problem is, where do teachers find the time for change in their already busy schedules? Unfortunately, the demands posed by daily teaching and other aspects of the reform continue to absorb a bulk of teachers' energy, thought, and attention.

Watts and Castle outline five approaches that have been used to create more time for professional development:
1. Using substitutes or releasing students. Some schools are effectively using one morning or afternoon a week for teacher development and other improvement activities. However, this approach provides only small blocks of time and is often resented by parents.
2. Purchasing teacher time by using permanent substitutes, retirees, or giving compensation for weekends or summer work. This is expensive, sporadic, and some teachers will not participate on weekends or during the summer.
3. Scheduling time by providing common planning time for teachers working with the same children or teaching the same grade on a regular basis. This is often done in schools using instructional teams, but it could be done in many more schools if assistance was provided with block scheduling.
4. Restructuring time by permanently altering teaching responsibilities, the teaching schedule, school day, or school calendar. This has serious implications for busing, union contracts, facilities maintenance, state regulations, and budgets. It also means changing public expectations—a reason few schools or districts have taken this approach.
5. Making better use of available time and staff.


The following note has been Adapted from: Critical Issue: Finding Time for Professional Development, written by Cathy J. Cook, Mathematics Education and Professional Development Specialist, Midwest Consortium for Mathematics and Science Education, North Central Regional Educational Laboratory, and Carole Fine, Director of Professional Development, North Central Regional Educational Laboratory, Oak Brook, Illinois.

School improvement efforts require teachers not only to study, implement, and assess learner outcomes outlined in the national educational standards but also to provide meaningful, engaged learning (cognitively, socially, and culturally) for a very diverse student population.

Teachers are expected to understand emerging standards—such as those in mathematics and science—and views of learning, and to change their roles and practice accordingly.
Teachers who were prepared for their profession prior to the curricular reform movement may not be prepared for these new practices and roles. In working toward change, teachers need to be continually supported with professional development. Teaching is a complex task, and substantial time will be required for teachers and other educators to test out new ideas, assess their effects, adjust their strategies and approaches, and assess again in an effort to reach all students and make learning meaningful.

A fundamental lesson learned in the past decade of school reform efforts is that far more time is required for professional development and cooperative work than is now available. In fact, time has emerged as the key issue in every analysis of school change appearing in the last decade (Fullan & Miles, 1992). Teachers' professional development in a climate of educational reform must address the additional challenges of implementing educational standards, working with diverse populations, and changing forms of student assessment. Clearly, teachers "need more time to work with colleagues, to critically examine the new standards being proposed, and to revise curriculum. They need opportunities to develop, master, and reflect on new approaches to working with children" (Corcoran, 1995).

McDiarmid (1995) echoes the connection between new expectations for teachers and the element of time: "The changes teachers must make to meet the goals of reform entail much more than learning new techniques. They go to the core of what it means to teach. Because, these changes are so momentous, most teachers will require considerable time to achieve them" (p. 2).

Professional development can no longer be viewed as an event that occurs on a particular day of the school year; rather, it must become part of the daily work life of educators. Teachers, administrators, and other school system employees need time to work in study groups, conduct action research, participate in seminars, coach one another, plan lessons together, and meet for other purposes. Fine (1994) states, "School change is the result of both individual and organizational development" (p. 2).

Unfortunately, implementing a professional development plan is often hampered by others' perceptions of teachers' work. According to McDiarmid (1995), "Although reform has changed expectations for teachers, how the public and policymakers perceive teachers' work has not changed. They continue to think teachers are working only when they are with their students. As a result, there is little support for providing the time and resources teachers require for teachers to change their practice" (p. 2). Castle and Watts (1992) explain that "the traditional view of teachers' work is governed by the idea that time with students is of singular value, that teachers are primarily deliverers of content, that curricular planning and decision making rest at higher levels of authority, and that professional development is unrelated to improving instruction" (p. 2). This limited view of teaching does not allow opportunities for teachers to participate in curriculum development, learn and share successful methods of reaching students, discuss comprehensive and efficient ways to implement standards, and continue their own learning.
Education must respond to the changing needs of students and their teachers, just as business has reacted to its changing needs by implementing employee training.

When professional development is redefined as a central part of teaching, most decisions and plans related to embedding professional development in the daily work life of teachers will be made at the local school level. Some reformers have recommended that at least 20 percent of teachers' work time should be given to professional study and collaborative work. Instead of being devoted exclusively to discrete in-service days, this time must be part of virtually every school day and must be closely linked to the day-to-day demands of teaching (e.g., collaborative lesson planning, assessment of student work). Schools must create time for professional development as an integral part of teachers' professional life. In Asia and Europe, teachers often are provided with more opportunities for job-embedded forms of staff development (e.g., the joint planning of lessons) and collaborative work than their American counterparts.

The reality is that teachers likely will require more than 20 percent of their work time for learning and collaboration if they are to be successful in implementing ambitious reform initiatives. The National Education Association (1994) recommends that 50 percent of teachers' time be given to professional development. Although providing even 20 percent of teachers' work time for these activities may seem like an unachievable goal in American schools, school systems need to strive toward that goal by "thinking outside the box" to revamp the working conditions of teachers so they will have the support required to plan and implement ambitious reform.

In addition to finding creative ways to carve out time for staff development, educators also must explore the most efficient ways to use whatever time is available. Using technology is one example. Fine (1994) notes, "Technologies can support and broaden professional learning communities and help teachers make better use of their time. Through a range of technologies, e.g., the Internet and video- and audio conferencing, teachers can access both instructional resources and collegial networks" (pp. 5-6). Some formats enable teachers to participate when it is convenient for them. Electronic mail and bulletin boards enable teachers to share information and solve problems with colleagues at any time. In addition, videoconferencing enables teachers to connect to different sites without spending time and money on travel.

Community support is essential for creating the professional development opportunities teachers require to help all of their students reach higher levels of learning. Parents and community members must understand that professional development is the linchpin for any reform efforts, not an addition to them. After all the reform policies are written, the true interpretation and implementation of reform is made in the individual classroom. Since 80 percent of the funding for professional development is controlled locally, the public must be convinced that professional development is an important part of teaching (Corcoran, 1995). Parental support is essential because scheduled changes to accommodate professional development may interfere with family schedules, which often

60
are planned around the school day. If parents are to support this effort, they must feel that their children will benefit from the time teachers spend on professional development.

**Goals:** The educational community will:
- Move away from past models of professional development (where it took place only on in-service days, weekends, or during the summer) to new models that embed professional development into the daily lives of teachers.
- Restructure teachers' work to create the mental space necessary for ongoing professional development.
- Assess how current professional development resources are being used and design strategies for securing additional resources as needed or for reallocating them.
- Develop strategies for informing and convincing the public and policymakers that professional development not only is critical but also is as much a part of teachers' work as instruction.

**Action Plan Options:** Educators can take the following steps to ensure that time is provided for professional development:
- Establish a provincial and/or divisional task force on professional development that focuses on identifying the time, resources, and opportunities for professional development as well as on gaining the support of the public and policymakers for professional development. The task force would bring together a broad-based group of practitioners, policymakers, and scholars in professional development.
- Work with a group involved with the establishment of professional development programs to help teachers implement the *National Science/ Mathematics Standards*.
- Meet with businesses, community groups, and parent organizations to describe school goals and the role of professional development in meeting them. In some areas, collaborations between business and schools have been established to encourage professional development.
- Involve the schools, DEOs, and provincial education department, and teacher education institutions/organizations. This group can review the literature that suggests a need for additional time for professional development and consider alternative ways in which that time will be used.
- Discuss the elements of high-quality professional development and review descriptions and examples of professional development programs.
- Study example plans for finding time for professional development from provinces, districts, and schools.
- Explore methods for creating time for professional development and brainstorm alternative methods for the school.
- Link school and individual improvement goals with purposes and use of the time created for professional development. Plan for how the time will be used.
- Develop a plan for implementing more time for professional development that includes communicating with parents and the community to ensure their support.
• Assess professional development programs to ensure they are building bridges between where educators are now and where they need to be to meet the needs of their students.

**SAQ:** Give a detailed account of the methods of professional development adopted in your area of work so far as these are employed to find suitable time for provision of professional development activities. Compare the practices employed with those described above. Suggest ways and means for improving the present practices.

### 5.2 Ensuring Equity

A report by the Intel (2010) has discussed the issue at length. The following is the abstract of the report.

Countries such as Singapore, Finland, and Korea had the foresight early on to see radical changes in their education systems would be necessary if they were to remain economically viable in a world defined by globalization, innovation, and participatory cultures. Today, students in these countries are the top performers on international tests. Critical to these high performing systems are teachers who are well prepared and who are committed to the practice of inquiry-based learning for themselves and their students.

1. Innovation fuels today’s global economy. Increasingly 21st Century Skills, such as creativity, self-direction, collaboration, multi-modal communication, and information, communications, and technology (ICT) literacy, are being integrated into learning standards of school systems across the globe. The new national resources that countries are beginning to mine are human ingenuity and creativity. The good news is these natural resources are malleable and renewable – but it necessitates schools that ready students for the complexities of the world today.

2. It is imperative that education shifts practice in order to prepare graduates to thrive in today’s highly collaborative, innovative, high tech society and workforce. The stakes are high. A recently released research study by a Stanford University professor linked highly cognitive teaching and learning in elementary and secondary schools directly to economic growth and health of states and nations.

3. The lynch pin to such learning is highly effective teaching. And that necessitates engaging teachers in sustained, high quality professional development, both as individuals and as a part of effective teams.

Many of the international, high-performing countries – as determined by scores on the Programme for International Student Assessment (PISA) assessments – recognized this chain of logic a decade or more ago. These countries revamped their systems for recruiting, developing, sustaining, and retaining high quality teachers – while simultaneously creating learning communities within schools that engaged teachers in thoughtful professional learning that advanced teacher and school effectiveness.
For example, Singapore has created learning communities within its schools that recruit its best and brightest students into the teaching profession. The students are then provided with extensive formal and informal professional, collaborative learning opportunities to ensure continued growth and commitment.1 Their professional learning is in the context of a culture of inquiry in which education professionals dedicate time within every school day to professional growth as they design, review, critique, and refine lessons, curricula, instruction, and assessment strategies. In addition, Singapore provides over 100 hours of professional development for teachers beyond the school day.

**Recommendation 1:** Position the school as an innovative learning community that engages students, teachers, administrators, and community in 21st Century Learning.

**Recommendation 2:** Use data and research to drive the design of professional development programs as well as to ascertain the effect of such programs on the system goals. Then, use that information to inform continuous improvement of the professional learning offerings.

**Recommendation 3:** Provide time, resources, incentives, and requirements, which engage all educators/teachers in formal and informal professional learning that meets high quality, established standards and is aligned to system goals.

**Recommendation 4:** Provide options in the type, duration, pedagogy, location, medium, and formality of professional development, and differentiate within professional development offerings to meet teacher participants’ needs, while also achieving system goals.

**Recommendation 5:** Establish and support teacher engagement in both local and global professional learning communities.

Now please read the Ref. 5.2

| 5.2 | Metiri Group Commissioned by INTEL (2010) | Professional Development: Ensuring a Return on Your Investment |

SAQ: In the light of the literature cited, please give details of prevailing situation regarding issues of equity in your field of work. Suggest measures to redress the situation.

### 5.3 Building Professional Culture

A professional culture is identified by the following key questions:

- What factors influence teacher satisfaction?
- How can schools improve the satisfaction of strong instructional teams?
• How can schools develop and maintain open, two-way communication between teachers and administrators?
• How can schools diagnose and monitor teacher satisfaction and professional culture?

**Promising Practices for Building a Healthy Professional Culture**

<table>
<thead>
<tr>
<th></th>
<th>Manage workload</th>
<th>Identify efficiencies that conserve teachers’ time to help prevent high-performers from leaving due to work-life imbalances.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Maintain multiple lines of communication</td>
<td>Provide teachers with multiple open channels for both giving and receiving feedback.</td>
</tr>
<tr>
<td>3.</td>
<td>Recognize excellence</td>
<td>Take time to offer formal and informal recognition of achievements, both large and small.</td>
</tr>
<tr>
<td>4.</td>
<td>Address all aspects of human capital</td>
<td>Organizations perceived to be strong in all areas of human capital tend to have much more satisfied teachers – simply excelling in one or two areas is insufficient.</td>
</tr>
</tbody>
</table>

Reference 5.3 discusses building of collaborative cultures.

| 5.3 | Peterson, K.D. and Brietzke, R. (1994) | **NCREL Monograph: Building Collaborative Cultures: Seeking Ways to Reshape Urban Schools.** |

**SAQ:** In the light of the reference 5.3 develop strategies of building professional culture in the Pakistani culture relevant to your own context.

### 5.4 Garnering Public Support

You need consensus and support to move your project or to run your school; there is no way around it. Whether it’s in construction, education, energy, medicine or litigation, public support – and decision-makers’ support – will improve your efficiency. We come across examples of success when parents/public are involved in the affairs of an institution, whether in the public sector or privately owned. How to garner public support? The following note helps answer the question.


**Five dysfunctions of a team**

• Inattention to results
• Avoidance of accountability
- Lack of commitment
- Fear of conflict
- Absence of trust

**What is Trust?**
- Trust is the firm belief in the reliability, truth, ability and strength of someone or something.

**Building a foundation of trust**
- Give people the benefit of the doubt
- Admit mistakes
- Offer and accept authentic apologies
- Focus time and energy on important issues
- Welcome questions
- Provide opportunities for genuine exchange about concerns and aspirations

**Outreach**
- How do you get people to care?
- How do you let people know what’s going on?
- How do you get people in your schools?

**Engagement**
- To engage the right people, at the right time, with the most helpful processes, for making decisions.

**Schools and communities shift from communication to engagement**
Communicate to ............... deliberate with
Establish and protect turf to ............... find common ground
Hold public hearings to ............... host community conversations and engage the public

**Potential view of the process:**
- Political controversy
- History of neglect or mistrust
- Equity concerns
- Apathy
- To what extent are stakeholders affected by the decision

**Planning for public participation**
- Gain internal commitment
- Learn from the public
- Select the level of participation
- Define the decision process and participation objectives
- Design the public participation plan
Gain internal commitment
- What is the core problem/opportunity?
- What “publics” are affected?
- What impact will the decision have on them?
- How much do major stakeholders care about this issue and the decision?
- What is the potential for public outrage?
- What degree of participation does the public appear to want?
- What can we accomplish with public exchange that we can’t accomplish without it?

Learn from the public
- What is the core problem/opportunity from your perspective?
- What impact will the decision have on you?
- Who else will be affected?
- What degree of participation do you want?
- What can we accomplish together that we can’t accomplish alone?

Select the level of participation

<table>
<thead>
<tr>
<th>Inform</th>
<th>Consult</th>
<th>Involve</th>
<th>Collaborate</th>
<th>Empower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promise to the public</td>
<td>We shall keep you informed</td>
<td>We shall work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and feedback on how public input influenced the decision.</td>
<td>We shall look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.</td>
<td>We shall implement what you decide</td>
</tr>
</tbody>
</table>

Conversation builds relationships
Relationships build trust
Trust boosts student achievement
Thus need for creating opportunities for more conversation.

The process of conversation
- Set the purpose and parameters of each dialogue
- Create hospitable space
- Explore questions that matter
- Encourage everyone’s contribution
• Cross-pollinate and connect diverse perspectives
• Listen together for patterns, insights
• Harvest and share collective discoveries

**SAQ:** Suppose you are appointed head of an institution and want to start a professional development of your science teachers. What measures will you take to take into confidence your own staff and how will you obtain support of the local community?
Bibliography


- Metiri Group Commissioned by INTEL (2010) *Professional Development: Ensuring a Return on Your Investment*


MODELS OF PROFESSIONAL DEVELOPMENT

Written by: Prof. Khadim Ali Hashmi
Reviewed by: Prof. Dr. Tanveer-Uz-Zaman
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Introduction

Modeling is a highly successful approach to teaching Physics that has spread into Chemistry and is now being developed for Biology. The impetus for the modeling approach was the demonstration in the 1980’s and 1990’s that both traditional and inquiry-based classroom instruction were failing to achieve basic competence in physics principles for most students. At that time, tools were developed by physics education researchers to measure the conceptual understanding of physics students.

Education research indicates that successful learning in science faces two particularly difficult hurdles:

- The first is pre-conceptions and misconceptions that are prevalent in the wider community. It has been shown that shifting such alternate conceptions is remarkably challenging.
- The second is that to learn effectively students need to directly engage and wrestle with the conceptual material, and that is not achieved for most students in a direct instruction environment, nor by increased problem solving practice.

Modeling tackles both hurdles through the use of a guided, constructivist pedagogy. The key to the success of modeling is that it supports students in the acquisition of both conceptual understanding and effective scientific reasoning. The use of models has now spread to most of the educational and training fields. In this Unit we shall consider different models of professional development adopted in Pakistan as well as elsewhere.

Sparks and Loucks-Horsley (1989) suggest five models that are useful for accomplishing the goals of staff development: Individually Guided Development Model, Observation and Assessment Model, Involvement in a Development or Improvement Process (Curriculum Development) Model, Training Model, and Inquiry Model. They have briefly defined these models as follows:

- **Individually Guided Development**: The teacher designs his or her learning activities. An assumption of this model is that individuals are motivated by being able to select their own learning goals and means for accomplishing those goals. A belief that underlies this model is that self-directed development empowers teachers to address their own problems and by so doing, creates a sense of professionalism.

- **Observation and Assessment**: Instructional practices are improved if a colleague or other person observes a teacher's classroom and provides feedback. Having someone else in the classroom to view instruction and provide feedback or reflection also is a powerful way to impact classroom behavior. The person observing acts as another set of "eyes and ears" for the teacher. Observers also learn as they view their colleagues in action.

- **Involvement in a Development or Improvement Process**: Systemic school-improvement processes typically involve assessing current practices and
determining a problem whose solution will improve student outcomes. The solution might include developing curricula, designing programs, or changing classroom practice. New skills or knowledge may be required and can be attained through reading, discussion, observation, training, and experimentation. Consequently, involvement in the improvement process can result in many new skills, attitudes, and behaviors.

- **Training:** A training design includes an expert presenter who selects the objectives, learning activities, and outcomes. The improvement of teachers’ thinking should be a critical outcome of any training program. The most effective training programs include exploration of theory, demonstrations of practice, supervised trial of new skills with feedback on performance, and coaching within the workplace.

- **Inquiry:** Teachers formulate questions about their own practice and pursue answers to those questions. Inquiry involves the identification of a problem, data collection (from the research literature and classroom data), data analysis, and changes in practice followed by the collection of additional data. The inquiry can be done individually or in small groups. This model is built on the belief that the mark of a professional teacher is the ability to take “reflective action.”

**Objectives**

After studying this unit, you will be able to:

- Discuss and describe “Individually Guided Model” and shall be able to develop a Model suitable for their own system of education.
- Describe and develop “Observational/Assessment Models” for Pakistani situation.
- Suggest different ways of involving the teachers in the Curriculum Development process as a mode of professional development.
- Discuss, describe and develop a research design based model of professional development.
- Describe and develop a collaborative partnership model for professional development of teachers.

**6.1 Individually Guided Models**

According to Sparks and Loucks-Horsley (1989) in this Model the teacher designs his or her learning activities. An assumption of this model is that individuals are motivated by being able to select their own learning goals and means for accomplishing those goals. A belief that underlies this model is that self-directed development empowers teachers to address their own problems and by so doing, creates a sense of professionalism.

**Individually Guided** Utilizes “learner-designed” experiences to address professional development needs
- Leading a committee
- Participating in an educational organization
- Reading educational literature
- Using technology skills to gather and assess information

Assumptions:
- Individuals can best judge their own learning needs and are capable of self-direction and self-initiated learning.
- Adults learn most efficiently when they initiate and plan their learning activities.
- Individuals will be most motivated when they select their own learning goals based on their personal assessment of their needs.

Phases of Activity:
- Identification of a need or interest
- Development of a plan to meet the need or interest
- Learning activities
- Assessment of whether the learning meets the identified need or interest.

Limitations:
- May be reinventing the wheel.

SAQ: Discuss and describe “Individually Guided Model” and develop a Model suitable for your own system of education.

6.2 Observational/Assessment Models

In this Model instructional practices are improved if a colleague or other person observes a teacher's classroom and provides feedback. Having someone else in the classroom to view instruction and provide feedback or reflection also is a powerful way to impact classroom behaviour. The person observing acts as another set of “eyes and ears” for the teacher. Observers also learn as they view their colleagues in action.

Observation and Assessment Model Uses colleagues’ input and feedback as well as personal reflection regarding professional practice
- Visiting other schools or classrooms
- Shadowing
- Observing other teachers
- Taking a self-assessment and drawing conclusions
- Participating in peer coaching
- Soliciting feedback from principal or other leader
Assumptions:
- Reflection and analysis are central means of professional development.
- Another observer can enrich reflection on one’s practice.
- Both observer and observe can benefit by the process.

Phases of Activity:
- Pre-conference, observation, data analysis, post-conference, assessment of process.

Limitations:
- Many teachers see it as a form of evaluation

Teachers Observing Teachers: A Professional Development Tool for Every School:
Typically evaluative by nature, teacher observation is usually linked to classroom performance. More and more schools, however, are using observation -- teachers observing teachers -- as a form of professional development that improves teaching practices and student performance. In this article, Education World's Michele Israel talks with experts about the benefits of this emerging professional development strategy. Included: The benefits of learning by observing -- for the teacher, administrator, and school, plus five observation models.

Being observed in the classroom can rattle any teacher's nerves. But, teacher observations that serve as vehicles for professional growth rather than performance evaluations have multiple benefits -- for teachers, administrators, and the school.

More and more, administrators and teachers are viewing peer observation as a form of collaborative professional development. This kind of observation can yield its greatest benefits when used as a means of sharing instructional techniques and ideologies between and among teachers. The intention of teacher-to-teacher observation is that it be a tool for professional development and, in turn, for student learning.

Learning from Colleagues: Teacher observation is one model of professional learning that "is key to supporting a new vision for professional development. The new vision involves teacher teams that meet daily to study standards, plan joint lessons, examine student work, and solve common problems. Team members then apply that learning in the classroom, watching each other teach and providing regular feedback. The most positive benefit of teacher-to-teacher observation is that it makes teaching a public rather than a private act.

A teacher struggling with classroom management can improve his or her skills by observing a peer in a safe and inclusive learning environment. Being observed by the same peer leads to suggestions about how to handle behavior problems, as well as opportunities to share successful teaching approaches with the observer. Teacher observation often has been built into familiar activities, such as mentoring. Being a mentor and observing one’s peers is truly enlightening. Here one can see many different
learning styles and student/teacher interactions. One learns a lot about teaching and what makes for a successful teacher.

**Establishing a Culture:** It is essential to effective use of the "teachers observing teachers" strategies that school administrators enable a culture that nurtures a collegial exchange of ideas and promotes a certain level of trust. That culture is often absent when observation is associated with performance rather than professional growth.

It's a risky thing to have your professional practice scrutinized by colleagues. A teacher needs to have some level of trust in [the observer's] motives, trust that the purpose of the observation is not to make the teacher look bad or to place blame, but to help. Most important to effective teacher observation is that it be student-focused. The emphasis needs to be on how things can be done differently in the classroom to ensure that students succeed academically.

**Extended Professional Development:** Teacher observation should be part of a pool of professional development opportunities. One way in which peer observation can be very effective is when teachers acquire new skills or ideas at conferences and then model those new approaches for their colleagues. That is best done through observation. Learning in the school, is always more effective than through "pull-out" training, such as workshops. Professional development should be job-embedded. That is one of the greatest benefits of teachers observing other teachers.

A solid repertoire of professional learning is focused on student results – standards-based, school-based, and content-specific – and includes training, study groups, action research, and observation. Any program dependent on one delivery mode alone is not likely to produce long-term results.

The professional development that a teacher values depends on what he or she needs at any given time. Generally newcomers report greater value in peer observation than do more experienced teachers.

Easily, peer observation is more valuable than other forms of professional development, if the proper context is created. If done well, it is carried out in a real, practical, immediately relevant situation. Compare that to attending workshops or conferences in which participants remain at a certain level of abstraction from their own classrooms.

There is no one right approach to teacher observation but, teacher observation is most successful when the teacher and observer work together and reflect on the teaching behavior. Teacher observation is least successful when the observer spends hours watching without analysis or dialogue with the teacher. The following sequence of events for effective teachers-observing-teachers programs has been suggested:

- **Overview.** A simple overview of the program with a focus on what the main point of observation will be.
- **Observation.** A short observation sequence.
- **Discussion.** Immediate discussion concerning the observation.
- **Reflection.** Reflection concerning how information from the sequence may be used by the observer.
- **Application.** Application of the behavior by the observer in a classroom with feedback from the teacher.

There is no single approach to teacher observation, but, that it is least successful when a peer observes a struggling teacher who doesn't know how to benefit from the process, especially if the observer isn't adept at identifying his or her colleagues' needs. Teacher observation works best when expectations are clear and participants understand how to use and benefit from the process, she added.

**“Teachers Observing Teachers” Models:** A variety of approaches to teacher observation support professional growth and student achievement. The following are several of those methods:

**Lesson Study:** In this three-pronged approach designed by Japanese educators, teachers collaboratively develop a lesson, observe it being taught to students, and then discuss and refine it.

**Peer Coaching:** In this non-evaluative professional development strategy, educators work together to discuss and share teaching practices, observe each other's classrooms, provide mutual support, and, in the end, enhance teaching to enrich student learning.

**Cognitive Coaching:** Teachers are taught specific skills that involve asking questions so that the teacher observed is given the opportunity to process learning associated with teaching the lesson.

**Critical Friends Group (CFG):** This program provides time and structure in a teacher's schedule for professional growth linked to student learning. Each CFG is composed of eight to 12 teachers and administrators, under the guidance of at least one coach, who meet regularly to develop collaborative skills, reflect on their teaching practices, and look at student work.

**Learning Walk:** The Learning Walk, created by the Institute for Learning at the University of Pittsburgh, is a process that invites participants to visit several classrooms to look at student work and classroom artifacts and to talk with students and teachers. Participants then review what they have learned in the classroom by making factual statements and posing questions about the observations. The end result is that teachers become more reflective about their teaching practices. Professional development is always linked to The Learning Walks.

**Source:**
http://www.educationworld.com/a_admin/admin/admin297.shtml#sthash.WckUBaT8.dpuf
Critical Elements of Teacher Observation as Professional Development

- Ensuring school leaders advocate and support teacher observation as a valid form of professional development
- Building a community of trust among faculty
- Establishing a school-wide commitment to the approach
- Separating observation from the teacher evaluation process
- Declaring the purpose for teacher observation and a commitment to its outcomes
- Inviting teachers to first participate in the process as volunteers
- Allowing time for teachers to observe other teachers
- Organizing scheduled meetings, coaching sessions, and follow-up conversations
- Creating teams that share students
- Selecting specific strategies and skills on which to focus during an observation session
- Instituting a way to measure the impact of observation

Teachers Observing Teachers: Everybody Benefits from the Model

Administrators benefit from:
- the opportunity for reflective dialogue with and among teachers.
- an increased sense of shared responsibility.
- an increased focus on student achievement.
- an increased trust and collegiality among staff.
- participation in a professional and collaborative learning community.
- a cadre of self-reliant, confident teachers who love teaching.
- enriched teacher efficacy
- participation in a professional and collaborative learning community.

Teachers benefit from:
- an opportunity to engage in reflective dialogue about their work.
- the focused classroom support.
- improvement of classroom practices.
- support from an "expert" (peer) who understands the daily demands of the classroom.
- satisfaction with one's work.
- reduced job stress, especially for the new teacher.
- a welcoming atmosphere for new teachers.
- the comfort of knowing that someone is available to help, explain, and assist.

The school benefits from:
- increased collaboration among teachers.
- the establishment of a professional learning community.
- an increased focus on student achievement.
- enthusiasm for the teaching profession.

**SAQ:** Describe and develop “Observational/Assessment Models” for Pakistani situation.

### 6.3 Involvement in Curriculum Development

In this Model Systemic school-improvement processes typically involve assessing current practices and determining a problem whose solution will improve student outcomes. The solution might include developing curricula, designing programs, or changing classroom practice. New skills or knowledge may be required and can be attained through reading, discussion, observation, training, and experimentation. Consequently, involvement in the improvement process can result in many new skills, attitudes, and behaviors.

This type of model embodies: Involvement in Improvement Process Uses discussion, training, and experimentation to acquire new levels of practice:

- Serving as a curriculum writer
- Serving as a cooperating teacher, demonstration teacher, or mentor
- Participating on School Improvement Team
- Serving as a team leader
- Publishing work of staff or team

**Assumptions:**
- Adults learn most effectively when they have a need to know or a problem to solve.
- People working closest to the job best understand what is required to improve their performance.
- Teachers acquire certain knowledge and skills through their involvement in school improvement or curriculum development processes.

**Activities:**
- Identification of a problem or need by an individual or group of teachers.
- After a need has been identified, a response is formulated.
- Plan is implemented or the product developed.

**Limitations:**
- Available time for groups to meet.

Kiehl, M.L. (2008) has described a research study, in which it was investigated how the Laboratory Science Teacher Professional Development Program (LSTPD), a three year professional development model that immerses teachers in learning science content through inquiry, impacts teachers’ learning and classroom practice. It first aimed to analyze teacher learning and pedagogical content knowledge (PCK); second, it examined their views on professional development; and third, whether they anticipate adapting their
practice to include facets of their laboratory experience. Participants were teachers in their second or third year of participation in LSTPD. The study followed a qualitative case study design and made use of in-depth interviews and observations to examine teachers’ knowledge, beliefs, and practice. The study drew on a constructivist framework. Findings demonstrated that teachers’ understanding of content, inquiry, and science as a living enterprise were greatly increased, and that teachers generated goals for practice that echoed their new understandings. Further, teachers articulated how they connected LSTPD to their classrooms, fueling further discussion of the role of PCK in their experience. This study has greater implications for the design of sustained research-based professional development experiences in promoting learning in teachers, and inquiry techniques in classrooms.

Please go through the Ref. 6.3

| 6.3 | Kiehl, M.L. (2008) | **An Examination of Science Teachers’ Learning in a Laboratory-Based Professional Development Program,** D.Ed. Dissertation submitted to the Faculty of the Graduate School of the University of Maryland, College Park. |

SAQ: Suggest different ways of involving the teachers in the Curriculum Development process as a mode of professional development.

### 6.4 Research Design Based/Inquiry Model

In this Model teachers formulate questions about their own practice and pursue answers to those questions. Inquiry involves the identification of a problem, data collection (from the research literature and classroom data), data analysis, and changes in practice followed by the collection of additional data. The inquiry can be done individually or in small groups. This model is built on the belief that the mark of a professional teacher is the ability to take "reflective action."

A research design/Inquiry Model is represented by:

**Inquiry** Identifying problems, collecting data, and making educational modifications
- Collecting and reviewing current educational literature and research
- Analyzing classroom or school-level data
- Conducting action research
- Participating in a study group
- Using videos for analysis
- Using personal reflection logs and journals

**Assumptions:**
- Teachers can formulate valid questions about their own practice and pursue objective answers to those questions.
• Teachers are intelligent, inquiring individuals with legitimate expertise and important experience.
• Teachers are inclined to search for data to answer pressing questions and to reflect on the data to formulate solutions.
• Teachers will develop new understandings as they formulate their own questions and collect their own data to answer them.

Activities:
• Identify a problem
• Explore ways to collect data that may range from examining existing theoretical and research literature to gathering original classroom or school data.
• Analyze and interpret data.
• Make changes and gather and analyze new data.

Limitations:
• Organizational support and/or technical assistance may be required throughout the phases of an inquiry activity.

Scientific inquiry helps students develop critical thinking abilities and enables students to think and construct knowledge like a scientist. A study by M. Sencer ÇORLU and Mehmet Ali ÇORLU (2012) [Ref. 6.4] describes a method course implementation at a teachers college in Turkey. The main goal of the course was to improve research and teaching abilities of prospective physics teachers (N=48) by developing scientific inquiry skills. The impact of the course was measured in two-folds:

(a) The results obtained from pre- and post-course scientific inquiry self-evaluations of student teachers, which showed a statistically significant improvement, and
(b) Independently measured scientific inquiry levels, which were found highly correlated with student grades from practical courses.

Qualitative data indicated that the student teachers were having difficulties in applying mathematical formula into physics applications.

Please read Ref. 6.4 now and develop your own proposal for such a study.


**SAQ:** Discuss how research can be employed for professional development and suggest how this model can be profitably used in your own context. Develop a research study for the model in your own context.
6.5 Collaborative Partnership / Training Model

In this Model training design includes an expert presenter who selects the objectives, learning activities, and outcomes. The improvement of teachers' thinking should be a critical outcome of any training program. The most effective training programs include exploration of theory, demonstrations of practice, supervised trial of new skills with feedback on performance, and coaching within the workplace.

A Training Model has the following parameters:

**Training** Participating in structured training programs focused on specific topics or areas for improvement

- Engaging in school-based professional development program
- Attending professional conferences
- Enrolling in university or in-service course work
- Participating in summer institutes
- Completing on-line course work
- Participating in the design of job-embedded modules

**Assumptions:**

- Behaviors and techniques exist that are worthy of replication by teachers in their classrooms.
- Teachers can change their behaviors and learn to replicate behaviors in their classroom that were not previously in their practice.

**Activities:**

- Participants serve on planning teams that assess needs, explore various research-based approaches, select content, determine goals and objectives, schedule training sessions, and monitor implementation of the program.

**Limitations:**

- Impact depends upon the objectives and the quality of the training program.

A *Collaborative Partnership Model* has been described in Ref. 6.5.1. (Jones, M.M. (2008))

Jones proposes a collaborative partnership between practicing and pre-service teachers as a model for implementing science teacher education and professional development. This model provides a structure within which partnerships will work collaboratively to plan, implement and reflect on a series of Science lessons in cycles of action reflection adapted from Korthagen’s (2001) ALACT model. Issues within Science education, teacher professional development and teacher education are considered in the development of the model which attempts to deepen constructivist approaches to teachers’ professional learning. It attempts to address issues with teacher professional development in the
science area and improve professional experience practice for pre-service teachers. The nexus between theory and practice is the focus of the model which hopes to inform both teacher education and professional development for science teachers in the primary sector.

|---|---|

An example of Collaborative Partnership is described in Van Hook, S. J., et al (2009), Ref. 6.5.2, in which PRISM program is studied in which K-12 science and mathematics graduate teachers served as Scientists or Mathematicians-in-Residence in the teachers’ classrooms. The teachers and graduate students participated in a Summer Inquiry Institute during which they learned about inquiry-based instruction, and then collaborated to develop and co-teach content-rich, inquiry-based instruction in the teachers’ classrooms for one academic year. In the first three years of the program, 27 teachers and 18 graduate students participated. The research study examined how participation in PRISM influenced the teachers’ and graduate students’ conceptions of inquiry, explored what they learned about inquiry by implementing inquiry together in the classroom, and studied the role that their collaboration played in the development of their conceptions of inquiry. Conceptions and use of inquiry were examined through surveys, online journals, interviews and classroom observations. The results indicate that the teachers and graduate students deepened and expanded their understanding of inquiry. Particular themes emerged related to what the teachers and graduate students learned about inquiry through the act of teaching via inquiry were

(a) inquiry engages students’ minds not just their hands,
(b) discussion is essential for student learning, and
(c) teachers need to help develop a classroom culture conducive to inquiry in order for students to be successful with inquiry-based learning.

This research indicates that teacher-scientist/mathematician partnerships can be beneficial to both parties when structured within a long-term professional development program that immerses the participants in the inquiry process and provides ongoing support.

Now please read Ref. 6.5.2.

Reference 6.5.3 has discussed a web-based teachers professional development system used in Malaysia. This may now be read.


**SAQ:** Describe Collaborative Partnership Model for professional development of teachers and develop a Collaborative Partnership model for Pakistani situation.
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Unit–7

APPROACHES TO PROFESSIONAL DEVELOPMENT – I

Written by: Prof. Khadim Ali Hashmi
Reviewed by: Prof. Dr. Tanveer-Uz-Zaman
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Introduction

Mentoring is most often defined as a professional relationship in which an experienced person (the mentor) assists another (the mentee) in developing specific skills and knowledge that will enhance the less-experienced person’s professional and personal growth. It is a relationship in which one person provides education, guidance, support and insight to another person. In the business world, many companies pair seasoned employees with new or younger employees to help them adjust to the corporate culture and develop as an asset to the organization. Not everyone is meant to be a mentor, however.

In this Unit, mentoring and reflection, strategies for mentoring and reflection, role of mentor, role of mentee, methods of mentoring, issues involved in mentoring and portfolio approach to science professional development have been discussed.

Objectives

- After studying this unit, you will be able to:
- Define and describe mentoring and reflection as approaches to professional development;
- Describe mentoring and reflection strategies as applied to professional development of science teachers;
- Describe and discuss role of the mentor in professional development programmes;
- Describe and discuss role of the mentee in professional development programmes;
- Describe methods of mentoring and develop methods for their own situation;
- Describe issues involved in mentoring as an approach to professional development of science teachers;
- Discuss and describe ‘portfolio approach’ to science professional development with particular reference to:
  a. Purpose and context of portfolios;
  b. Models of portfolios;
  c. Use of portfolios in teacher enhancement – case study.

7.1 Mentoring and Reflection

Mentoring: Every person benefits from a mentor during her life. The term "mentor" was originally the name of an old friend of Ulysses' in "The Odyssey." Athena, goddess of wisdom, disguises herself as Mentor when she urges Ulysses' son Telemachus to go search for his lost father. The term "mentor" thus took on the meaning of one who provides wisdom and leadership to someone less experienced.

Unlike teachers or advisors, mentors often share a personal relationship with their students. This type of tutelage is usually a mutual agreement in which the mentor will
offer to teach their apprentice what they know and answer any questions they might have along the way. Tips, advice and personal experiences are also provided by mentors to help their pupil hone his or her skills. However, unlike a teacher, the role of a mentor doesn’t always end. Even after the student has excelled in his pursuits, the mentor will often remain in his life as a counselor.

A mentor doesn’t necessarily require any formal education. That depends solely on what it is he is mentoring about. For example, if veterinary student has a mentor who advises him/her in veterinary training, chances are he is a certified veterinarian. But if a painter takes a young artist under his wing, he too is a mentor even if he lacks a degree in art. That is because the key to being a mentor doesn’t lie specifically in academics. Instead, it’s the possession of both knowledge and experience in the field a mentor is admired for that makes him credible.

The traits of a mentor include wisdom, knowledge, experience, amiability and the patience to nurture a newcomer into becoming a professional. Mentors are familiar enough to where their pupils feels comfortable sharing questions as well as any uncertainties, fears or issues they may have along the way. Also, because of their teaching role, mentors must have strong communication skills that allow them to break down elements of their expertise so that the people seeking their advice can understand it.

The significance of mentors is monumental. Some of the greatest professionals in the world got where they are today through the guidance of those they consider teachers and mentors. Even when novices become leaders, they often still seek their counsel due to the personal relationship and level of trust that are created through such bonds.

The following are among the mentor’s roles:

- Teaches the mentee about a specific issue
- Coaches the mentee on a particular skill
- Facilitates the mentee’s growth by sharing resources and networks
- Challenges the mentee to move beyond his or her comfort zone
- Creates a safe learning environment for taking risks
- Focuses on the mentee’s total development

Ref. 7.1 describes “mentoring” for the beginning teachers. This may please be read now.

Please read reference 7.1.1 and see the accompanying video of the experiences of the Merck Organization in mentoring women for their preparation for executive openings in the said organization. In this reference, experiences of an organization in mentoring and successfully conducting professional development activities and using mentors from different organizations have been described particularly for female participants.


**SAQ:** Examine critically discuss the contents of the Ref. 7.1.1. Keeping in view the experiences of Merck, develop a mentoring programme for the teachers of your own institution/department.

**Reflection:** Reflective practice utilises a dynamic thought process. It is more than merely consulting with oneself. Schon's (1983, 1987) work has been highly influential regarding reflective practice and he developed a ground of knowledge based on observations of practitioners at work. From the basis of the assumption that practitioners knew more than they could say, Schon distinguishes between the "hard" knowledge defined in universities from the "soft" knowledge necessary for professional practice.

Good practice entails practitioners selecting from all theoretical perspectives they have access to and choosing the one, or aspects of the one, most suitable to the particular case they are confronted with. The rejection of theories not applicable to this particular situation must also form part of this process.

Benner (1984) discusses personal qualities that are implicit in the reflective practitioner. She talks about a tactful person, one who overcomes the apparently natural tendency of seeing oneself at the centre of all things. This is neither good nor bad, it just is, but it is only when one can enter the subjective experience of another that one can be tactful. Tactfulness is a form of practical intelligence.

Dewey (1933) considers the attributes of a reflective practitioner. His terminology includes:

- open-mindedness, where the individual actively listens to more than one side.
- makes use of and takes account of facts from a wide source.
- gives the situation their full attention and explores possible alternatives, will acknowledge the possibility of errors even in their own dearest held beliefs
- is willing to question and challenge.

He goes on to discuss responsibility, in that the reflective practitioner is willing to accept responsibility for his/her own decisions and actions. These will include being open to a
variety of ideas, having a desire to think about and synthesize ideas, make sense of nonsense and ask why you are doing what you are doing.

(Tzemin Chung, et al., 2006) have defined reflection and suggested four steps of reflection (Priming, Guiding, Momentum, and Termination) as follows:

Reflection is a process of making sense of ideas and concepts in relation to our existing knowledge structure and our feeling (Smith, 2001). When a student talks to a peer, a teacher, writes a report, or creates a portfolio, he “allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique” (Schon, 1983, p. 68). Smith further explains that reflection is an evaluation process to help verify if current practice is effective and if not, how to adapt and modify it. Reflection is a pedagogically sound cognitive tool where it leads to insight in informing us of our design and planning (Russell, 2002). Kimball (2005) points out succinctly the important role played by reflection in portfolios: it “undergrids the entire pedagogy of portfolios” (p. 451). However, if reflection does not encourage a dialogue that includes reasoning and judgment about knowledge, it is unlikely to lead to in-depth learning. Meaningful dialogues can only take place when they are guided by a mentor within a community of practice (CoP) (Lipman, 1991). In such educational or Vygotskian-like inquiries, social interaction or cooperative learning is key. Dialogues that encourage exploration are more likely to lead to deep learning. As a community explores, it evolves. Ideas and activities that are meaningful to the community become its culture and will be available for integrating into its member’s perspective (Cook, 2002). The traditional stages of reflection are self-awareness, description, critical analysis, synthesis, and evaluation. This is the cognitive model of learning by reflection. We are interested, however, in the active process of reflection, i.e., in how a mentor can intervene to assist in healthy and effective reflection. We propose that reflection can be broken down into 4 steps: Priming, Guiding, Momentum, and Termination

1.1 Step 1 Priming
Priming is the process which gets a user to start reflection in any form.

1.2 Step 2 Guidance
Making reflective statements can become meaningless if it is not based on reflective thinking. Reflective thinking is a complex and difficult process that requires careful mentoring. Students are unlikely to reflect successfully without considerable guidance (Kimball, 2005). Guidance occurs during the process of reflection when the mentor intervenes to help guide the user. Furthermore, guidance need not come from the mentor. It can be from a peer who has performed the same task, or from an automatic model (Lipman, 2003). The reflection process should be recursive (Kimball, 2005). A reflection triggers prompting of the next till a certain condition, such as completion of an

---

artifact or readiness to move on, is met. In order to achieve knowledge integration, reflection prompts should take the form of self-monitoring prompts such as reflecting on the areas that are confusing, or difficult, areas that needed to be improved on, and plan for future learning activities. Activities prompts that remind learners to perform certain activities during the inquiry process such as to make sure certain articles are read, are less effective (Davis, 2000). Both types of prompts have their roles to play and they complement each other. First, to check for completeness, self-monitoring and activities prompts are needed. Second, to prompt for future growth, self-monitoring prompts that focus on planning are essential. Reflection, therefore, can take two forms: First, completeness, you want to make sure an artifact is well covered, or, it has more or less met its goal; second, growth, which refers to advancing from the current artifact to a higher-order artifact.

1.2 Step 3 Momentum
Once a user starts reflection, how do you get him to continue the effort to ensure he gets good benefit out of it? A mentor needs to ensure that the user spend sufficient time and effort to achieve self-improvement. Students should have the flexibility to include their reflection at any developmental stage of their portfolio and be able to link from an artifact the portfolio proper. To keep the momentum going, the mentor can leverage on the community dialog. Methods such as getting the students to put up meaningful questions for the group to look for answers, give recognition to those whose questions are discussed, ask follow up questions, include everyone in the activities unless there is adequate justification, forge friendship and bonds, encourage consideration of alternatives based on evidence, and build on each other’s ideas (Lipman, 2003). These activities can help the student to achieve two types of improvement: first, extrinsically, the student performs well in class; second, intrinsically, the student finds inner satisfaction in the newly acquired skill or knowledge. With continual feedback, encouragement, and challenges pitched at the level of the student (Bailin, Case, Coombs, & Daniels, 1999) during these activities, the learners are likely to participate and reflect enthusiastically. In the study of a Mexican learning community, the researchers found that when children learn in a community which promotes modeling and guidance, dialogues, exploratory activities, and metacognitive reflection, the children will participate eagerly (Rojas-Drummond, Fernandez, Gomez, Marquez, Martinez, & Velez, n.d.).

1.2 Step 4 Termination
It is when they have done enough and should move on to higher-order learning. Lipman (2003) describes this stage as achieving “reflective equilibrium”. It is when all the follow up questions, or reflective prompts, for that level have been exhausted; when one can apply the acquired knowledge to exercise sound judgment and has the “capacity to listen to or be open to reason” (p. 97).

Details of Reflection may please be read in Ref. 7.1.2.

| 7.1.2 | University of Stirling (n.d.) | School of Nursing, Midwifery and Health Mentor Programme - Reflection |
In a study by (Ref. 7.1.3), the researcher studied the reflections of PhD candidates about the guidance of their supervisors during their doctoral studies. This study is an example of reflective thinking by the mentees after the mentoring (supervision) process.

In this study, it was aimed to analyze supervisor-student relationship in the doctoral education based on views of students. For this reason, research assistants having completed doctoral education and got PhD title were asked what the contributions of their supervisors were and what kind of problems they experienced in doctoral education. Considering academic advising process, it was intended to shed a light on both formal and information sides of supervisor-student relationship. As a design of the study, qualitative case study method was used. In the light of the aim of the study, “semi-structured data collection form”, one of the qualitative data collection tools, was used to collect the data. The data gained from 19 research assistants having completed their PhD degrees in the past 36 months were analyzed with content analysis. The past/ongoing contribution of supervisors to their students’ education were classified under the themes of contribution to their personal development, contribution to academic development, contribution to professional development, and contribution to intellectual development. The students, being in intimate relationship with their supervisors, emphasize positive contributions of supervisors. However, the students, not being in an intimate relationship, underline the negative characteristics of their supervisors. Few of the participants utter ongoing contribution of supervisors. This study analyzes dimensions for the contribution of supervisors to students in doctoral education, and the experiences of students in these dimensions. In this regard, academicians who are supervisors or will be supervisors are expected to benefit from the study.

Now please read Ref. 7.1.3.

| 7.1.3 | Kazim Celik (2013). | The Contribution of Supervisors to Doctoral Students in Doctoral Education: A Qualitative Study; Creative Education. Vol.4, No.1, 9-17 Published Online January 2013 in SciRes (http://www.scirp.org/journal/ce) |

SAQ: Write a brief note on “Reflection” as used in the context of mentoring.

### 7.2 Mentoring and Reflection Strategies

Ref.7.2.1 has listed the following strategies for Mentoring of initial teacher education participants:

**Strategies for Mentoring**

- Provide regular oral and written evaluation of teaching performance. (View evaluation information and forms on mYlink.)
- Present demonstration lessons using varied teaching strategies and discuss them with the student teacher.
• Review all lesson plans and provide appropriate feedback.
• Provide the student teacher with opportunities to prepare and develop original teaching plans using a variety of strategies and materials.
• Plan with the student teacher for effective assessment of learning.
• Guide the student teacher in planning assignments and homework that provide appropriate challenges for students in the class.
• Assist the student teacher in accommodating students with special needs.
• Guide the student teacher in using and caring for school equipment and materials.
• Provide feedback on the student teacher's classroom presence: e.g., movement throughout the classroom, effective voice and expression, appropriate professional appearance, etc.

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<tr>
<th>7.2.1</th>
<th>David O. McKay School of Education (2015)</th>
<th>Guidelines for Effective mentoring; from the net.</th>
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</thead>
</table>

Strategies for reflective thinking in monitoring: Educational Leadership (Ref. 7.2.2) lists following strategies for reflection:

To foster higher levels of reflection, encourage teachers to ask themselves questions about their classroom practice. Prompts like the following promote frequent reflection:

- What worked in this lesson? How do I know?
- What would I do the same or differently if I could reteach this lesson? Why?
- What root cause might be prompting or perpetuating this student behavior?
- What do I believe about how students learn? How does this belief influence my instruction?
- What data do I need to make an informed decision about this problem?
- Is this the most efficient way to accomplish this task?

Now please read the ref. 7.2.2

|-------|--------------------------|--------------------------------------------------------------------------------|

**SAQ:** Mentoring and reflection strategies may be identified from the references 7.2.1 and 7.2.2, and from your own experiences of professional development activities.
7.3 Role of Mentor

Mentor teachers are increasingly sought to provide more effective school-based support for beginning teachers.

Successful mentorship depends upon clarity of participant roles and responsibilities. Successful programs have shown that mentors should

- continue to teach while serving as mentors,
- understand the typical needs and challenges of the beginning teacher,
- develop and use a variety of strategies to assist the beginning teacher,
- prepare themselves for effective one-on-one consultation with individual teachers,
- initially focus their efforts in areas known to be difficult for novice teachers,
- make the accumulated wisdom of other experienced teachers accessible to beginning teachers, and
- develop strategies for giving acceptance and support for the beginning teacher within the school context.

Stan Koki has listed the following qualities of teacher mentors:

Hawai’i’s experience with mentoring has identified the following essential qualities of mentor teachers:

1. A range of interpersonal skills to fit a variety of professional encounters and situations.
2. Good working knowledge of a repertoire of teaching methods, alternative modalities of learning, and styles of teaching and learning that affect student achievement.
3. Ability to use coaching processes that foster increased self-direction and self-responsibility of the beginning teacher.
4. Effective communication skills that facilitate the growth of the new employee and accommodate the employee’s emotional, social and cognitive needs.
5. Understanding the stages of teacher development within the context of how adults learn.

AMTA (2015) have listed the following four phases of the roles and responsibilities of mentors:

**Phase 1: Identifying Roles**
- Have a clear understanding of why you want to be mentored
- Select a Mentor based on criteria relevant to your goals

**Phase 2: Communicating Expectations**
- Have a clear understanding of your expectations for your mentor
- Clearly communicate those expectations
- Stay flexible in changing expectations or plans
- Create goals with milestones and deliverables
- Inform your mentor about your preferred learning style
- Be realistic about setting timelines

**Phase 3: Working Together**
- Listen and contribute to the conversation
- Understand that your mentor will not have all the answers
- Accept constructive feedback
- Set time aside for self-reflection
- Evaluate progress
- Celebrate success
- Be consistent and reliable

**Phase 4: Meeting All of the Goals**
- Provide your mentor with updates after the mentoring is completed
- Provide an evaluation of the experience
- Say thank you
- Give back to the profession and volunteer to become an AMTA mentor

<table>
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<tr>
<th>7.3.1</th>
<th>Stan Koki (n.d.)</th>
<th>The Role of Teacher Mentoring in Educational Reform; Pacific Resources for Education and Learning</th>
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</thead>
</table>

### 7.4 Role of Mentee

Mentees’ role has also been specified by different authors, some of these are given here:
The role of the protégé (Mentee) is complex. As a beginning teacher, the protégé is a qualified professional as is the mentor. The difference lies in the repertoire of teaching and management strategies that the experienced, veteran teacher possesses.

Just as the role of the mentor is based on a number of understandings, the role of the mentee is based on some key principles.

For the most part protégés (mentees) still have much to learn about putting their knowledge to work;
- develop their own teaching styles over time;
- develop active listening and consultation skills;
- are committed to an ethos of collegial reflective practice;
- develop observation and analytic strategies to enhance their teaching effectiveness;
- provide guidance, support and assistance in analyzing teaching that enhances their own teaching effectiveness; and
- move through well-delineated stages of development from day-to-day survival to concerns about managing responsibilities to concerns about the impact of their teaching to raising questions about their profession

AMTA have listed the following phases of mentee roles (Ref. 7.4):

**Phase 1: Identifying Roles**
- Have a clear understanding of why you want to be mentored
- Select a Mentor based on criteria relevant to your goals

**Phase 2: Communicating Expectations**
- Have a clear understanding of your expectations for your mentor
- Clearly communicate those expectations
- Stay flexible in changing expectations or plans
- Create goals with milestones and deliverables
- Inform your mentor about your preferred learning style
- Be realistic about setting timelines

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- Be consistent and reliable

**Phase 4: Meeting All of the Goals**
- Provide your mentor with updates after the mentoring is completed
- Provide an evaluation of the experience
- Say thank you
- Give back to the profession and volunteer to become an AMTA mentor

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**SAQ:** Develop a list of the roles of mentors and mentees from these sources and your experiences of professional development activities in Pakistan.
7.5 Methods of Mentoring

E. Wayne Hart has given the following seven key tasks for the mentor to perform (Ref. 7.5)

*Develop and manage the mentoring relationship.* Initially, this involves assessing your own readiness and interest, selecting someone to mentor and getting to know each other. Over time, it means working to build trust, set goals and keep the mentoring relationship on track.

- **Sponsor:** Opening doors and advocating for your mentee can allow her to develop new skills and gain meaningful visibility. You can create and seek new opportunities for her and connect her with people in your network.

- **Survey the environment:** Mentors keep a watchful eye on the horizon, looking for both threatening organizational forces and positive opportunities. You want to be on the lookout for include rumors, people taking an adversarial position relative to the mentee, shortcuts through the system, low-visibility or no-win assignments and high-visibility or win-win assignments.

- **Guide and counsel:** You may serve as a confidant, sounding-board and personal advisor to your mentee, especially as the relationship grows deeper over time. You may help your mentee understand conflict or explore ways to deal with problems, for example. You also can warn your mentee about behavior that is a poor fit with organizational culture.

- **Teach:** Many mentors enjoy the teaching aspects of mentoring, which mean not only imparting their knowledge but also sharing their experiences and recommending assignments.

- **Mode:** Just while observing you mentees pick up many things: ethics, values and standards; style, beliefs and attitudes; methods and procedures. They are likely to follow your lead, adapt your approach to their own style, and build confidence through their affiliation with you. As a mentor, you need to be keenly aware of your own behavior.

- **Motivate and inspire:** Mentors support, validate and encourage their mentees. When you help your mentees link their own goals, values and emotions to the larger organizational agenda, they become more engaged in their work and in their own development.

You will not do all seven of these things all the time. Each mentoring situation is different, and you’ll need to shift your role depending on the person and their goals. For example, if you’re mentoring an up-and-coming project manager who will be moving on to another assignment soon, your focus may stay on her near-term challenges and preparation for the next step. Another mentee may be need help navigating the organization and building his career, so sponsoring and protecting may be your focus.

Always remember that mentoring is a shared job. You aren’t solely responsible for creating a successful mentoring relationship. The person being mentored needs to be flexible, honest, open and receptive to feedback and insight. He or she needs to be willing and able to take action in pursuit of goals, to invest in learning and to take steps toward
needed change. The mentee also needs to be willing to give you feedback and talk about what is or isn’t working well in the relationship.

As you work together, you’ll make course corrections, the relationship will deepen, and you’ll discover that being a mentor is no longer an unnecessary, expendable task. Instead it will be a rewarding one for you that has a profound impact on others.

| 7.5.1 | E. Wayne Hart (2010) | Seven Ways To Be An Effective Mentor; www.forbes.com/…010/06/30/mentor-coach-executive... |

SAQ: Develop a strategy for a programme for mentoring, using the methods listed in Ref. 7.5 as well as your own experience of professional development of teachers.

### 7.6 Issues Involved in Mentoring

Mentoring relationships do not always succeed. Some of the most frequent problems with mentoring relationships include:

*Mismatch* between Mentor and Mentees: A mismatch between the mentor and the mentee can be a cause of failure in the relationship. One or both members of the relationship may feel uneasy with the other, or they may not be able to achieve the level of friendship necessary for rich communication. Under such circumstances it may be necessary to assign the young entrepreneur to a different mentor. If the problem is identified during the first six months of the relationship the change can usually be made in an amicable way with no hard feelings on either side.

Unrealistic Expectations: Problems in the relationship can also occur if the mentee expects or demands too much from the mentor. It is important, therefore, that expectations are clearly-defined from the beginning. The mentee should not expect the relationship to meet every need, nor for it to continue indefinitely.

Breaches of Confidentiality: In order to develop the type of relationship in which the mentor can be effective, he or she must first be perceived as trustworthy and able to keep confidences.

Since both parties in a mentoring relationship typically realize and accept the fact that a high level of trust is essential in order for an effective relationship to develop, there is little evidence of breaches of confidentiality. However, codes of conduct regarding the confidential nature of the relationship should be clearly defined and understood by both parties at the beginning of every mentoring relationship.

Ref. 7.6 is report of a symposium that discusses in detail different aspects of problems encountered in mentoring programmes. This reference may now be read.
SAQ: Based upon the reference above and your own experience with PD in Pakistan, write a note on issues involved in mentoring programmes.

7.7 Portfolio Approach to Science Professional Development

Babar Khan and Salima Begum (2012) have discussed portfolio in the Pakistani setting in these words:

This study focused on the role of portfolios for professional learning of the course participants in a module of master programme in a private university. The study was conducted using the qualitative mode of research and was carried out at private sector university of Pakistan with six course participants from different contexts and three faculty members. Interviews and portfolios of six course participants were the major source of data. As a result of qualitative data analysis, the study has generated some findings related to the role of portfolios as a professional development/learning tool for teachers. One of the significant roles was documentation of teachers’ learning over a period of time, which is generally not documented by the teachers. The process leads the teachers to continuous reflection on their beliefs and practices. This continuous reflection provides opportunities for teachers to learn from their own experiences and construct their knowledge and understanding.

They portfolio in these words: The portfolio is a very strong source of learning because it enables teachers to record and reflect on their learning as evidence. (Retallick & Groundwater-Smith 1999). The portfolio is a form of reflection but it is a systematic and organized way of reflection. Portfolio development is not a sudden activity, it is a regular and continuous process and it prompts teachers to reflect on their practices (Seldin 1991 & Winsor 1998). Portfolio creates opportunities for teachers to learn from their own practices.

7.7.1 Purpose and Context of Portfolios

The purpose and context of portfolio is described in the study Ref. 7.7, pp. 367-72, which may please be read now.
7.7.2 Models of Portfolios
Katherine Hsu and Dr. Sheila Ford (July 2, 2012) in a PORTFOLIO, have stated purpose of the portfolio as to integrate a variety of teaching models that have been presented in our class in the form of lesson plans. The objective of their Portfolio being: The objective of this portfolio is to provide teaching models to a variety of lessons that can be used in the classroom for meaningful student learning. I believe this portfolio will show how different models can be used to reach the goal of dynamic and meaningful student learning. This portfolio includes the following models:

Adjectives and Verbs (Inductive Model), Can You Guess My Concept? (Concept Attainment Model), Seasons (Picture-Word Inductive Model), How Do Magnets Work? (Scientific Inquiry Model), Cardinal Directions (Memorization Model), Making Good Choices (Non-directive Model), The Life of a Water Droplet (Synectics), Story Elements (Advance Organizer Model), Geometric Shapes (Group Investigation), and CHAMPS (Role playing). (Ref. 7.7.1)

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<tr>
<th>7.7.1</th>
<th>Models of Teaching Portfolio</th>
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<tr>
<td>Katherine Hsu and Dr. Sheila Ford (July 2, 2012)</td>
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</table>

SAQ: Describe what types of models can be used in a portfolio for PD of science and mathematics teachers in Pakistan.

7.7.3 Use of Portfolios in Teacher Enhancement – Case Study
Loucks-Horsley, et al (2003, pp. 168-177) have listed following key elements for Case discussion:
- Case materials present a focused picture of a specific aspect of teaching or learning;
- Case materials illustrate theory in practice;
- Case materials provide images of reform-oriented mathematics and science teaching and learning;
- Teachers interact and learn through discussions;
- Cases are facilitated by a knowledgeable and experienced facilitator who promotes reflection by case discussants;
- Case discussions necessarily involve effective group dynamics; and
- The cases are relevant and recognizable (pp. 171-73).
Please read Ref. 7.3.1:

|----------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**SAQ:** Develop a portfolio for an in-service professional activity in which you participated. Give case studies of some of the participants. Discuss the merits and limitations of this method in Professional Development of Science and Mathematics Teachers in your own context.
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Unit–8

APPROACHES TO PROFESSIONAL DEVELOPMENT – II

Written by: Prof. Khadim Ali Hashmi
Reviewed by: Prof. Dr. Tanveer-Uz-Zaman

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Introduction

Professional Development is a supportive activity aimed to help improve individuals professionally strong. At the heart of good practice for guides providing this service must be the notion that participants in the PDP process should be taking an active part in making decisions. In this unit we shall continue with the ‘approaches to professional development’ started in the previous unit No. 7. Here we shall take into consideration Case Study method of teacher enhancement and shall develop strategies for employing case study methods in preparing science teachers. We shall next move on to work-based learning as applied to the professional development of science teachers and the mini-sabbatical method of professional growth of science teachers. Our next approach to professional development would be examining the teaching and learning techniques. Another approach in this respect will be that of Workshop. Finally we shall consider the methodology of ‘teachers training teachers’ for the professional development.

Objectives

After studying this unit, you will be able to:

- Describe and develop case study method of teacher enhancement;
- Employ Case Study Based Pedagogy to Science Teacher Preparation
- Describe and develop Work-Based Learning approaches for professional
- Describe and discuss pros and cons of the Mini-Sabbatical approach for Professional Development of science teachers.
- Develop approaches of examining teaching and learning for professional development;
- Describe and develop workshop approach for professional development of science teachers
- Discuss an approach in which teachers train teachers.
8.1 Case Study Method of Teacher Enhancement

A Case Study is defined as “An intensive description and analysis of a single individual or (sometimes) group.” The Holy Quran uses CASE HISTORIES of the ancient nations and of His Messengers who were sent to guide the people of these nations. These CASE HISTORIES were narrated to reform the believers and to show them the right path. In a way, the Holy Quran has used Case Study method for instruction of the people whom it addresses.

As a distinct approach to research, use of the case study originated only in the early 20th century. The Oxford English Dictionary traces the phrase case study or case-study back as far as 1934, after the establishment of the concept of a case history in medicine. The use of case studies for the creation of new theory in social sciences has been further developed by the sociologists Barney Glaser and Anselm Strauss who presented their research method, Grounded theory, in 1967. The popularity of case studies in testing hypotheses has developed only in recent decades. One of the areas in which case studies have been gaining popularity is education and in particular educational evaluation. Case studies have also been used as a teaching method and as part of professional development, especially in business and legal education.

Case Studies are stories with an educational message. They have been used as parables and cautionary tales for centuries, yet their formal use in the science classroom is recent. So recent, in fact, that until the early 1990s the case study literature in science was virtually non-existent. This has begun to change as more and more faculty are realizing the inadequacies of the lecture method and are seeking novel methods of instruction. Enter the case study, a method imported from business, law, and medical schools.

A student reading a retrospective case study is not directly involved in the events in question. That is, he is an impartial observer who benefits from knowledge that was not available to people involved in the actual event. (This is why retrospective cases are also known as ‘descriptive cases’ and ‘evaluative cases’.) A student working through a decision-forcing case, however, places himself inside the story, taking on the role of the actual person who was faced with a particular problem at a particular point in space and time. Like that protagonist, the student involved in a decision-forcing case does not know the outcome of the events in question and, in particular, whether or not the solution he chooses will work. Because decision-forcing cases put students in the role of a decision-maker who is looking forward towards an unavoidably uncertain future, they are sometimes called ‘prospective cases’.

It may be considered as one form of problem-based learning. The most common form of case study is a narrative of an actual event or situation in which learners and teachers examine, discuss and propose solutions to a realistic problem situation. Good case studies have several attributes. They are usually open-ended, that is, there are multiple possible solutions with no single "right answer". They tell a story and report the facts just as a news reporter should, that is, without interjecting bias and opinions into the story. Cases
should seize learners’ attention from the start with a situation that is realistic and compelling, since learners need to become immersed in the story. It is also important not to complicate the case with a myriad of information and details. Length must be tailored to the time available, and the complexity of cases should be matched to the learners’ sophistication.

The case study method is based on focused stories rooted in reality providing contextual information such as background, characters, setting, and enough specific details to provide some guidance. Cases can be used to illustrate, remediate, and practice critical thinking, teamwork, research, and communication skills (for instance, Socratic cross-examination, directed discussion, debates, public hearings, research teams, term papers, dialogue paper). There were identified two broad categories of case studies:

**Open or Closed**: Open cases are left to one’s interpretation and may have multiple correct or valid answers depending on the rationale and facts presented in the case analysis. Closed cases have specific, correct answers or processes that must be followed in order to arrive at the correct analysis.

**Analysis or Dilemma**: Analysis Cases (Issues Cases) are a general account of “what happened”. Dilemma Cases (Decision Cases) require students to make a decision or take action given certain information.

These two categories are helpful in planning and writing cases but obviously, there is some overlap. Case studies are written in a way that can be both an open and dilemma case, or a closed and analysis case, and so on.

The methodological definition – the “case” is a description of a real situation, it is a small part of a real life. These cases which have really happened in this or that field of activity are described by authors to provoke discussion in an educational audience, “to push” learners to discussion and the situation analysis in order to find the most acceptable decision.

**Purposes of case method of teaching**

The case method of teaching can have several important purposes:

- A central purpose is to foster analytic or critical thinking, which will also develop learners’ confidence and skill in dealing successfully with unanticipated issues under practical constraints.
- Another key purpose is to transfer much of the responsibility for learning from the teacher to the learner, whose role shifts from passive absorption to active construction of meaning. The teacher challenges learners to be prepared to discuss various aspects of the material, to set priorities for learning and to acquire information as it is needed to deal with the problem at hand.
- Cases help learners study higher-level concepts and their application to practical situations.
They emphasize synergistic collaborative learning, in which the group product exceeds the sum of learners’ individual contributions because it results partly from the interaction among them.

**The following are main requirements of a case:**

1. The case should describe the situation fully. It must clearly indicate the person (“worker”) handling the problem and should focus upon this person’s actions throughout.
2. The situation should be one in which the learners can fairly easily identify i.e. similar to one in which they have been involved, or looking to possible involvement.
3. The description should be clear. It should convey the main issues involved and the overall atmosphere of the incidents so that the learners can make a judgment.
4. It should describe clearly how the situation was handled and with what outcome. However, it should not in any way imply criticism of the person or actions as it discourages identification by those studying the case.

The case study approach encourages person-oriented learning and allows the instructor to serve as a facilitator. Learners frame and identify problems and continually identify and test hypotheses. These questions form the basis for learning issues students will study independently between sessions. It takes an alert and actively involved instructor to facilitate and to be the necessary guide for the group.

The analysis of case studies may be among the most challenging assignments given to a learner. Cases are not just "busy work" given to fill up a learner's time. Approached properly, case analysis can be extremely beneficial in preparing learners for a career by giving them a chance to develop decision-making skills in the classroom so that they will be better prepared to meet the challenges of after-graduation job.

By preparing solutions to cases studies, a learner will be exposed to a variety of roles and situations. The decision-making skills will be enhanced as learners sift through large volumes of information to identify problems, determine corporate goals, define relevant alternatives, and develop plans to implement decisions. Learner will hone ability to apply analytical tools in true-to-life situations. By preparing reports, they will learn how to express themselves succinctly, both orally and in writing. Learners will also develop the ability to defend the logic of analysis and conclusions. Case studies are extremely rich in content and can provide the learner with the potential to consolidate already acquired knowledge and train specific language skills.

In Ref. 8.1 Grossman (1994) has discussed the use of case study method for encouraging critical thinking and cooperative learning techniques. Please read this reference now.

SAQ 1: Please prepare a summary of the Grossmann paper and comment upon its suitability with reference to Pakistani context.

SAQ 2: Prepare a case study of a professional development programme that you are familiar with and suggest improvements in the same.

8.2 Employing Case Study Based Pedagogy to Science Teacher Preparation

Levin, B.B. (1995) has argued that *discussion* as a crucial variable in teachers' learning from cases has not been tested empirically. She investigated what teachers understood from just reading and writing about a case, compared to what they thought when also discussing it. In her study, quality, form, and content of the thinking of 8 student teachers, 8 beginning teachers, and 8 experienced teachers was examined. Quantitative and qualitative analyses of participants' writing and oral discourse from the case discussions were undertaken. The work of Piaget and Vygotsky provide the theoretical basis for interpreting how discussion affected teachers' thinking about cases. Levin’s paper (Ref. 8.2) may now be read.


WORK-BASED LEARNING

What is Work-Based Learning? Work-based learning includes internships, mentoring, and apprenticeship. It's a way to test-drive a career. Work-based learning is your chance to discover things you can't learn in a classroom. Get inside information about the career you're interested in, or simply get a taste of what it's really like on the job.

Work-Based Learning can be beneficial to students, schools, and to employers as follows:

- **Benefits to Students.** Work-based learning can help students improve academically. It helps them learn how the things they learn in the classroom are connected to the real world. It's also a great way to explore career options.

- **Benefits to Schools.** Work-based learning can improve student motivation, attendance, and graduation rates. It can also improve the school's relationship with the community.

- **Benefits to Employers.** Work-based learning helps employers reduce their recruitment and training costs. It also helps them hire better-prepared employees who understand workplace expectations.

Misconceptions about Work-Based Learning

Don't let any of these common myths about work-based learning keep you from trying it out:
• I'm too old (or too young). There are at least a dozen different types of work-based learning, with choices for adults as well as youth (generally aged 16 and older).

• I won't get paid. Some opportunities are unpaid or volunteer, but all apprenticeships and certain internships come with a salary.

• I'm a student and I'm already too busy. Students can often earn course credit for work-based learning, so you may be able to do two things at once.

• I'd have to commit to something long-term. Some work-based learning opportunities are formal and last for years, but just as many are informal and last only a few hours.

• I'm already working so what's the point? Think outside the box about work-based learning. Even if you're already working in your dream job, you may still benefit from experiences like a mentorship or a practicum.

8.3 Work-Based Learning Types

Although tradition of work-based learning is deep-rooted in traditional societies like Pakistan, yet it has not been documented properly. In the western societies, work-based learning is now a common phenomenon and is finding its place in Pakistan as well. Work-based learning lets you learn through real work experience instead of — or in addition to — classroom learning. Some of the common forms of Work-Based Learning are detailed here.

a. Apprenticeship _ An apprenticeship program:
   • Is for anyone interested in getting a foot in the door of a skilled craft or trade.
   • Is a structured, formal way to gain skills on the job.
   • Is always paid.
   • Combines on-the-job training with classroom instruction.
   • Registered apprenticeships are for adults aged 16 and over. Youth apprenticeships are for high school juniors and seniors.

b. Cooperative Work Experiences _ A cooperative work experience:
   • Is for high school or college students.
   • Is a formal arrangement between your school and an employer.
   • Allows you to do paid work while attending high school or college.
   • Is usually supervised by a school representative to make sure that it matches your educational goals.
   • Might require a class or seminar to supplement what you're learning on the job.

c. Credit for Prior Learning (CPL) _ Credit for Prior Learning programs:
   • Are for college students or prospective college students.
• Give you college credit for activities or classes you've taken outside the normal college setting.
• Are sometimes based on classes that substitute for college work. Others allow you to meet college requirements by taking tests or substituting related work or life experiences.
(Paid work experience, military service, volunteer work, and self-directed learning can all qualify as related experience.)

d. Internships – An internship:
• Is for high school or college students who want real-world experience to supplement classroom learning.
• Is a short-term work experience that allows you to gain practical skills and learn about an occupation.
• Can be either paid or unpaid.
• Sometimes provides school credit.
• Involves certain legal requirements for students under the age of 18.

e. Job Shadowing – Job shadowing:
• Is for anyone, at any stage in their career, but is most common for middle or high school students.
• Ranges from a few hours to a few days.
• Allows you to follow an employee on the job to experience real, day-to-day work in a specific occupation or industry.

f. Mentorship – A career mentorship:
• Is for anyone, at any stage in their career.
• Is a relationship with someone who's further along in their career field. Your mentor may or may not be someone you already work with.
• Can help guide your career decisions, both big and small.
• Can give you inside information about an occupation, industry, or career. This can help you set or achieve your career goals.
• Can offer guidance, support, and motivation.
• Can range from a very informal to completely formal relationship.
• Can be face-to-face or via e-mail (often called e-mentoring).

g. Practicum – A practicum:
• Is for students from 10th grade through any level of higher education.
• Allows you to complete a project related to your chosen career at a worksite.
• Lets you use state-of-the-art technology and resources that are often too expensive for schools to buy.
• Allows you to demonstrate your knowledge.
(Student teaching is an example of a practicum for education majors.)
h. **Service Learning** _Service learning:
- Is for learners of all ages.
- Can be a short-term or long-term project.
- Helps you apply what you learn in a classroom or training to address community needs.

(Local businesses, social service organizations, and schools form partnerships to involve youth in service learning.)

i. **Teacher Externship** _A teacher externship:
- Is for teachers to see examples of how school learning is applied in real life situations.
- Helps teachers create lesson plans and activities.
- Are common during the summer.
- Are sometimes paid (through a teacher stipend).

j. **Vocational Student Organizations** – Vocational student organizations:
- Are for adult and college students enrolled in vocational education programs.
- Provide career and leadership development, motivation, and recognition.
- Are an integral part of education and employment transitions programs?

k. **Volunteer Service**
- Is for anyone interested in making a difference and/or gaining new skills.
- Usually involves being assigned to a public service position for a certain length of time.
- Often includes pre-assignment training.
- Is most often unpaid, but you can sometimes earn a cost-of-living allowance.
- Sometimes includes other incentives, like credit for payment on school loans.

l. **Worksite Field Trips** – A worksite field trip:
- Is a guided tour of a business? It is usually for elementary or middle school students.
- Is a chance to learn about work processes and the skill requirements of different jobs?
- Is a short-term experience that lets you explore many occupations at one time and ask questions?
- Is for an individual student or an entire class. It is usually more valuable for both students and employers when it involves a small group.
- Junior Achievement provides worksite field trips that to help young people learn about economics.

**SAQ:** Describe different types of work-based learning. Discuss how any one type can be applied to professional development of science teachers in Pakistani context.
8.4 The Mini-Sabbatical

Sabbatical or a sabbatical (from Latin sabbaticus, from Greek σαββατικός sabbatikos, from Hebrew שבעת, i.e., Sabbath, literally a "ceasing") is a rest from work, or a break, often lasting from two months to a year.

In recent times, "sabbatical" has come to mean any extended absence in the career of an individual in order to achieve something. In the modern sense, one takes sabbatical typically to fulfill some goal, e.g., writing a book or travelling extensively for research. Some universities and other institutional employers of scientists, physicians, and/or academics offer the opportunity to qualify for paid sabbatical as an employee benefit, called sabbatical leave. Some companies offer unpaid sabbatical for people wanting to take career breaks; this is a growing trend in the United Kingdom, with 20% of companies having a career break policy, and a further 10% considering introducing one.\footnote{1}

In British and Irish students' unions, particularly in higher education institutions, students can be elected to become sabbatical officers of their students' union, either taking a year out of their study (in the academic year following their election) or remaining at the institution for a year following completion of study. Sabbatical officers are usually provided with a living allowance or stipend.

The University of Denver mini-sabbatical
According to The University of Denver mini-sabbatical provides one quarter release from teaching with full pay. Its timing is typically in the third or fourth year of a new appointment, or in the third or fourth year between regular sabbaticals. Its primary purpose is to provide time away from teaching to allow for research, scholarship, and creative activity. Unlike faculty on University sabbaticals, those with mini-sabbaticals are expected to remain active members of their departments and to fulfill all on-going service commitments. The following terms for a Mini –Sabbatical have been laid down by the University. (University of Denver, The Mini-Sabbatical Guidelines, 2013).

- Untenured faculty, who occupy tenure lines, may apply for a mini-sabbatical to be granted during their third or fourth year at the University, or earlier in the case of faculty who, when hired, were awarded time toward their tenure and promotion reviews. These mini-sabbaticals must involve research, scholarship, or creative activities that can be anticipated to result in publications, performances, or creative works necessary to attain tenure.

- Tenured faculty may apply for a mini-sabbatical to be granted in the third or fourth year following a University sabbatical. These mini-sabbaticals must involve research, scholarship, or creative activities that can be anticipated to result in publications or performances necessary to attain promotion and/or to further scholarly/creative professional development.
- Non-tenure line faculty (e.g. lecturers) may apply for a mini-sabbatical to be granted during their seventh year of continuous full-time service at the University and during the seventh year of continuous full-time service since their last mini-sabbatical. These mini-sabbaticals must involve research, scholarship, or creative activities that further their scholarly/creative professional development.
- Mini-sabbatical proposals must present a clear sense of purpose and must include a statement from the applicant's chair supporting the proposal, as well as a current curriculum vitae.
- Mini-sabbaticals must be understood as a release from teaching only. All other faculty obligations (department meetings, advising, etc.) remain intact.
- At the end of the mini-sabbatical, the faculty member must submit a 1-2 page report, attached to the original application, detailing the work accomplished during the quarter released from teaching. Failure to do so will result in denial of further eligibility.

**University of Montana: Mini-Sabbatical:**
The Mini-Sabbatical Program offers faculty the opportunity to acquire new academic skills through travel off-campus for a period of no less than five working days (excluding travel days) and up to one semester. For example, applicants are encouraged to work in a specialized laboratory, take courses at another university, work with a master artist or scholar, or undertake similar efforts of a professional nature. Please note that the committee will not support attendance at what they judge to be routine association meetings.

**Goal:**
The goal of this program is to help faculty develop or acquire new knowledge, skills or abilities which will assist them in teaching, conducting research/scholarship, or performing creative activities.

**Requirements:**
1. The submission must specifically address how the goal listed above will be achieved.
2. A detailed time schedule of the proposed activity must be provided.
3. A budget must be included. Please indicate requests for or commitments of, any matching funds, since these are viewed as very meaningful by the Faculty Development Committee.
4. When applicable, a letter of support from the individual or institution where the Mini-Sabbatical will be performed must be included.
5. A letter of support from the Department Chair must be provided. Letters of support from other departments will also enhance the proposal.
6. Please prioritize applications when multiple proposals or proposals in more than one category of faculty development are submitted.
7. The UM Faculty Development Program should be acknowledged as having supported any activities which may result from this funding. Examples would be if manuscripts are published, presentations or performances given, or so on.

SAQ: Please survey practices of Sabbatical, if any, in Pakistan and describe such programmes.

8.5 Examining Teaching and Learning

In order for Professional Development to improve science and mathematics learning, it must improve classroom practices as well. When designing programmes to improve classroom practice, professional developers seek to understand four dimensions of classroom practice, namely: Curriculum (What is taught), Instruction (How it is taught), Assessment (How learning is measured), and the learning environment (The physical facilities and arrangements as well as the culture within the classroom). A learning environment that supports students in learning a rigorous mathematics and science curriculum encourages appreciation of students’ diversity, active participation, respect for students’ ideas and contributions, collaborative working relationships among students and between students and the teacher, and intellectual rigor. (Loucks-Horsley, et al., p.61)

A variety of tools have been developed to help mathematics and science reformers assess classroom practice, instruction, assessment, and learning environments and opportunities. Examples of such tools and the questions they can answer are outlined in Ref. 8.5. Please read the same now.

|-----|---------------------------------------------------------------------------------|

SAQ: Discuss how far professional development programmes of science teachers in Pakistan are able to improve teaching learning situation and assessment practices.

8.6 Workshop Approach

Workshop as vehicle for Professional Development of Science Teachers:
The workshop has been invented to permit the development of intellect and personality of an individual. In a way it is a protest against the weaknesses of the course as an educational technique. A course emphasises (a) content rather than personal development, (b) non-functional content rather than functional content, and (c) compartmentalised experiences rather than integrated experiences.

On the other hand workshops are designed to aid in the application of knowledge rather than in the acquisition of knowledge. Courses are satisfactory for acquisition if motive or desire is
such. Knowledge is applied in *problem* situations. Knowledge needed in problem situations is seldom found in a single field or course. A workshop can provide a setting in which a teacher can consider a problem in its entirety, not in unrelated fragments.

**Basic Principles of Workshop Approach:**
The workshop makes use of well known principles involved in the learning process. Some of these are discussed here under.

(i) **Readiness:** The first principle in connection with Workshop is that of *Readiness*. For any experience to be meaningful, one must bring to it a background that that enables the participants of the workshop to interpret that experience.

(ii) **Felt need:** The workshop takes into consideration the second principle as *felt need* of the participants of the workshop. A memorised knowledge is soon forgotten. The knowledge acquired in response to felt need is permanent and applicable.

(iii) **Democratic procedures:** In a course work the climate is usually authoritarian in its organisation and procedure, whereas it is democratic in a workshop. This attitude toward people is apparent in the working of a workshop. Each person is an individual, the individual is important and is thus able to contribute towards the attainment of the workshop.

(iv) **New way of working – the group habit:** In order for the members of a workshop to work together and benefit from each other’s experience, it is necessary that the organisation must permit and promote discussion, not between the instructor and the participants alone, but between the participants as well.

(v) **Individual problem:** The workshop is organised in such a way that each individual participant has an opportunity to work on his/her own project or problem. This builds confidence among the participants to develop expertise in working for their own objectives and needs.

(vi) **Plumbing all resources:** In a workshop its staff and members act as useful resource for all the participants. This human resource is useful along with the print and other media form a bank of resources for all the participants.

(vii) **Invited resource persons:** To supplement the input made by the staff and participants of the workshop, invited speakers/resource persons enrich the experiences of the workshop participants.

(viii) **Community:** Most of the problems have solutions in the community. A workshop looks towards community for resources to solve the problems faced by the education community and others.

**Benefits of workshop in Professional Development of Teachers:**
The following outcomes of learning by Workshop method have been identified:

(a) The workshop participants have a great deal more energy to devote to the project of learning.

(b) The saving in energy means that the participants will be able to accomplish more.

(c) The workshop method ensures that learning if no longer disagreeable.

(d) The members of workshop have an opportunity to develop socially.

(e) The member of a workshop becomes a contributor rather than an absorber of pre-determined knowledge.
(f) Because a workshop member has worked on his/her own problems and has been selecting and developing material on those problems, he/she will become adept in using these materials in his/her work.

Adapted from: Earl C. Kelly (1945); Why All This Talk about Workshops? *Educational Leadership*, Association for Supervision and Curriculum Development; February 1945, pp.200-204

**Activity:** Recall two workshops that you participated, one that you found most beneficial, and the other that was least beneficial to you. Outline following characteristics of each of these workshops:

i. General atmosphere of the workshop, whether it was authoritarian or democratic, level of participation of the participants;

ii. Faculty, its conduct of the workshop, attitude toward the participants and toward each other, knowledge of content, level of presentation and expectations from the participants;

iii. The participants, their knowledge of content, did they work collaboratively or individually, were their view given any weightage by the faculty, did they come up with their own problems for solutions or the workshop was planned to tackle some pre-planned problems.

Loucks-Horsley, et al. have discussed the workshops, institutes, courses, and seminars at length. Now please read Ref. 8.6


**SAQ:** Compare and contrast the working of different types of workshops and develop a plan for a model workshop for professional development in your own context.

**8.7 Teachers Training Teachers (TTT)**

It has been suggested that teacher are best suited to train other teachers, this is sometimes also termed “Peer Learning”. Loucks-Horsley, et al. have considered this aspect of professional development under the title “Developing Professional Developers” (pp. 227-235). Please read ref. 8.7 now.


**SAQ:** Please develop a plan for science teachers’ professional development on the basis of Teachers Training Teachers and comment upon its pros and cons.
Bibliography

- Kelly, Earl C. (1945); Why All This Talk About Workshops? *Educational Leadership*, Association for Supervision and Curriculum Development; February 1945, pp.200-204


Unit–9

SCIENCE TEACHER ENHANCEMENT PROGRAMMES

Written by: Prof. Khadim Ali Hashmi
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Introduction

The science Teacher Effectiveness Enhancement Programmes aim to improve science teachers’ classroom practice. Such programmes focus on improving science teachers’ understanding of what effective teaching and learning behaviours are and give them the skills to encourage these in the classroom. In such programmes, training is run by outstanding teachers, and participant teachers take the role of pupils during the training, in order to gain a deeper understanding of how effective learning behaviours can be encouraged.

In this unit we shall take into consideration enhancement programmes for science teachers. We shall discuss the historical development of enhancement programmes for science and mathematics and mathematics teachers with particular reference to Pakistani situation. We shall then go on to the impact of enhancement programmes and shall consider some case studies in this respect. Finally we shall discuss role of the NGOs in the area of professional development of science teachers in Pakistan.

Objectives

After studying this unit, you will be able to:

- Describe historical perspectives on science and mathematics teachers’ enhancement programmes;
- Discuss dimensions of science teachers’ enhancement programmes;
- Discuss and identify the impact of enhancement programmes on the performance of the science teachers and on their professional development;
- Study and describe some case studies of Science Teachers’ Enhancement Programmes and develop a programme of their own; and
- Describe the role of NGOs in Professional Development in the Pakistani context.
9.1 Historical Perspectives on Science and Mathematics Teachers’ Enhancement Programmes

In Pakistan, science teachers’ enhancement programmes have been in vogue from the very beginning. The establishment of Education Extension Centres at Lahore and Dhaka gave institutional setting for the purpose. The Education Extension Centre, Lahore (renamed Directorate of Staff Development – DSD, with enhanced status) with its regional centres at Abbottabad, Khairpur Mirs, and Karachi, organised in-service education programmes in an organised way.

In 1967, the project on “Modernisation of Syllabi in Science and Mathematics” was based at the Education Extension Centre and catered for training of teachers of Intermediate classes (1967-68), Secondary classes (1968-69), and B.Sc. classes (1969-70).

In 1972, the Federal Ministry of Education, Curriculum Wing was entrusted the task of all aspects of curriculum and instruction and under its auspices training was organised for teachers of classes I through XII, while the task of higher classes became the responsibility of University Grants Commission (UGC), later re-named as Higher Education Commission (HEC).

After the 18th amendment of the constitution, the Curriculum Wing’s role was delegated to the Provinces. However, the Universities and other institutions of teacher education continue working in the provinces and in the Federal territories.

Loucks-Horsley, et al. have considered historical aspect of professional development under the title “History of Professional Developers” (pp. 73, 75, 76). Please read ref. 9.1 now.


SAQ: Please go through the history of science professional development undertaken in Pakistan (refer to the education policies, reports of curriculum projects and programmes of different agencies, institutions and universities), and develop a resume of your readings on the theme.

9.2 Dimensions of Science Teachers’ Enhancement Programmes

Here we shall discuss (i) Preparing science and mathematics teachers to teach with technology; (ii) Integrating technology with science/mathematics and teaching and learning; (iii) Conceptual and empirical framework investigation of PCK; and (iv) Connecting the preparation program with student teachers’ TPCK development.
1. Preparing science and mathematics teachers to teach with technology:
Emergence into the 21st Century features tools that are different, communication that is different, information that is different, and work that is different. Given this shift, education must shift to incorporate computer-based, electronic technologies integrating learning with these technologies within the context of academic subject areas. However, how the teachers learned their subject matter is not necessarily the way their students will need to be taught in the 21st century. Few teachers have been taught to teach their subject matter with technology and as a survey by the National Centre for Education Statistics found, only 20% of the current public schoolteachers feel comfortable using technology in their teaching (Rosenthal, 1999). Shortages of mathematics and science teachers in concert with massive retirements of teachers over the next 10 years raise the concern about the preparation of teachers for a changing curriculum that integrates technology, mathematics, and science standards (National Council of Teachers of Mathematics – NCTM, 2000). National Research Council (1996) point toward a scientifically and mathematically rich curriculum where technology is an essential component of the learning environment, not only in the curriculum but also in instruction. Similarly, the International Society for Technology in Education (ISTE, 2000, a, b) developed new technology standards for students and teachers that specifically confront teachers with integrating technology throughout education. These standards direct that electronic technologies become “an integral component or tool for learning and communications within the context of academic subject areas” (ISTE 2000, a, p. 17).

2. Integrating technology with science/mathematics and teaching and learning:
The challenge for teacher preparation programs is to prepare their candidates to teach from an integrated knowledge structure of teaching their specific subject matter – the intersection of knowledge of the subject matter with knowledge of teaching and learning, or pedagogical content knowledge (PCK) characterized by Shulman (1986). But, for technology to become an integral component or tool for learning, science and mathematics preservice teachers must also develop an overarching conception of their subject matter with respect to technology and what it means to teach with technology a technology PCK (TPCK).

3. Conceptual and empirical framework investigation of PCK:
Research studies provide some insight into the preparation of pre-service teachers to develop a TPCK (Ball, 1988; McDiarmid, 1990; Grossman, 1991; Wilcox, Schram, Lappan, & Lanier, 1990; Civi, 1992; Simon & Brobeck, 1993; Simon & Mazza, 1993). Grossman’s (1989, 1990) work proposed four central components of PCK. Amending these components with technology provides a framework for describing the outcomes for TPCK development in a teacher preparation program: (1) an overarching conception of what it means to teach a particular subject integrating technology in the learning; (2) knowledge of instructional strategies and representations for teaching particular topics with technology; (3) knowledge of understandings, thinking, and learning with technology in a particular subject; (4) knowledge curriculum and curriculum materials that integrate technology with learning in the subject area (Borko & Putnam, 1996, p.
With this perspective, the preparation of science and mathematics teachers should be directed at guiding the development of their knowledge and thinking in a manner that considers the development of an overarching conception of teaching with technology. Pre-service teachers must be challenged to consider their subject matter content and the impact of technology on the development of that subject itself as well as on teaching and learning that subject. But this attention must recognize the importance of that learning to teach is a “constructive and iterative” process where they must interpret “events on the basis of existing knowledge, beliefs, and dispositions” (Borko & Putnam, 1996, p. 674).

4. Connecting the preparation program with student teachers’ TPCK development:

Preparing student teachers to teach with technology in science and mathematics content areas offers a unique lens from which to investigate the development of TPCK. The content knowledge of technology is both scientific and mathematical. Teaching with technology using demonstrations and labs/hands-on activities is consistent with major pedagogical strategies employed in teaching mathematics and science. Classroom management issues with technology are consistent with the classroom management issues in science and mathematics lab activities. Thus, the addition of preparing teachers to teach with technology is

SAQ: Please describe the dimensions of professional development programmes with respect to: (i) Preparing science and mathematics teachers to teach with technology; (ii) Integrating technology with science/mathematics and teaching and learning; (iii) Conceptual and empirical framework investigation of PCK; and (iv) Connecting the preparation program with student teachers’ TPCK development. How far these practices are employed in the professional development programmes in Pakistan? Discuss.

9.3 Impact of Enhancement Programmes

Totterdell, et al (2004) have defined “impact” of induction programmes on newly qualified teachers (NQTs) in the following way: Impact is defined as the outcome of programmes in terms of teacher expertise, job satisfaction, professional development and retention. Specifically, has induction improved NQTs’ resourcefulness and repertoire for classroom work? Has it helped them to be better informed and develop deeper levels of understanding with regard to both curriculum and pedagogy, allowing them to gain new awareness about the management of teaching and learning? Has it led to motivational, attitudinal and affective outcomes for individual NQTs, especially in relation to their competence and confidence to effect change in their own practice and participate in collective effort within their institutions? The aim of all professional development activities should be to bring about a change in the thinking and practice of participants, which in turn will have a positive impact in the workplace. Therefore, professional development should have the following impact:

- Improving the thought and practice of teachers and their provision for students
- Developing the personal and professional attributes, knowledge, skills, understanding, experience and values of teachers
- Helping teachers to gain confidence and competence and maintain them.
- Providing teachers with a means of valuing their learning and helping them demonstrate it to others
- Enabling teachers to see everyday practice as the actual source of professional.


Burnett, et al (2010) have prepared a detailed report on The Impact of Targeted Continuing Professional Development (CPD) On Teachers’ Professional Practice in Science (Ref. 9.3.2). Please read it now.


Blank, et al, (February 2008, Ref. 9.3.3) have analysed evaluation reports of Evaluation Findings from Programs for Mathematics and Science Teachers in 14 states and have assessed the findings so far as professional development had any effect upon teaching and learning. Their findings are summarized as:

The reports primarily address evaluation findings from professional development activities conducted during the period 2004 through 2007. Following are several key findings from the study:
- One-third of evaluation studies reported measurable effects of teacher professional development.
- Content focus plus sufficient time plus in-school component equals significant effects.
- Purposeful evaluations yield measurable effects.
- Teacher vs. school-based professional development designs provide differing data on success.
- Include outcome measures in allocation of evaluation resources.
- Plan for use of data systems and experimental designs.
- Link teacher knowledge gains to change in classroom practices.
- Use findings in program decisions.
- Value partnerships for evaluation.
SAQ: In the light of the References 9.3.1, 9.3.2 and 9.3.3, discuss the impact of different programmes of professional development of Pakistan and give suggestions to improve the same.

9.4 Some Case Studies of Science Teachers’ Enhancement Programmes

In a case study on “Integrating ICT in Kenyan secondary schools, J. Tondeur, et al (2015) have studied integration of ICT in secondary schools of Kenya. Their findings are summarized here:

This study is a case study of four schools with no previous access to ICT. The professional development programme from which data for this study were drawn was designed to support teachers learning to integrate ICT in the curriculum. Using a mixed-method research approach, the authors collected data from multiple sources and triangulated the views of various stakeholders: questionnaires with teachers, focus groups with teachers, school leaders and ICT coordinators, field observations and document analysis. While the broader programme focused on the use of ICT, the results highlighted in this study focus on the development of the four schools with respect to 1) vision building, 2) leadership, 3) collaboration, 4) expertise and 5) access to adequate resources. The discussion centres on the challenges and opportunities inherent in understanding how to prepare schools in developing countries to integrate ICT in education.

SAQ: Prepare a case study of your own institution with respect to professional development of science teachers and propose measures to improve the situation.

9.5 Role of NGOs in Professional Development

In the Islamic world, education has always been in the purview of Non-Governmental Organisations (NGOs). At the time of independence, in Pakistan several institutions in the formal education sector were running by NGOs (this term has come into use rather very late), along with the state run institutions. However, religious education has all along been provided by the NGOs.
Non-Governmental Organisations (NGOs) have been playing a central role in education of marginalised groups in developing countries since 1980s. They emerged as alternative providers of education against the backdrop of the State’s failure to provide relevant and quality education for economically and culturally disadvantaged groups. They are assumed to have pro-poor orientation, flexibility, innovation, cost-effectiveness, and participatory approaches in their educational projects. Democratization in 1990s has been working as a further boost for role of NGOs in education sector in developing countries. Though NGOs vary in their ideologies, strategies and geographical coverage, donor-drivenness make them as part of the global “associational revolution”. NGOs are seen as symbols of social responsibility and global morality. They have long been working with project-based approach to reach the non-enrolled and dropouts from public schools with the active support of international donor agencies.

However, introduction of Sector-Wide Approaches (SWAs) and Poverty Reduction Strategic Plans (PRSPs) by multilateral and bilateral development cooperation agencies since mid-1990s has strong bearings on the future role of NGOs in development in general and education sector in particular. Under the new framework of sector programmes, donors have been emphasising national ownership of sector programmes by highlighting on coordination, complementarity and coherence among different stakeholders. Within the new modality of development cooperation, the role of NGOs in education sector has been facing serious dilemmas. On the one hand, they provide educational opportunities for hard-to-reach groups who are left out by public schools. On the other hand, they are blamed for creating parallel education system which run outside national educational administration and monitoring system.

Non-government organizations with their advantage of non-rigid, locality specific, felt need-based, beneficiary oriented and committed nature of service have established multitude of roles which can effect rural development.

Non-government organizations with their advantage of non-rigid, locality specific, felt need-based, beneficiary oriented and committed nature of service have established multitude of roles which can effect professional development.

Non-Governmental Organizations in a Balochistan Project: An interesting component of the PED was the creation of a local NGO, the Society for Community Support for Primary Education in Balochistan, which took over many of the responsibilities for the maintenance and advancement of the various components of the program. The Society rapidly grew into a fairly large organization that serves many community development and monitoring functions. Due to the success of the Society, there are currently attempts to either form new NGOs in other parts of the province, or to provide training to NGOs to carry on the expansion of the project into additional regions of the province. While not unique to Balochistan, the formation and maintenance of an NGO to carry out many of the tasks of an internationally funded project appears to be a powerful mechanism to encourage local involvement and commitment, in addition to helping maintain...
momentum, if and when international assistance is cut back or discontinued. The Society has provided a cadre of well trained, committed young people to carry on the work.

Two other NGOs play a role in the reform of Balochistan’s educational system. The Teachers’ Resource Center in Karachi provides longer-term specialized training for the field trainers as part of the MFTTU, and Institute for Educational Development at the Aga Khan University in Karachi serves a critical role in providing eight-week training sessions for the mentor–trainers in the new Primary Teacher Mentoring Program (PTMP). To have highly qualified national NGO trainers with up-to-date skills, linguistic and cultural competencies, and commitment to educational reform is a great advantage to any program.

As part of a broad based social-action program (SAP), the Government of Balochistan formed the Primary Education Quality Improvement Project (PEQUIP), which began in 1996 under a grant from the Government of the Netherlands to provide special outreach programs to improve the lot of the rural female through strengthening village and women’s village education committees, help form new (or strengthen existing) NGOs in under-served regions, community assessments, hire and train master teachers, and select and train learning coordinators, field promoters, and master trainers. This unique program attempts to assist and supplement the work of government bureaucracy by helping to expand the efforts in female education through its various activities. By 1998 the organization had already helped establish 109 schools, which, along with the 167 established under BPEP, gave a current total of 276. (pp. 96-97)


Reference 9.5.2 is a brief of research undertaken in four African countries; it summarizes findings on how NGOs have become involved in the education sector: how their presence and relationships with governments and donor partners evolved, what implications their presence has caused for educational systems and civil society, and which contextual factors have affected NGOs' interventions. This study reviews four major areas of NGO involvement in the education sector: the relationship between NGOs and government; the role of NGOs in education policy; the relationship between NGOs and donors; and the influence of NGOs on civil society. Now please read this reference.

| 9.5.2 | SARA Project (2003) | Partnerships in Education – Key Findings on the Role of NGOs in Basic Education in Africa. |

SAQ: From the available literature, develop a scenario of NGOs role in the professional development of Pakistan and comment on their strengths and limitations.
Bibliography


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