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QUALITY ASSURANCE IN TEACHER EDUCATION PROGRAMMES OFFERED THROUGH DISTANCE MODE IN PAKISTAN

ABSTRACT

The quality of education is directly related to the quality of instruction in the classrooms. The teacher is considered the most crucial factor in implementing all education reforms at the grassroots level. It is a universally recognized fact that the academic qualification, knowledge of subject matter, competence and skills of teaching and the commitment of the teacher have effective impact on the teaching-learning process. Recognising the deteriorating quality of education at various levels, efforts need to be intensified to accord adequate priority to the effectiveness of teacher education programme in the country the qualitative dimension of teacher education programmes in Pakistan has received only marginal attention resulting in mass production of teachers with shallow understanding of both the content and methodology of education. The objective of this paper is to review the teachers education programmes being offered through distance mode in Pakistan in the context of present challenges and opportunities, outline current global and regional trends, suggest policy and strategy considerations, and identify new initiatives in open and distance learning. Therefore, it has become necessary to introduce the quality measures in teacher education programmes offered through distance mode in Pakistan. The paper deals with the introduction of quality criteria in teacher education programmes offered through distance mode. It will focus on the organization and management, physical facilities, curricula, instructional material, study centers and evaluation system of pre-service teacher education programmes offered through distance mode. The study will also appraise the international distance education models and reshape the distance education model of Pakistan on the lines of international model and

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putting forward the feasible suggestions to bring the existing pre-service teacher education programmes offered through distance mode at a par with quality.

1. INTRODUCTION

(i) Evolution of teacher education programmes through distance mode

The distance education programmes were started with the correspondence mode of teaching before one hundred years ago. After mid of 19th century there was a rapid escalation in the provision of distance education world wide because the technological development also accelerated the new innovation in education in general and in particular the distance education. Nowadays, there are thousands of courses being offered through the net-working mode of teaching also from the institutions of the above one hundred countries of the world and this is way of teaching which is globalization the world as a village through exchanges of information and education through telecommunication courses. The Twentieth century saw a novelty in the educational field with the introduction of Distance Education. Geography, family, time and money are no more considered barriers in the way of supplementing one's educational qualifications (Hofmann, 2002)

In the late 1950's and early 1960's, television production technology was largely confined to studios and live broadcasts, in which master teachers conducted widely-broadcast classes. The major drawback of radio and broadcast television for instruction was the lack of a 2-way communications channel between teacher and student. As increasingly sophisticated interactive communications technologies became available, however, they were adopted by distance educators. Currently, the most popular media are computer-based communication including electronic mail (E-mail), bulletin board systems (BBSs), and Internet; telephone-based audio conferencing; and videoconferencing with 1- or 2-way video and 2-way audio via broadcast, cable, telephone, fibre optics, satellite, microwave, closed-circuit or low power television. Audio graphic teleconferencing using slow scan or compressed video and FAX is a low-cost solution for

transmitting visuals as well as audio for a description of distance education delivery systems. Mosaic, a graphical interface to the World Wide Web, has become popular in parts of Canada, Europe, and Australia over the past year. The development of open universities in twenty five developing countries has added an impetus to the growth of distance education during the last quarter of the previous century (Perraton, 2000).

Today, political and public interest in distance education is especially high in areas where the student population is widely distributed. Many of the developing Asian countries are now a days resorting to higher education through distance (Tam, 1999). Teacher education is an important area where distance education has been used extensively to provide pre-service teacher preparation, upgrading of academic qualifications, and in-service continuing professional development in particular subjects, content areas and instructional methods. An interesting phenomenon, though it arises from ignorance, is that fact that people equate distance learning with self-study. Contrary to that, distance education has to be institution based. It is non-formal education where the learning group is separated from the teaching group, and where interactive telecommunication systems are used to connect learners, resources, and instructors (Schlosser, 2002).

Many examples, particularly from both developing and developed countries, show that teacher training at a distance may reach large groups of teachers and may have profound impact on the development of national education systems. Examples include distance learning initiatives in countries such as Burkina Faso, Chile, China, India, Mongolia, Nigeria, and South Africa to prepare new teachers or upgrade skills of the existing teaching force. The use of open and distance learning for teacher education is therefore a crucial strategy when expansion or quality improvement is needed in the public education system.

Current Trends in Teacher Education Programme through Distance Education

Distance education may play an increasingly important role during this decade in helping address the growing shortage

of teachers, educational administrators and other educational professionals experienced in both developing and developed countries.

The current and emerging communication and information technologies provide unique opportunities to continue the professional development of teachers and other educators. The Web provides teachers with incredibly rich instructional and information resources to enhance their instruction and professional skills. The Web also provides opportunities for online mentoring and support of novice teachers during their first year of teaching and to develop online communities of practice. Virtual Web-based environments for teachers now enable them to seek help from other teachers, locally, nationally, or globally in solving classroom problems, sharing lesson plans and materials, interacting with experts in particular fields, and in planning collaborative curriculum development projects.

A particular advantage of distance education is that it makes teacher preparation and professional development programmes accessible to indigenous peoples and others located in remote, rural areas who do not have convenient access to higher education institutions and where there is often a shortage of well-prepared teachers and other educational professionals.

Many factors are responsible for shaping the quality of teacher education in Pakistan. These factors range from ideological and socio-economic needs to the existing structure of education system as well as ill-defined theories and practices of teaching and learning. The population pressure obviously remains a prime impetus for the rapid expansion of education in the years to come. The teacher education programmes, being an integral part of the education system, has also expanded and will expand further for catering to the fast emerging needs of the country. Due care, however, needs to be taken that the essential qualitative imperatives of teacher education are also reckoned while meeting the pressures of demand on the system. The quality concerns of teacher education relate to policy formulation and planning, development and management of teacher education programmes,

provision of adequate infrastructure to training institutions, pre-service and continuous in-service education of teacher educators, regular enrichment of curriculum content, methods, evaluate infrastructure to training institutions, pre-service and continues in-service education of teacher educator, regular enrichment of curriculum content, methods, evaluation techniques, teaching aids and other teacher related resources.

2. TEACHER EDUCATION THROUGH DISTANCE MODE (WORLD SCENARIO)

To overcome the institutions of traditional models for training teachers, many countries of the world have adopted alternative approaches. Distance education approached is one of these which provide education facilities to large number of learners in different discipline. The developing countries are now expanding their use of distance education for teacher's education. In Asia, both initial teacher training and further professional development to teachers have been provided through various combination of radio, television, self-study materials, correspondence, tuition and local study groups.

The establishment of the Open University at Milton Keynes in UK in 1969 is a great landmark in the development of distance education in the world. The University's first degree, for which courses began in 1971 were the B.A. (Open), a general degree awarded on a system of credits for each course completed. The university also started a higher degree programme including B.Phil., M.A., M.Sc., M.Phil. and Ph.D. degrees, available mainly through research. A continuing programme, including short courses of community education, in service training for teachers, and up-dating courses for managers, scientists and technologists in the latest growing aspects of the university's work also exists. The Open University, UK (OUUK) first became involved in initial teacher education in 1992 Distance education and the new tools for learning may serve as a catalyst for changing teaching practices and the roles of teachers. The Open University programmes at present take up about 15 hours transmission time per week at the BBC's television network and about the same

number of hours on radio. Films or cassettes can be acquired by other establishments; The Open University combines correspondence tuition and broadcast lecture with study at local centres. They have their radio, television, radio-tapes and films, but they also have tuition with them from the nearest university or technical college. Main Features of the open University are non-formal academic qualifications are necessary for admission, no upper age limit is prescribed for admission, no admission test is conducted for admission, students can continue to study at their own rate, and Students can appear in any examination they like (Keegan. D and Rumble. G, 1998).

The Darling Downs Institute of Advanced Education in Queensland is an Australian model of distance education at the tertiary level. In this model, internal and external teachings are fully integrated. A number of universities and Colleges of Advanced Education offer pre-service teacher training at a distance. Distance education for in-service teachers takes the form of degree courses in education, post-graduate diplomas in various aspects of educational studies and post-graduate degree courses. Instruction is done largely through print materials. Teachers working in the Teaching and Further Education sector are often trained during their first one or two years of employment. Some colleges of Advanced Education offer such training at a distance. Some of the well known universities and institutes that provide distance education in Australia are: Deakin New England, the Royal Melbourne Institute of Technology, and the Gippsland Institute of Advanced Education. The China Television Teacher's College, a part of the China Central Radio and Television University, uses television-based distance education to prepare new teachers and provide a range of distance education professional development programmes to primary and secondary teachers, principals and administrators.

The first Open University in the India was established by the Government of Andhra Pradesh in 1982 to provide access to higher education to adults to upgrade their skills, improve the quality of their life, equalise educational opportunities and provide lifelong education. The encouraging response to this

university culminated in the establishment of the Indira Gandhi National Open University by an Act of Parliament on 20th September, 1985. The university has been charged with the dual responsibility of providing opportunities for higher education to larger segments of the population, particularly those for whom access to the formal system is difficult or impossible, and also to develop the open university and distance education systems in the country and to co-ordinate and determine standards in such systems. Distance education universities in India offer pre-service teacher training at a distance. Distance education for in-service teachers takes the form of degree courses in education, post-graduate diplomas in various aspects of educational studies and post-graduate degree courses. Instruction is done largely through print materials. Teachers working in the Teaching and Further Education sector are often trained during their first one or two years of employment. Distance Education Programme being offered by various Institutions in India can be broadly categorised into the: (a) correspondence courses offered at the Secondary and Tertiary levels. (b) distance education programmes offered by open universities. (c) educational TV and radio programmes to supplement classroom teaching at the primary, secondary and tertiary levels and for Adult, Education. (Mullick, S.P. 1998).

3. TEACHER EDUCATION THROUGH DISTANCE MODE IN PAKISTAN

The giant step to make education free upto matriculation under the recommendation of education policy 1972 supported by other supplementary measure to popularize education resulted in a shoot up in the enrolment in the secondary schools from 1.0 to 3.3million; from 0.4to .85million in classes IX-X (middle schools) and form 0.15 to 0.36millions in classes in XI-XII. As estimated by the education policy 1972-80; 0.225million additional teachers for elementary classes and 19,000 teachers for secondary classes were required to meet the immediate needs during the first three or four years. Since the competent teachers cannot be produced overnight, revolutionary steps were taken to increase the rate trained teachers by launching non-formal and distance education teachers training institutions. (Munshi.P,

2002a) The National Educational Policy 1972 makes us understand that: People Open University was established in 1974 under an act of parliament. A people's Open University will therefore be established to provide part time educational facilities through correspondence courses, tutorials, seminars, workshops, laboratories, television, radio broadcasts, and other mass communication media. (The Education Policy, 1972) The main objectives of the university were to provide facilities, to the people who cannot leave their homes and jobs in such a manner as it may determine, to the masses for their educational uplift as it may determine, for training of teachers in such a manner as it may determine, to provide instruction in such branches of learning technology or vocation as it may deem fit, and to make provision for research and for the advancement and dissemination of knowledge in such manner as it may determine; to hold examination and to award and confer degree, diplomas; certificate and other academic distinctions.

The Allama Iqbal Open University offers teacher education programmes through the: correspondence material such as, text books, study guides, tutorial Instruction through contact session and academic guidance facilities at study centers (mostly in the afternoons). The university has Regional Centers in all big cities which are managed through Regional Directors. Each student is assigned to a tutor who is a subject specialist. Tutor organizes workshops/practical training in the regions. Recently all the regions have been linked with the Central Data Base through E-mail /Fax /Internet dial up to facilitate better and faster communication, removal of student, complaints, and responses to queries (Chaudhry, 2004). In distance learning system, teacher education courses are taught through self-instructional materials, tutorial meetings and workshops. Tutorials provide useful guidance in the form of lectures, discussions, and questions-answer sessions.

The University of Sindh in 1995 also launched the off-campus programme under the Non-Formal and Distance Education Center (NFDEC). Objectives of the programme were to promote distance education system, produce well-qualified and

better skilled professional teachers, and enable the teachers to avail the distance learning education facilities while remaining in their job, lay emphasis on research work, and provide education facility through distance learning to rural population. The University of Sindh is running non-formal and distance education center under the Director of the center only for teacher training. The overall organization and management of the center is controlled by the faculty of education, which operates and run its programmes of B.Ed and M.Ed on the pattern of Allama Iqbal Open University. The center has only provision of face-to-face contact hours and reading material is the mode of teaching. The study centers are established at a place where 50 or more students are enrolled. Centers are placed in government/private school/college buildings. Workshop for practice teaching component, which is included in the course. The examination is conducted after the end of course (Munshi. P, 2002 b). The scheme of the courses given below of two main institutions which are offering teacher education programs through distance mode shows the detailed comparison of two universities at B.Ed level. The chart below shows that both institutions offer similar courses at B.Ed level. The Allma Iqbal Open University offers PTOC, CT and M.Ed courses while the University of Sindh only offers B.Ed and M.Ed program.

General Comparison of Essential Features of B.Ed Distance Programs of Two Universities

Table: 1

Features	*AIOU Program	**US Off-campus Program
Starting Year	1988	1995
Duration of the Programme	18 Months 3 Semesters	18 Months 04 Terms
Admission Requirement	Minimum 2 nd division	Minimum 2 nd division 3 rd division from US
Course/ Marks		
Core	06 (600)	06 (600)
Special	02 (200)	03 (300)
Practice	01 (100)	03 (300)
Mode of Teaching	Instructional Material, guide books, tutorial meetings	Instructional Material, guide books, tutorial meetings
Tutorial Contact / Credit Hours	15 Hours 10 Meetings	24 Hours 12 Meetings
Number of Assignments	02 Per Course	02 Per Course
Number of Practice Lessons	40 Lessons 20 Lessons in each subject	30 Lessons 10 Lessons in each subject
Number of Final Lessons	02 Lessons	03 Lessons
Research	Nil	Nil
Conduct of Examination	End of Semester	End of Session
Final Evaluation	Assignment + Final Examination	Final Examination
Minimum Passing % Per Course	40 %	33 %

Source: Reproduced from unpublished thesis title as a Critical Evaluation of B.Ed Distance Program in Sindh by Dr. Parveen Munshi. Pp. 160

4. ISSUES IN DISTANCE LEARNING IN PAKISTAN

Distance education technologies are expanding at an extremely rapid rate. Too often, instructional designers and curriculum developers have become enamoured of the latest technologies without dealing with the underlying issues of learner characteristics and needs, the influence of media upon the

instructional process, equity of access to interactive delivery systems, and the new roles of teacher, site facilitator, and student in the distance learning process.

(i) Policy and management

Policy and management is most important. Without affective policy and management no organization or any programme can achieve its set goals. The institutions all over the world which offer teacher education programme higher the services of experts in policy planning before launching any new initiative in teacher education programmes through distance mode. Similarly for proper implementation of the policies high skilled managers are selected and they are assigned the responsibilities to manage the programmes. But the all the teacher training institutions which offer teacher training programmes through distance mode in Pakistan have so far failed to develop a affective policy and if there exist any policy then there is no well qualified personnel to implement the policy. Consequently we are not able to offer quality teacher education through distance mode.

(ii) Modernization

The advance countries have developed their teacher education programmes offered through distance mode on modern lines and their distance education system has become technology oriented. They have brought revolutionary changes in policy formulation and planning, development and management of teacher education programmes, provision of adequate infrastructure to training institutions, pre-service and continuous in-service education of teacher educators, regular enrichment of curriculum content, methods, evaluate infrastructure to training institutions, pre-service and continues in-service education of teacher educator, regular enrichment of curriculum content, methods, evaluation techniques, teaching aids and other teacher related resources. In Pakistan we are still facing the challenges such as budget with potentially low-cost electronic learning options, teacher certification, assessment and evaluation, nationally accepted institutional accreditation standards to insure the quality of distance education, technology training and

accessibility for all, not just for progressive students and teachers.

(iii) Learner support services

In advance countries they have adopted many ways of facilitating learner support. Audio and video teleconferences or interactive chats with mentors through internet which provides good alternative to site visitation, telephone calls. In Pakistan Allama Iqbal Open University most recently have launched FM radio service for delivering its distance education programmes more effectively and also they are providing CDs of study material to study centers but on the whole Pakistan is still far behind and its most of the distance education institutions offering teacher education programmes relying on traditional correspondence model.

(iv) Teaching strategies and media-based challenges

Effective distance learning requires extensive preparation, as well as adapting traditional teaching strategies to a new learning environment which often lacks visual cues. In modern world the Distance education is a combination of the effective use of mass media such as radio, television, Internet and communication technologies, correspondence material, a variety of audio-visual aids, study centres and distance tutors. In Pakistan most of the tutors adopt traditional teaching strategies because supporting material such as libraries discussion groups and effective mass media etc are not available. Willis (1993) describes the strategies which are effective in distance learning: namely, developing appropriate methods of feedback and reinforcement, optimizing content and pace, adapting to different student learning styles, using case studies and examples which are relevant to the target audience, being concise, supplementing courseware with print information, and personalizing instruction.

(v) New learning approaches

Inquiry learning is a new technique to many teachers. The inquiry teaching promotes an environment that tolerates ambiguity and encourages students' questions. In their studies of

classrooms using the "Voyage of the Mimi" multimedia program, OTA researchers observed that teachers tended to ask the majority of the questions, rewarded students for guessing correctly, and required continual help in maintaining a classroom climate that emphasized reasoning rather than right answers. Only those teachers who had experience in inquiry-based instruction used the materials in open-ended ways. They found that it was important not only to provide training in the scientific concepts covered in the materials, but also to give participating teachers rich and varied suggestions for classroom activities. But in case of Pakistan the tutor model is adopted for imparting teacher education in Pakistan. But lecture method is adopted practically

(vi) Teamwork and assignment

Many developed countries, the teacher education institutions in their current teacher education programmes through distance education programmes incorporate cooperative learning, collaborative projects, and interactivity within groups of students as well as between sites. Grouping certain students productively for project work, or assigning particular students to individual research projects. Teacher education institutions in their distance education Programmes in Pakistan assign individual assignments of very low standard at B.Ed. level and at M.Ed. level a research thesis is prescribed.

5. PROPOSED QUALITY ASSURANCE MODEL FOR TEACHER EDUCATION PROGRAMMES THROUGH DISTANCE MODE IN PAKISTAN

Quality assurance strategies for distance learning tend to be oriented toward institutional assessment activities and to affirming that the core capacities to assure quality such as faculty credentials and student support service snare in place. Quality assurance strategies appear to be integrated into the design of most of the teacher education distance learning programs. These strategies look quite similar to those in traditional institutions and programs, focusing on the following three key aspects of quality assurance: The quality assurance process therefore appears to be less process-driven, where there is a high value placed on

consultation, consensus building and dialogue, and more oriented to "bottom-line" or market-oriented results.

1. Key Aspects of Quality Assurance

(i) Transparency

The transparency is most important tool for establishing quality at all levels in teacher education programs offered through distance mode the principle of transparency includes: selection of all personnel's, selection of tutors utilization of funds / budget, selection of tutors, monitoring of the centers and over all monitoring of execution and implementation process of the program.

(ii) Assessment

Assessment is crucial for maintaining a quality in teacher education programs both Formative and summative assessment activities are necessary and must be undertaken at all levels. Mayes and Banks (1998), in setting out the quality assurance principles link quality assurance with consistency of materials development, assessment and approach.

(iii) Systematic monitoring

The systematic monitoring is must for having affective check and balance over the over all efficiency of students, teacher and administrative machinery.

2. Student support services

Student support services as one of the important element of quality control. In fact, focus on adequate student support as an essential element of teaching and learning may be one of the most distinctive features of quality control in distance learning environments. An independent, well-equipped and efficiently run library is an asset for any distance education programme. The library should have not only the text and reference books, but it should also be well equipped with journals, and if possible Xeroxing or duplicating machines. Apart from remaining open to students at all hours of the day, the library should extend facilities to students at a distance in the following ways:

- i) Provide lists of relevant books to the students and others involved in the system of distance education, so that they know what books to ask for. Issue lists of new books. The duplicating or xeroxing section should copy material from journals and books that must remain in the library.
- ii) Open sub-branches of the main library in places where student concentration is appreciable, the local colleges as well as a correspondence unit could be of at-most help. Further, in other public libraries, the corner of distance education materials may be provided for the benefit of students and public at large.
- iii) Send library personnel with the basic reference and textbooks to the students working or living in remote and undeveloped areas. Even a fortnight's exposure to such reading material can make a student more active than he has been.
- iv) Establish book banks for students who want to borrow extra books. They would encourage the willing student and, perhaps, motivate the less willing (Rashid. M., 1998).

3. Faculty credentials, selection and training

Faculty credentials, selection and training is another important measure to have quality assurance in teacher education programs through distance mode. In addition to possessing a graduate degree relevant to the field of instruction, faculties are expected to understand the role of technology in a learning environment, be trained in online teaching concepts, and use assessment techniques appropriately.

4. Time-on-task measures

Time-on-task measures must be focused which includes minimum weeks for courses and monitoring of course "log-ins". In addition to textbooks, many courses are accompanied by a comprehensive study guide which provides course objectives and key concepts. Students are expected to spend a minimum amount of time per week for study and homework assignments. Interaction with faculty is mandated and, in many cases, students share access to a class group mailbox along with the instructor,

which provides a platform for instructor communication at virtually any time.

5. Academic accreditation / quality control

The accreditation model remains a viable and effective means for public quality assurance in distance learning. The researches conducted shows that the core processes of setting and measuring standards can work effectively in distance learning settings. Yet accreditation is challenged by distance learning to adapt standards that are rigorous, to be prepared to re-evaluate traditional processes, to be open to alternatives, and to provide public evidence of measures of performance against the standards. It also must engage in public discussion about fundamental questions regarding the purpose and values of higher education, particularly in degree-granting collegiate programs.

6. CONCLUDING REMARK

Distance education is certain to play a role in teacher training in developing countries in the future. Though it has a growing track record of achievement, its performance so far has been uneven in quality and efficiency. Neither it has yet been fully exploited nor a sufficient variety of models developed and tested. There is scope to experiment to increase the knowledge and understanding of how best to use it. Evaluation and research need to grow side by side as indicated in previous chapters. It is hoped that this study will encourage further research on these innovative and major distance education system. Areas of particular interest from a research perspective are: Student retention and graduation rates. In conclusion, the author wishes to reiterate that each quality assurance system needs to be careful in analyzing the situation of the specific institution. It needs to be very flexible in its approach, and the combination of process and technology needs to be carefully considered.

7. REFERENCES

- Allama Iqbal Open University. (2006), "*Faculty of Education, Vice Chancellor's Annual Report. 2005-2006*". AIQU: Islamabad
- Chaudhry, M. (2004). "*Vice Chancellor's Annual Report. 2003-2004*". AIQU: Islamabad. pp. 14.
- Government of Pakistan. (1972) "*The Education Policy (1972-80)*", Islamabad: Ministry of Education.
- Hofmann, D. W. (2002, August). "*Distance learning in Higher Education. Tec directions*", pp. 28-32.
- Keegan D. and Rumble, G.(1998) "Distance Teaching at University Level", In Rumble, G. and Harry (Eds) (1997), "*The Distance Teaching Universities*, London, Croom Helm pp:15-13
- Munshi, P (2002a). "*A critical Evaluation of B.Ed distance of education in Sindh*", Unpublished research thesis, "Hamdard University Karachi.
- Munshi, P (2002b). "*A critical Evaluation of B.Ed distance of education in Sindh*", Unpublished research thesis, Hamdard University Karachi.
- Mayes, A. S., & Banks, F. (1998). "*High quality and new standards: an open learning*" contribution to the improvement of pre-service teacher education. Paper presented at the "American Educational Research Association Conference".
- Mullick. S.P. (1998), "*Distance Education in India*": in "*Distance Education in Asia and the Pacific*", Vol. II, ADB, Manila.
- Non-Formal & Distance Education Centre, (2000). "*Prospectus B.Ed Distance learning Programme (2000 onwards)*", Hyderabad, Sindh University Press. Pakistan
- Perraton, H. 2000, "*Open and Distance Learning in the Developing World*", London: Routledge.
- Rashid, M. (1998). "*Non-Formal Education. M.A/M.Ed Study Guide on Course Code 844*". Islamabad: Allama Iqbal Open University.
- Schlosser, L.A. (2002). *Distance Education: Definition and Glossary of Terms*, Definitions and terminology committee Association for Educational Technology: Bloomington.
- Tam, S. (1999). "*Developing countries and the future of distance education and open learning in the twenty first century*". Journal of Instructional Science and Technology. 3(1), <http://www.usq.edu.au/electpub/e-jist/article3.html>