

#### **European Journal of Education Studies**

ISSN: 2501 - 1111 ISSN-L: 2501 - 1111

Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.3875972

Volume 7 | Issue 5 | 2020

# PROPOSED ACCREDITATION MODEL FOR EARLY CHILDHOOD EDUCATION IN BOTSWANA

N. B. Mswela<sup>i</sup>

Dr., Faculty of Education,
Department of Primary Education,
University of Botswana,
Botswana

#### **Abstract:**

The paper seeks to assess aspects that can be considered high priority in formulating an Early Childhood Education (ECE) accreditation model in Botswana. The article further proposes such a model based on these high priority factors. The study adopts the Minimal Accreditation Model (MAM) as the Theoretical Framework and uses Principal Component Analysis (PCA) and Factor Analysis to prioritise data in order to identify the most preferred aspects for inclusion the proposed accreditation model. The research reveals first-preferred and second-preferred factors and elaborated how these could be incorporated in the accreditation model, which is in turn presented and explained.

**Keywords:** accreditation, early childhood education, quality education, accreditation model, standards, priority factors

#### 1. Introduction

Early Childhood Education (ECE) refers to branches of education and care of young children from birth to 8 years (Meier & Marais, 2012). It is also referred to as pre-school, kindergarten, nursery and crèches. Various policies are used in the provision of ECE in Botswana. These policies have been aligned with global interest such as the 1990 Jomtein Conference 'Education for All' held in Thailand. The most prominent are the following: The Revised National Policy on Education of 1994 and the Early Childhood Care and Education Policy of 2001. Although these policies have assisted stakeholders in Botswana in the provision of ECE services, they seem not to be adequate in assuring quality ECE standards.

The objective of the ECE policy of 2001 is to create an opportunity for the establishment and development of professionals in the field of ECE. This policy further seeks to develop care and education to give women an opportunity to join the labor force.

-

<sup>&</sup>lt;sup>i</sup> Correspondence: email <u>mswelan@mopipi.ub.bw</u>

It also seeks to promote the rights of children. Education, especially ECE, is considered a right for all children and thus all children need to be provided with such (Jomtein Conference for All, 1990). At the same time, the ECE Policy of 2001 seeks to strengthen the support of identification as well as the referral of children with developmental problems.

#### 2. Objective of the Study

The paper seeks to assess aspects that can be considered high priority for formulating an ECE accreditation model and to attempt to propose an ECE accreditation model for ECE in Botswana on the basis of these high priority factors.

#### 2.1 Theoretical Framework

This study adopts the Minimal Accreditation Model (MAM) as the Theoretical Framework. The essential features of the MAM include having a formal authorizing power (Berliner & Schmelkin, 2010). Having accreditation standards implies the existence of an accreditation body which acts as an authorizing power and reviews, assesses and gives permits to carry out ECE provisions. The Botswana Qualification Authority (BQA) is in place for issuance of accreditation and ECE Minimal Accreditation Standards (MAS) may be developed by the authority in consultation with relevant stakeholders. The presence of BQA gives this study an impetus to propose the use of the Minimal Accreditation Model as a Theoretical Framework. BQA already deals with setting up minimal standards to be adhered to by institutions of learning.

Furthermore, the MAM uses quantitative indicators like required number of teaching staff, adequate size of the establishment, reasonable teaching load, spread of responsibilities, size of teaching rooms and laboratory facilities as well as the availability of a library and computers. Another aspect of this model is that assessment is done in numeric value. For example, a minimum number of children with corresponding number of staff can be set for ECE programs to start running or continue the provision.

The MAM determines basic characteristics of the school and program. This model is often numeric, and regulation based, focusing on basic questions such as: Does the school satisfy basic legal requirements? Does the school have enough budget, infrastructure and reserves to conduct the program? Etc. The MAM ascertains that the fundamentals in a school setup are in place. In relation to accreditation standards for establishing quality in ECE, the fundamentals may include a prescription for a minimal core provided by MAM. This model recommends adhering to the 'minimal' philosophy; thus, it can be an appropriate way to start the processes of accrediting the provision of ECE in Botswana. It can also factor in policies and documents already in place, such as the Early Childhood Education Policy of 2001, to ensure that it is comprehensive in assessment.

The MAM as a Theoretical Framework chosen for this study helped in the choice of appropriate research questions. Creswell (2014, p. 50) states that, "the selection of a theory should depend on its appropriateness, ease of application, and explanatory power". Creswell

(2014) further advises that a Theoretical Framework should help the researcher to specify key variables that can highlight what the researcher is interested in examining about the phenomenon. While there may be a number of areas of foci in relation to accreditation standards that researchers may be interested in, the MAM theory that will be used in this study permits the research to focus on minimal requirements for accreditation.

Thus, MAM supports and strengthens this study in different ways: a). It can help practices pertaining to learners in terms of characteristics like family backgrounds: b). It will assess learning environments with regard to whether they are healthy, safe, protective and adequate: c). It assesses the relevance of content and other learning materials—for example, whether learners are provided with numeracy and skills for life: d). It will examine teaching approaches—whether they are child-centered and if skillful assessment is used: e) It will also identify learning outcomes—whether they encompass knowledge, skills and attitudes, and are linked to national goals for education and positive participation in society (UNICEF, 2000).

The MAM framework helped the researcher to limit the scope of the relevant data by focusing on specific variables and defining the specific viewpoint framework that the researcher took in analysing and interpreting the data that was gathered (Creswell, 2017). Furthermore, it was a means by which new research data can be interpreted and coded for future use (Creswell, 2017). The author further states that a Theoretical Framework provides a means for prescribing or evaluating solutions to research problems, and of discerning certain facts among the accumulated knowledge that are important and which facts are not important. Creswell (2017) furthermore says that a Theoretical Framework should provide a means to guide and inform research so that it can, in turn, guide research efforts and improve professional practice.

#### 2.2 Data Collection and Analysis

The population of a study means all people who meet the criteria for inclusion in the study (Burns & Grove, 2016). For the purpose of this study, eligible participants were teachers, head teachers and teacher aides currently employed in ECE programs throughout Botswana.

The sampling strategies used were multi-staged. Purposive sampling was used to select pre-schools in Gaborone only. Purposive is explained as "a type of sampling in which the researcher consciously selects specific elements or subjects for inclusion in a study in order to ensure that the elements have certain characteristics relevant to the study" (Cohen, Manion & Morrison, 2013, p.153). In addition to purposive sampling, convenient strategy was used to choose participants and sites close to the researcher's place of residence and work. Convenience sampling is a sampling approach where the researcher selects subjects/participants that are near to participate in the research (Creswell, 2017). In this case the researcher used teachers in Gaborone as they were conveniently near to her workplace and place of residence.

This section discusses the exclusion criteria, research sites, selection criteria for sites and data collection and analysis. Newly recruited ECE teachers with less than one year of experiences were excluded. The reason for the exclusion of newly recruited

teachers was that they did not have enough experience of teaching and learning and were unfamiliar with the policies that govern the ECE programs in Botswana. It was assumed that their lack of experience may not richly inform decisions on whether there is need to develop accreditation standards to govern/regulate provision of ECE in Botswana, and which aspects could be used to develop minimal accreditation standards. Unqualified teachers were also not included regardless of years of experience. Teachers without qualifications may lack the theoretical understanding to guide practice (Roller & Lavrakas, 2015).

It should however be noted that providers with any form of training, be it preservice, in-service, short courses or workshop with clear certification of knowledge acquired were accepted. Finally, those who met the eligibility criteria but expressed their reservation to participate and were uncomfortable with signing the consent forms were not forced to participate. Further, those who declared their unavailability during the time of the field work or data collection phase were also excluded.

Data was collected by means of questionnaires and interviews. There were 89 questionnaires distributed to pre-schools in Gaborone for quantitative data. There were also 13 interviews that were conducted to collect the qualitative data. The qualitative data was collected to supplement quantitative data. The study used mathematical and computational techniques in the analysis of quantitative data. The level of significance was tested using SPSS, which, among other things generated a technique known as *Principal Component Analysis* (PCA). PCA emphasizes variation and brings out strong patterns in a dataset. It was helpful in the prioritisation of data which was necessitated by the need to identify the most preferred aspects to be included in the proposed accreditation model. Factor Analysis, which is also within SPSS, became necessary to use in the prioritization of data. For the analysis of qualitative data, *NVivo 12* was used (Marshall & Rossman, 2016). This is a coding system that places emphasis on the actual words spoken by the participants (Manning & Kunkel, 2014). In this study it was thus used to capture the actual words of the participants.

#### 3. Findings on the Quantitative Findings

This section presents the findings of key aspects considered suitable as suggested by the participants of the study. The first question that the study sought to answer was 'Which aspects do you consider a high priority in formulating an ECE accreditation model.' This was determined using Factor Analysis, which was conducted in this manner. First, the data, which was rather mixed up, was entered into the SPSS. Then FA was selected and commanded to prioritized the factors. FA then analyzed and rank ordered the factors to see which ones were highly prioritized and which ones were not. The findings of the study show that the most preferred aspects with regards to participants' views were those in the .900 rankings and these were three in number. These were safety devices, mission and vision and establishing a strong PTA. They are presented in Table 1.

<b>Table 1:</b> The most preferred aspects per participants' views .900+90	<b>Table 1:</b> The most	preferred aspects	per participants	' views .900+9	31
--	--------------------------	-------------------	------------------	----------------	----

Aspect	Rankings
Safety Devices	.932
Mission & Vision	.931
Establishing a Strong PTA	.909

The findings of the study show that 8 factors were second most preferred and considered necessary to constitute part of an ECE accreditation mode in Botswana. These were ranked from .898-.850. These are listed in order of preference as shown in Table 2.

Table 2: Second most preferred aspects as per participants' views .930 - .850

Aspect	Rankings
Quality of Teacher Training	.898
Evaluation and Monitoring Teachers' Performance	.895
Trained Teachers	.891
Admission Policy	.881
Indicators of Progress towards Achieving the Desired Goals	.871
Pupils	.870
Pre-school Facility	.859
Trained Leadership	.850

There were factors that fell below the .850 cut off point which will not be considered in the Minimal Accreditation Model and these will be listed according to their rankings starting with the highest. These are objectives of the program, meaningful job-related activities, tight security, confidential pupils' records, parents' teachers association, curriculum and availability of equipment and materials.

#### 3.1 Findings and Discussion on the Interview/Qualitative Data

The second research question of the study was 'What recommendations can be made to the authorities in Botswana regarding accreditation of ECE programs? The suggestions emanating from the qualitative findings are many and include among others, the prominence of accreditation in ECE provision. Participants further stressed the need to have preparatory measures put in place before the inception of the accreditation model. These include making facilities accreditation worth, prioritizing the training of ECE providers and standardizing ECE provision across the country irrespective of region, among other things.

The third question that the study sought to answer was 'Do the participants attach any importance to having accreditation model to monitor the provision of ECE in Botswana?' Responses indicated that teachers regarded the accreditation as a necessary tool to standardize quality in ECE programs across the country. Factors that could be incorporated in the accreditation model were identified, ranked accordingly and prioritized as discussed above. It should be kept in mind that these participants are practitioners who are already in the field, which field as yet has no accreditation standards, and their responses are a reflection of what they see as needful on the ground. Other points raised by the qualitative findings were that through accreditation the youth

could be empowered with a strong foundation as future leaders, further that it could bring with its salary increment for ECE practitioners.

Qualitative findings complement and augment quantitative findings presented and discussed in the current section. Evidently, recommendations of the findings of the current research undertaking to the Government of Botswana and the envisage responses by way of not only making of policies specific to the improvement of ECE provision in Botswana but also by way of introducing accreditation to monitor such provision can make a significant difference in the life and learning of the children across the country. Standardization across the board for the different providers and regions of the country as suggested by the qualitative data, and the current strides in making ECE accessible to all could work towards bridging the achievement gap between children of the haves and have not's, and thus foster social cohesion and harmony, both among the kids and their parents as all participate in the education of their children through Parents Teachers Associations. At grassroots level, this could indeed work towards attaining one of the pillars of the long-term national vision of being an educated and an informed nation (Government of Botswana, Presidential Task Group, 1997).

The relevant authorities in the country could treat factors discussed in both the quantitative and qualitative study as the base or preliminary since in that fulsome education of students, and more so of young children inescapably needs to be broader than just pedagogical, learning environment matters (European Union, 2014). Although differences in the socio-economic and cultural background of children (and their parents) cannot be completely eliminated, efforts on the part of the education system to provide equity (as suggested by participants who argued that quality should not be compromised because of context/region) can go to significant extent in eliminating bias and 'otherness' from young learners. The impact of these negative issues on the learning of the children should not be underestimated. In Report of the Working Group on Early Childhood Education and Care, the European Union (2014, p. 63) states that if the provision of ECE is done for financial gains, several negative consequences result. The Report states that one of the consequences is that the "unequal access" and "social stratification" in attendance of school because of a number of reasons including

"private-for-profit provision tend to be more available in more affluent areas; publicly subsidised provision is rationed and bureaucratic procedures as well as unequal access to information about enrolment (including language barriers) are preventing marginalised groups from taking up ECEC places even though they might be entitled to provision; private-for-profit arrangements in poor neighbourhood's tend to offer lower quality provision and consequently it might exacerbate inequalities among children from disadvantaged background and their more affluent peers; benefits and measures aimed at increasing ECEC attendance of children from low-income families might unintendedly have adverse effects on their participation. For these reasons, there is an increasing consensus among researchers and policymakers that developing and implementing public policies that progressively move towards universal provision of publicly subsidised ECEC is both a priority and a necessity, if the goal of reducing the attainment gap is to be met."

Evidently there is need to find ways in which ECE management can be done more efficiently by management and all other stakeholders. One of the suggestions that this study posits is the development of an accreditation model; the belief is that accreditation would contribute significantly towards quality ECE in the country, make the efficient training of teaching staff mandatory, create other related benefits such as the increment of salaries and generally increase gains for the country in the long term. The description of the proposed accreditation model follows.

Figure 1 presents a model that the study is proposing to be used in the accreditation of ECE programs in Botswana.

#### 3.2 Explanation of the Model

The accreditation model in Figure 1 is categorised into three areas of concentration, these areas are Standards, Management Processes and the Stakeholders. The major responsibility of the stakeholders is to utilise the management process in order for the standards to be achieved in ECE programs. The following is an explanation of what should happen at each stage.

#### 3.2.1 Planning Stage

Planning is an organizational management activity that is used to set priorities, focus energy and resources, strengthen operations, ensure that employees and other stakeholders are working toward common goals and establishes agreement around intended outcomes/results (Hearron & Hildebrand, 2015; Gordon & Browne, 2017). In this proposed accreditation model, it would be advisable to have an initial meeting where all the stakeholders select a Standard Development Committee (SDC). This committee will comprise staff that is knowledgeable about ECE and related matters, policies and teaching techniques together with appropriate facilities for the development of standards.

According to Van Damme (2004) the SDC shall identify members to set the standards and the functions they will perform within the committee, provide a biography of senior members of staff involved in the preparation of standards and describe the physical resources needed for the development and maintenance of standards (Van Damme, 2004). This is the committee that would lead in discussions as experts assisting the rest of the stakeholders in issues of policy, facilities etc.

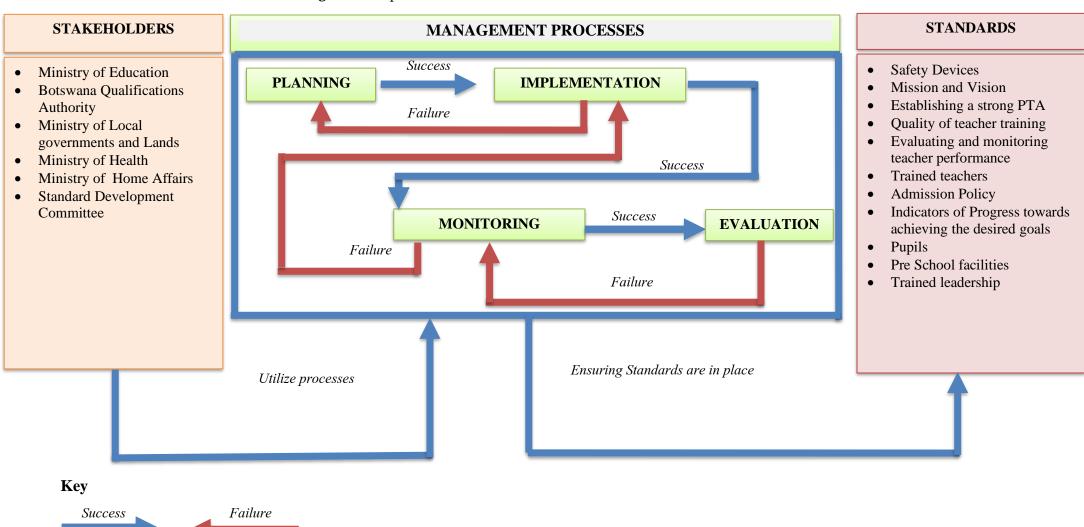


Figure 1: Proposed model of Accreditation recommended for Botswana

### PROPOSED ACCREDITATION MODEL FOR EARLY CHILDHOOD EDUCATION IN BOTSWANA

In the planning stage, resources have to be availed to hold workshops with the stakeholders and providers in order to align them with the requirements of the accreditation process, which is the need to have all the standards prescribed by the findings and allow them time to work on implementing them, which would be would be a period of approximately 2 years. Again, there might be need for more consultations to check on the progress of the providers, in order to give them time to 'polish' their programs e.g. employing qualified staff and making sure their facilities, equipment and all the standards prescribed by the study are in order.

Figure 1 shows that all the stakeholders will be involved in the planning process; this is the time to distribute work among themselves and get funding from various Government departments and NGOs as well as the private sector. The blue arrow shows that once planning has been done, the next step will be implementation.

#### 3.2.2 Implementation Stage

Implementation is a process of putting a decision or plan into effect (Hearron & Hildebrand, 2015; Gordon & Browne, 2017). This is the stage that calls for all the resources facilitated for the accreditation process to be available and in their respective positions to start the work assigned, which is the accreditation process (Hearron & Hildebrand, 2015; Gordon & Browne, 2017). In the implementation stage, all programs will be working hard to make sure they are following the standards set. At the same time, the SDC with the help of BQA, the main accreditation authority in Botswana, will be regularly visiting programs to provide advice where necessary.

Figure 1 shows that all the stakeholders will be involved in the implementation stage. In this stage there would be two groups of programs; those that have succeeded are represented by the color blue and those who have failed are represented in color red. The successful programs (blue arrow) will proceed to the monitoring stage while the unsuccessful ones or failing ones represented by the (red arrow) will go back to the planning stage to re- plan. There is no time frame given to the programs going back to the planning stage as programs may require different time frames. If the re-plan has succeeded then the program can now move to the implementation stage, given the fact that SDC and BQA has seen that all the requirements in the planning stage are well met.

#### 3.2.3 Monitoring Stage

Monitoring according to (Hearron & Hildebrand, 2015; Gordon & Browne, 2017) is the regular observation and recording of activities taking place in a project or program. It is a process of routinely 'monitoring to check how project activities are progressing' (Hearron & Hildebrand, 2015, p. 248). This is a stage that needs regular, effective and systematic checks. It is in this stage that SDC and BQA will be taking regular checks in all the ECEs in Botswana to make sure that they are following the standards as stipulated by the accreditation model. This is a sensitive stage in that some programs will be meeting challenges here and there. It is at this stage that SDO and BQA should be able to advice

providers, teachers and school administrators where necessary. This stage should be on the 3rd year.

Figure 1 also shows that at this stage, all the stakeholders will be involved in the monitoring led by the SDC and BQA. Again, in the monitoring stage there will be two groups of programs, those that have been successful (blue arrow) and those that have not been successful (red arrow). The other programs not having met the requirements set by SDC and BQA will go back to the implementation stage to re-strategize. Again, if they succeed in the implementation stage, they would now move to the monitoring stage. The successful group will proceed to the evaluation stage. The success and failure of a program will be mandated by SDC and BQA.

#### 3.2.4 Evaluation Stage

Evaluation is defined as a rigorous analysis of completed or ongoing activities that determine or support management accountability, effectiveness and efficiency (Hearron & Hildebrand, 2015; Gordon & Browne, 2017). In this proposed model, evaluation will take place after four years of implementation to allow providers to 'find their feet'. In the evaluation stage, programs will be assessed to see if they are effective in the implementation of the standards set.

Figure 1 shows that in the evaluation stage there will be two groups of programs, those that have succeeded (blue arrow) and those that have not succeeded (red arrow). Successful programs will be accredited according to the standards set by SDC and BQA. The programs that have failed to meet the requirements outlined by the SDC and BQA will go back to the monitoring stage until such a time that they are approved to move to the next stage which is the evaluation stage.

#### 3.3 Implications of the Findings to the MAM

The MAM defined standards of accreditation such as having an authorizing body that could review, assess, give permits or retain permits as being imperative factors in the model. As mentioned earlier, in Botswana, it is the Botswana Qualifications Authority that is the authorizing body and has the power to review, assess, give or retain permits for an ECE program. Since BQA is thus tasked by the Government to assess programs, teachers and institutions in the country, it would be incumbent upon ECE providers to ensure that that they meet the standards required to be accredited. This study has demonstrated factors (albeit preliminary) that are regarded as high priority, and those that are second best to be included in the accreditation model that BQA would need to consider when putting together an accreditation model that could be used as an assessment tool. The factors have also been ranked according to priority. SDC and BQA would also need to consider utilizing compliance checks that may be numeric as the Minimal Accreditation Model requires.

BQA would further need to determine the pass value for each factor. All the factors that are ranked highly and second most preferred would need to be incorporated in the assessment tool/accreditation model. Having these in place would go a long way towards

regularizing and standardizing ECE in Botswana and ensuring that quality education/teaching and quality learning is taking place in all the programs that offer ECE across the country.

Figure 1 shows the proposed accreditation model for Botswana context. This model has been designed using the highly preferred factors as per participants view; and these include safety devices, mission and vision and establishing a strong PTA. The model also recognised the second-best preferred aspects; these being the quality of teacher training, and evaluation and monitoring teachers' performance, trained teachers, admission policy, indicators of progress towards achieving the desired goals, pre-school facility and trained leadership.

Figure 1 further shows the stakeholders and their role in the accreditation model. Basically it is recommended that all the stakeholders, that is the government through BQA, Ministry of Education, Ministry of Local Government, Ministry of Labour and Home Affairs, Standard and Development Committee discuss issues related to the improvement and delivery of services for young children and also be available to assist the providers in the planning, implementation, monitoring and the evaluation stages.

In order to achieve quality ECE it is imperative that accreditation of ECE programs be established in Botswana. It must be remembered that the process of accreditation is not an easy process; it is challenging and time consuming. The four stages mentioned above require that each stage be done effectively. Each stage implicates another. If there has not been good planning, then the implementation suffers as no one will know what to do and how to do it. The same can be said about monitoring and evaluation, if there is no monitoring then it would be difficult for stakeholders to know what is happening in the ECE programs. The evaluation stage also needs other stages before it can be addressed adequately. In the evaluation stage, SDC and BQA will assess ECE programs on what has been recommended to see its successes or failures. It is at this stage that programs may be awarded certificates by SDC and BQA for good performance, improvement or to close down. Figure 1 presents a model that the study is proposing to be used in the accreditation of ECE programs in Botswana.

#### 4. Conclusion

This article explored standards or factors that would contribute to the development of an accreditation model for ECE programs in Botswana. The findings identified key factors suggested by the participants and showed how these factors could be used in the model. The article further presented the proposed model and proceeded to elaborate on its various components.

#### References

- Berliner, H., & Schmelkin, L. (2010). Accreditation Best Practices and Implications in Resource Constrained Environments Advancing Higher Education. TIAA-GREF Institute.
- Cohen, L., & Manion, L. & Morrison, K. (2013). Research Methods in Education. Croom Heim. London.
- Creswell, J. W. (2014). (4<sup>th</sup> Edition) Research Design: Qualitative, Quantitative and Mixed Methods Approaches. Sage. Los Angeles.
- Creswell, J. W. (2017). (7<sup>th</sup> Edition). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches*. Sage. Los Angeles.
- Early Childhood Education & Care Policy (2001). Division of Pre-School, Department of Education, Gaborone.
- European Union (2014). Proposal for key principles of a Quality Framework for Early Childhood Education and Care: The Report of the Working Group on Early Childhood Education and Care. European Commission: Brussels.
- Gordon, A. M, & Browne, K. W. (2017). *Beginnings & Beyond*: Delmar Learning. Australia. Hearron, P. F., & Hildebrand, V. (2015). *Management of Child Development Centres*. Pearson. New Jersey.
- Jomtien World Conference for All. (1990). World Reports. Thailand
- Marshall, C., & Rossman, G. B. (2016). *Designing Qualitative Research*. Library of Congress Cataloging in Publication Data. USA.
- Meier, C., & Marais P. (2012). Education Management in Early Childhood Development, 2nd Edition, Open University Press. London
- Roller, M. R., & Lavrakas, P. J. (2015). *Applied Qualitative Research Design*, Guilford Press. New York.
- UNICEF (2000). (Education for All Records) Country Reports Botswana. Gaborone. UNICEF Report
- Republic of Botswana, (1994) Revised Policy on Education. Government Printers. Gaborone.
- Van Damme, D. (2004). Standards and Indicators in Institutional and Programme Accreditation in Higher Education: A Conceptual Framework and a Proposal. Vlasceanu, L & Barrows, L.C. (Eds). Indicators for Institutional and Programme Accreditation in Higher / Tertiary Education. Bucharest: *UNESCO p. 127-158*.

## N. B. Mswela PROPOSED ACCREDITATION MODEL FOR EARLY CHILDHOOD EDUCATION IN BOTSWANA

#### Creative Commons licensing terms

Author(s) will retain the copyright of their published articles agreeing that a Creative Commons Attribution 4.0 International License (CC BY 4.0) terms will be applied to their work. Under the terms of this license, no permission is required from the author(s) or publisher for members of the community to copy, distribute, transmit or adapt the article content, providing a proper, prominent and unambiguous attribution to the authors in a manner that makes clear that the materials are being reused under permission of a Creative Commons License. Views, opinions and conclusions expressed in this research article are views, opinions and conclusions of the author(s). Open Access Publishing Group and European Journal of Education Studies shall not be responsible or answerable for any loss, damage or liability caused in relation to/arising out of conflicts of interest, copyright violations and inappropriate or inaccurate use of any kind content related or integrated into the research work. All the published works are meeting the Open Access Publishing requirements and can be freely accessed, shared, modified, distributed and used in educational, commercial and non-commercial purposes under a Creative Commons Attribution 4.0 International License (CC BY 4.0).