Environmental Scanning in Teacher Education: The Practice in Higher Education in Kenya

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Abstract

Strategic teacher education is a crucial factor of development today that needs diverse initiatives to sustain it. This owes to the fact that education serves a dynamic society, hence the need to keep up with the changing realities to meet the changing needs of society. Educational institutions therefore need to respond appropriately to changes in their environment if they are to remain relevant, viable and valuable entities. This underscores the need for environmental scanning, a process through which educational institutions identify the needs, changes, and challenges characteristic of the environment in which the graduate teacher will work and understand how the impact of these affects an institution's teacher preparation strategies. This enables an institution to develop contingency plans and actions which reduce the response time needed to address an environmental opportunity or threat. However, a study carried out in selected Kenyan universities engaged in teacher education points at failure by these institutions to carry out clear process of environmental scanning.

This paper presents the findings of a study investigating the practice of environmental scanning as an element of responsiveness in teacher education in higher education. The objectives of the study were to: determine the pattern of flow of information from selected stakeholders to teacher education universities; determine the extent of flow of information from selected stakeholders to teacher education universities; establish the factors influencing the flow of information from selected stakeholders to teacher education universities; establish the key elements teacher education universities focus on while carrying out environmental scanning, and identify the challenges teacher education universities face in carrying out environmental scanning.

Upon presenting the findings which point at lack of clear policy in environmental scanning by Kenyan universities, this paper makes recommendations both at research-specific action and future research orientation. This is done with a view to making teacher education more effective by establishing synergy among stakeholders at local, regional, and global levels.

Key words: teacher education, responsiveness, feedback, feed forward and environmental scanning

Introduction

A university interacts considerably with other institutions that are consumers of its graduates. From a Systems Approach, the university cannot ignore factors within these other institutions and be able to process outputs acceptable to the institutions. It therefore has to guard an attitude of active watchfulness on what changes are taking place in the other institutions in order to respond to their needs; for example, teachers find it difficult coping with the demands of learners who may be ahead of them, or know more than they do (Abenga, 2005). Such information is fed to the university's decision making subsystem and provides feed forward (forecasting changes in the future and setting up goals, or planning) and feedback (reporting on events that have already happened and determining whether or not that event was predicted). Universities engaged in teacher education similarly have intense interactions with institutions that experience high degrees of turbulence. In order to have a practical vision for effective use of educational technology to facilitate training and preparation for graduates to address emerging issues, the universities need to be aware of change within the other institutions and do something about it.

Environmental scanning is a concept from business management by which businesses gather information from the environment, to better achieve a sustainable competitive advantage. To sustain competitive advantage the company must also respond to the information gathered from environmental scanning by altering its strategies and plans when the need arises. Environmental scanning is an important activity in the development of an organization's capacity and capability for change. It helps identify the external forces, events, trends, issues and

relationships that might assist or adversely affect an organization's future. It is particularly important to universities because of the nature of these organizations. Universities as creators and disseminators of knowledge through research, trainers of manpower and providers of service to the society have to continuously respond to the external environment. They have broad and permeable boundaries due to the fact that, among other things, they are intrinsically connected with the community/society, they have additional reporting, legislative and governing responsibilities, and they have strong international links. Universities engaged in teacher preparation have a daunting task of ensuring that their graduates receive quality training.

In Kenya, the Report of the National Committee on Educational Objectives and Policies of 1976 recognized that improvement of the quality of education cannot occur without a major improvement in the quality of teachers as a result of appropriate preparation, especially in the use of the tools of their (teachers') trade. Quality training can only be received through a programme that is relevant to the needs of its recipients. The nature of the workplace environments provides a backdrop for realigning workplace needs with workforce competencies and strategies to ensure quality performance. Similarly, such institutions need to have a far-reaching vision for the effective use of technology in education to help their graduates to be better educated and better prepared for the evolving demands of the new economy. With sufficient access and support, teachers will be better able to help their students comprehend difficult-to-understand concepts and engage in learning, provide their students with access to information and resources, and better meet their students' individual needs. Technology in education involves learning in, with, and through use of educational technologies. As Chickering and Ehrmann (1996) state, new communication and information technologies have become major resources for teaching and learning in higher education. Such technologies are tools with multiple capabilities. This is on the basis that programmes that employ technology for teaching and learning yield positive results for students and teachers. These positive results suggest a future for education that could be quite bright if institutions maintain their commitment to harnessing technology for education. Any given instructional strategy can be supported by a number of contrasting technologies (old and new), just as any given technology might support different instructional strategies. It is reasonable, therefore, to conclude that teachers adequately trained in and by the use of educational technology would perform better in their use, or apply them more readily, than one not adequately trained or one not trained at all.

It makes sense for the above institutions to keep a close watch on their environments and adapt to any changes if their graduates are going to be acceptable in the job market. The twenty-first century learner is very informed and up-to-date in the use of modern communication and information storage, transmission, and accessing devices such as computers, television, video, and others, resulting from familiarity due to home use. Such learners definitely find teachers' use of traditional instructional technology outdated and uninterestingly slow paced. The teachers also find it difficult coping with the demands of learners who may be ahead of them, or know more than they do. This situation does not augur well for effective instruction and requires that teacher preparation takes cognizance of the changes taking place in the society where the graduate teacher will work.

One may argue that nobody can predict the future; it however is important to create a future rather than reacting to it. Implicit here is the need to carry out environmental scanning; this enables an institution to develop contingency plans and actions which reduce the response time needed to address an environmental opportunity or threat. This move would help identify the needs, changes, and challenges characteristic of the environment in which the graduate teacher will work and understand how the impact of these affects an institution's teacher preparation strategies. The key to minimizing uncertainty is having accurate and timely information about the critical aspect of the environment.

The 1973 Commonwealth Conference on Teacher Education recognized the need for specific and relevant training. It also noted that the key to educational quality is the quality of the training force as a whole and individually. The said teachers need to be trained in the use of educational technology that is responsive to the needs of the teaching profession. Such kind of training would ensue from a well co-ordinated environmental scanning which would enable lecturers to be proactive, as opposed to being reactive.

Statement of the Problem

Education is dynamic and serves a dynamic society, and there is, therefore, need to keep up with the changing realities in order to meet the changing needs of society. In Kenya, this has been noted and has been emphasized by the Minister for Education during the launch of Rapid Results Initiative held on 5th September 2007 at the Kenya Institute of Education. The minister noted that as the Ministry of Education undertakes its task of providing quality education to all Kenyans, its overriding philosophy is client sensitivity and responsiveness to the society's needs and the right of every Kenyan to quality service (The Standard, September 5 2007). The

Minister further asserted that the ministry needed to be demand-driven and also practise collaborative engagement with its clients with a view to nurturing partnerships that will lead to quality service delivery. To achieve this goal, he noted, the ministry officers must be efficient and timely in their responses to public demands for services.

Quality education can be achieved through, among other things, proper preparation of teachers. Since teacher training is one of the nerve centres of an education system, more needs to be done to raise the standards of the teachers' preparation. Current training therefore needs a global outlook and approach which must be clearly expressed in the university curriculum, reflected in the objectives and technology applied during delivery. This is against a background where the world is becoming a global village and graduate teachers go to teach school children who keep abreast with the advancements in information and communication technology and apply them in their private studies.

Upon completion of their training course, teachers may find themselves using the conventional instructional technologies regardless of the needs of the learners, and without minding the advancements in information and communication technology (ICT) that are influencing instruction. Yet literature reviewed on studies carried on educational technology reveal that most of the studies have focused on availability, use, adoption and adaptation, and attitude towards educational technology.

For these reasons, there is need to investigate whether and how environmental scanning in relation to educational technology for teacher preparation at the universities is carried out.

Objectives of the Study

The purpose of this study was to investigate whether and how environmental scanning in relation to educational technology for teacher preparation at the universities is carried out. The specific objectives of the study were to:

a) determine the pattern of flow of information from selected stakeholders to teacher education universities;
b) determine the extent of flow of information from selected stakeholders to teacher education universities;
c) establish the factors influencing the flow of information from selected stakeholders to teacher education universities;
d) establish the key elements teacher education universities focus on while carrying out environmental scanning, and
e) identify the challenges teacher education universities face in carrying out environmental scanning.

Significance of the Study

Environmental scanning is integral in any institution which expects to remain relevant in society and make a significant impact on its client's needs. Universities as creators of knowledge through research, trainers of manpower and providers of service to the society have to continuously respond to the external environment in their teacher preparation programmes.

This study focused on the pattern and extent of flow of information from selected stakeholders to teacher education universities, the factors influencing the flow of information from selected stakeholders to teacher education universities, the key elements teacher education universities focus on while carrying out environmental scanning, and the challenges teacher education universities face in carrying out environmental scanning.

Findings of this study will help produce competent teachers able to meet the emerging societal needs and challenges both locally and globally.   Policy makers especially at the Ministry of Education, teacher trainers, educational technologists and all those concerned with teacher preparation at the university will find these findings relevant. Other trainers at the universities will also find these findings important as they can possibly apply them. Above all, universities will find these findings useful as they need to remain 'relevant' in teacher preparation.

Theoretical and Conceptual Framework for the Study

The General Systems Theory (GST) advanced by Bertalanffy (1975) provided the theoretical framework for this study. This is a framework by which one can analyse and/or describe any group of objectives that work in concert to attain some goal. It describes the relationship between an institution, or system, and its environment as shown in Figure 1. The system acquires inputs, transforms them, and generates outputs. These outputs are

exchanged with the environment. If the environment accepts the outputs, the cycle continues. If the environment does not accept the outputs, the system must change the outputs it produces otherwise it will fail and become extinct.

The General Systems Theory helps an institution to identify the critical aspects of its environment. It also illustrates why an institution needs to be proactive and responsive to changes in its environment in order to survive. The strength of this theory can be illustrated through the Theory of Evolution. Charles Darwin, the 19thcentury naturalist, proposed the Theory of Evolution of the species by observing how specific animal species had adapted to changes in their environment. His theory was based on the observation that those species that were able to change to meet changes in their environment had survived and thrived, while those that were not able to adapt perished and disappeared.

The philosophical underpinning of GST is the need to adapt to environmental changes in order to survive (that is, to remain a viable and functional entity), otherwise the tendency towards entropy will grow. The fact that the environment is outside an institution's control does not mean that it should be ignored. The attitude of the institution toward the environment should be one of active watchfulness, referred to as environmental scanning.

Literature Review

A review of literature related to environmental scanning in relation to educational technology in teacher preparation revealed that teacher education is important in preparing teachers for their work and is expected to equip them with the necessary knowledge, skills, and attitudes for competent performance.

Robinson and Latchem (2003), Nzomo, Kariuki, and Guantai (2001), Ministry of Education, Science, and Technology, Kenya (2003), Orfield (2004), and Popkewitz (1993) note that there is growing evidence that teacher education and development in Africa presents one of the greatest challenges to both governments and teacher education institutions. Some of the challenges relate to advances in ICTs and the resultant need for leveraging modern ICTs in the training of teachers; pressure for national competitiveness in a globalized knowledge-based economy against an existing reservoir of untrained and under-trained teachers in many African countries.

Karugu (2007) asserts that interaction between university lecturers and secondary schools in terms of curriculum matters has diminished over time, and that reduced interaction between universities and secondary schools has been characterized by, among others, non-participation in setting and marking of secondary school examinations by university lecturers. He also notes that it would be expected that lecturers would have an opportunity to familiarize themselves with secondary school curriculum when they visit schools during the teaching practice (TP), to supervise their students. This is however not the case as the TP time is too short, usually not more than eight weeks. There is also little follow up of TP after students complete the exercise and rejoin the university to continue with the academic studies.

The literature review also reveals major challenges facing teacher preparation. The first challenge is that of reviewing and restructuring graduate teacher education so that it meets both the needs of student teachers and those of the schools themselves. In respect to student teachers, this means equipping them with academic and professional training to enable them discharge their daily duties in schools effectively. The second challenge facing graduate teacher education is the production of graduate teachers who merely swell the increasing number of unemployed university graduates. If this problem is to be addressed, there is need for constant review of graduate teacher education courses so that they are in tune with the changing needs of schools. The third challenge is to produce teachers of impeccable integrity and character who stand out as role models to the youth and finally, there is the challenge of producing specialist teachers in the many and varied areas of education.

The Ministry of Education Master Plan (1997-2010) indicates that among others, universities are expected to: nurture the internalisation of universal knowledge, including key technological advances, with a view to harmonising it for national development; provide, through basic and policy research, knowledge, skills and services that help solve the problems facing society. It is true that appropriate application of educational technology contributes tremendously to the improvement and enhancing of effective teaching and learning. Various strategies and programmes intended to improve teaching and learning have been developed and some are currently in use in Kenyan schools. Graduate teachers, who were the focus of this study, find themselves in such arena. This calls for a responsive educational technology to be used in their preparation in the face of globalisation and anticipated industrialisation. This being the case, it was in order to conclude that there is much in education and training which could be improved by thinking more carefully about environmental scanning. The process of environmental scanning consists of at least three important steps namely:

a) identifying the variables in the environment that affect its survival and performance
b) determining whether or not those variables are changing, what direction the change is taking, and the speed and rate of change, and
c) assessing the magnitude of the change to decide whether to develop plans of action to counteract these changes.

The need for environmental scanning is driven by the intensity of the interactions between the environment and the system and the degree of turbulence of the environment. Some of the benefits universities would have from environmental scanning include:

a) reduce uncertainty - assist both short term decision making and the development of long term strategies in the use of educational technology
b) identification and monitoring of new and emerging risks and opportunities
c) benchmark assumptions
d) teaching process would improve
e) enhance contextual awareness - assist staff to develop their awareness of the organization's environment and promote strategic conversation
f) develop experience and techniques in obtaining and reporting on organizational intelligence

Methodology

The study was a descriptive survey research. The study sample comprised of four universities, randomly selected from ten Kenyan universities engaging in teacher education. Stratified sampling technique was employed to select 45 lecturers and 240 4th year students from different departments within the schools/faculties/colleges of Education. Purposive sampling was adopted to select 4 Heads of Department from selected universities. Observation schedules and questionnaires were used to collect data. Data was collected on the following aspects: the pattern of flow of information from selected stakeholders to teacher education universities; the extent of flow of information from selected stakeholders to teacher education universities; the factors influencing the flow of information from selected stakeholders to teacher education universities; the key elements teacher education universities focus on while carrying out environmental scanning, and the challenges teacher education universities face in carrying out environmental scanning. The data was analysed using inferential and descriptive statistics.

Summary of Major Findings

a) The pattern of flow of information from selected stakeholders to teacher education universities

All participating universities did allude to carrying out some form of environmental scanning; all did this on an irregular system. On information seeking patterns, this study noted higher informal levels of lecturer-interactions with sources of information as shown in Table 1. An institution needs to intrude actively into the environment in order to be aware of the changes taking place in the environment. The findings from this study show that lecturers frequently interacted with teachers in the field (75%) and registered low interaction with university mechanisms of reporting from schools (27.5%) and tracer research reports (27.5%). Other major sources of information are postgraduate research at the university (70%) assessment during teaching practice (67.5%) and feedback from students after teaching practice (60%). The fact that lecturers interact more with teachers in the field than with students during and after teaching practice means that lecturers are more engaged in informal environmental scanning than in formal environmental scanning. This is further attested to by the finding that lecturers least interact with university mechanisms of reporting from schools.

The findings also show that there are minimal interactions between lecturers and headteachers (15%), parents (30%), the Kenya Institute of Education (32.5%), tracer research reports (27.5%), and university mechanisms of reporting from schools (27.5%). These low levels of interaction between lecturers and other stakeholders would mean missing relevant information, which would otherwise be useful in teacher education, and especially in the area of educational technology.

b) The extent of flow of information from selected stakeholders to teacher education universities

This study established that environmental scanning took place at a school/college or departmental level and tended to be much more focused, looking at forces specifically relevant to the unit. The findings of this study show that 50% of the lecturers rated the flow of information on changes outside as fast; the mean score of the

responses shows a flow that is not fast, agreeing with Gall et al (2005) who argue that it often takes a long time for information to find its way into practice and that the change process in education is very slow.   The implication is that lecturers response time was increased, thus not allowing them to keep at par with changes taking place in the graduate teacher's work environment. In relation to this, failure to ensure a timely filtering of information into lecturers' profession amounts to a serious omission by teacher education universities. This is articulated by Materu (2007) who says that without a robust system to ensure that programmes offered are relevant to the socio-economic needs of the society they serve, universities lack a mechanism to promote and monitor their accountability to their stakeholders (students, parents, government, and other funders).   This implies that Kenyan universities have to endeavour to improve the filtering of information into lecturers' profession in order to maintain relevance and responsiveness.

Lecturers, therefore, would find it difficult to forecast the future and prepare for it, and be able keep in pace with technological changes taking place in the graduate teachers' work environment. Universities, therefore, need to put certain mechanisms in place to ensure that any changes taking place are immediately communicated to the lecturers.   Such mechanisms would include setting up a unit composed of educational technology specialists whose main duty would be to monitor changes, carry out research, constantly inform lecturers and advise on what needs to be purchased. This has been articulated by Mckersie and Walton (1991) that managers who understand the management of technological change often realize success in educational technology use and implementation. That way, responsiveness would always be ensured as lecturers would have more time to teach, guided by research findings and recommendations.

c)   The factors influencing the flow of information from selected stakeholders to teacher education universities

As shown in Table 2, this study noted that lecturers' efforts at environmental scanning are motivated by curriculum review (resulting in need to keep abreast), labour market demands, communications needs in the classroom (thus the need for self-improvement), syllabus change, and technological changes in the society.

d)   The key elements teacher education universities focus on while carrying out environmental scanning

It was found that the information used in the environmental scanning efforts related to the following elements as reported by the lecturers: availability of educational technologies for teaching (25%); state/condition of the technologies available in schools (25%); student teachers' competence in preparation and use of educational technologies during teaching (37.5%); student teachers' familiarity with certain educational technologies (37.5%); appropriateness of certain educational technologies to teach particular topics (66.7%); students' attitudes towards new and emergent educational technologies (25%); parents' attitudes towards and emergent educational technologies (25%); challenges encountered in the use of educational technology in both teaching and learning (40%).

e)   The challenges teacher education universities face in carrying out environmental scanning.

The findings of this study, as shown in Table 3, showed that time availability, technical competence, attitude, and accessibility were cited as major challenges to environmental scanning. These findings agree with the BECTA Report (2003) which identifies lack of access to appropriate technology, lack of time, negative attitude towards technology in education, anxiety and lack of confidence, and lack of technical, administrative, and institutional.

From the findings, it is observed that lecturers experience challenges which act as barriers to their use of appropriate educational technologies for teacher preparation.   Similar challenges are also experienced by students so that once they graduate, they are unable to meet the educational technology needs of their workplace.

Conclusion

This study established that in all participant universities little was done to 'connect the dots' as to the relevance of environmental scanning to their decision-making processes in teacher education. From this study, it is evident that the scope and source of information for environmental scanning efforts are wanting. For example, the scope would include more information such as: technology preferences against age groups, religious groups, income levels, education levels, and ethnic origins; appropriate qualities of educational technologies; and emergence of

new technologies – opportunities and challenges they offer. On the part of the sources of information, this needed to be expanded to include ICT specialists, opinion leaders, and religious leaders.

There is a clear lack of deliberate and well-coordinated environmental scanning in the universities as lecturers indicated an individual initiative to gather information, oft times as a result of informal contact with the sources of information. Contingency, adaptation, and offensive response strategies, which are positive in nature, were commendably used in all universities.

In conclusion, the author recommends that universities engaged in teacher preparation re-focus their concern, and invest in a well-planned environmental scanning system, guided by the following objectives (Coates, 1985):

a) detecting scientific, technical, economic, social, and political trends and events important to the faculty/school/college,
b) defining the potential threats, opportunities, or changes for the faculty/school/college, implied by those trends and events,
c) promoting a future orientation in the thinking of management and staff, and
d) alerting management and staff to trends that are converging, diverging, speeding up, slowing down, or interacting.

Finally, universities will need to remember that environmental scanning is only one component of external analysis. It is the starting point, however, from which university staff can identify trends and events in the environment worthy of monitoring. More importantly, it provides a basis for discerning the strategic direction of the institutions from which staff can plan far more effectively.

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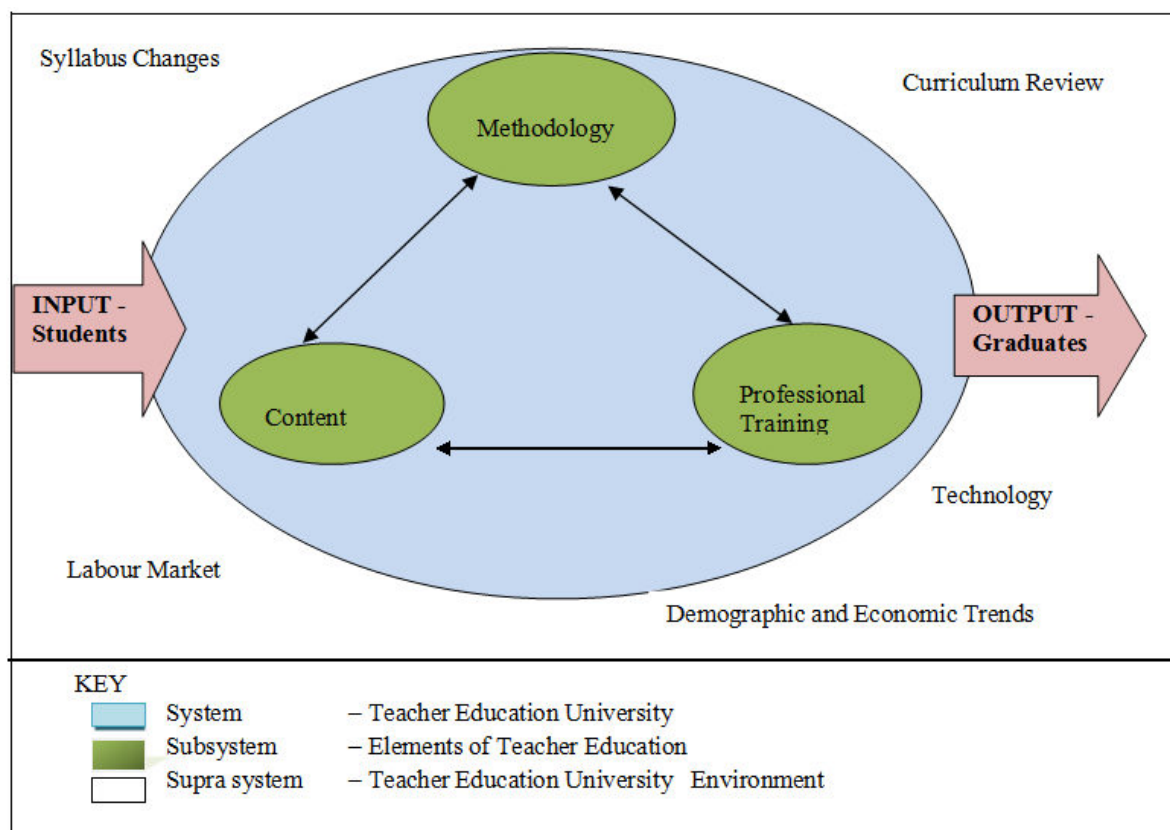The Standard (September 5, 2007). Rapid Results Initiative

Figure 1: A General Systems Approach to Teacher Education

Table 1 Lecturers' Interaction with Sources of Information

Sources of information	Frequency of interaction									Means	
	Most Frequent		Frequent		Un-decided		Sometimes		Never			
	F	%	F	%	F	%	F	%	F	%	Mean	SD
Media	2	5.0	14	35.0	4	10.0	11	27.5	9	22.5	2.7250	1.3006
Interaction with headteachers	0	0	6	15.0	4	10.0	24	60.0	6	15.0	2.2500	.8987
Interaction with teachers in the field	8	20.0	22	55.0	2	5.0	7	17.5	1	2.5	3.7250	1.0619
Interaction with parents	3	7.5	9	22.5	11	27.5	12	30.0	5	12.5	2.8250	1.1522
Interaction with the KIE	1	2.5	12	30.0	8	20.0	10	25.0	9	22.5	2.6500	1.2100
Feedback from students after Teaching Practice	6	15.0	18	45.0	5	12.5	10	25.0	1	2.5	3.4500	1.1082
Tracer research reports	4	10.0	7	17.5	11	27.5	14	35.0	4	10.0	2.8250	1.1522
University mechanisms of reporting from schools	1	2.5	10	25.0	12	30.0	10	25.0	7	17.5	2.7000	1.1140
Postgraduate research at the university	3	7.5	25	62.5	7	17.5	3	7.5	2	5.0	3.6000	.9282
Assessments during Teaching Practice	10	25.0	17	42.5	7	17.5	5	12.5	1	2.5	3.7500	1.0561

Table 2 Factors Influencing Flow of Information to Teacher Education Universities

Factors	Frequencies										Means	
	Very strong		Strong		Moderate		Weak		Very weak			
	F	%	F	%	F	%	F	%	F	%	Mean	SD
Changes in syllabus	9	22.5	18	45.0	10	25.0	3	7.5	0	0	3.8250	.8738
Focus on changes arising from curriculum review	11	27.5	21	52.5	5	12.5	3	7.5	0	0	4.000	.8478
Awareness of labour market demands	12	30.0	17	42.5	9	22.5	2	5.0	0	0	3.9750	.8619
Awareness of technological changes in the society	11	27.5	16	4.0	8	20.0	5	12.5	0	0	3.8250	.9842
Communication needs in the classroom	14	35.0	12	30.0	9	2.5	5	12.5	0	0	3.8750	1.0424

Table 3 Challenges Faced by Teacher Education Universities in Carrying Out Environmental Scanning

Challenges	SD	N	Mean	SD
Time availability	.9390	40	4.4000	.7442
Technical competence	1.0031	40	4.3500	.8638
Technical quality	1.0461	40	4.0250	.8912
Level of sophistication	1.1505	40	4.0750	.9167
Attitude	1.0227	40	4.1500	.9213
Workload	.9807	40	3.7750	1.1655
Peer influence	1.2880	40	3.8250	1.1068
Accessibility	1.1192	40	4.3250	.9971
Portability of the technology	1.2659	40	3.9250	1.0473
Class size	1.1691	40	3.8000	1.1140