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Information and Communication Technology Empowerment of Early Childhood Education Teachers in Botswana

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Abstract

The study assessed the views of in-service participants of the University of Botswana (who are pursuing Bachelors degree in Primary Education) regarding the empowerment of Early Childhood Education teachers with Information and Communication Technology skills. Both quantitative and qualitative research designs were adopted. Eighty-two final year students constituted the sample. A semi-structured questionnaire was used. The findings showed that the respondents strongly believed that the Early Childhood Education teachers in Botswana should be empowered with Information and Communication Technology skills. However, they didn't find the existing curriculum feasible due to lack of in-depth content and pedagogy adopted to deliver the content. The findings showed that the student teachers were not able to realize the usefulness of the popular, generic packages and communication tools. The participants of the study suggested for a comprehensive curriculum with spread-out modules that could offer basic Information Communication Technology skills initially, and provide advanced features in succession, in order to enable them infuse content with technology; perform administrative tasks efficiently; conduct research in Early Childhood Education; and generate local-specific multi-media packages for young Batswana.

Keywords: Early Childhood Education, Information and Communication Technology curriculum, Teacher Education Programme, Teacher Empowerment, Capacity Building

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INTRODUCTION

Information and Communication Technology (ICT) has a wide range of benefits for Early Childhood Education (ECE), as it can be motivating; has positive effects on children's overall development that signifies cognitive, social and affective domains. It reiterates that activities through ICT is more effective as compared to traditional ones; as it encourages children to be involved in creative play, mastery learning, problem solving and conversation (Clements 1994; Haugland & Shade, 1994; Bredekamp & Rosegrant, 1994; Technology and Young Children, 1996; Bose, 2005). Studies have shown that young children prefer to work with peers when working with computers instead of working alone and prefer to get help from peers rather than teachers; show more turn taking behaviour which forms attachments with others and show participation in educational and cooperative play activities (Lipinski, Nida, Shade, & Watson, 1986; Rhee & Chavnagri, 1991; Clements, Nastasi & Swaminathan, 1993).

However, a prolonged usage of ICT has harmful effects both on physical and social development and it might expose children to unsuitable content as well (New Zealand council for educational research, 2004). Thus, an effective school reform is necessary which could spread the best common practices across the whole school

through certain leadership practices, culture and structural supports and use ICT effectively in ECE. Perhaps, the Productive Pedagogy that is often used by teachers to reassemble familiar classroom techniques and strategies into a workable model in order to focus on individualized instruction and ensure high quality, relevant, improved student learning outcomes in a supportive classroom environment might become instrumental for such an effective reform. And ICT could be the solution for such an innovative process, to challenge the older school-based pedagogies.

It is believed that teachers are the key agents to such a transformation as the class-room practices adopted by them are positively linked with high quality student's performance and improved academic and social outcomes of students. Indeed, teachers are the central forces in tapping the learning opportunities created by the introduction of ICT and they hold the key to how teaching-learning takes place in schools. As professionals, they can use and integrated ICT with an understanding of the purpose, the social context, and the best utilisation towards developmentally appropriate practices for young children; and can augment the ability in young children to learn, move, communicate, recreate that are necessary for positive dispositions towards learning (Blatchford & Blatchford, 2006).

The purpose of introducing ICT at a foundation level will be lost if ECE teachers do not establish a linkage between the contemporary theories of learning & development with ICT and facilitate teaching/learning processes (Bolstad, 2004). The ECE teachers need to adopt a cross-sectional objective of the curriculum to permeate all teaching with elements of ICT (ICT and Teacher Education in Chile, 1999) instead of using them sparingly in the computer labs for computer literacy rather than infusing it with content (Bose, 2005). Thus, a reform that values teachers; supports their professional development and systemic policies is essential, especially in an era that refocused on pedagogy and welcomed ways of support that could be provided to teachers, in spite of incidences of teachers' suffering either from change fatigue or from change cynicism (Hayes, Mills, Christie, Lingard, 2006).

Proper attention towards their capacity building must be paid so that they can genuinely integrate ICT in the teaching-learning processes (Wachholz, 2005). To use the new technology in classrooms, they must be empowered with the required state-of-the-art ICT skills, so that the generational gap between the students and the teachers could be met, and the aliens in the classrooms, i.e., the new computer, could be exploited most fruitfully. Training programme that enables the ECE teachers to relate to educational philosophy, and allows them to incorporate their own aspirations, skills, knowledge, and understanding into ICT is essential. Thus, it calls for introduction of an appropriate, effective teacher education programme that provides relevant content tailor-made for ECE teachers as well as empowers the teachers with ICT skills to infuse content and deliver them with a skilful pedagogy.

The curriculum should include right content that enables them to familiarize with ICT and its potential; provides basic skill training to make them computer literate; enables them to log on to the Internet; provides curriculum-integration training; encourages collaborative knowledge-building among practicing teachers by sharing their situated teaching/learning experiences; and enhances their capabilities in researching in their own settings and accessing current research and expertise in ECE (ICT and Teacher Education in Chile, 1999; Sherry & Gibson, 2000; Maheshwari, Mallik & Bose, 2000, Bolstad, 2004). It should have enriching content that would enable teacher educators to become aware of the variety of ways in which ICT can complement and extend teaching and learning contexts in new and dynamic ways, rather than be used to perpetuate existing pedagogical strategies that need to be reconceptualised in the information age (Yelland, Grieshaber & Stokes, 2000, p. 95).

For any teacher training programme, in addition to content, the pedagogical practices are vital as they optimise learning of the students, as well as ensure a proper delivery of the content. Different pedagogy proves to be fruitful in different situations as some are instrumental in incorporating children's ideas, theories, or questions more as compared to others (Pollman, 2000). Selection of strategies for delivering content is essential, as some are more suited for a particular concept, skill, field or group (Vakali & Pallis, 2002, Chalmers, 2000) as compared to others.

Thus, it becomes inevitable to emphasise both on content and pedagogy for any teacher training curriculum to be effective, as upon graduation, these teachers are expected to be able to explore new ways of working in their own ECE setting and engage in reflective thinking about children's learning.

Since this study is conducted in Botswana, it is necessary to get an overview of its scenario. In its National Development Plan, Botswana outlines strategise to produce knowledgeable, skilled, enterprising and independent individuals to face a technologically advanced environment (Republic of Botswana, 2003); and in its Revised National Policy on Education, it proposes that the society needs to be computer literate and that the work force should be prepared to make the best use of Information Technology (Republic of Botswana, 1994). The Government also plans to provide resources for the expansion of educational facilities and proposes that all schools have access to computer and Internet by 2016 (Republic of Botswana, 1997). However, such an aspiration can only be realised by adopting an effective teaching/learning practice, especially at a time of multiple effects of

globalization and new technologies on identities, knowledge, practices, economies and nations. And preparing informed teachers, thus becomes most crucial.

As far as teacher training programmes are concerned, there is a dearth of degree/diploma awarding programme dedicated to produce ECE teachers in Botswana! And in the absence of such a programme, other programmes that train primary school teachers, have taken the burden of offering ECE courses, both at diploma and degree levels. However, the University of Botswana (UB), in the mean time is getting ready with a dedicated teacher training programme for ECE specialists. Therefore, under the present circumstances, it would be wise to get ready with an effective curriculum for ECE teachers in order to make them face various challenges in the classrooms efficiently. Indeed, ICT could be tied in with these efforts which contribute to the compression of time and space, as well as the creation of new identities and new cyber communities, especially for young people of school age, who are better positioned as compared to their parents' generations, in relation to such technologies (Hayes, et al. 2006). Attempts must be made to develop curriculum that empower the ECE teachers with ICT skills, so that they can utilise ICT industriously in ECE classrooms.

However, researches have shown that in Botswana, the teacher training institutions offer most basic level computer training to the student-teachers, which are not very productive both in terms of content and pedagogy (Bose, 2004). Thus, the current study was envisaged and the views of the student teachers of University of Botswana (UB), who are one of the key stakeholders in ECE, were captured regarding ICT empowerment of ECE teachers.

Research Objectives

The study intended to find out the view of the students teachers on empowerment of ECE teachers with necessary ICT skills. Thus the objectives of the study were as follows:

1. To find out the necessity of ICT in ECE
2. To establish the need to empower ECE teachers with ICT skills
3. To critically review the existing ICT curriculum and propose a way forward for ICT empowerment of ECE teachers

METHODOLOGY

This study was carried out in 2008. A survey research design was adopted for the study. The population used was the in-service participants of B.Ed primary programme who were recently teaching in primary schools spread across the country, and were being provided with in-service training at the University of Botswana. A purposive sampling technique was used, where eighty-two (82) fourth year students participated in the study. These in-service participants were selected as they were completing and getting ready to go back to their services as primary school teachers. Out of the entire sample, only seventeen (17) had opted for ECE as a second Major and were being trained to teach children in pre-primary, lower and upper primary classes. The rest of the sample was primary school teachers who were being trained to teach children in both in lower and upper primary classes only. The researcher felt that these primary school teachers would be able to provide necessary, valuable inputs regarding ICT requirements of ECE teachers. Taking cues from Gay and Airasian (2003) the most appropriate instrument to use was a questionnaire as the number of in-service teachers was big and there was not much time to individually interview these respondents. The questionnaire was semi-structured and had both open and closed questions. The instrument included questions on necessity of empowering ECE teachers with ICT skills and the kind of ICT curriculum needed. The researcher used both the quantitative and qualitative approaches to analyse the data collected. Microsoft EXCEL was used to analyse the data quantitatively, and various kinds of Charts were used to present the processed data. The response of the participants was recorded and verbatim was presented wherever necessary, in a descriptive form. Analysing data both by quantitative as well as qualitative measures were adopted so that both numbers and verbal description could help in retrieving information from the data collected.

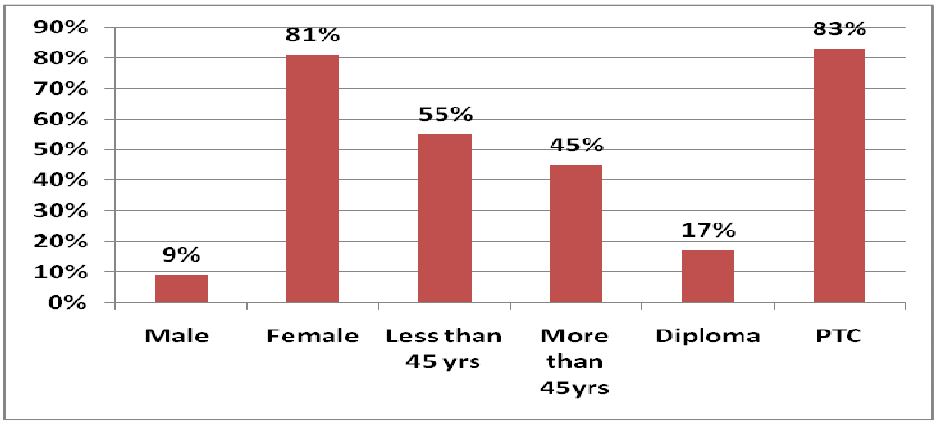
RESULTS AND DISCUSSIONS

The findings lead to a lot of introspection to the issues raised above. The results are presented as per the objectives and folowed by discussions. The firat part of the results deal with the demographic data of the participants (student-teacher) as that would give a fair understanding of the background of the sample selected for the study.

Demographic Data

As shown in Fig.1, the sample was heavily dominated by females as 81% comprised of females and only nine (9%) were males. This is a true reflection of the reality that most teachers at the foundation level of education are females. There is a gender bias in the teaching profession in schools and particularly in primary grades. It was also found that almost half of the students (45%) were more than 45 years old. This raises a concern because older teachers do not seem to accept any change in the teaching/learning process, and may be resistant to a new idea like the empowerment of the ECE teachers with ICT skills. Prior to joining the in-service programme in UB, 17% of students acquired diploma in Primary Education (either from UB or from the Teacher Training Colleges of Botswana), 83% had Primary Teachers Certificate (PTC); and the entire sample of participants had a minimum of two years of teaching experience. This need to be addressesd as well as most of them was neither optimally qualified nor was they very experienced. So one wonders how profound would be their understanding of the empowerment of ECE teachers with ICT skills!

Fig. 1 Demographic Data

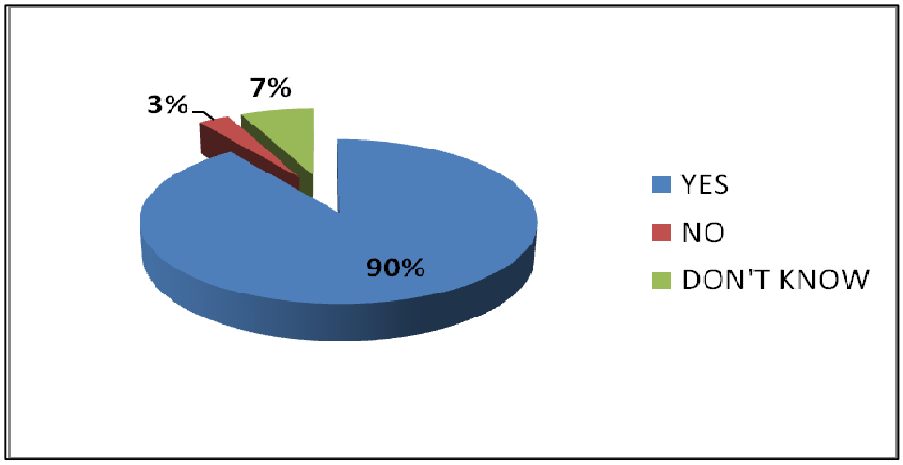


Necessity of ICT in ECE and Empowerment of ECE teachers with ICT Skills

To reflect on the issue of necessity of ICT in ECE classrooms the views of the student teachers were captured. As high as 88% of the participants felt that ICT is most essential in ECE and stressed that the ECE segment should be given top priority and allocation of computers should be granted much earlier in ECE rather than in higher stages of education, as it lays the foundation for children.

In most schools in Botswana it is found that ICT is the core business of computer teachers. Thus, while using computers for young children in the classrooms, often the computer teachers are found to take classes, and the issue of infusing computers in teaching/learning process gets lost completely, as the computer teacher does not have the content to be integrated with ICT. The current study found that nearly the entire sample (90%) was in favour of empowerment of the ECE teachers with ICT skills, as they felt that it would make the ECE teachers competent, and motivated to make ICT accessible to people of varying backgrounds and ages (Sinko & Lehtinen, 1999). Incidentally, in Botswana, a lot of children come from different cultural settings (Fig.2).

Fig. 2 ICT Empowerment



To emphasise on the same issue, the participants went on to explain that "*Computer teacher is required only for handling specialized computer courses like computer science, computer studies, etc. in higher classes, and not in ECE".* This confirms that the teachers were eager to be empowered with ICT skills as that would bridge the gap between the computer teachers and the ECE/subject teachers, and they would no longer have to depend on an outsider for using it for their own teaching/learning purposes!

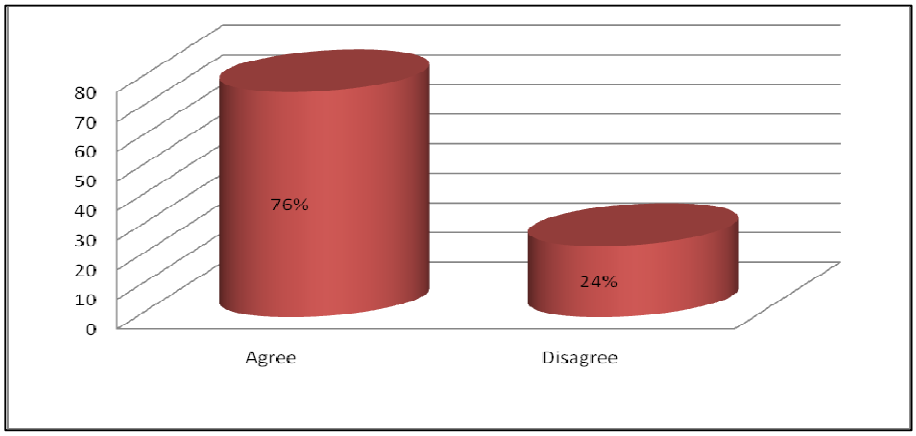
In Botswana, 50% of primary schools do not have computers (Bose & Tsayang, 2005). So the question often arises as what is the point of empowering these teachers with ICT skills? The participants felt that unavailability of computers should not influence the decision of empowerment of ECE teachers and responded positively with the following words:

> *Even if schools do not have computers, efforts must be made to empower the teachers with ICT skills as it would create an awareness regarding its application and necessity in ECE.*

ICT Utilization in the Classroom (Efficiency)

Mere empowerment is not the solution though. It is also necessary to exploit the ICT skills competently and efficiently to yield the best results. Undeniably, an ECE teacher needs to be efficient as s/he handles quite a few things single-handedly. S/he not only teaches all the subjects as a class teacher, but also manages a large group of children. In Botswana, the teacher/student ratio is often very high in lower classes. And by using computers to develop teaching aids, to prepare teaching notes, which s/he can preserve and use recurringly on successive demands, s/he will definitely be able to utilise more time constructively, perhaps in doing research in ECE or by amalgamating ECE curriculum from other certified sources, especially in the absence of one in Botswana! In addition, an ECE teacher manages various types of class registers, records of all the students without any teaching aide, most of the times. So to make the ECE teacher efficient and to enable him/her to use computers for administrative purposes, ICT empowerment is essential. The views of the participants regarding the best utility of ICT for ECE teachers were captured, and majority of them (76%) felt that they would use ICT in performing administrative tasks as well as preparing teaching materials (Fig. 3).

Fig. 3 ICT Utilisation in the Classroom (Efficiency)

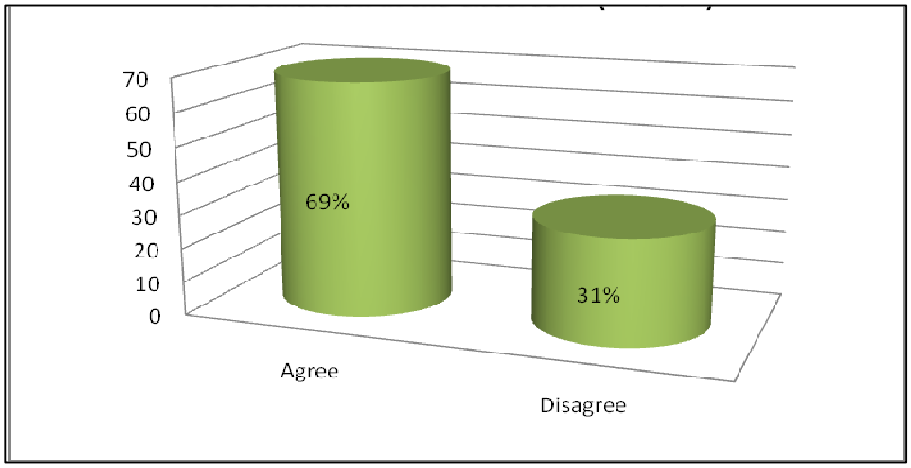


ICT Utilization in the Classroom (Infusion)

Another 69% of the participants opted for infusion and said that ICT empowerment will not only enable them to infuse subject matter with computers but would enable them deliver the content to children by making it attractive, while using the innovative multimedia features of computers (Fig. 4). Indeed, at pre-primary level, computer aided multimedia packages could prove to be ideal for such integration as it enables one to provide content and can make learning a pleasurable experience as it evokes a child's sensory perception, and can make a child's learning more effective as compared to posters, static photographic material and limited video clippings which are rigid and non-

interactive. Such packages make teaching/learning process flexible, diverse, user-centred, and interactive and allow an autonomous use of quantity and quality of information as per one's requirements (Bose, 2005).

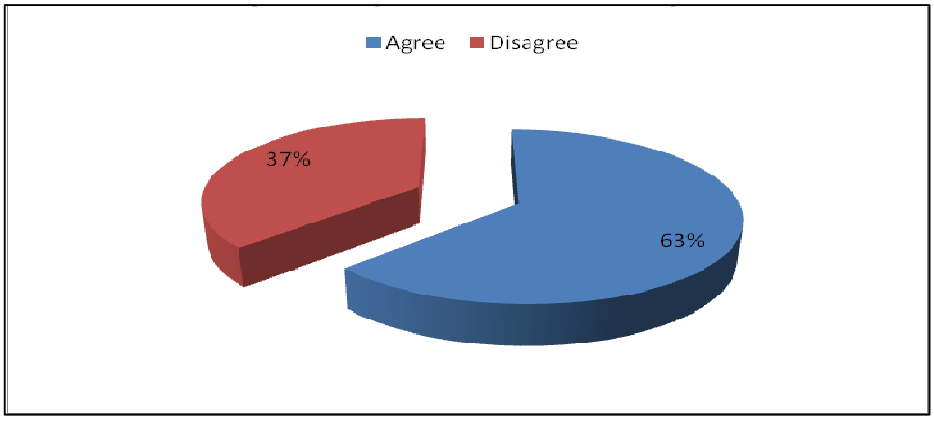
Fig. 4 ICT Utilisation in the Classroom (Infusion)



Utility of Multi-Media Packages

The participants were also asked to air their views regarding the utility of Multi-Media packages. A large number of them (63%) felt that the multimedia packages were very useful for teaching/learning purposes especially in ECE as they felt that during early years, children need to be presented with materials in a more interesting manner, perhaps with sound, graphics and animation which could only be achieved efficiently and solely with the help of a computer which is interactive, unlike other technologies used in education (Fig. 5)!

Fig. 5 Utility of Multimedia Packages



The participants also expressed their concern regarding cultural and language bias that most of the packages seemed to have! For example, the stories, pictures, games, dramas, language, music, dance, food, vegetables, animals, clothes, celebrations, beliefs and myths, customs, national days and to what have you, were specific to western culture, and not refering to Botswana at all. Some of them said that:

> *The packages were good but the language and the images were more appropriate to the Western countries*.

This raises a concern. Children in Botswana need to be exposed to their own cultural values and customs in their own language, especially at the foundation level. The teachers can certianly use the culturally viable software in the classrooms, if only they are available. This calls for indigenous development of software for children!

The next issue was concerning content, i.e. what kind of skills should be inculcated in them so that they can perform efficiently in administrative tasks, develop teaching materials, as well as infuse content with ICT and deliver it in the ECE classrooms. In an effort, the participants were asked to list the programmes that they feel important as part of their curriculum for ECE teachers. Only 43% ranked Word Processor as an important tool and said that:

> *It helps the teachers to create documents, prepare teaching notes and research reports* (Fig. 6).

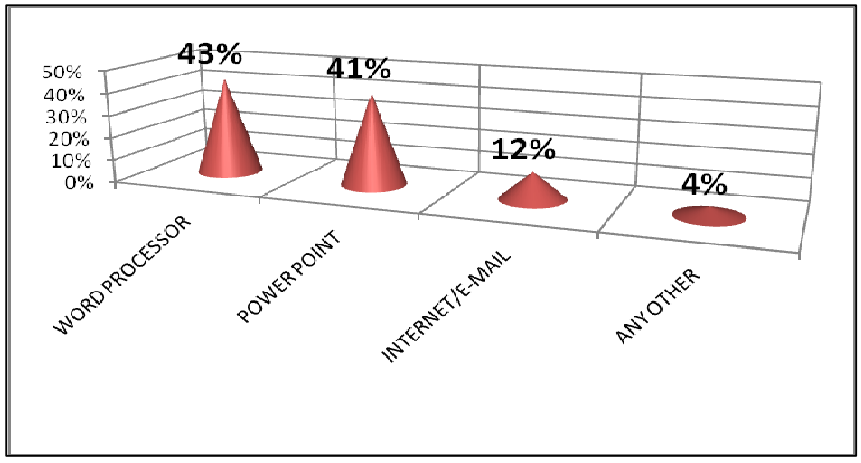
Another small section of participants (41%) chose Power Point Presentation as an important tool and mentioned that Power Point is a teacher's tool and it helps in*:*

> *Creating teaching aids for lessons presentations in classrooms and making presentations in workshops and seminars that we attend quite often (Fig. 6).*

Although the rate of response is not very high, the findings somewhat support the report of the Ministry of Education (Chile, 1999) which stated that:

> Student teachers use ICT in the design and organisation of their teaching activities as a tool for creating more open and flexible learning environments and for preparing teaching materials and develop a reflective stance regarding the uses of ICT in classrooms.

Fig. 6 Important ICT Programmes



Unfortunately only twelve (12%) rated Internet and E-mail important for ECE teachers. This raises a concern as the participants didn't visualize the importance of communication tool like the Internet, which could prove to be extremely valuable, both for teachers as well as children, especially in Botswana where the ECE curriculum is still not on the floor; and there is a prevalence of untrained ECE teachers (Bose, 2008), who could explore on-line to get guidance regarding curricular issues.

As regards the category of 'Any Other' which listed software dedicated for administrative tasks like Spreadsheets, Databases, even a smaller percentage i.e., only four percent (4%) indicated it as important. This contradicts the findings which pointed that the participants chose ICT as a useful tool for performing administrative tasks. Perhaps, the current sample had not been exposed to the popular packages like Word Processor, Power Point Presentation, Spreadsheets and Databases till they participated in the study. And thus they did not identify them as very important because the potentials of these tools were not fully realised by them. The implication is that the lack of exposure and relevant content might have caused them ignore the important tools.

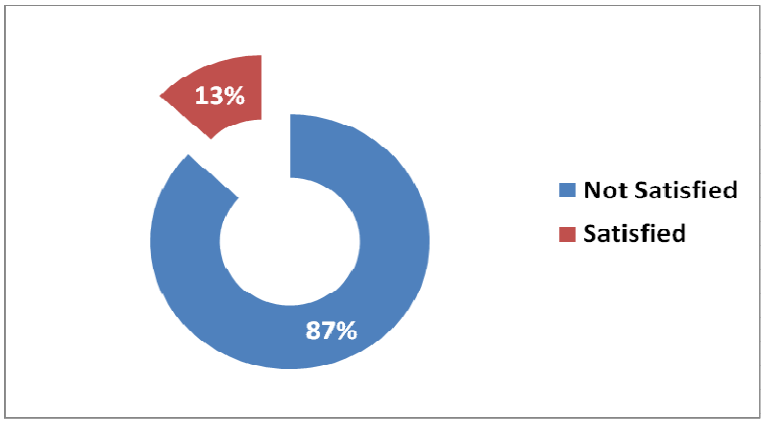
Review of Existing ICT Courses and Curriculum

The participants were asked to review the curriculum, focusing on the curricular structure, the content of the current ICT courses offered to the teachers. And their views were recorded. The participants primarily indicated the shortfalls of the current curriculum and recommended an alternative viable curriculum that they thought would be appropriate in providing ICT empowerment to ECE teachers. Their focus was on providing skills and competencies

to the ECE teachers so that they are able to integrate ECE content with the state of the art technology and also to perform administrative tasks efficiently.

On the question of their satisfaction with the current curricular structure, majority of the participants (87%) revealed that they were dissatisfied with it (Fig.7). The reasons given by them were the existing ICT courses prepared them partially and provided very basic and introductory skills, which may fail to make them marketable.

Fig. 7 Satisfaction with ICT



On scrutinizing the individual ICT courses that were part of their curriculum, majority (68%) of them found the **General Education Courses (GEC)** ineffective due to time constraint, lack of computers and lack of specialised instructors. On the other hand, a large number of them (73%) rated **Computer Applications for Primary Schools (CAPS)** as effective but required restructuring. They suggested that the students need to be taken through the important modules, e.g. Power Point Presentations and Graphics much leisurely, as the hurried coverage of the topics could not benefit them much. They reiterated that mastering of ICT skills requires recurring hands-on practice for a longer span of time. According to them, when a handful of ICT modules are covered over a short span of time, it becomes difficult to fully acquire the required skills.

The study found that the participants pushed for a revision of the existing ICT curriculum and proposed an alternative one that they felt would prepare the teachers better to use the technology efficiently in dealing with young children in the classrooms. While proposing an alternative curriculum, the participants reiterated that there should be no provision for any optional computer courses, as these courses are unavoidable and must be made compulsory.

The subject matter knowledge is a reservoir from which teachers draw when they prepare for teaching (Barnes, 1989). In the present study the participants emphasized that provision of two GECs and one CAPS is not adequate for any ECE teacher training programme and more core courses with strong content matter should be included in the curriculum. The participants discarded the prescription of barely three ICT courses for ECE teachers altogether, which did not provide enough on-line experiences to them as each of them carried merely two credits and persisted for one semester only. Introduction of advance ICT tools that were beyond the scope of the existing ICT curriculum was encouraged. The state of the art tools that can empower them to use advance graphics, sound and animation, in addition to acquiring basic skills were in demand. They recommended provision of skills to infuse ICT with the subject matter. Such courses, they thought would enhance their capacity to develop appropriate teaching materials for young children. The participants felt that ECE teachers need special training to develop software so that they can infuse the right content while exploiting the ICT features efficiently.

Truly the pedagogy is crucial in making any teachers/teacher educators familiar with actions and strategies of teaching, organization of classroom experiences, providing for diverse learner needs, evaluation and implementation of learner's prior notions, and transformation of ideas into understandable pieces (Enfield, 2008). The participants of the current study also focussed on the delivery of the content. They said that an ECE teacher should be exposed to a wide range of graded, compulsory, core courses that offer hands-on-experiences. They felt that with a gradual, continuous flow of core courses covering different ICT content in each semester, from the entry point till the end of the teacher training programme, would really be able to empower an ECE teacher effectively. The current scenario where the ICT courses were offered either in the beginning of the teacher training course (first year of the study), or at the end of the programme (final year of the study) was not acceptable to the participants. They made it very clear that different modules should be offered at different levels of study, over the whole span of the programme, so that it can provide the participants with computing skills in a continuous succession and help them build up new skills on the older ones. They recommended more contact time with the

ICT tools as they felt that one needs to practice more to acquire those skills. They felt that such a strategy would help the students keep the computer basics that were introduced during the first year fresh in their minds and would also save a lot of time usually required revising them. In short, they felt that there is a need to propose a new, appropriate ICT curriculum for ECE teachers, by incorporating their suggestions.

CONCLUSION

The ECE teachers in Botswana felt that ICT is necessary at ECE level, as it is effective in an overall development of young children. Those teachers, who have a key role to play in making ICT accessible to all children in the early years, also emphasized that all ECE teachers must be empowered with ICT skills, so that they can explore ICT and use it in their classrooms in a variety of ways that is expected out of them in this new information age! However, an alternative ICT Curriculum needs to be developed for witnessing the desired outcome, i.e. ECE teachers with empowered ICT skills.

The outcome of the present study makes it very clear that while developing an effective, alternative ICT curriculum for ECE teachers who are responsible for optimizing learning of young children, the content as well as the pedagogy adopted to offer it need to be revisited. Care should be taken to offer a comprehensive ICT curriculum that contains rich, relevant in-depth content that not only could give them a rich exposure, but would also enable them to be proficient with all the necessary ICT skills to perform efficiently both in their teaching/learning process as well as in administrative tasks. In addition, strategies for delivering content need to be chosen cautiously, so that the teachers do not fail to realise the power of the popular, generic programmes like Word Processor, Power Point Presentations, Databases, Spreadsheets, communication tools, and the Internet, and use them competently in classroom situations. The real challenge would be that the modules of the ICT curriculum should be spread-out over the entire span of the teacher education programme, rather than intermittently appearing here and there. The ECE teachers must master the basic skills at first, and then move on slowly, in succession, to acquire the advanced skills, instead of hurrying through the modules. The irregular, discontinued delivery of content, i.e., a few in the first year and rest in the last bout of the teacher training programme need to be substituted in favour of an incessant, continuous delivery of ICT courses.

An introduction of administrative tools will certainly ease the burden of an ECE teacher who is managing the whole show probably single-handedly, in a large class-room with no teacher aide most of the time, which is normal in Botswana! If s/he knows how to use spreadsheets for managing attendance register, and how to use Database for maintaining a student's individual record, or how to plan a daily routine by using word processor, s/he would undeniably economize on time spent to get the jobs done and devote more time on providing overall development to the young ones, which is the core business of an ECE teacher. Thus, it could be recommended that an ICT curriculum for ECE teachers should definitely include advance features of Word Processor, Spreadsheets and Databases as that would make them proficient in managing records and registers; would also exempt them from doing repetitive tasks while saving time for constructive tasks in their own area. With such an effort, the ECE teachers would certainly be better equipped!

Generally, ECE teachers devote a large chunk of their time in preparing for their classes, and develop teaching materials for delivering content to their wards. Utilisation of Power point Presentation in developing teaching aids could be an excellent idea, and ECE teachers should be encouraged profusely and empowered with such a skill. Usage of attractive graphics, appropriate and relevant text for the target group, along with some multimedia features could help an ECE teacher produce teaching aids aesthetically, without spending much time and resources. S/he can even preserve it easily in an electronic medium, as a file/folder in the computer, for futuristic, repetitive usage, without consuming much space, and use it without any delay.

While developing an alternative curriculum, the participants' apathy towards communication tools should positively be addressed as ECE teachers need to be empowered with communication skills, as that would enable them to locate appropriate materials for teaching/learning purposes. Normally, teachers do not utilise web-based resources as a result of insufficient Internet access and perhaps, lack of training to integrate ICT skills in their teaching (Girod & Cavanaugh, 2001). But efforts need to be made to acquaint them with communication tools so that they can enrich themselves with the latest information and engage in research activities. In Botswana, communication tool like Internet would prove to be extremely valuable both for teachers as well as children, especially in the absence of a prescribed ECE curriculum and teaching/learning materials on floor; and also in a situation where majority of ECE teachers are not trained (Bose, 2008). Thus, gathering relevant information from Websites regarding issues on child protection, child advocacy and children's right, ECE policies and programmes in different countries would certainly throw light on the classroom practices.

ECE teachers in Botswana are the class teachers, who are solely responsible for delivering content of different subjects like math, science, languages, social sciences, etc. Thus, the ECE teacher can heavily rely on multi-media packages and teach topics that are interconnected in a curriculum web. An ECE teacher needs to know

about safety, health and nutrition of young children. Multimedia packages with relevant content in these areas can even provide basic knowledge, primarily in the absence of ECE curriculum, which is paramount in the country.

Quite emphatically it can be said, that success of an ECE teacher training programme that intends to empower its wards with ICT skills relies on improvement in the capacity of educators to integrate ICTs into teaching; and on extending assistance to teachers in developing locally-specific learning materials (Meleisea, 2005). The utilisation of developmentally appropriate software for young Batswana's (citizens of Botswana) overall development has been a concern for the ECE teachers. Young children need to learn about their own cultural values and norms at the foundation level. Thus, efforts need to be made to build up their capacity to develop culture-specific, regional, local specific learning materials for Batswana children, with advance ICT skills and enable them to infuse content in the form stories and myths into ICT for the young ones, so that they can internalize them without a hitch. Such an empowerment would enable them to work in collaboration with the software developers so as to understand ICT related issues better. Because a software vendor often misses the intricate issues of ECE in terms of content, and the ECE teacher, due to lack of ICT skills, fails to provide required guidance to generate developmentally appropriate multimedia packages that are appropriate for young children.

To conclude, it can be envisaged that in Botswana ECE teachers need to be empowered to infuse culture-specific content with the technology and also need to be made competent to develop socio-culturally appropriate software for the young Batswana.

REFERENCES

Barnes, H. (1989). Structuring Knowledge for Beggining Teachers. In M. C. Reynolds (Ed.), *The knowledge base for beginning teachers,* 13-34. New York: Pergamon.

Blatchford, I& Blatchford, J. S. (2006). *A Guide to Developing the ICT Curriculum For Early Childhood Education*. Stroke on Trent, UK: Trentham Books.

Bolstad, R. (2004). *The role and potential of ICT in early childhood education: A review of New Zealand and International literature*. Wellington, New Zealand: New Zealand Council for Educational Research. Retrieved February 8, 2008, from http://www.minedu.govt.nz/web/downloadable/dl10074_v1/ictinecefinal.pdf

Bose, K. (2004). Computer Training Programme for Primary School Teachers in Teacher Training Institutions of Southern Region of Botswana. *Research in Post-Compulsory Education, 9*(3), 401-415.

Bose, K. (2005). Computer use in Reception schools, A Case of Gaborone, Botswana. *Early Childhood Education Journal, 33*(1),17-24.

Bose, K. (2008). Gaps and remedies of early childhood care and education (ECCE) programs of Botswana. *Educational Research and Reviews*, *3*(3), 77-82. http://www.academicjournals.org/ERR.

Bose, K. and Tsayang, G. (2005). Availability and Utilisation of Information and Communication Technology (ICT) in Primary Schools-A Case of Southern Region of Botswana. *PULA-The Botswana Journal of African Studies, 19*(1), 28-36.

Bredekamp, S., & Rosegrant, T. (1994). Learning and teaching with technology. In J. L. Wright & D. D. Shade (Eds.), Young children: Active learners in a technological age pp. 53-61. Washington, DC: National Association for the Education of Young Children.

Chalmers, H. (2000). *Integration of Productive Pedagogies and Principles of Effective Learning and Teaching.* Retrieved January 29, 2009, from http://www.google.co.za/search?hl=en&q=Integration+of+Productive+Pedagogies+and+Principles+of+Effective+Learning+and+Teaching.+&meta=

Clements, D. H. (1994). *The uniqueness of the computer as a learning tool: Insights from research and practice*. In J. L. Wright & D. D. Shade (Eds.), *Young children: Active learners in a technological age*. Washington, DC: NAEYC. ED380 242.

Clements, D. H., Nastasi, B. K., & Swaminathan, S. (1993). Young children and computers: Crossroads and directions from research. Young Children, 48(2), 56-64.

Enfield, M. (2008). *Content and Pedagogy: Intersection in the NSTA Standards for Science Teacher Education.* Retreived September 20 2008, from https://www.msu.edu/~dugganha/PCK.htm.

Gay, L. R. & Airasian, P. (2003). *Educational Research Competencies for Analysis and Applications*. New Jersy: Merrill Prentice Hall.

Girod, M & Cavanaugh, S. (2001). Technology As an Agent of Change in Teacher Practice. *THE Journal, 2001 - eric.ed.gov., (4).* Retrieved on February 8, 2008, from http://upetd.up.ac.za/thesis/available/etd-04032003-142408/unrestricted/05chapter5.pdf .

Haugland, S. W., & Shade, D. D. (1994). Software evaluation for young children. In J. L. Wright & D. D. Shade (Eds.), *Young children: Active learners in a technological age*, 63-76. Washington, D.C.: National Association for the Education of Young Children.

Hayes, D; Mills, M; Christie, P; Lingard, B. (2006). *Teachers and Schooling Making a Difference: Productive pedagogies, assessment and performance.* Retrieved January 27, 2009, from http://www.ebooks.com/ebooks/book_display.asp?IID=239654#.

Information and Communication Technology (ICT) and Teacher Education in Chile: Trends and Issues. (1999). Retrieved on 10th Nov, 2006 from: http://www.cmec.ca/international/forum/itr.Chile.en.pdf.

Lipinski, J.A., R.E. Nida, D.D. Shade, & J.A. Watson. (1986). The effect of microcomputers on young children: An examination of free-play choices, sex differences, and social interactions. Journal of Educational Computing Research 2 (2): 147-68.

Maheshwari, A.N., Mallik, U., Bose, K. (2000). A Blueprint for Smart Schools. *Perspectives in Education, 16(Special Issue),* 102-109. India: Society for Educational Research and Development.

Meleisea, E. (2005). UNESCO Bangkok Prepares for the World Information Summit, *ICT in Education Unit*. Retrieved November 10, 2006 from http://www.unescobkk.org/index.php?id=3229.

Pollman, M. J. (2000). Using technology to document children's work. *Journal of Early Childhood Teacher Education, 21* (2), *261-267.*

Republic of Botswana (1993). *Report of the National Commission on Education.* Botswana: Government Printers.

Republic of Botswana (1997). *Vision 2016: Towards Prosperity for All-Long Term Vision for Botswana. Botswana*: Government Printers.

Republic of Botswana. (1994). *The Revised National Policy on Education*- Government Paper No.2 of 1994. Botswana: Government Printers.

Republic of Botswana. (2003). *National Development Plan 9*: 2003/4-2008/9- Ministry of Finance and Development Planning. Botswana: Government Printers.

Republic of Botswana. (2004). *Ministry of Education.* Botswana: Government Printers.

Republic of Botswana. (2008).*Ministry of Education*. Retrieved January 23, 2008 from http://www.moe.gov.bw/cde/index.html.

Rhee, M. C., & Chavnagri, N. (1991). 4 year old children's peer interactions when playing with a computer. ERIC, ED 342466

Sherry, L. & Gibson, D. (2000). *The Path to Teacher Leadership in Educational Technology*. Retrieved November 10, 2008 from http://www.vermontinstitutes.org/pub/TeacherLeadership.pdf.

Sinko, M. & Lehtinen, E. (1999). *The Challenges of ICT: In Finish Education*. Finland: SITRA.

Technology and Young Children -- Ages 3 through 8. (1996). NAYEC (Position Paper). Retrieved on Nov. 2003 from Website: http://www.naeyc.org/resources/position_statements/pstech98.htm.

Vakali, A. & Pallis, G. (2002). Content delivery networks: status and trends. IEEE Explore, Digital Library. Aristotelian Univ. of Thessaloniki, Greece

Wachholz, C. (2005). *Effective Use of ICT in Teaching and Learning*. Retrieved November 10, 2008, from http://www.unescobkk.org/index.php?id=2772.

Yelland, N., Grieshaber, S., & Stokes, J. (2000). Technology in teacher education: Examples of integration and implementation in early childhood courses. *Journal of Information Technology for Teacher Education, 9* (1), *95-108.* Retrieved June 30, 2008, from http://www.triangle.co.uk/ciec/.

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