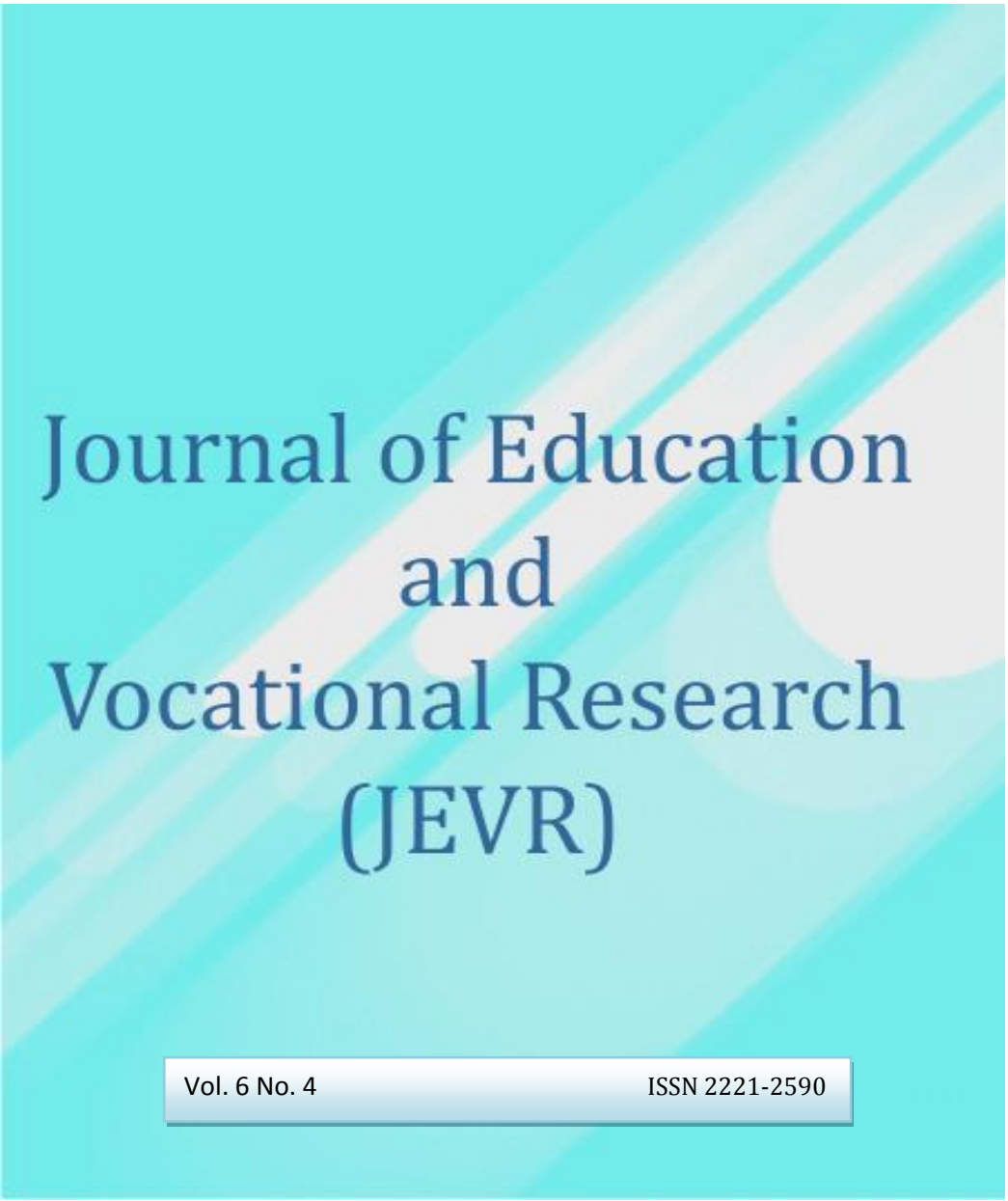

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Editorial

Journal of Education and Vocational Research (JEVR) provides avenue for quality research in the ever-changing fields of Education and Vocational Research and related disciplines. Work submitted for publication consideration should not be limited by any narrow conceptualisation of educaton and vocational research, but comprises interdisciplinary and multi-facet approaches to education and vocational theories and practices as well as general transformations in the fileds. Scope of the JEVR includes: subjects of educational technology, educational administration, educational planning, measurement and evaluation in education, developmental psychology, special education, distance learning, vocational education, technology-based learning, environmental education, business education, educational psychology, physical education, innovation, vocational training, knowledge management. Author(s) should declare that work submitted to the journal is original, not under consideration for publication by another journal, and that all listed authors approve its submission to JEVR. It is JEVR policy to welcome submissions for consideration, which are original, and not under consideration for publication by another journal at the same time. Author (s) can submit: Research Paper, Conceptual Paper, Case Studies and Book Review. The current issue of JEVR comprises of papers of scholars from Indonesia, Morocco, Pakistan, Malaysia, Nigeria, West Africa and Mauritius. Digital book & business education, distance learning, online & collaborative learning design model, big data & scientific research, industrial work practice & family environment, women entrepreneurs business performance, technological growth in developing nations and transferable skills for work based learning are some of the major practices and concepts examined in these studies. Journal received research submission related to all aspects of major themes and tracks. All the submitted papers were first assessed by the editorial team for relevance and originality of the work and blindly peer reviewed by the external reviewers depending on the subject matter of the paper. After the rigorous peer-review process, the submitted papers were selected based on originality, significance, and clarity for the purpose. Current issue will therefore be a unique offer, where scholars will be able to appreciate the latest results in their field of expertise, and to acquire additional knowledge in other relevant fields.

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PAPERS

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An Advantage of Digital Book for Business Education in Indonesia Country

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Abstract: The main objective of this paper is to see the opportunity of a business education about digital book that consist of media education in Indonesia country. As we know the technology of a digital book for multimedia learning are still rare use by Indonesia educational teachers, the purpose is to determine the profit business in the future for making of digital book. The research design consisted of development design. The methodology analysis that will use in this research is SWOT (Strength, Weakness, Opportunity, Threats). The result of a research is finding that the business of digital book for learning tools in Indonesia country still open wide. Recommendations have been given on the basis of findings.

Keywords: *Digital book, Indonesia country, multimedia learning, learning tools, business.*

1. Introduction

The design of multimedia-based interactive media with all its advantages are expected to overcome the various obstacles faced education in Indonesia. Interactive media is the integration of digital media including combinations of electronic text, graphics, moving images, and sound, into a structured digital computerized environment that allows people to interact with the data for appropriate purposes. The digital environment can include the Internet, telecoms and interactive digital television (Elaine & Andy, 2011). Some constraints in the face is, at time of indirect materials is learning knowledge use print and hardcopy media is usually less clear the picture knowledge. The rapid advancement of technology today is very versatile computerized effect on brain development, be it positive or negative. Look on the bright side we can utilize these technologies to create an interactive learning media to increase interest in children's learning. Because one of the old methods likes seeing normal images without animation or with real props are less than the maximum and interesting for the kids. Teaching and learning process will be more interesting and exciting because in the multimedia are combining element of text, images, audio, video, and animation, which was made into a media that is easily digested and understood by student.

Using this technology, the author make learning application media based interactive multimedia about knowledge. In this digital book, there are materials and exercise, so they can measure how much their ability to understand and absorb the materials that has presented. With this learning media, it is expected that student's can more quill understand and improve their enthusiastic in study. By improving the quality and the quality of early childhood education, would be much better if the old method coupled with current learning methods that completely computerized, easy to use, more attractive to children and can be applied as a tool in teaching and learning activities. Instructional media presented in a multimedia package that used to make the learning process can now be done monotonous interactive and interesting. Output of this multimedia education is digital book that compatible with Smartphone, tablet, and PC. An e-book is "any content that is recognizably 'book-like', regardless of size, origin or composition, but excluding journal publications, made available electrically for reference or reading any device (handheld or desk-bound) that includes a screen" (Armstrong, 2008).

2. Methodology

Table 1: SWOT Analysis

Opportunities	Threats	Strengths	Weakness
Massive mobile market at Indonesia Integrated advertising	Payment gateway Infrastructure problem	Great learning progress Interactive media Low Cost	Low adapting technology among teacher Long editing process

Procedure of computer-based learning software products by Chadwell (2009, 8-14) is as follows:

- Concept
- Design
- Material collecting,
- Assembly
- Testing.
- Distribution

E-Book Types: As e-books move further away from conveying a story or content in the way print-based books do, we may well ask at what point is an e-book really no longer a book but something else? Our traditional concept of content consumption is changing because of technology, which will ultimately have a profound impact on the concept of a book as new generations of readers mature and gravitate to new technologies (Nelson 2008, 44). As in the traditional print book market, there are several different types of e-books currently being published. In general, the forms that an e-book can take are familiar: reference, textbook, monographs in series, and the more traditional or standard monograph. Where e-books diverge from their print counterparts, however, is in the distinction between these forms. The lines between the types of e-books are more blurred than with print books, which can be either attractive or troublesome. Furthermore, the lines are blurred between e-books that appear to be monographs and those that more closely mimic other electronic material such as e-serials and databases.

Digital publishing business models: Digital publishing business model can be used as a planning and management to determine the right strategy to develop a model of digital books in Indonesia. Without an understanding of these strategies, it will be difficult to develop products that match the requirements of a region in the country of Indonesia. The pattern of territory includes language, habits and interests to shape the implementation of digital books have become important factors in look, that the content of the digital book can be well understood and demand by the public. Implementation of cooperation with the government as a regulator of education in Indonesia and private companies in the field of smart phone products can also be used as a business strategy in developing the application of digital books. Suppose the company that developed the smart phone application digital books can be embedded in a package with the purchase of smart phone so it can appeal to the buyer. With the implementation of sustainable business, the digital books that have been pinned in the smart phone can continue to be the need for users and company can offer additional content of the material with purchased at low prices, why it's cheap? Because buyers do not have to buy an entire chapter just on some chapters they need. Other advantages that the material is not tangible like a book so durability is maintained.

In the literature reviewed, the document with a typology of business models for publishing is the report prepared for the Joint Information Systems Committee published on 2009 (Houghton & Charles, 2010). These models are within the context of research communication evolution. The types of models are:

a) Subscription, this model is typical of prints, considering document availability it has been present in paper-view plans.

b) Hybrid/transition: a mix of business models with 2 alternatives, access is opened after a period of time of the document being published and access is opened according to the author's decision.

c) Open access: this has two kinds, on one hand there are open access journals and on the other hand there are open access files obtained through databases. In this case, several services overlap: overlapping publications, peer review services, index and summaries, quality control evaluation, a new file analysis, new metrics evaluation, warning services, etc.

Digital publishing in Indonesia Country

- Until now, eBook sales have only made up about 2% of total turnover. Not all publishers have started publishing eBooks, not least because of the omnipresent piracy challenge. Most people read on tablets rather than e-readers. Persona Edu now produces an eBook reader (tablet) together with Gramedia.

- With a growing middle class, education is becoming more and more important. Indonesia's youth are very digitally minded, and the country has the third largest facebook and twitter communities worldwide.
- In 2013 there were c.63 million social media users, and about 45% of the population used mobiles to read and study. In 2006 the ministry of education planned to make digital textbooks available all over the country, and it went on to produce it sown teaching material. This resulted in a fiasco, and some publishers of the original textbook send up printing the digital material as the (often poor) schools were unable to use it. Teaching of e-learning is mandatory.(source : frankfurter buchmess international book exhibition 14 – 18 October 2015)

By December 2012, the iTunes Store had been made available in 119 countries, with Hugh markets such as India and Indonesia, Russia, Saudi Arabia and Turkey being able to access an online market place for music and various other digital content. (Apple press release, 4 December 2012). By late summer 2013, claims to have sold eBooks from its catalogue of 3.5 million books and magazines into 190 countries, with its devices supporting 68 languages. As of September 2013, Kobo has expanded beyond Canada, where in 2012 it controlled a market share of 46%, according to IPOs, by establishing localized platforms in Brazil, France, Germany, Indonesia, Japan, the Netherlands, Portugal, South Africa, Thailand, Taiwan, UK, and the US. Rakuten's CEO Hiroshi Mikitani has been quoted that Kobo was the market leader for eBooks in France. (Forbes, 6 September 2012).

3. Results and Discussion

Business education for digital book have a huge opportunity in Indonesia country, this can be seen from the development of the population of a country compared to other countries. Indonesia is the third largest Asian nation it shown by table 2.

Table 2: Comparative indicators for selected Asian nations

Nation	Total land surface area ('000 km2)	Total Population(2013)	Average annual population growth rate 2008 - 2013	Population density (2012)	Age dependency ratio(2012)
China	9597	1361	0.5	142	36
India	3287	1233	1.3	131	53
Indonesia	1905	249	1.5	131	52
Korea	100	50	0.5	503	37
Malaysia	331	30	1.7	91	47
Pakistan	796	184	2.1	232	63
Philippines	300	97	1.5	325	62
Singapore	0.7	5	2.2	7540	36
Thailand	513	65	2.4	126	39
Vietnam	331	90	1.1	271	42

Source: Asian Development Bank, Basic Statistics 2014.

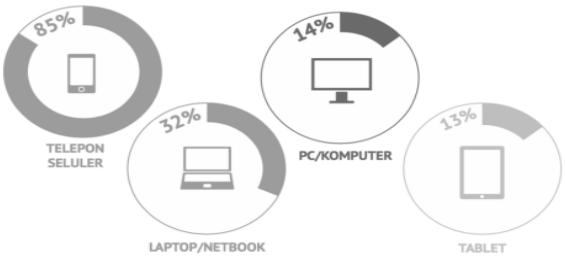
The distribution of the age for Indonesian population in 2014 according the UNFPA (United Nations Population Fund) has projection Indonesian population as show by table 2.

Table 3: Age composition of the Indonesian population, 2014 estimate

Nation	0-14 years	15-25 years	25-54 years	55-64 years	65 years and over
Percentage in each age group	27.6	17.2	42.8	7.2	5.3

From the data tables above show that there are opportunities, why? If population associated with the use of technology, especially mobile applications how much the use of the technologies of the everyday life can be show by figure 1.

Figure 1: Technology use in Indonesia for Internet



Source: APJII, Profile Internet Indonesia, 2014

Associated with it through Presidential Decree No. 96 of 2014 on the Broadband Plan 2014-2019 Indonesian government is targeting 30% of the population in urban areas can enjoy broadband internet in 2019. While in the countryside, the target of broadband penetration will reach 6%. Of the development plan, the government expects the price of broadband services can reach 5% of total revenue per capita (Rüdiger, 2014). That is, this is an opportunity for businesses in a variety of telecommunication industry.

Digital Book for Business in education: Digital book for business education need special treatment that involve support from government, education institution, and parent to apply the use of digital book for class learning, why? Digital book can be constructed and customized accordance with the requirements. Content for digital book in education can be manage for targeting the level education for the student, choose for the content is flexible for:

- Content can produce like a game education with fun graphic and minimal text
- We can provide some exam, practice and simulation so it can interact with the student more collaborative.
- Customize for the material content such media text, graphic, video, animation like 2D or 3D and sound is limitless.

Value of Proportion Digital Book: There is a proportion of the value of building a digital book for developers and for users

- Zero Installation
- Interactive
- Easy Build
- Great Design
- Low Price
- Adorable & portable
- Massive Distribution
- Updatable

Table 3: Profit Analysis Business of Digital Book

Profit Analysis	
TARGET MARKET	23.000.000
# of leads	10.000.000
% conversion rate	10%
COSTUMER	
Average sale	Rp. 50.000,-
# of transaction	5
REVENUE	Rp. 250.000.000
% margin	25%
PROFIT	Rp. 62.500.000

Business Calculation: This is just an example for the calculation in business education for digital book. Let' subscribed amount the total market tilled 23 million customers spread from primary school students to students and teachers researchers. Target only affordable related to technology availability in 2015 only 10

million subscribers. But in the first year, the company only targeting 10% of the market that are affordable. So that the carrying amount of costumer as many as 1000 people. With an average income of price of digital books Rp. 50,000, with a repeat order as much as 5x the amount was reached Rp. 250,000,000. If cut with a margin of 35% then the benefits are Rp.62.500.000 (millions) it shown by table 3.

4. Conclusion

There is a huge opportunity for business education in digital book, with a good management between government, institution and developer it will be a massive income in the other hand we support for global green environment. Reduction in the use of paper by changing the pattern of the community to better utilize digital book technology in everyday life helped preserve nature. Provides an insight into the use of digital technology in a more positive context is not just an entertainment.

References

Armstrong, C. (2008). Books in a virtual world: the evolution of the e-book and its lexicon. *Journal of Librarianship and Information Science*, 40, 193-206.

Chadwell, F. A. (2009). What's next for Collection Management and Managers? User-Centered Collection Management. *Collection Management*, 34(2), 69.

Elaine, E. & Andy, F. (2011). Interactive Media - What's that? Who's involved? ATSF White Paper—Interactive Media UK—©2002/2011.

Frankfurter-Buchmesse (2015). International book exhibition 14–18 October 2015 Retrieved from http://www.buchmesse.de/images/fbm/dokumente-ua pdfs/2015/book_market_indonesia_ 52246.pdf

Houghton, J. W. & Charles, O. (2010). The economic implications of alternative publishing models. *In: Prometheus: Critical Studies in Innovation*, 28(1), 41-54.

Nelson, M. R. (2008). E-books in Higher Education: Nearing the End of the Era of Hype? *EDUCAUSE Review*, 43 (2).

Rüdiger, W. (2014). Global eBook: A report on market trends and developments OECD/Asian Development Bank (2015), Education in Indonesia: Rising to the Challenge, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264230750-en.

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Distance Learning: Responsibilities and Challenges Facing Educators in the 21st Century

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Abstract: The emergence of distance learning has brought to the fore new responsibilities and challenges that must be taken into consideration by educators especially at the university level (White, 2003; Larreamendy-Joerns & Leinhardt, 2006). Thus, two main questions might need to be risen: what are the new roles of educators with regard to distance learning? Also, what are the challenges that face educators in distance learning? Hence, the present paper goes through the new roles and responsibilities that distance learning educators need to bear in mind to make an outstanding contribution in the learning process. Basically, educators are in dire need of the use of new mediums and skills. Additionally, this paper deals with the main challenges facing educators in the area of distance learning. The emergence of the latter comes not to be free of some constraints including issues related to planning, teaching, and evaluating. Raising an explicit awareness towards these responsibilities and challenges plays a tremendous role in promoting the status of distance learning. This paper provides beneficial implications for educators, curriculum designers, and stakeholders in that it provides a good platform to reconsider serious issues related to distance learning/education.

Keywords: *Distance Learning; Educators; Responsibilities; Challenges; Implications*

1. Introduction

Over the last two decades or so, the developments of learning environments have partially contributed in changing the general map of learning and teaching. The emergence of E-learning as well as the development of life conditions has paved the ground to the need to what is called distance learning (White, 2003). White attributes this emergence to three main factors. First, the rapid change of the world given the space and time constraints. Second, the significant changes of the learning environments which have been affected by the opportunities provided by online learning. Third, the outstanding developments in information and communication technology. According to Bower and Hardy (2004), despite the strong connection between distance learning, or distance education as used interchangeably by many researchers, the emergence of distance learning goes back to the beginnings of the twentieth century. The first form of distance education was what they called *correspondence study*, "a method of learning via postal mail" (p, 6). The major characteristic of distance learning/education is its opportunity to study at one's own time without face-to-face communication. Talbot (2007) provides a comprehensive definition of distance learning/education and declares that: "Distance learning or distance education, as the word 'distance' implies, takes place when you, the student, are geographically remote from the educational institution at which you are registered. You will also be remote from your tutor and other students for most or all the time" (p. 1)

In spite of the precious opportunities distance learning offers to learners in the new era, Talbot (2007) believes that studying at a distance can be a "mixed blessing" because, in addition to the outstanding opportunity it grants, a lot of hard work is emphasized as well. Thus, distance learning/education puts great responsibilities and challenges on the shoulders of distance learning educators. The present paper seeks to deal with the responsibilities and challenges facing educators in the new millennium and asks two main questions: what are the new roles of educators of distance learning? Also, what are the challenges that face educators in distance learning? This paper is divided into four main sections. The first section deals with the rationale. The second section investigates the interconnectedness of E-learning and distance learning/education. The third section provides a set of roles and responsibilities that distance learning educators are in need. And the last section is mainly concerned with the major constraints and challenges facing educators at the level of distance learning.

Statement of the problem: Given the fact that distance learning/ education has brought new ideas and unfamiliar issues with new learning environments, a number of challenges and responsibilities need to

explicitly be raised so as to provide insightful suggestions. Bower and Hardy (2004) state that for any institution to grow and develop, it must take into consideration these challenges, and educators need to be flexible to avoid any probable obstacles and face more wisely the new changes caused by distance learning/education. In other words, educators need to be skilful in tailoring their learners' needs in different learning environments.

2. E-learning as a basis for distance learning

The diffusion of distance learning/education has been surrounded by many circumstances. E-learning has greatly facilitated the process of learning at a distance and has provided propitious opportunity for learners to learn at any time or any space. Larreamendy-Joerns and Leinhardt state that one of the main strands of evidence for distance education's changing role "is the growth of e-learning, an umbrella term for receiving instruction over the public internet" (2006, p, 571). By the same token, Naido (2006) illustrates that "… e-learning would incorporate all educational activities that are carried out by individuals or groups working online or offline, and synchronously or asynchronously via networked or standalone computers and other electronic devices" (P, 1). Undoubtedly, the plethora of communication tools including emails, webcams, videos, computers, tablets, and smart phones has contributed in facilitating the process of learning at a distance. Additionally, e-learning makes education accessible to a large number of people. As Mason and Rennie (2006) implicitly declare, online learning in general provides outstanding opportunities for its users to reflect on the information since they can capture and store documents and resources in all formats.

However, using e-learning as a platform for distance learning, as mentioned before, is a mixed blessing. All the stakeholders need to react and adapt, in one way or another, to the new environment of online learning and learning at a distance. Educators are undoubtedly one of the important responsible who can facilitate this learning. They need to reshape their awareness, skills, and knowledge to tailor insightfully their learners' needs. Larreamendy-Joerns and Leinhardt (2006) declare that: "If educators are going to engage in the practice of online education in a thoughtful fashion, then they need to understand two things: first, that online education has evolved from previous conceptions of education; and second, that there are social, political, economic, and ethical assumptions and implications in what appear to be simple actions of design and instruction" (p, 567). Evidently, engaging in online education is not a random issue which is governed by merely taking a decision, but rather it requires a holistic understanding of the surrounding conceptions in which education/learning has evolved. It is necessary for educators of distance learning to make a linear connection of the development of learning environments so as to be systematic in building wisely distance learning/education courses. That is to say, numerous responsibilities need to be taken seriously by educators. The next section deals with these responsibilities in much more details.

Roles and responsibilities of distance learning educators: For any instructor to engage in distance learning/education, a variety of responsibilities must be borne in mind. White (2003) illustrates various roles related to awareness and skills on the one hand, and others related to communication and interaction on the other hand. For communication, it is indispensable to orient and encourage learners to working within unfamiliar environments. It is axiomatic to expect learners' anxiety when they engage for the first time in distance learning course. Thus, it is up to the educators to orient them properly to engage in this new environment. In this respect, interaction is of concern to tailor learners' needs through using technologies. As mentioned in the previous section, many communication tools are available to organize and systematize the interaction between educators and learners. For instance, emails and webcams are good tools in which interactions can be organized.

Awareness and skills, on the other hand, are interesting components for any educator. Having a distinguished background about distance learning issues make educators in an advantageous position to understand the long term effect of distance learning and how it might be integrated given the specific characteristics of age, social class, and the environment. In addition to this, educators need to manage multiple roles within online environments-for example facilitator, coach, co-ordinator-alongside student demands for individualized feedback (White, 2003). Additionally, they need to be innovators and create different sources of learning based on the available materials taking into consideration the constraints of *digital divide* Warschauer (2003). Moreover, the use of new mediums of technology is at the core of educators' responsibilities. They

need to master various skills especially computer skills. For example, for language educators, they need to be familiar with computer-assisted language learning (CALL). In this context, Evans, and Nation (1993) stress the importance of providing training programs for Australian teachers at all levels. Given this huge number of responsibilities, many challenges and constraints in turn need to be overcome to provide a good platform to teaching/learning at a distance. The next section is concerned with the main challenges facing educators of distance learning/education.

3. Challenges and constraints facing distance learning educators

Whereas distance learning/education has brought new issues to the landscape of education, various challenges have come to the fore as well. One of the evident challenges is the psychological and the physical distance between educators and learners. Sometimes it is hard for teachers to detect the psychological barriers interfering in learners' motivation and attitudes. In this regard, blended learning might be a solution that keeps balance between face-to-face and online learning. Following Garrison and Vaughan (2008), "blended learning in higher education provides a vision and a roadmap for higher education faculty to understand the possibilities of organically blending face-to-face and online learning for engaging and meaningful learning experience" (p, 6). Furthermore, working virtually usually includes learners and educators with different cultural backgrounds. Cultural differences, as stated by Pallof & Pratt (2005), are one of the primary hindrances for online collaboration. Moreover, educators are in need of a solid leadership. Controlling learners at a distance requires some characteristics of leadership such as vision, managing differences, and providing useful solutions in high time (Pallof & Pratt, 2005). Educators as leaders need effectively to monitor and manage the life cycle of virtual work and raise the degree of trust in case there are different learners. Furthermore, educators are under pressure to experience heavy workloads. They then need to prepare specific courses to fit their learners' needs, manage their participation, and use different mediums. Hence, time pressure is a great challenge for distance learning educators.

As discussed in section 2, distance learning/education is strongly related to e-learning. Accordingly, limited resources can be a big obstacle in facilitating the process of learning at a distance (White, 2003; Pallof & Pratt, 2005). In other words, digital divide (DD) is a principal challenge in that learners may not have the same access to the different ICTs. For example, Morocco's performance in the network readiness index is poor in comparison with 115 countries. Table (1) is an indicator that measures the propensity for countries to be able to exploit the opportunities offered by information and communications technology, and is published annually by the World Economic Forum (Cattaneo, Diop & Walkenhorst, 2007).

Table 1: Morocco scores poorly in terms of network readiness (Country ranking in the Network Readiness Index)

	2005/06	2004/05	2003/04
Estonia	23	25	25
Czech Republic	32	40	33
Tunisia	36	31	40
Hungary	38	38	36
India	40	39	45
Turkey	48	52	56
China	50	41	51
Poland	53	72	47
Romania	58	53	61
Egypt	63	57	65
Bulgaria	64	73	67
MOROCCO	77	54	64

Note: The number of ranked countries amounted to 115 in 2005/06, 104 in 2004/05, and 99 in 2003/04.
Source: World Economic Forum.
Cattaneo, Diop & Walkenhorst, (2007)

It is crystal clear that if any country strives to enlarge ICTs, much effort is recommended for spreading networks. The government's policy in providing the technological mediums contributes in the success of

distance learning/education. In the light of these challenges, and the different responsibilities as discussed in the previous section, distance learning educators can draw numerous implications to improve their conception of the new learning environment. These implications are well illustrated in the following section.

Implications: Based on what has been discussed, educators need to take some implications into account. First, they must design courses at a distance based on the availability of the technological mediums. Following slavishly programs of distance learning/education in different environments can impede the learning process given the dissimilarities between regions and countries in using the technological devices. As discussed in the previous section, Morocco's ranking in the Network Readiness Index is different in comparison with other countries. Following the discussion of the challenges facing educators of distance learning/education, it is indispensable to provide programs of training for educators at the level of course design, evaluation, and the use of technological devices. Moreover, institutions must be supplied with free connections (WiFi) to facilitate online learning. Distance learning courses, especially with groups with different social backgrounds, might engage with cultural differences. Accordingly, educators need to raise their awareness about diversity and develop their intercultural competence. Also, they are in need to use different learning styles to keep encouraging learners to participate in learning at a distance. In the same context, since the field of distance education is constantly bringing unfamiliar issues, educators need to keep up-dated as much as possible to keep the pace with recent developments.

4. Conclusion

Undoubtedly, the field of distance learning/education is a fresh area of research; despite the arguments supporting its status in enlarging learning opportunities, much effort is recommended to provide techniques and approaches to promote this learning environment. In other words, research on the field is still at its embryonic stage and it puts much responsibility on the shoulders of researchers, practitioners, and educators to provide effective ways in order to improve learning at a distance.

References

Bower, B. L. & Hardy, K. P. (2004). From Correspondence to Cyberspace: Changes and Challenges in Distance Education. Wiley Periodicals, Inc. pp, 5-12

Cattaneo, O., Diop, N. & Walkenhorst, P. (2007). The Potential for ICT-Development in Morocco. https://mpra.ub.uni-muenchen.de/24024/.

Evans, T. D. & Nation, D. E. (1993). Educating Teachers at a Distance in Australia: Some Trends. In H. Perraton (ed), Distance Education for Teacher Training. Routledge: London and New York. PP. 261-286

Garrison, D. R. & Vaughan, N. D. (2008). Blended Learning in Higher Education. Framework, Pronciples, and Guidelines. Jossey-Bass

Larreamendy-Joerns, J. & Leinhardt, G. (2006). Going the Distance With Online Education. *Review of Educational Research*, 76, 567

Mason, R. & Rennie, F. (2006). E-learning: Key Concepts. London: Routledge

Naido, S. (2006). *E-Learning: Guidebook of Principles, Procedures and Practices*. (2nd ed), Australia, Commonwealth Educational Media Center for Asia

Palloff, R. M. & Pratt, K. (2005). Collaborating Online: Learning Together in Community. Jossey-Bass

Talbot, C. (2007). Studying at A Distance. A Guide for Students (ed). Open University Press.

White, C. (2003). Language in Distance Education. Cambridge University Press.

Warschauer, M. (2003). Technology and Social Inclusion: Rethinking the Digital Divide. MIT Press, Massachusetts

Woudstra, A. & Adria, M. (2003). Issues in Organizing for the New Network and Virtual Forms of Distance Education. In M, G. Moore, & W, G. Anderson (eds), Handbook of Distance Education, + (531-548). Lawrence Erlbaum Associates, Publishers Mahwah, New Jersey London.

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An Online and Collaborative Learning Design model based on IMS-LD to Stimulate Collaborative Learning in E-learning Environments

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Abstract: In the e-learning field, there is an urgent need for the sharing, reuse and design of online courses as learning objects. However, in the vast majority of cases, e-learning courses are built in a manner that not stimulating cooperation, interaction, and collaborative learning. The primary aim of this paper is to develop a strategy for constructing learning objects, strategy targeted at supporting instructors in designing educational contents in order to promote collaborative learning in e-learning environments. A key challenge in this work is the definition of a new method of learning design of e-learning contents to stimulate collaborative learning. In addition, we introduce a general model of online and collaborative learning design. Model is based on the methods of instructional design and Educational Modeling Languages, particularly the IMS-LD specification. Firstly, the paper presents the online and collaborative design process of a content based on a life cycle adapted. Then, the paper describes the steps of the modeling process of content. Finally, the paper exposes the adopted technical choices and a first prototype is set up to provide a subjective evaluation of the new framework.

Keywords: *Collaborative learning, e-learning, learning design, learning object, IMS-LD*

1. Introduction

Today, the pedagogical possibilities made possible by digital technologies constituting a main lever for the modernization of practices of e-learning. The evolution of Web 2.0 technologies and its implications in e-learning allows envisaging new teaching and learning forms, giving a preponderant place to the collaboration, cooperation and social interaction (El Mhouti et al., 2014). However, the problematic of digital uses in e-learning focuses today on the design of learning content: have we digital content adapted to this new type of learning: collaborative learning, socioconstructivist learning, etc.? What is being done to promote the production of quality digital content? Various studies show that, from a pedagogical point of view, these contents do not perform their function and that they are individually designed which leads to learning content little/no adapted to collaborative learning vision (Trillaud, 2013). The work presented in this paper fits in the light of these findings. It relates of the work on learning design and is focuses mainly on the processes of design of e-learning contents by means of reusable and interoperable Learning Objects (LO). This work has as main objective to search conceptual and computer solutions to designing e-learning contents promoting collaborative e-learning.

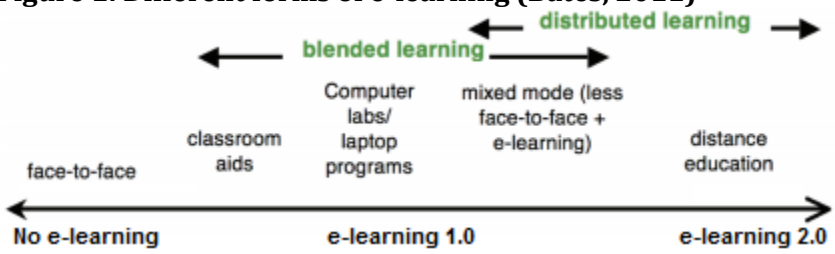
Thus, to promote collaborative learning, this work proposes a model based on socioconstructivism approach, for developing structured learning content and methodically developed, for an e-learning platform. For that, this work propose to implement an *online and collaborative learning design model* to modeling pedagogical contents as units of learning adapted to the IMS-LD (Learning Design) format. The collaborative learning design process takes place in a *Collaborative Design Environment* while the process of development takes place in the *Reload Learning Design Editor* tool. As a first step, this paper presents the e-learning concepts, while at focusing on its collaborative dimension: collaborative e-learning. Then, this work highlights the role of learning content in an e-learning platform. In this context, a literature review of methods and models of LD was presented, especially the IMS-LD specification, on which this work is based. In the next section, this work describes the basics of design and architecture of the proposed model. The paper then proceeds to describe the technological choices to implement the model and concludes with prospects of this research.

2. Literature Review

The design of teaching and learning contents is the concern of all educational institutions at all their levels. However, several works in practical contexts show that these contents are the eternal forgotten in political reform of educational systems. Their design is done in most of the time individually (Cormier, 2012). This leads to pedagogical contents little/no adapted to social and collaborative learning vision, vision increasingly favored in e-learning (El Mhouti et al., 2013). To overcome the shortcomings raised, this work aims to establish a model of *online and collaborative and online learning design* and development of educational contents to stimulate collaborative learning in e-learning. Before describing the design and the implementation of the proposed model, current section is oriented towards the presentation of theoretical and methodological basic concepts which we refer in the e-learning design process.

E-learning: e-learning is the result of the integration of technologies, Internet an computers in education. Nowadays, e-learning forms the nucleus of a number of programs offered by educational institutions (Rupesh, 2009). The evolution of Web 2.0 technologies has spawned e-learning 2.0. The impact of practices on the Web has led to a new range of services that can be called eLearning 2.0.

Figure 1: Different forms of e-learning (Bates, 2011)



E-learning 2.0 represents the second version of e-learning relying on Web 2.0 technologies and new trends of e-learning like collaborative e-learning. e-learning 2.0 relies on the creation and sharing of knowledge with various users using tools such as wikis, blogs, social networking and social bookmarking to support collaborative learning practices (Rupesh, 2009).

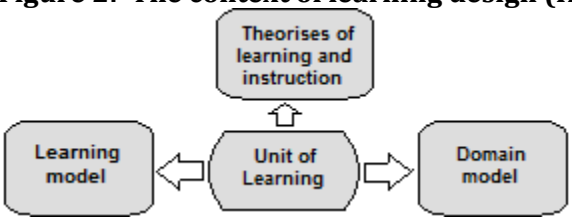
Collaborative e-learning: Collaborative learning (CL) is a learning method which involves effort of learners and teachers. In this approach, learners are working in groups on case-based learning, problem-based, discussions and other ways where learners are actively participate in the learning process. In e-learning environments, learning as a collaborative way where learners must reflect, discuss, gather and analyze information promotes practices of *collaborative e-learning*. The aim of the courses in collaborative learning environments is to help the learner to learn from others and share knowledge and information (Anne & Grete, 2009). Traditionally, e-learning courses are designed and built individually, manner that not promote, collaboration, cooperation and interaction. This is why these courses must be adapted to this new type and context of learning.

E-learning content-design process, methods and tools: The changes performed by Web technologies are determinant when it comes to the subject of the educational act: the *pedagogical content*. However, the implementation of content suited to the *collaborative learning* context cannot succeed without the taking into account, in addition to the constraints of *costs* and *time*, some pedagogical and technical aspects. One of the main aspects concerns the design process of such content. Although most of what we see as individual learning becomes collaborative, and spite of the diversity of actors involved, the design of contents is done in most of the time individually (Trillaud, 2013). Another aspect concerns the mechanisms for implementing pedagogical contents

using learning objects. In this context, the important international movement to establish pedagogical standards and norms for e-learning has changed the way that we exercise the practices of learning design (Wiley, 2002).

Learning Design process: LD (Learning Design) consists in describing the learning and teaching process following a pedagogical approach that addresses objectives of learning for a particular audience in a particular discipline (Koper & Olivier, 2004). Figure2 illustrates the relations among the *Unit of Learning* (UoL: a concept increasingly used in the field of the LD), *learning model*, *domain model*, and *theories of learning and instruction*. The UoL is the result of the LD process.

Figure 2: The context of learning design (Koper & Miao, 2008)

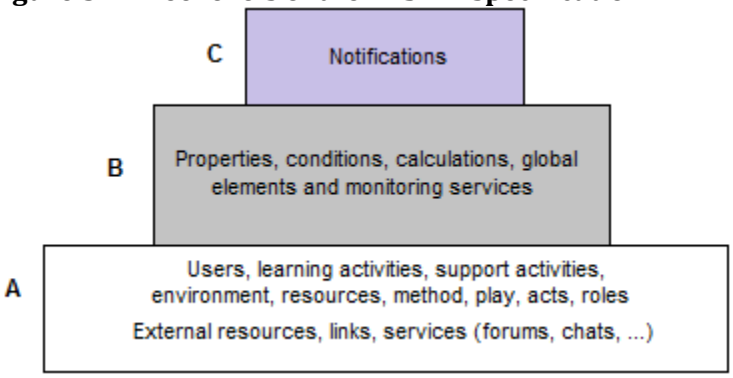


The *learning model* describes how students learn based on various learning theories. The *domain model* describes the content and its organization, for example, software engineering or data on the Web. The *theories of learning and instruction* describe the instruction principles and models based on the literature or the experience of practitioners (Koper & Miao, 2008). In e-learning systems, to allow the conception of the dynamic of learning and teaching and their standardization, the Consortium IMS-Global Learning has set a new specification for implementing e-learning courses: IMS-LD (IMS-Learning Design). In the following, we describe in detail this specification.

Instructional Management Systems-Learning Design (IMS-LD): IMS-LD is an e-learning standard used to build digital courses, known as *Unit of Learning* (UoL), in a semantic, reusable, interoperable and formal fashion. This is a specification to design and encode learning structures (IMS-LD, 2003). The IMS-LD supports a various pedagogical methods like *collaborative, active* and *adaptive learning* (Koper & Olivier, 2004). The life cycle begins with a lesson plan modeled according to IMS-LD, and defining services, activities, roles and many other elements within an XML document (Burgos et al., 2007).
The conceptual structure of IMS-LD is composed of 3 main levels (Figure 3):

- *Level A*: it is the basis of IMS-LD, and provides baseline elements to construct any UoL;
- *Level B*: it adds others functionalities to build complex lessons and courses;
- *Level C*: it adds the concept of notifications.

Figure 3: Three levels of the IMS-LD specification



The use of the IMS-LD specification requires an authoring tool environment compatible with this specification. In this sense, several existing tools and editors can be used to design and create UoL such as: Cosmos, Reload Learning Design Editor, Copper Author, etc.

3. An Online and Collaborative Learning Design model to develop e-learning contents

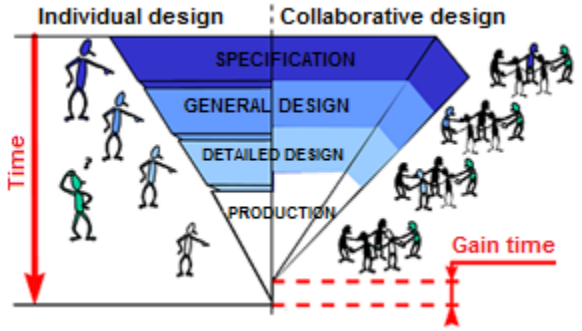
In e-learning systems, learn collaboratively is not always easy when digital courses are not adapted to this type of learning. However, one way to reduce these problems and stimulate collaborative e-learning is to design contents according to an *Online and Collaborative Learning Design* (OCLD) process promoting interactions between teachers-authors. In this section, we will define and explain the foundation on which rests the implementation of the *Online and Collaborative Learning Design* model and we continue by describing its conceptual architecture and technical choices adopted to implement it.

The collaboration in the content learning design process: The term "*collaboration*" has different meanings depending on who uses it and in what circumstances. In some projects, "*collaboration*" simply means that the persons concerned are involved in the project activities. In the most advanced cases of collaboration, it means the act of working together to achieve a goal. In common sense, collaboration is a process by which two or more persons or organizations join forces to achieve a work. The practice of collaboration in the design of educational content means that teachers and trainers concerned are actively involved in the different stages of the design phase rather than produce these contents individually. Thanks to the information and experiences exchanges, collaboration in the design of educational content brings together the maximum of experiences and opinions. In this context, and in order to promote *collaborative learning* practices, teachers can make a very practical contribution to the process of e-learning content design by working collaboratively online. This leads to the production of quality content, too much pushed to the activity and which meet the needs of learners in terms of "*collaboration*".

Online and Collaborative Learning Design model

Description: In the proposed model, online and collaborative design process of contents is similar to what we find in the software engineering. The collaborative design is assured according to a life cycle adapted, following to an incremental process broken down into several phases which correspond to a set of tasks to perform collaboratively. The use of a life cycle brings several advantages: promotes traceability, improves the visibility on the content evolution and promotes the constitution of groups of collaborative work (Catteau & Vidal, 2008). Indeed, evoke the concept of life cycle to develop e-learning contents returns to adapt to the educational context methods from industry. In this sense, the first advantage of adopting a lifecycle to implement e-learning content will thus reducing the *time* and therefore *costs* of development of such contents (Figure 4).

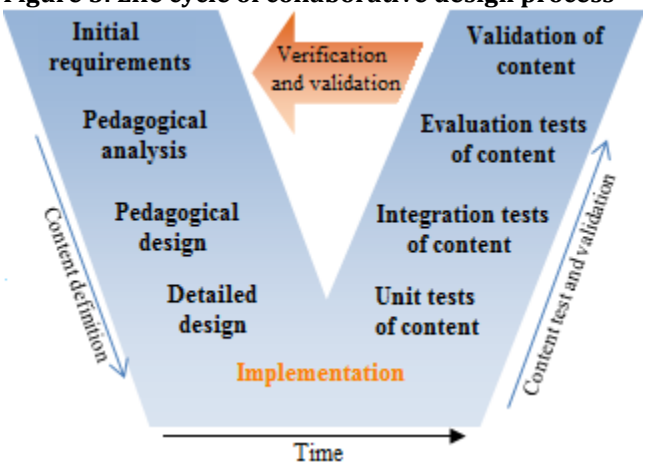
Figure 4: From the individual to the collaborative learning design process



Besides the advantages mentioned above, in the proposed online and collaborative learning design method, the actors involved in the different stages work together. They are moving towards a partial parallelism throughout this process.

Collaborative design life cycle: Considering its advantages, the choice fell on the model known as "V-Cycle". The strong point of this model is that any description of a pedagogical component is accompanied by tests, which will ensure that it matches its initial description. Figure 5 illustrates the steps of the collaborative design process of contents.

Figure 5: Life cycle of collaborative design process



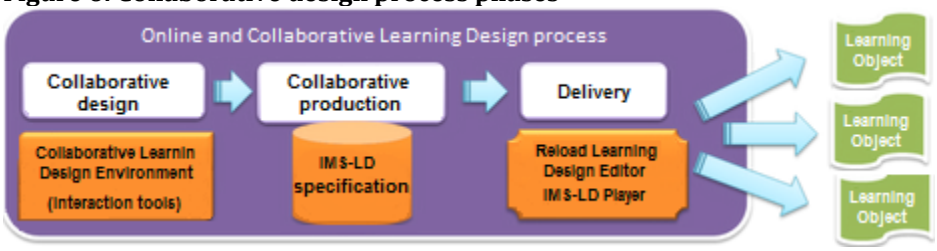
The collaborative design process is done in natural language and through descriptive texts and schemas. On completion of this process, the authors must have a database of detailed e-learning resources and e-learning contents. In the next section, we describe in more detail the main phases of the educational model of *OCLD* of e-learning contents.

Main phases: The *Online and Collaborative Learning* D*esign* process proposed is composed of three main steps:

- *collaborative design*;
- *collaborative production*;
- *Diffusion* of learning objects produced.

In each step, a graphical interface and a set of tools used to complete the corresponding task: *pedagogical task*, *didactic task*, *mediatic task* and *technological task*. Figure 6 shows the process of generating of contents packages as learning objects.

Figure 6: Collaborative design process phases



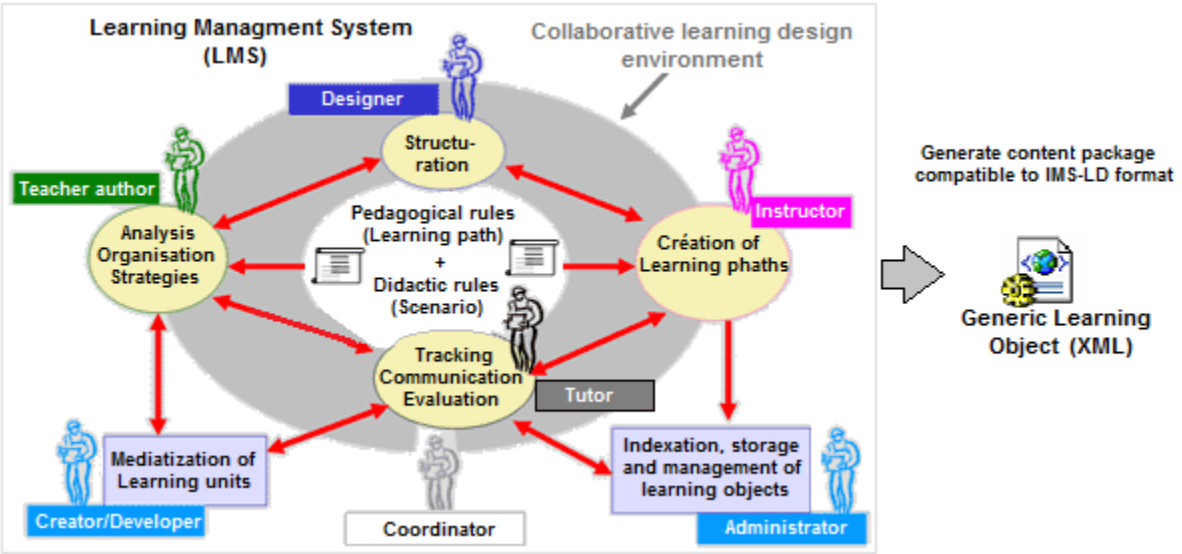
The *collaborative design* phase takes place in an online space called "*Collaborative Design Environment*" (CDE). In this space, teacher's authors develop a structured and hierarchical representation of concepts and knowledge to teach and model the learning paths, scenarios and possible sequences. The *collaborative production* phase concerns the mediatization of learning paths and scenarios developed in the previous step. Here, the units of learning are produced according to IMS-LD format. Teacher authors consult a resources management system to select a mediatic object (image, video, animation, etc.) previously created and saved in database. Every selected mediatic object is linked with one or more acts. The last phase of the collaborative design process is that of *content delivery* as standard learning objects. To facilitate this task, it was proposed

to use the authoring called *Reload Learning Design Editor* (that we will present in detail in the next section).It is a scenario development tool to generate the executable version of the learning object compatible to IMS-LD format to ensure reusability and interoperability. Note also that at the end of this process of *online and collaborative design*, the teacher author can make changes on all stages.

4. Conceptual structure

The general structure of the proposed *Online and Collaborative Learning Design* model of e-learning courses is based on two complementary parts: 1/ *design part*, which is done in collaboration between the various actors according to the V life cycle; and 2/ *development part*, to create units of learning as learning objects compatible with IMS-LD format. Figure 7 illustrates the general structure of the model.

Figure 7: Architecture of the proposed model

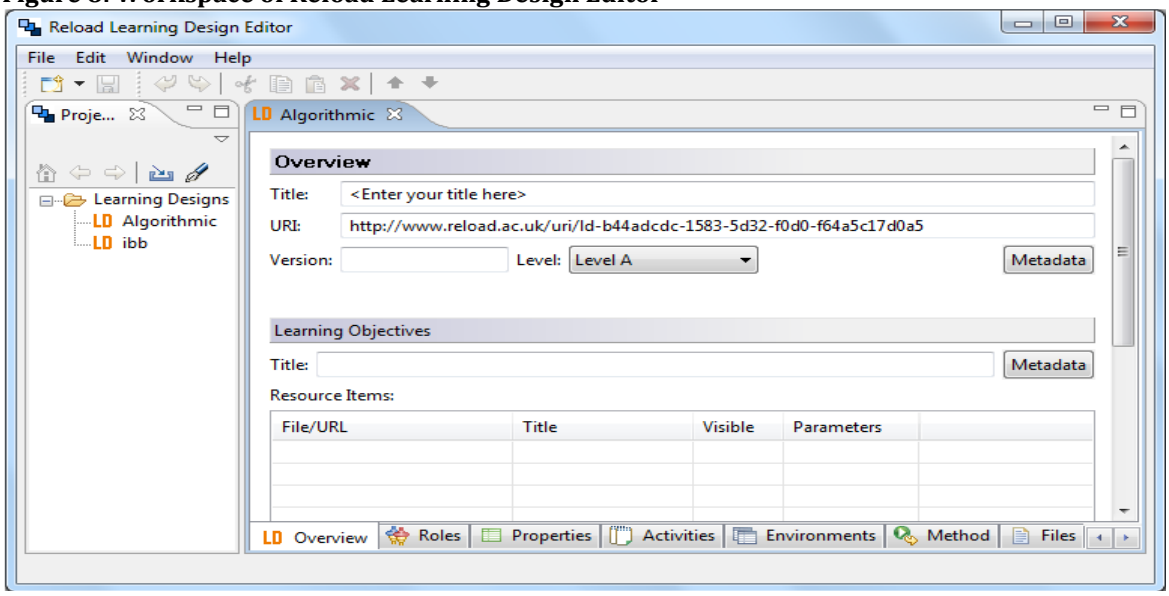


In this architecture, we can distinguish two tasks performed by the staff of authors/designers (authors-teacher, designer, developer, coordinator, etc.):

- Design task: this task concerns two roles carried out by members of the staff according to their specialty: pedagogical role and didactic role.
- Development task: this task also concerns two functions exercised by the members of the staff: technical role and mediatic role.

The *design task* takes place in the *CDE*. This space aims at making available to teachers an environment which allows many possibilities. This is an LMS (Learning Management System) providing two main functions. Firstly, this LMS offers the online *Collaborative Design Environment* and thus implements the *Online and Collaborative Learning Design* process proposed. Through this space, collaborative design is facilitated by exchange and sharing of information, participation in forums, use of videoconference and other tools of synchronous/asynchronous communication. Secondly, this area is responsible for everything related to management: it manages the contents and educational resources, author's profiles, registration, etc. After the design of the UoL, the staff starts *development task*. Among many standards analyzed, the IMS-LD was used to create UoL and generating learning paths. We have adopted this specification for modeling UoL because it is a formal pedagogical standard accounted the most popular language for describing learning design. Its strength is that it focuses on the "*scenario*" more than the "*aggregation*" of content/resources, and it formally dissociates "*activity*" and "*resource*" by specifying the semantic relations linking them. At the end of the *online and collaborative design-development process*, author creates the executable version of the learning object produced. This task is done using the authoring tool *Reload Learning Design Editor (RLDE)* (Figure 8). It should be noted also that it is a modeling using the adaptive level of IMS-LD (level A).

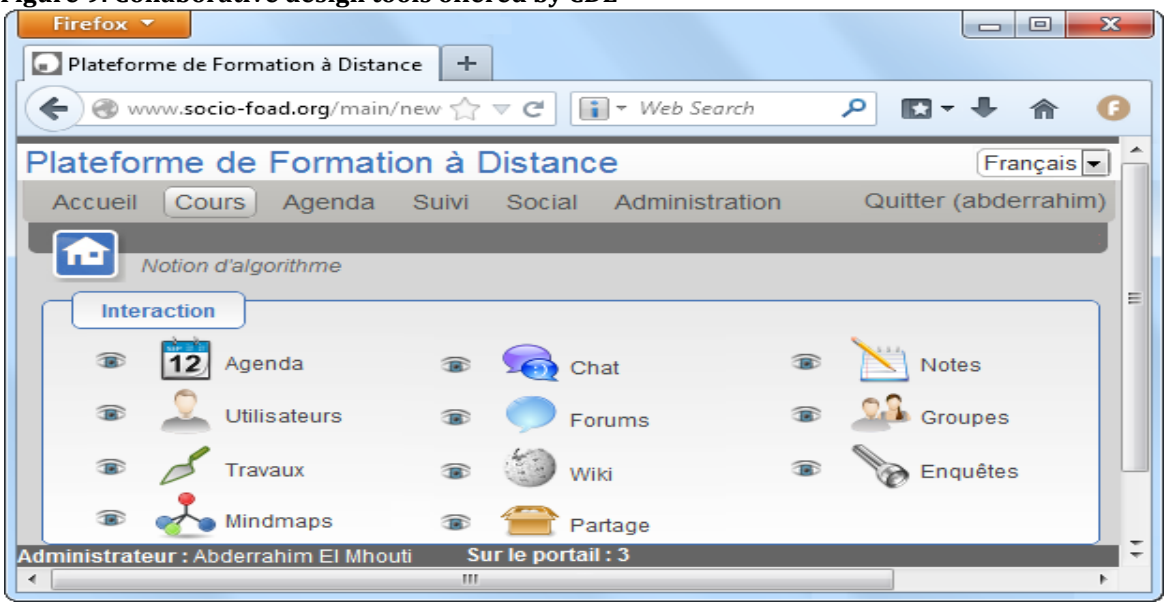
Figure 8: Workspace of Reload Learning Design Editor



The *RLDE* is an authoring environment developed in Java language. It is an open source and tree-based LD editor tool used to build UoL compatible to the IMS-LD format (Milligan et al., 2005).

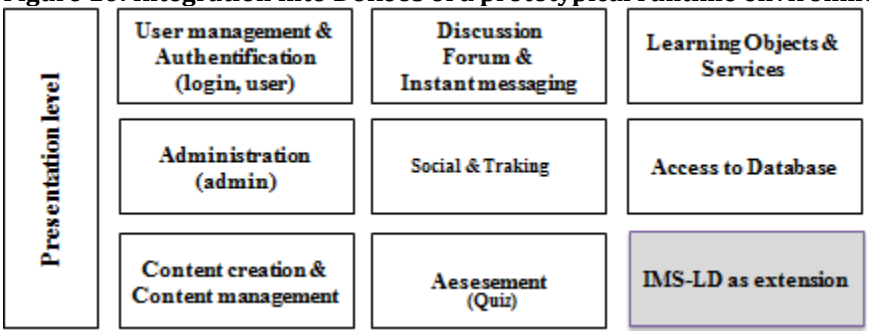
Implementation: To implement the proposed *online and collaborative learning design model*, the choice of technologies is based on the reuse and the linking of many existing software solutions. Thus, we have setting up an LMS ensures two main functions: 1/ integrates *Online and Collaborative Design Environment*; and 2/ manages resources, courses, users accounts, etc. In addition, this LMS offers a *teacher environment* and a *learner environment*. The software design of the proposed model is based on technology choices on which rest the development of modern forms of distance training (Web 2.0 technologies). Thus, after comparative studies conducted, the *CDE* is implemented using the LMS Dokeos (version 2.1). It is an LMS developed in PHP and built around a client-server architecture. It is accompanied by a software called "Dokeos Mind" facilitating the representation and design of educational content in the form of concept maps, and very useful in the design phase. The *CDE* offers a rich online space that allows facilitating and organizing exchanges between teacher's authors/designers. Figure 9 shows an overview of tools available in *CDE*.

Figure 9: Collaborative design tools offered by CDE



The features of Dokeos ensure maximum interactivity between teacher-authors. They help to plan online meetings and video-conferences. These tools make it easy to organize online discussions and do not require additional installation on the teacher-author's computer. To support the IMS-LD standard, we have oriented our work towards the management and exploitation of educational content by implementing an export and import mechanism in IMS-LD format. That's why we have added to the platform Dokeos an runtime environment of learning objects compatible with this format. Indeed, in Dokeos, the features are implemented separately in the form of modules (like chat, documents, quiz, forum, etc.). This provides the opportunity to create and integrate new formats for Dokeos courses. Thus, in order to support courses compatible to the IMS-LD format, a new format of courses has been implemented in Dokeos to provide functionalities to use this LMS as a runtime environment for learning units consistent with IMS-LD Level A. Figure 10 illustrates the new architecture of Dokeos to support IMS-LD format, with extended components marked in grey.

Figure 10: Integration into Dokeos of a prototypical runtime environment of LMS-LD



Following the structure of the level A of IMS-LD, the e-learning courses structure is constructed from activities, activity structures, acts and plays. Mediatic resources (images, videos, animations, etc.) for learning are add to the IMS-LD environment and are linked to activities. Designers can edit the *imsmanifest.xml* file and thus practice learning design process by implementing learning activities organized in structures, acts and plays. The graphical interface of the LMS Dokeos provides various views of the digital course structure, based on the user choice and its role and the progress in the teaching-learning. For this, the information contained in the imsmanifest.xml file to run UoL is treated (through XSL) and presented to learners and teachers.

5. Conclusion

The high costs of design and development in e-learning and the challenge of restraining those costs cannot be denied. However, the purpose for which this type of learning was created cannot be ignored: the *collaborative learning* without constraints of time and place. In this research work, we have presented a general model for *Online and Collaborative Learning Design* based on IMS-LD specification. The objective is to provide design support for teachers-authors and instructors to promote *collaborative learning* in e-learning systems. The *Online and Collaborative Learning Design* process, which takes place in an online collaborative design environment, is ensured following a generic life cycle that we have adapted to the design of teaching/learning contents (life cycle V) according to an incremental process broken down into tasks to perform collaboratively. A novel aspect of this approach is that the collaborative learning design process is becoming less the product of a single author, but this is a team work, consists of a manager who ensures the educational coordination (coordinator) and several teachers (authors) who design educational contents. The authors, freed from the constraints of *time* and *place*, must work together, pool their efforts and exchange relevant data. They may also be required to collaborate with external teams of experts, multimedia and graphic designers, instructional designers, etc. The modeling of units of learning is done using the *Reload Learning Design Editor*, an authoring tool to facilitate the generation of learning objects reusable, interoperable and compatible to IMS-LD format. As part of the continuity of this work, we are working on the extension of the model to integrate the levels B and C of the IMS-LD specification. On the other hand, we have planned to develop an authoring environment to collaboratively modeling of UL by implementing real-time collaboration on the different steps of learning design process. The authoring environment will be developed from Web 2.0

perspective by implementing necessary techniques for synchronization of the content published by users (teachers-authors).

References

Anne, K. L. & Grete, O. H. (2009). Collaborative learning in e-learning, Virtual book e-pedagogy for teachers in higher education, Bergen University College, Bergen, Norway.

Bates, T. (2011). Understanding Web 2.0 and its Implications for e-learning. Web 2.0 based e-learning: Applying Social Informatics for Tertiary Teaching, 21-42.

Burgos, D., Tattersall, C., Dougiamas, M., Vogten, H. & Koper, R. (2007). A First Step Mapping IMS Learning Design and Model. *Journal of Universal Computer Science*, 13(7), 924-931.

Catteau, O. & Vidal, P. (2008). Le Cycle de Vie de l'Objet Pédagogique et de ses Métadonnées, Doctoral dissertation, Paul Sabatier University, France.

Cormier, L. (2012). Le soutien au développement de ressources numériques pour l'enseignement et l'apprentissage dans les universités québécoises, In proceedings of the 80ème Congrès de l'ACFAS.

El Mhouti, A., Nasseh, A. & Erradi, M. (2013). An Evaluation Model of Digital Educational Resources. *International Journal of Emerging Technologies in Learning*, 8(2), 29–35.

El Mhouti, A., Nasseh, A. & Erradi, M. (2014). Design and implementation of a Socioconstructivist Model of Collaborative Learning Design (SMC-LD) dedicated to distance learning. *International Journal of Computer Sciences and Engineering*, 2(8), 1-10.

IMS Global-LC. (2015). IMS Global Learning Consortium, Website: http://www.imsglobal.org/learningdesign/

(IMS-LD, 2003) IMSLD: IMS Learning Design. (2003). Available at: http://www.imsglobal.org/learningdesign/index.cfm

Koper, R. & Olivier, B. (2004). Representing the learning design of units of learning. *Educational Technology & Society*, 7(3), 97–111.

Koper, R. & Miao, Y. (2008). Using the IMS LD Standard to Describe Learning Designs. In: Lockyer, L., Bennet, S., Agostinho, S. and Harper, B. (Eds.), Handbook of Research on Learning Design and Learning Objects: Issues, Applications and Technologies (pp. 41-86). IDEA group.

Milligan, C. D., Beauvoir, P. & Sharples, P. (2005). The Reload Learning Design Tools. Journal of Interactive Media in Education (Advances in Learning Design. Special Issue, eds. Colin Tattersall, Rob Koper), 2005/07. ISSN: 1365-893X.

Rupesh, K. A. (2009). E-Learning 2.0: Learning Redefined, Library Philosophy and Practice, ISSN 1522-0222.

Trillaud, F. (2013). Architecture pour le contrôle des interactions et le pilotage d'une application interactive multi-utilisateurs à exécution adaptative : application à un environnement de FOAD, Doctoral dissertation, University of La Rochelle, France.

Wiley, D. A. (2002). Connecting learning objects to Instructional design theory: a definition, a methaphor, and taxonomy. In Wiley (Ed), the Instructional Use of Learning Objects. Agency for Instructional Technology and Association for Educational Communications of Technology, Bloomington, Indiana.

List of non-standard abbreviations

OCLD: Online and Collaborative Learning Design
CDE: Collaborative Design Environment
UoL: Unit of Learning
RLDE: Reload Learning Design Editor
LO: Learning Object
LD: Learning design

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Big Data at the Service of Teaching and Scientific Research within the UAE

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Abstract: With the emergence of the digital world, data access has become an action as quick and direct that many questions arise about the reliability and value of information. However, the data returned by the online search engines are based on an open and massive environment, which include data of any type, which come from different sources of information. Indeed, in the field of education and especially when using online search, the learner is left with a set of heterogeneous information that does not exist in an orderly format and are not easy to consume. This aspect of data variety represents the second V in the design of the Big Data phenomenon. With the aim to support learners in their search for information, it is proposed to design a specialized structuring tool to combine process and classify the variety of these massive data so they can provide the best result to the learner. The present article deals with the descriptive study of the current state of using online search by UAE's students, and the proposal to explore new methods and approaches through experimentation of our solution for open and massive data environment, in order to enhance learning and scientific research in the UAE.

Keywords: *Big data, e-learning, online search, data structuring, digital pedagogy*

1. Introduction

Search engines provide the user with a large amount of data at each use. However, this mass of heterogeneous and unstructured information at a time, does not always meet the user's expectations against the requirements he expressed. To date, these data have rarely been exploited intelligently with the aim of improving learning and practical information in the academic community, although evidence from other sectors such as marketing, sports, health and technology suggest that the effective use of large volumes of data can provide the education sector the opportunity to improve its systems and results (Macfadyen et al., 2012). In this context, it has proposed to design a tool that can rework the enormous data resulting from online search, making them easily consumable by the learner, and providing relevant and optimal search with consistent and adequate data to expressed needs. The next chapter presents the state of the art concerning the use of online search in Big Data environment by the learner, with discussing the problem of data variety provided by traditional online search engines. Chapter 3 is devoted to the presentation of a new mode of learning that takes as case study the Moroccan University Abdelmalek Essaadi of Tetuan, with the proposal to explore new methods and approaches through the use of our technique of restructuring, classification and presentation of data, tailored to the open and massive data environment, with the aim to enhance learning and scientific research for the UAE's students. The last paragraph presents a general conclusion highlighting a range of perspectives.

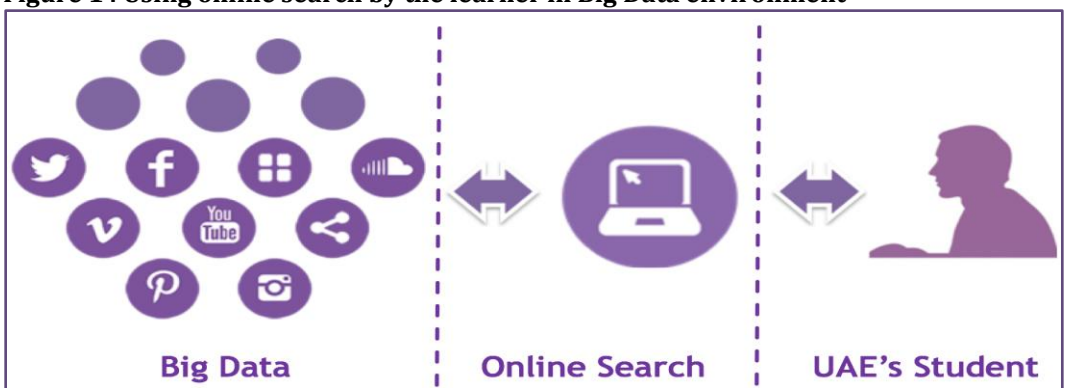
2. The use of online search by the learner in Big Data environment

Definition and state of the art: The significant growth of information in the Internet requires search tools more and more efficient that can discern relevant information from hundreds or even thousands of raw data. However, the quality of the results provided by the search engines is not always relevant, especially when the user comes to compose more than one request (Soussi et al., 2008). Indeed, the online documentation systems and especially the search engines have developed strongly since the advent of Big Data phenomenon. The effectiveness of the search for information, especially on the Web, would be particularly related to the use of the system expertise, including knowledge of the procedures and documentation tools, but also the heuristics and strategies to use in documentation and that, to assess quickly and correctly the content quality and credibility of data and information (Vibert et al., 2007). Today, information is manifested in various forms: the geo-location, mobile data, data from social networks, video and satellite imagery, customer transactions, motion data of connected objects, etc. This great mass of heterogeneous data has a negative

impact for the learner who uses the online search and makes the process of learning or knowledge difficult to succeed. Thus, the use of an online information retrieval support system based on the raw data of Big Data phenomenon has significant strengths. To do this, the need for a fictitious model to represent and process this type of data that are not necessarily text becomes essential. However, semi-structured databases No SQL do not provide enough structure to organize unstructured data, but there are NoSQL engines that implement a variety of data models, and they generally run on flexible storage formats such as JSON. This allows to analyze and to process the data stream in real time (Duggan et al., 2015).

In this context, we mention the solution "DOCUPOLE" which was designed in 2007 to offer an introductory online course in documentary research modeled with MOOC. His new version opened in December 2014, has posted a first significant movement consultation on referencing information (Blondeel et al., 2015). Similarly, we find the system "SARI Onto" which is an online information retrieval support system based on both domain and service ontologies issued from the information search process and document classification (Soussi et al., 2008). Both systems tend towards facilitating access to documental information but without considering the reorganization of heterogeneous data resulting from online research. The Figure 1 shows the appearance of using online search by the learner in the Big Data environment.

Figure 1 : Using online search by the learner in Big Data environment



As shown from this figure, the learner accesses the online search platform for its learning and documentation needs. But finally he left with a multitude of unstructured data and heterogeneous information (text, image, video, ...) that comes from several sources of information (Twitter, Facebook, YouTube, ...).This situation, pushes the learner to question about the value and reliability of the returned information results following the execution of its online search process.

Table1: Some of data types returned by search engines

Data Type	Examples
Web and social media	Click stream data; Twitter feeds; Facebook postings; Web content.
Machine to machine	Utility smart meter readings; RFID readings; Oil rig sensor readings; GPS signals.
Big transaction data	Healthcare claims; Telecommunications call detail records; Utility billing records.
Biometrics	Facial recognition ; Genetics.
Human generated	Call center voice recordings; Mails; Electronic medical records.

Problematic of data variety returned by online search and its impact on pedagogy of teaching: The growing number of available data on Internet makes necessary the use of appropriate tools to assist and support users in their use of online search. Moreover, the techniques generally used by search engines are based on statistical methods and syntactic treatments that not processing the relevance of the user request and the good presentation of the result. Other problems, such as those related to the vocabulary and the data variety, the selection of key words and data filter may be encountered. In this context, helping a user to find the information that he seeks becomes a task increasingly difficult. Hence, the recourse to the inclusion of the semantic level to overcome these difficulties in the information search, this is called the Semantic Web (Berners-Lee et al., 2001). However, the analysis and processing of mass data produced by Big Data phenomenon exceed human capacity, which requires the use of algorithms and powerful computer systems able to explore them. Moreover, the information provided by Big Data is not manifested in an orderly format and are not easy to operate for analysis (Aoulad et al., 2015). This issue concerns us in the context of this article and especially the question of data variety and unstructured information produced by Big Data phenomenon. The Table 1 shows some examples of data types returned by search engines while using online search.

As presented in this table, the information collected with online search engines comes in several types (Web, RFID, and Mail) and from different sources of information. In addition, the emergence of Web 2.0 has made it possible to create and publish any type of content such as courses, exercises, assignments, or bibliographies, and any kind of digital resource that allow an informal collaborative learning known as name of Learning 2.0 (Sbihi et al., 2013). Similarly, Web 2.0 offers several of other collaboration tools such as blogs, wikis, social networks or podcasts and video casts (Sbihi et al., 2013). Consequently, the problematic of data variety exists clearly in the educational field and especially during an online search process used by the learner. At the end of his search, the user is left with a mixture of heterogeneous data that do not always correspond to its requirements and create sometimes a sense of confusion about the reliability and the value of the obtained information.

3. Towards a new learning mode using online search in Big Data environment

Case study of Abdelmalek Essaadi University: The Abdelmalek Essaadi University is one of the four public universities in Morocco; it is considered the primary Northern University. It has consists of 11 institutions, including schools and institutions in the Tangier-Tetuan region distributed at four sites: Tangier, Tetuan, Larache and Martil (El Amrani et al., 2012). It covers three main areas: Science and Technology, Arts and Humanities and Law, Economics and Management. The UAE holds several structural projects and knows a continuous development. It counts with around 41,000 students, 780 teachers, 579 staff members, 35 teams and 29 research laboratories. The University provides students, teachers and administrative partner's universities, his research labs, Internet and other services to enable them to perform their daily work at ease. The university also provides libraries with an important documentary base. For the digital development of the university's work. The UAE has chosen the cloud computing to improve communication, connectivity and collaboration. Following "Google Apps for Education" is the IT solution adopted, it has also reduced IT costs. This suite includes several applications including Gmail (email services), Google Calendar (shared calendaring), Google Docs (documents and presentations), Google Video (10 GB free) and Google Sites (website creation). UAE's students now have the opportunity to work together in real time on the same document while sharing information. At any time, each student will have access to all data through a laptop, tablet or Smartphone connected to the Internet.

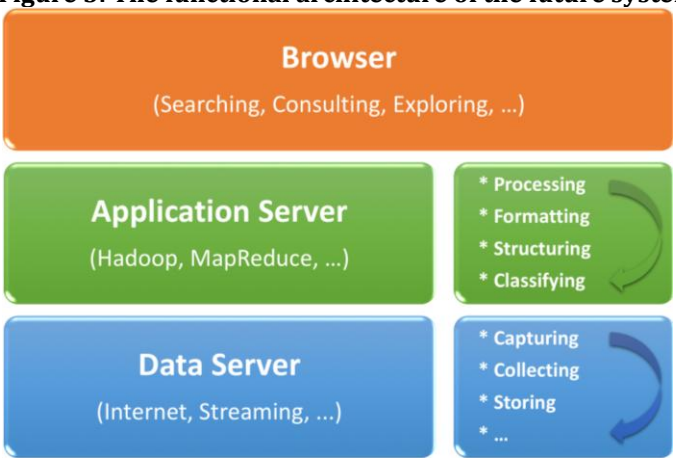
As part of this article we want to study the opportunity to experience a new way of learning in the UAE via the proposal to explore new methods and approaches through the use of our technique of restructuring, classification and presentation of data, tailored to the open and massive data environment, with the aim to enhance learning and scientific research within the UAE. This solution can be then added to the cloud computing applications that the University already possesses. The case study is a nominal scenario concerning the use of online search by the learner for his learning or documentation needs on a specific topic or theme. The example illustrated in Figure 2, shows the current state of using the traditional search engine by the UAE's student through its interface to search for information and documentation. Thus, we have chosen the example of searching about the subject of the system "e-learning"(the platform for training and distance learning) as shown in the Figure 2.

Figure 2: The use of the online search system about the subject "e-learning"

After entering keywords to search the specific theme as presented in the previous figure, the system proceeds to capture all types of data (text, image, video, etc.) about the topic "e-learning" and displays the results in a crude manner and in the same interface of the user, without showing any signs of structuring or insight that can give to the learner a structured view and a prior idea about the result content, which normally can discharge him of an additional phase of data discovery by browsing each result separately to check finally whether it corresponds to its requirements or not.

Towards a based tool on Big Data to improve learning and research in the UAE: It is important to identify a sophisticated strategy to combine different types of data in a way that they provide the best result to the learner. In this context, we propose to develop a technique based on a tool that integrates all structured and unstructured data in one data layer to facilitate access and optimize relevance with search adequate and consistent results according to the expectations of the learner (Aoulad et al., 2015). The Figure 3 shows the functional architecture of the future system.

Figure 3: The functional architecture of the future system



As shown in the figure, the job consists in to develop a top layer to the layer of raw and massive data provided by Big Data, which will take charge of dealing with the large and unstructured data and subsequently offer

storage, research and dissemination of consistent information with the data requested by the learner through the online search. To do this, it is proposed to capture initially the metadata values of the meaningful information constituting the results of the gross search returned by traditional search engines, and then organize them in the form of well-formatted structures to present them to the learner as an overview or summary of the result contents returned by the online search. This will allow it to browse the essential and meaningful information, allowing it to decide on the follow mining them or not. This technique will discharge the learner the phase concerning the random exploration of the raw results returned by the classic online search, as these data do not always meet his expectations and take unnecessarily time consuming for their consultation. Technically speaking, the task consists to organize the resulting data from the online search as data overviews that summarizes their contents. Thus, we present in the following Figure 4, the Java class used to organize information about it by choosing the relevant and corresponding metadata to the proper presentation of search results:

Figure 4: The Java class used to organize the search results

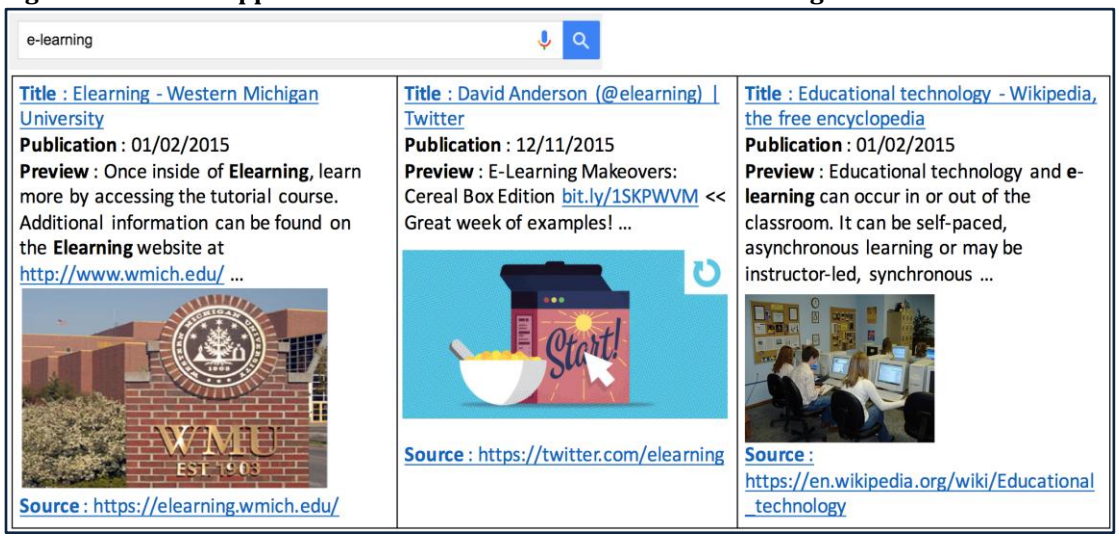
```
Public class Search Result {
      private String title;          // The title of the search result
      private String type;           // The type of the search
                                  result (post, image, video)
      private Calendar publication; // The publication date of the
                                  search result
      private String preview;        // The text preview for the
                                  content of the search result
      private String thumbnail;      // The path of the image preview
                                  for the content of the search
                              result if it's exists
      private String source;         // The content source of the
                                  search result (Wikipedia,
                              Twitter, YouTube, ...)
}
```

The "Search Result" class refers to the summary of the content to be presented for the user in his first search result screen. So, we can find the information about the title of the result, his type (text, image, video, ...), his date of publication (allows to order the result by the most recent element), a preview of the content (a kind of descriptive text), an illustration image if it exists and finally the source of the information (Wikipedia, Twitter, YouTube ...).Thus, the nominal usage scenario of online search that we have already mentioned in the case study of the UAE paragraph at the top, can be realized through this new system as described at the Figure 5.

Figure 5: Towards a new structuring technique of the online search results

Thus, the system user (learner) accesses the search interface to enter the keywords of his information request. These keywords are sent to the system to retrieve the corresponding information to their semantics from the Big Data layer. Then, the captured data is processed at the middle layer that concerns our future system that it's responsible for structuring the processed data, classifying and sending them at the end to the results page of the system, which will be displayed to the learner in an organized and well presented manner. It then finds the data related to the type "post" classified in the same category even though they come from different sources (Facebook, Twitter, Google+, ...), also for image data type (Instagram, Picasa, ...), video data type (YouTube, Vimeo, Dailymotion, ...), and finally the audio data type (Soundcloud, ...). In order to have a clearer idea about the future system, the Figure 6 exposes the real appearance of the final user interface that performs the online search process executed by the learner.

Figure 6: The real appearance of the final user interface concerning the future solution



As shown, the search results will be organized in a way to present to the learner an overview or summary data of the results contents. Thus, the learner can now to have a prior idea about the rest of content and to decide to continue exploring the significant result or not depending their needs. In addition, this new process will allow him to economize his research time through browsing only the relevant search results and then exploring the most adequate to its needs.

4. Conclusion and future work

The integration and structuring of various data types is a rare feature that we can find on the big data solutions in the current market. That is why we focused our future solution on the design of a technique that integrates the set of structured and unstructured data in a single data layer to facilitate access and to offer optimum ergonomic presentation of online search results achieved by the learner. Finally, students from the UAE will run online search process for their learning or documentation needs on a given theme, with flexible and mastered manner. Thus, they can browse faster all results of their search and access only to appropriate and consistent results that meet better their requirements. Moreover, this technique will relieve them of unnecessary exploration phase of the non-corresponding results in their quest for information and will save their search time. The solution is to detect language elements and turn them into a kind of summary data that can be easily operated and consumed by the user. The adopted method consist first to the capture of metadata elements and to classify its information according to each type of result returned, providing a list of significant results and presented in an ergonomist way. As a perspective of this work, we will conduct a study survey of criteria and factors affecting learner's environment against massive data offered by Big Data, and through the study of use cases Search online by the learner for a learning purpose or documentation on a given theme. This, through the creation and submission of the corresponding questionnaires to a sample of the UAE students using online research for their learning. This will be followed by a detailed analysis of the results collected from these questionnaires and that will frame the functional and technical requirements of

the future solution and begin the development of the corresponding tool based on a fictitious model to process the massive and heterogeneous information provided by Big Data.

References

Aoulad, A. K., Sbihi, B. & Aknin, N. (2015). Big-Learn: Towards a tool based on Big Data to improve research in an e-learning environment. *International Journal of Advanced Computer Science and Applications*, 6(10).

Berners-Lee, T., Hendler, J. & Lassila, O. (2001). The semantic web. *Scientific American*, 284(5), 28-37.

Blondeel, S., Pochet, B., Collette, C., Delbushaye, T., Frédéric, F., Lanners, C. & Thirion, P. (2015). DOCUPOLE: un cours en ligne d'initiation à la recherche documentaire modélisé en MOOC. In Former aux compétences informationnelles à l'heure du Web 2.0 et des discovery tools (pp. 20-28).

Duggan, J., Elmore, A. J., Stonebraker, M., Balazinska, M., Howe, B., Kepner, J. & Zdonik, S. (2015). The Big DAWG Polystore System. *ACM SIGMOD Record*, 44(2), 11-16.

El Amrani, C., Tani, H. G. & Eloutouate, L. (2012). Towards Setting up IBM Cloud Computing VCL at Abdelmalek Essaadi University. *International Journal of Computer Applications*, 56 (16), 26-28.

Macfadyen, L. P., Dawson, S., Pardo, A. & Gasevic, D. (2014). Embracingbig data in complex educational systems: The learning analytics imperative and the policy challenge. *Research& Practice in Assessment*, 9(2), 17-28.

Sbihi, B., El Kadiri, K. & Aknin, N. (2013). Towards an Implementation of the Concepts of E-Learning 2.5 through one Group of ten Master's Learners: Case of the UML Course. *International Journal of Emerging Technologies in Learning (iJET)*, 8(4), 68-73.

Soussi, R., Mustapha, N. B., Zghal, H. B. & Aufaure, M. A. (2008). Un système d'aide à la recherche d'informations en ligne basé sur les ontologies. In CORIA 2008 (pp. 483-490).

Vibert, N., Rouet, J. F., Ros, C., Ramond, M. & Deshoullieres, B. (2007). The use of online electronic information resources in scientific research: The case of neuroscience. *Library & Information Science Research*, 29(4), 508-532.

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Effect of Industrial Work Practice and Family Environment on Interest in Entrepreneurship to Students of Vocational High School

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Abstract: The purpose of this study was to determine the effect of industrial work practices and family environment on interest in entrepreneurship at state vocational high school 1 of Parepare. Population showed in this study was all students of class XII at state vocational high school 1 of Parepare in the academic year 2015/2016 as many as 232 students. The total sample of 30 % or as many as 70 students. Data collection techniques in this study are a questionnaire, observation, interviews, and documents. The data analysis techniques used in this study is multiple regression analysis using the Statistical Product and Service Solutions (SPSS). The results showed that (1) the industrial work practices has a positive and significant impact on interest in entrepreneurship at students of vocational high school of state 1 of Parepare by 58.40 %, (2) family environment has a positive and significant impact on interest in entrepreneurship on students of vocational high school of state 1 of Parepare by 55.70%, and (3) influences of industrial work practices and family environment simultaneously positive and significant impact on students of vocational high school of state 1 of Parepare by 65.30%. The study recommended that the head school should more pay attention to the implementation of the industrial work practices, so that students' interests in entrepreneurship can be improved estuary on improving the quality of education

Keywords: *Industrial Work Practice, Family Environment, Entrepreneurship Interest*

1. Introduction

In the law of Republic of Indonesia No. 20 of 2003 on National Education System in article described 15 that "Vocational education is an education that prepares students to work in a particular field". Furthermore, the Government Regulation No. 29 of 1990 in article 3 paragraphs (2) states that "vocational secondary education priority to preparing students to enter the workforce and develop a professional attitude". Vocational high school (SMK) is expected to develop students' interest in entrepreneurship and after graduation of vocational school is not only looking for work but capable of independent and can create their own jobs. Therefore, one of the programs implemented by SMK to achieve this is through the working practices of the industry. Implementation of the working practices of the industry will indirectly give students experience and sufficient knowledge and skills in the work because in addition to learning how to get a job, are also taught how to have jobs that are relevant to their talents and the ability to work independently. Thus, experience, knowledge, and skills acquired by students who have followed the practice of industrial employment are expected to increase the interest of students to entrepreneurship. In addition to the working practices of the industry, the family environment is also very important in growing interest in entrepreneurship for students. Family environment is a home base for every human life. Family education is part of the overall education system. The family had a very strong influence on the development of the child's personality, because most of the child's life was in the midst of his family. Both parents have a very important role in realizing the child's personality.

Given that education entrepreneurship is lifelong, so it is a period of parental education for children regardless of age, parents are not only in charge of caring for the child but also has the task of laying the foundations of education, religious feeling, volition, a sense of joy in beauty, prowess in economics, knowledge, ideas and other social attitudes. Therefore, the maximum support of parents who will form the entrepreneurial spirit for children. Vocational high school in addition to conducting learning programs that support entrepreneurial interest also seeks to involve parents in the hope of encouraging students to cultivate interest in entrepreneurship. This is done through school committees are always in collaboration with the school to discuss the development and socialization of school and student work programs involving school students or children. Thus, parents will understand the orientation of the schools that eventually expected to provide a boost to their children to develop an interest in entrepreneurship. Knowledge,

attitudes, and skills and encouragement of parents to foster interest in entrepreneurship for students. Interest in entrepreneurship will make a person to be more active search for and take advantage of business opportunities to optimize its potential. Interests whom are not under the birth but grow and develop in accordance with the factors that influences it.

Vocational high school is a formal educational institution that is expected to create output that is ready to face the world of work. Vocational high school should be able to do good management, especially in the implementation of learning that can support the interest in entrepreneurship for students. Moreover, it also should be able to create a conducive learning atmosphere in the form of practical learning program that supports the industry working interest in entrepreneurship for students, as well as the expected contribution of the family by involving parents in supporting the learning process that supports students' interest in entrepreneurship. Based on the background of the problem, it can be argued formulation of the problem is: "Is the practice of industrial employment and family environment has an influence on students' interest in entrepreneurship at vocational high school of state 1 of Parepare? The purpose of this study was to determine the effect of industrial working practices and family environment on student interest in entrepreneurship at vocational high school of state 1 of Parepare. As Hilgard and Bowers (2004: 22) defines interest as "a persisting tendency to pay attention to and enjoy some activity or content, especially a vocational interest". Interest in entrepreneurship is not inborn but grows and develops in accordance with the factors that influence. Factors influencing the decision to entrepreneurship growth are a result of interaction of several factors: the character of a person's personality and environment (Bygrave, 2003). As Lambing and Kuehl (2007), new research suggests there are four things that influence the decision to entrepreneurship, namely personal, cultural environment, social conditions, and the combination of the three. Meanwhile, according to Hisrich (2005: 18) and Alma (2011: 12), factors that affect interest in entrepreneurship is an educational environment, a person's personality and family environment.

So, the interest in entrepreneurship is influenced by several factors, including the self, an environmental culture, social conditions, and others. The industrial work practice is a form of education provision of professional expertise, which combines in a systematic and synchronized between education programs in schools and exploitation program obtained through working directly in the work to achieve a level of professional expertise. Where such as professional expertise can only be established through three main elements, namely science, techniques and tips. Science and techniques can be learned and mastered when and wherever we are, while the issue cannot be taught but can be controlled through the process of doing direct to work on the field of the profession itself. The industrial work practices implemented to meet the man power needs of professionals in the art. Through the practice of industrial employment is expected to create the professional workforce. Where students who carry out such education is expected to apply the knowledge acquired and simultaneously studying the industrial world. Without holding this industrial work practices students cannot be directly plunge into the world of industry because students do not know the situation and working conditions. In addition, the company cannot know where the professional labor where labor and unprofessional. Dual system of education had to be implemented because it can be beneficial to all parties who carry it out.

Implementation industrial practice work aims to: produce a workforce that has the professional expertise (with the level of knowledge, skills, and work ethic in accordance with the demands of employment), strengthening "link and match" between school and the world of work, improve the efficiency of the process of education and training professional-quality workforce and give recognition and appreciation of the work experience as part of the educational process. Activities of the working practices of the industry are a mandatory program to be implemented by the school, especially vocational and followed by learners. Education Minister's decision No. 086/U/1993/ chapter IV clause C1. The purpose of the activities of the cult of the industrial work itself according to the Directorate of Technical and Vocational Education (Dikmenjur, 2008) are: (1) Produce workers who have professional expertise, the workforce has the level of knowledge, skills, and work ethic in accordance with the demands of the field-work. (2) Improve and strengthen linkages and equivalence (link and match) between educational institutions of vocational training and the world of work. (3) Improving the efficiency of the education process and training of qualified and professional workforce. (4) Giving recognition and appreciation of work experience as a process of teaching. As Uya that, field-work Practice goals are: (1) In order for the student to add insight to the way down to study abroad in

the world of industry, (2) order for students to know how to work in the industrial world that emphasizes discipline, safety and quality of products, (3) To supplement the teaching curriculum of vocational high school, (4) Produce a quality workforce, that workforce has the level of knowledge, skills, work ethic in accordance with the demands of the field-work, (5) Strengthening the link and match between the vocational and the world of work, and (6) Improve the effectiveness and efficiency of the education process and training of qualified labor.

Family environment is one of the environmental factors that can affect a person's interest in entrepreneurship. The factors contained in the family according to Slameto (2003:60-64) family environment consisting of: (1) How to educate parents, (2) Relation between family members, (3) The atmosphere of the house, (4) family economic situation (5) Definition of Parents, (6) Background Culture. As Supartono (2004:50) says that the way parents in achieving success in a job is a good capital to train their interests, skills and ability of certain values related to the work desired child. The family factors as determinants of student success consist of: (1) Economic family conditions and (2) the emotional relationship of parents and children, (3) How to educate parents (Sobur, 2003:248-249). There are several previous studies which are relevant to this study include research Putra (2009), entitled "Effect of industrial work practices to the interest in entrepreneurship in class XII in Automotive Engineering Program at vocational high school of Texmaco of Pemalang". These results indicate that there is significant influence between work practices of the industry interest in entrepreneurship in vocational students of Texmaco. With the industry work practices program, will give impetus to the student interest in entrepreneurship. Research conducted by Yulianto (2013) with the title "Achievement Effects of Industrial Employment Practices against the Interests of Entrepreneurship Student" indicates that there is a positive effect of industrial work practices to variable interest in entrepreneurship. Yulianto study concluded that the hypothesis "There is the influence of the achievements of the industry working practices interest in entrepreneurship students majoring in mechanical engineering automotive class XII of Integrated SMK of Darul Ulum of Jepara" unacceptable.

As Ditya (2011) conducted a study entitled "Factors affecting the interest in entrepreneurship students at the University of Education of Indonesia "The results showed that the variables of the family environment, the mental attitude to entrepreneurship students, and students' perceptions of entrepreneurship has a positive influence on interest in entrepreneurship students at the University of Education of Indonesia. In the study Guntoro (1997) mentions the existence of a high interest is also not free from the activities of the working practices of the industry. The study concluded that there is a relationship with the achievement of the industrial work practices with interest students in entrepreneurship class II of vocational high school of Yapin of Bekasi in academic year 2006/2007. It is concluded that the higher the value of industrial work practices followed by the high interest of the students for self-employment. Furthermore, research conducted by Yanti et al. (2014) with the title "The Influence of Family Environment for Entrepreneurship Interests of students class XI of vocational high school of state 1 of Singaraja" which aims to determine the influence of family environment on student interest in entrepreneurship. Research results indicate that the student's family environment is very high with a total score of 5998, a very high interest in entrepreneurship students with a total score of 7808, and the family environment and significant positive effect on students' interest in entrepreneurship with a percentage of 18.3 % and 81.7 % influenced other factors. Based on these results, we can conclude that industrial work practices and family environment are all factors that can influence the interest in entrepreneurship.

2. Methodology

This study was classified as a quantitative descriptive research. Population showed in this study was all students of class XII at vocational high school of state 1 of Parepare the academic year 2015/2016 as many as 232 students. The total sample of 30% or as much as 70 respondents. Data collection techniques in this study are a questionnaire, observation, interviews, and documents. The data analysis techniques used in this study is multiple regression analysis using the Statistical Product and Service Solutions (SPSS).

3. Results and Discussion

Influence of Industrial Work Practices for Entrepreneurship Interests.

The results showed that the R value of 0.764 and R Square of 0.584. This means that the Job Training Industry has a positive influence on interest in entrepreneurship, with strong category and the contribution of Industrial Work Practices for Student Interest in Entrepreneurship at vocational high school of state 1 of Parepare by 58.40% or 41.60% while the rest is determined by other factors. In this study also obtained the value of Sig.000[a], this means the influence of the Job Training Industry Student Interest in Entrepreneurship at vocational high school of state 1 of Parepare is very significant, which significantly limits the value obtained is less than the value significantly limit of 0.05. Thus, the research hypothesis which states that "there are significant Industrial Work Practices significant interest in Entrepreneurship to students of vocational high school of state 1 of Parepare accepted. "As for the influence of Industrial Work Practices for Entrepreneurship interest is determined by the linear equation Y = 14.296 + 1,134X1. This means that every increase of one in the variable Industrial Work Practices will increase by 1,134 in the variable interest on Entrepreneurship of students of vocational high school of state 1 Parepare. The research result is in line with the results Guntoro (1997) and Yulianto (2013) that there is a positive effect of industrial work practices to variable interest in entrepreneurship. The head school is the leader of education has an important role in developing their education agency. Nowadays, science and technology education has enormous influence, because education is always changing in accordance with the demands of society and the life of the State concerned. To deal with this, the head school is required to improve the performance of teachers in order to trust the public has not changed, so that it can generate a good fit with the times. In order to achieve a good quality of education, one way in which the head school is through increased interest in entrepreneurship, because teachers will be the most important element in determining the success or failure of education. A head school as educational leaders and authorities has an important task in print professional teacher then in this case the head school must have the vision, mission and strategy in bringing the students towards the achievement of a more optimal and able to bring the students in achieving a better performance.

Interest in entrepreneurship that is expected to boost the quality and relevance of education, in its implementation depends on many factors that influence and interrelated, such as factors working practices of the industry. Industrial Work Practices to determine the quality, without good industrial practice quality improvement process cannot be done and realized (Sallis, 2006: 170). Industrial Work Practices primacy effect is not merely a form of instruction, but rather the motivations or triggers that can provide inspiration to the students, so that the initiative and creativity to develop optimally to increase interest in entrepreneurship. Based on the results of the study showed that the Industrial Work Practices affect the interest in entrepreneurship in the context of research carried out to show the truth scientifically. Industrial Work Practices is a very big influence on the achievement of the goals of the school, especially the purpose improve the quality and interest in entrepreneurship, cooperation of school and the world of business or industry in order to improve the quality will get good success if the program can generate and increase interest in entrepreneurship to meet the needs and personal satisfaction as well as the goals and targets of school. Based on these descriptions can be presumed that there are significant Industrial Work Practices for Student Interest in Entrepreneurship at vocational high school of state 1 of Parepare. In other words, the better the Industrial Work Practices increasingly better the interests of Entrepreneurship.

Influence of Family Environment for Entrepreneurship Interests: The results showed that the R value of 0.746 and R Square of 0.557. This means that family environment has a positive influence on the strong interest in entrepreneurship by category and size of the contribution to the Interests of Family Environment on Student Entrepreneurship of vocational high school of state 1 of Parepare by 55.70% or 44.30% while the rest is determined by other factors. In addition, the results of this study also showed that the value of Sig.L000[a] is less than the significance limit of 0.05. This means that the influence of family environment on the interest in entrepreneurship in students of vocational high school of state 1 of Parepare is very significant. Entrepreneurship of students. Thus, the research hypothesis which states that "there is the influence of family environment in a positive and significant impact on student interest in entrepreneurship at vocational high school of state 1 of Parepare accepted. As for the size of the contribution to the Family Environment variable interest demonstrated entrepreneurship through that line is the linear equation Y = 29.175 + 0,884X2, This

means that every increase of one in the Family Environment variables, will increase by 0.884 at variable interest Entrepreneurship. The family environment plays an important role in increasing interest in entrepreneurship. The family environment is an important thing that should be improved for a family because it will affect the interest in entrepreneurship. Because, the better the Environment family of a student, the higher the interest This is consistent with the results of research conducted by Ditya (2011) and Yanti, et al. (2014), a family environment and a significant positive effect on students' interest in entrepreneurship. Thus, a student needs to maintain and preserve the family environment in order to establish good communication and harmony with all the components of society. Given a good family environment that is owned by a student will be able to increase the motivation and interest in entrepreneurship.

Interest in entrepreneurship refers to a situation where students in a school are sincerely doing things that are associated with learning activities at school. Seriousness of learning is evident in trying to resolve all the duties and charges in each subject well, organized, disciplined enter the classroom to follow the subject matter and the guidance of learning activities, exams orderly/ regular and loyal and obedient run or completing other school activities right time. Thus, interest in entrepreneurship is the result of learned and accomplished by a teacher in an educational institution in accordance with the duties and responsibilities in achieving the educational goals outlined. Implementation of the education indirectly raise the awareness of education in improving the family environment manifested in Family Environment dimension, namely how parents educate, parents relationship, home atmosphere, and economic circumstances. The condition of the family environment would also be an impact on student success in managing the interaction between students and students or between students and other environments, so that a student can maintain order and control the classroom, participating in learning activities, and improve academic achievement.

Influence of Industrial Work Practices and Family Environment on Interests in Entrepreneurship: These results indicate that the R value of 0.808 and R Square of 0.653. This means Industrial Work Practice and Family Environment simultaneously have a positive influence on the interest of Entrepreneurship with a very strong category, and the contribution of Industrial Work Practices and Environmental Family Interests simultaneously towards entrepreneurship by 65.30% or 44.70% while the rest is determined by other factors. In addition, the results of this study also showed that the value of Sig.000[a] is smaller than the value significantly limit is 0.05, this means that the influence of Industrial Work Practices and Family Environmental on Interests simultaneously towards entrepreneurship in students of vocational high school of state 1 of Parepare is very significant. Thus, the research hypothesis which states that "there are significant Industrial Work Practices and Family Environmental simultaneous positive and significant for the Student Entrepreneurship Interest of vocational high school of state 1 of Parepare is received." As for the contribution of Industrial Work Practice and Family Environment on Interests simultaneously towards entrepreneurship in students of vocational high school of state 1 of Parepare decided in the form of the line equation is Y = 9.592 + 0,694X1 + 0,470X2. This means that every increase of one in the variable Industrial Work Practices and Family Environment will increase by 1,164 in the variable interest in Entrepreneurship of students of vocational high school of state 1 of Parepare. Generally Interests Entrepreneurship seen from the desire, motivation, and business opportunities are good.

Many factors affect the interests of Entrepreneurship usual good factor of the student as well as outside factors the student or perhaps because both these factors simultaneously. In this study the factors that affect interest in entrepreneurship which is the focus of the study authors is a factor Industrial Work Practices and Family Environment factors. The Industrial Work Practices can affect Interests in entrepreneurship. Knowledge, discipline, loyalty, and courage students can level through a program of industrial work practices that will increase students' interest in entrepreneurship, if the implementation of the program industry practice goes well according to the program has been formulated in the curriculum it will affect students' interest in entrepreneurship. In addition, Family Environment also is a matter that affects the interest in entrepreneurship which have a high score, ranking first will not necessarily be successful in the job, whereas people who are outstanding in performance but even more unusual success in employment this is caused by emotional factors obtained from the family environment such as how parents educate, parents relationship, home atmosphere, and economic circumstances. If a student is able to control emotions then he will be able

to respond to what was assigned to him by the leadership well and he will try to focus on the work assigned to him as quickly as possible so that their work will be good.

4. Conclusion and Recommendations

Based on the results of research and discussion, it put forward some conclusions, namely:

- Work Practices Industry has a positive and significant impact on interest in entrepreneurship to students of vocational high school of state 1 of Parepare by 58.40% with the linear equation Y = 14.296 + 1,134 X1 that any increase in the variable practice of the industry, will increase by 1,134 in the variable interest in entrepreneurship of students of vocational high school of state 1 of Parepare.
- Environment Family has a positive and significant impact on interest in entrepreneurship of students of vocational high school of state 1 of Parepare by 55.70% with a line equation Y = 29 195 + 0,884 X2, namely every increase of one in the family environment variables, will increase by 0.884 in the variable interest in Entrepreneurship of students of vocational high school of state 1 of Parepare.
- The influences of Industrial Work Practices and Family Environment simultaneously positive and significant impact on interest in entrepreneurship to students of vocational 1 Parepare by 65.30% with a line equation Y = 9.592 + 0,694 X1 + 0,470 X2 that every increase of one in the variable Industrial Work Practices and Family Environmental, will increase by 1,164 in the variable interest in Entrepreneurship of students of vocational high school of state 1 of Parepare.

Suggestions: Based on the conclusions of this study, may put forward suggestions as follows:

- To the head school, should pay more attention to the implementation of industrial work practice on interest in entrepreneurship so that students can be further improved the estuary at improving the quality of education, especially vocational high school of state 1 of Parepare.
- To the students, should follow the program with good industry practice and increasing interest in entrepreneurship that can be independent or create jobs after completion of their education program.
- Researchers should the results of this study can be used as a reference in order to assess the field of education management that is relevant, especially regarding the industrial work practice, family environment, and interest in entrepreneurship.

References

Alma, B. (2011). Kewirausahaan Untuk Mahasiswa dan Umum. Bandung: Alfabeta.
Bygrave, W. D. (2003). The Portable MBA Entrepreneurship. Jakarta: Binarupa Aksara.
Dikmenjur. (2008). Kurikulum SMK. Jakarta: Dikmenjur.
Ditya, G. (2011). Faktor-faktor yang Mempengaruhi Minat Berwirausaha Mahasiswa Universitas Pendidikan Indonesia. *Portal Jurnal*, 6(1).
Guntoro, H. (1997). Hubungan Prestasi Kerja Praktik Industri Terhadap Minat Berwirausaha Siswa Kelas II Teknik Otomotif SMK Yapin Bekasi Tahun Ajaran 2006/2007. Semarang: UNES.
Hilgard, E. R. & Bowers, G. (2004). Theory of Learning: Century Psychology Series. New York: National Book Foundation.
Hisrich, R. D. (2008). *Entrepreneurship, Edisi 7*. Jakarta: Salemba Empat.
Lambing, P. & Kuehl, C. R. (2007). *Entrepreneurship. 4th edition*. Upper Saddle River: Prentice Hall.
Peraturan Pemerintah Republik Indonesia Nomor 29 Tahun 1990 tentang Pendidikan Menengah. Jakarta: Departemen Pendidikan dan Kebudayaan.
Putra, I. A. (2009). Pengaruh Pengalaman Praktik Kerja Industri terhadap Minat Berwirausaha pada Siswa Kelas XII Program Keahlian Teknik Mesin Otomotif SMK Texmaco Pemalang. *Jurnal PTM (Online).* 9(1). (http://smapeunaron.pas.sch.id/, diakses 22 Januari 2015.
Sallis, E. (2006). Total Quality Management in Education. Jogjakarta: IRCiSoD.
Slameto. (2003). Belajar dan Faktor-faktor yang Mempengaruhinya. Jakarta: PT. Rineka Cipta.
Sobur, A. (2003). Psikologi Umum. Bandung: Pustaka Setia.

Supartono. (2004). Ilmu Budaya Dasar. Jakarta: Ghalia Indonesia.

Undang-undang Republik Indonesia Nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional. Jakarta: CV. Eko Jaya.

Yanti, P. E. D., I Made, N. & I Ketut, D. (2014). Pengaruh Lingkungan Keluarga terhadap Berwirausaha Siswa Kelas XI SMK Negeri 1 Singaraja. Vol: 4 N0: 1 Tahun: 2014. Portalgaruda.org/ article.php?article=138903&val=1355. Diakses tanggal 22 Januari 2015.

Yulianto, A. (2013). Pengaruh Prestasi Praktik Kerja Industri Terhadap Minat Berwirausaha Siswa. Gardan**,** Jurnal Ilmiah IKIP Veteran Semarang. *Prodi Pendidikan Teknik Mesin*, 3(2) Tahun 2013.

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A Proposed Framework on the Relationship between Islamic Microfinance Related Factors and Women Entrepreneurs Business Performance in Nigeria

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Abstract: Microfinance plays a key role in poverty alleviation, employment generation, mitigating rural urban migration, utilization of local resources and raw materials and contributing to the gross domestic product (GDP) of Nigeria. Women, majority of who are poor and engaged in informal/micro, small and medium scale businesses are mostly the target of microfinance institutions. However, women entrepreneurs find it difficult to have access to the products and services of the conventional banks due to their stringent lending requirement. The presence of Islamic banking which promotes the profit and loss sharing (PLS) concept increases the awareness among women entrepreneurs to alternative funding sources. Despite availability of financing options, women entrepreneurs are constrained by their reluctance to use interest based microfinance services. This paper aims to provide a proposed framework that examines the impact of Islamic investment and financing contracts (*Murabaha* financing and *Mudharabah* savings) and other microfinance related factors (training, social capital and self-esteem) on women entrepreneurs business performance. Religiosity is a new moderating variable within the framework that is hypothesized to enhance business performance of women entrepreneurs. The proposed framework will fill the gap in Islamic banking and finance studies since the area of Islamic microfinance and the moderating effect of religiosity has not been empirically investigated.

Keywords: *Microfinance, Islamic banking, religiosity, women entrepreneurs, business performance.*

1. Introduction

Globally, the interest in women entrepreneurship is linked to the important consideration that women are important forces in the socioeconomic development of a nation (Verheul, Stel & Thurik, 2006). As indicated by Kiraka, Kobia, and Katwalo (2013), the global ownership of businesses by women has reached 25 to 33 percent. Additionally, it is further indicated that 60 percent of the potential working population is employed in the informal sector in which women control and run majority of the businesses (Fapohunda, 2012). In Nigeria, amid the colonial era (1800-1960), women are in charge of businesses even though these businesses were small scale in nature compared to their male counterparts (Halkias, Nwajiuba, Harkiolakis & Caracatsanis, 2011). After the colonial period, unfavorable government policies and oil boom resulted in a drastic fall of women actively participating in the casual informal sector (Halkias et al., 2011), rendering many women unemployed (Ekpe, 2012). However, from 1980s, their desire for survival through addressing essential needs became extremely solid and drove them to take part in entrepreneurial activities (Akinwumi, 2000). In Nigeria, women poverty has a strong gender dimension which hampers socioeconomic advancement (Alese, 2013). Berger and Byvinie (2003) reported that majority of the women engaged in small scale businesses did not yield much profit to bring them out of poverty and raise their living standard. Rather, women entrepreneurs are found to have lower sales returns, smaller number of assets, little profit margins and slim chances of survival than their counterparts' enterprises (Shane, 2003). Many of the entrepreneurship programs that are meant to address the needs of women entrepreneurs in Nigeria such as Better Life for Rural Women (BLRW), Agricultural Credit Guarantee Scheme (ACGS), Family and Economic Advancement Program (FEAP), among others have fizzled (Ekpe, 2012).

Having realized the importance of women entrepreneurship, in 2005, the government of Nigeria initiated the microfinance policy to target the economically active and financially dynamic poor through job creation and poverty reduction by 2020 (CBN, 2005). However, in Nigeria, the loans provided by conventional microfinance institutions (MFIs) to the poor women essentially include credit for consumption and meager loans accompanied with high interest to engage in productive activities (Okojie, Monye-Emina, Eghafona, & Ehiakhamen, 2010). The stringent requirements imposed by conventional banks pose constraint to women accessing capital for their businesses. Due to a large number of Muslim microfinance entrepreneurs the

microfinance banks have dedicated units to meet the needs of Muslim women entrepreneurs. These units offer modest and reasonable *Shariah* compatible products and services to address the funding constraints hence, enhance the business performance of women entrepreneurs; consequently help to reduce poverty (Abbas, Abdul Razak, & Saad, 2014). Islamic microfinance here refers to the *Shariah* compliant products and services offered by Islamic microfinance institutions (IMFIs) or conventional MFIs. These are micro-credit in the form of *Murabaha* financing, and micro-savings in the form of *Mudharabah* savings. Other microfinance related factors include training, social capital and development of personal attributes such as self-esteem. Despite the importance of women entrepreneurship to the economy there are limited studies to the knowledge of the researcher that links together Islamic microfinance related factors to the business performance of women entrepreneurs particularly in Nigeria. The difference in this study compared to other past studies is the inclusion of religiosity as a moderating variable in a proposed framework that will link Islamic microfinance related factors and women entrepreneurs business performance in Nigeria. This paper consists of four sections. The first section is the introduction of the study. The second section is review of literature on Islamic microfinance related factors (*Murabaha* financing, *Mudharabah* savings, training, social capital, self-esteem) and religiosity; and women entrepreneurs' business performance. The third section presents the proposed conceptual framework for the study, and section four concludes the paper.

2. Literature Review

Women Entrepreneurs Business Performance (WEBP): Women Entrepreneurs Business Performance (WEBP is defined as the performance of the women entrepreneurs in terms of change in output, change in profit, change in investment and change in employment. Earlier studies on women entrepreneurs focused on how gender influences business performance (Chaganti, 1986; Cuba, Decenzo & Anish, 1983; Hisrich & Brush, 1987), providing information on characteristics and motivations towards women entrepreneurs' business performance. Those that dwelled on gender comparison include studies such as Holmquist and Sundin (1988), Kalleberg and Leicht (1991) and Johnson and Storey (1993). In some studies, women are meant to achieve success in relation to their achievement in attaining personal goals such as self-fulfillment and goal attainment (Lerner, Brush & Hisrich,, 1997; Still & Timms, 2000). While Kalleberg and Leicht (1991) portrayed that women owned businesses are not likely to fail compared to their male counterparts, others (Cliff, 1998; Fasci & Valdez, 1998) indicated that women perform less well on quantitative measures of performance such as job creation, sales turnover and profitability. In Islam, the maximization of profit alone is not sufficient for the women entrepreneurs as such, maximization of output must be accompanied by efforts directed to ensure spiritual health at the inner core of human consciousness and justice and fair play at all levels of human interaction (Chapra, 2000).

***Murabaha* Financing (MF):** *Murabaha* financing entails an arrangement in which the entrepreneur requests the bank to acquire a particular good or equipment then the bank sells to the entrepreneur on a cost plus basis (Al-Mulhim, 2009). Among Islamic microfinance products, *Murabaha* financing has the largest outreach of 672,000 customers and total portfolio of assets of approximately US$413 million (El-Zoghbi & Tarazi, 2013). *Murabaha* financing is essentially an Islamic substitute to the commercial conventional interest based loan where a mark-up is an alternative to interest rate (Ahmed, 2010; El-Zoghbi & Tarazi, 2013). In Islam, the encouragement to engage in legitimate trading practices such as *Murabaha* financing is clearly evident in *Al-Quran* where Allah (SWT) says: *"Allah has permitted trade and forbidden usury"* (*Al-Quran*, 2:275). Furthermore, Al-Suyuti mentioned a *Hadith* narrated on the authority of Rafi' that: The Holy Prophet (Peace Be Upon Him (PBUH)) was asked: *"Which are the best forms of income generation?" He (PBUH) replied, "A man's labor and every legitimate sale"* (Cited in El-Gamal, 2000).

Suberu, Aremu and Popoola (2011) indicated that microfinance loans positively and significantly impact on small scale business performance via increasing overall market share, production efficiencies and competitiveness. Relating to micro enterprises, Hadisumarto (2013) saw that, in East Java, Islamic micro financing (*Baitul Mal wat Tamwil*) is effective in increasing income. However, Suresh, McKenzie and Woodruff (2008) in their empirical study found low returns to capital in women owned microenterprises. Suberu et al. (2011) suggested that future studies should explore the impact of alternative sources of finance available on small scale enterprise performance. This suggestion together with the preference for Islamic mode of financing present a new research gap for this study as to whether the *Murabaha* financing significantly

influence the women entrepreneurs' performance. Such study has not been undertaken before. As such, this paper puts forward the following preposition:
Preposition 1: *Murabaha financing (MF) is positively related to women entrepreneurs' business performance (WEBP).*

***Mudharabah* Savings (MS):** *Mudharabah* savings is similar to savings from the conventional banking point of view (Kasri & Kassim, 2009), where reward paid on deposits is in the form of profit and not interest. The striking difference between profit and interest is that profit is the positive end result of trading which Allah (SWT) Has permitted as indicated in *Al-Quran* (2:275*); "….That is because they say; trade is (just) like interest, but Allah has permitted trade and has forbidden interest."* However, interest is excess over the principal amount in a loan contract. Savings enables depositors to meet two essential needs: to meet future consumption and to provide means for investment (Kasri & Kassim, 2009). In support of *Mudharabah* savings, *Al-Quran* (17:29) explains that Muslims should *"…not spend everything so that you became blameworthy and destitute"*. *Mudharabah* savings is therefore an arrangement in which entrepreneurs (savers) invest their deposits (savings) in the form of a contribution to be managed in the business of the micro finance institution which has to be *Shariah* compliant (Al-Mulhim, 2009; Ariff & Rosly, 2011; El-Zoghbi & Tarazi, 2013). The legal maxim derived from the Prophet (PBUH), that "profit comes with liability," justifies the difference between lawful profits, other forms of gain and entitlement only if there is liability or possibility of risk (Mohieldin, Iqbal, Rostom & Fu, 2012). Additionally, the need for Islamic compatible services also presents a new research gap for this study as to whether the *Mudharabah* savings significantly influence the performance of women entrepreneurs. Therefore this paper posits the following preposition:
Preposition 2: *Mudharaba savings (MS) is positively related to women entrepreneurs' business performance (WEBP).*

Training (TR): Training is an essential requirement in the development of strong and confident entrepreneurs who will facilitate the growth of their enterprises (Rao, 2014). Financial services alone cannot yield increased productivity (Ullah, Ahmad, Manzoor, Hussain, & Farooq, 2012). It is therefore clear that micro-credit can only be effective when combined with training (Jalila, Mughalb, & Isac, 2014). As explained by Berge, Marie, Nancy, Linda and Donna (2002), the dire need for improved performance requires ways through which training and education can be identified, measured and improved. According to Cheston and Kuhn (2002), training can significantly benefit the poor women entrepreneurs when it is tailored to match their existing skills and deal with their vital needs. The ethics of Islam strongly encourages Muslims to acquire training and skills by calling it *fadhl* (grace) of Allah (SWT) and highly praises those who strive in order to earn a living (Abeng, 1997). Islam calls on humans to use intellect and think as well as seek knowledge and discover the truth. This is evident in *Al-Quran* where Allah (SWT) says: "*Proclaim! And thy Lord is the Most Bounteous; who taught by the pen, taught man what he knew not"* (*Al-Quran*, 96:4-6). This paper therefore posits the following preposition:
Preposition 3: *Training (TR) is positively related to women entrepreneurs' business performance (WEBP).*

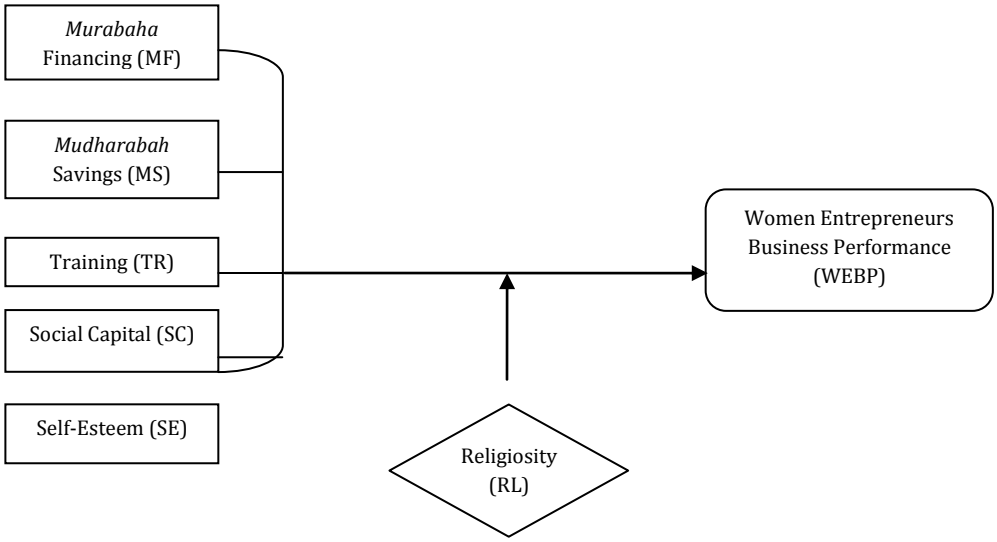
Social Capital (SC): Human beings as social creatures can only achieve their essential needs in groups, thus the desperate need for *A'sabiyyah* (i.e. one group shares same feelings, opinions, and values) which makes women entrepreneurs cooperate for common goals through social harmony (Chapra, 1999). Social capital is formally defined as the entirety of the actual and potential resources jointly found within, accessible through and obtained from a network of relationships controlled by individuals or social units (Nahapiet & Ghoshal, 1998; Rhodes, Lok, Hung, Fang, 2008). In support of social capital, Allah (SWT) in *Al-Quran* (5:2) says: *"And cooperate with each other in furthering righteousness and piety, but do not cooperate with each other in furthering evil and transgression"*. A relationship with fellow humans is thus prescribed in terms of corporation and that each person is a brother or sister to the other (Rice, 1999). Allah (SWT) in *Al-Quran* (49:13) says: *"O mankind! We created from you from a single (pair) of a male and a female, and made you into nations and tribes, that you may know each other".* Therefore, this paper posits the following preposition:
Preposition 4: *Social Capital (SC) is positively related to women entrepreneurs' business performance (WEBP).*

Self-Esteem (SE): Self-esteem entails views or evaluations towards oneself which an individual makes and maintains (Coopersmith, 1967; Wells & Marwell, 1976). Duffy, Shaw and Stark (2000) emphasized that self-esteem varies in direction of relationship as well as intensity with the individual assessment of self-worth.

Self-esteem is frequently considered as self-confidence, self-competence, self- respect, self-satisfaction and self-worth among others (Tharenou, 1979). Literature suggests that future researchers in the area of micro finance/or entrepreneurship could investigate whether self-confidence could be positively related to women entrepreneurs business performance either in the Nigerian context or other countries (Ekpe, 2012). In their study, on entrepreneurial characteristics and business success, Hassan, Ramli, and DeSa, (2014) recommends the inclusion of other independent variable such as self-esteem. Pinho and Desa (2014) further suggested that other personal attributes like self-esteem should be examined in relation to entrepreneurial performance. These suggestions present a new research gap for this study as to whether self-esteem significantly influences women entrepreneurs' business performance. From an Islamic point of view, the entrepreneur has a right to make choices and take decisions and the management and workers are in charge of their actions and cannot blame anyone such as the organization for their deficiencies (Abuznaid, 2009). This is evident in *Al-Quran* (53:38-39) where Allah (SWT) says: *"That no bearer of burden will bear the burden of another, and there is not for man except that (good) for which he strives".* Thus, the paper posits the following preposition:
Preposition 5: *Self-Esteem (SE) is positively related to women entrepreneurs' business performance (WEBP).*

Religiosity (RL): Chusmir and Koberg (1988) emphasized that religiosity plays a role in businesses entities by impacting on the operations of the business organization through shaping business organizations and personal lives. Disregarding religiosity can cripple a business and the stakeholders such as customers, employees and even competitors (Fatimah-Salwa, Mohamad-Azahari, & Joni-Tamkin, 2013). Religiosity is an integral part of the *Maqasid Al-Shari'ah* (objectives of Islamic law) in safeguarding the Muslim's faith which is evident both in *Tahsiniyyah* (luxuries) and *Daruriyyah* (essentials) (Said, Ahmad, & Yusuf, 2014). It is therefore arguable that Islamic microfinance related factors in order to achieve business performance depends on religious values of the Muslim women entrepreneurs. In Islam, business choices are guided by faith, or *Iman*, which essentially entails distinguishing between *halal* (ethical) and *haram* (unethical), appropriate and inappropriate, fair and unjust, good and bad intentions in business dealings (Abuznaid, 2009). Muslim entrepreneurs are therefore encouraged to have faith and fear Allah in their entrepreneurial endeavors (Zainul, Osman & Mazlan, 2004). Based on the suggestion of Baron and Kenny (1986), the inclusion of a moderating variable (religiosity) is very important and thus justified. As such, it is arguable that Islamic microfinance related factors to achieve women entrepreneur's business performance can be moderated by religiosity. Therefore, the paper posits the following preposition:
Preposition 6: *Religiosity (RL) moderates the relationship between Islamic Microfinance related factors and women entrepreneurs' business performance (WEBP).*

Figure 1: Conceptual Framework



Research Framework: The relationship between Islamic micro finance related factors and women entrepreneurs business performance can be moderated by religiosity (Baele, Farooq & Ongena, 2014; LePine & Van Dyne, 1998; Adamu, Kedah & Osman-Gani, 2011). Furthermore, the suggestions and the existence of

inconsistent relationships between the independent variables and dependent variable in previous studies (Baron & Kenny, 1986), warrant the use of religiosity as a moderating variable. This is a new dimension in the research framework to be tested against a Nigerian background. If Muslim women entrepreneurs are religiously connected, it is more likely that they will utilize Islamic micro finance services (Baele et al., 2014), which will result in better performance of their enterprises. The proposed framework therefore has seven constructs as illustrated in figure 1.

3. Conclusion

Although this study is an ongoing research, the development and establishment of Islamic banking and finance in Nigeria has significantly influenced the research. The provision of the research framework will be used to examine the relationship between Islamic microfinance related factors and women entrepreneurs' business performance and the validated findings will enhance decision making in Nigeria.

References

Abbas, K., Razak, D. A. & Saad, N. M. (2014). The perception of micro-entrepreneurs and petty traders on conventional and Islamic microfinance: a case study of Pakistan. *Journal of Islamic Finance*, 3(1), 38-48.

Abeng, T. (1997). Business ethics in Islamic context: Perspectives of a Muslim business leader. *Business Ethics Quarterly*, 7(3), 47-54.

Abuznaid, S. A. (2009). Business ethics in Islam: the glaring gap in practice. *International Journal of Islamic and Middle Eastern Finance and Management*, 2(4), 278-288.

Adamu, I. M., Kedah, Z. & Osman-Gani, A. (2011, December). Entrepreneurial motivation, performance and commitment to social responsibility: A conceptual analysis on the influence of Islamic religiosity. Paper Prepared for the 10th International Conference of the Academy of HRD (Asia Chapter, (pp. 1-33). Kuala Lumpur, Malaysia.

Ahmed, A. (2010). Global financial crisis: An Islamic finance perspective. *International Journal of Islamic and Middle Eastern Finance and Management*, 3(4), 306-320.

Akinwumi, O. (2000). Women entrepreneurs in Nigeria. Africa update newsletter, (Nigerian culture and society), Retrieved February 28th, 2015, from http://www.ccsu.edu/afstudy/upd7-3.htm#, Women Entrepreneurs.

Al-Mulhim, N. K. (2009). Islamic funding of small business in Saudi Arabia: Unpublished master thesis, Open University of Malaysia.

Al-Quran, Arabic Text with corresponding English Meanings. (1997). Translated by Saheeh International. Riyadh: Abdulqasim Publishing House.

Alese, O. D. (2013). Women and poverty alleviation programs in Nigeria: The Napep approach. *Academic Journal of Interdisciplinary Studies,* 2(3), 515-521.

Ariff, M. & Rosly, S. A. (2011). Islamic banking in Malaysia: Unchartered waters. *Asian Economic Policy Review*, 6(2), 301-319.

Baele, L., Farooq, M. & Ongena, S. (2014). Of religion and redemption: Evidence from default on Islamic loans. *Journal of Banking & Finance*, 44, 141-159.

Baron, R. M. & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173-1182.

Berge, Z., Marie, D. V., Nancy, B., Linda, D. & Donna, S., (2002). The increasing scope of training and development competency. *Benchmarking: An International Journal,* 9(1), 43-61.

Berger & Byvinie. (2003). Nature and determinants of the linkages between informal and formal sector enterprises in Nigeria. *African Development Review*, 13(1), 114-144.

Central Bank of Nigeria (CBN). (2005). Microfinance Policy, Regulatory and Supervisory Framework for Nigeria. Abuja, Nigeria.

Chaganti, R. (1986). Management in women-owned enterprises. *Journal of Small Business Management*, 24(4), 18-29.

Chapra, M. U. (1999). Socioeconomic and political dynamics in Ibn Khaldūn's thought. *The American Journal of Islamic Social Sciences,* 16(4), 17-38.

Chapra, M. U. (2000). The Future of Economics: An Islamic Perspective. Leicester: The Islamic Foundation.

Cheston, S. & Kuhn, L. (2002). Empowering women through microfinance. Unpublished draft, Opportunity International.

Chusmir, L. H. & Koberg, C. S. (1988). Religion and attitudes toward work: A new look at an old question. *Journal of Organizational behavior*, 9(3), 251-262.

Cliff, J. E. (1998). Does one size fit all? Exploring the relationship between attitudes towards growth, gender, and business size. *Journal of Business Venturing,* 13(6), 523-542.

Hadisumarto, W. B. M. C. (2013). Enhancing the role of Islamic microfinance institution in poverty alleviation. Proceedings of the Roundtable Discussion on Financial Inclusiveness of the Poor: Beyond Microfinance, Universitas Islam Negeri Maulana Malik Ibrahim, Malang, Indonesia.

Coopersmith, S. V. (1967). Antecedents of self-esteem. San Francisco: Freeman.

Cuba, R., Decenzo, D. & Anish, A. (1983). Management practices of successful female business owners. *American Journal of Small Business*, 8(2), 40-46.

Duffy, M. K., Shaw, J. D. & Stark, E. M. (2000). Performance and satisfaction in conflicted interdependent groups: When and how does self-esteem make a difference? *The Academy of Management Journal,* 43(4), 772-782.

Ekpe, I. (2012). Women entrepreneurs' performance: microfinance factors with mediating effect of opportunity and moderating effect of attitude. Unpublished doctoral dissertation, Universiti Utara, Malaysia.

El-Gamal M. A. (2000). A basic guide to contemporary Islamic banking and finance. Available at http://www.nubank.com/islamic/primer.pdf

El-Zoghbi, M. & Tarazi, M. (2013). Trends in Sharia-Compliant Financial Inclusion. *CGAP Focus Note*, 84, 1-12. Retrieved April 16th, 2015 from http://www.ruralfinance.org/fileadmin/templates/rflc/documents/Focus-Note-Trends-in-Sharia-Compliant-Finanicial-Inclusion-Mar-2013.pdf

Fapohunda, T. M. (2012). Women and the Informal Sector in Nigeria: Implications for Development. *British Journal of Arts and Social Sciences*, 4(1), 35-45.

Fasci, M. A. & Valdez, J. (1998). A performance contrast of male-and female-owned small accounting practices. *Journal of Small Business Management*, 36(3), 1-7.

Fatimah-Salwa, A. H., Mohamad-Azahari, A. & Joni-Tamkin, B. (2013). Non-Financial performance of micro credit entrepreneurs: Does personal religious values matters? *International Journal of Economics and Finance,* 5(6), 34-45.

Halkias, D., Nwajiuba, C., Harkiolakis, N. & Caracatsanis S. M. (2011). Challenges facing women entrepreneurs in Nigeria. *Management Research Review*, 34(2), 221-235.

Hassan, I. F., Ramli, A. & Desa, N. M. (2014). Rural women entrepreneurs in Malaysia: What drives their success? *International Journal of Business and Management,* 9(4), 10-21.

Hisrich, R. D. & Brush, C. G. (1987). Women entrepreneurs: A longitudinal study. In: N. C. Churchill, J. A. Hornaday, B. A. Kirchhoff, O. J. Krasner & K. H. Vesper (Ed.) Frontiers in Entrepreneurship Research, pp. 187-199. Wellesley: Babson College.

Holmquist, C. & Sundin, E. (1988). Women as entrepreneurs in Sweden: Conclusions from a survey. *Frontiers of Entrepreneurship Research,* 2, 626–642.

Jalila, M. F., Mughalb, Y. H. & Isac, A. H. (2014). Effect of microfinance services towards women entrepreneurs development in Pakistan. *International Journal of Business Management and Economic Studies,* 1(1), 37-51.

Johnson, S. & Storey, D. (1993). Male and female entrepreneurs and their businesses: A comparative study. In S. Allan and C. Truman (Ed.) Women in Business Perspectives on Women Entrepreneurs, pp. 70-85. London: Routledge.

Kalleberg, A. L. & Leicht, K. T. (1991). Gender and organizational performance: Determinants of small business survival and success. *Academy of Management Journal*, 34(1), 136-61.

Kasri, R. A. & Kassim, S. H. (2009). Empirical determinants of saving in the Islamic banks: Evidence from Indonesia*. J.KAU: Islamic Econ.,* 22(2), 3-23.

Kiraka, R. N., Kobia, M. & Katwalo, A .M. (2013). Micro, small and medium enterprise growth and innovation in Kenya: A case study of women enterprise fund. Investment Climate and Business Environment Research Fund, Report No. 47/13, Nairobi, Kenya. Retrieved November 8th, 2014, from http://www.strathmore.edu/pdf/Final -Report-TA-11-056.pdf

LePine, J. A. & Van Dyne, L. (1998). Predicting voice behavior in work groups. *Journal of Applied Psychology,* 83(6), 853-868.

Lerner, M., Brush, C. & Hisrich, R. (1997). Israeli women entrepreneurs: An examination of factors affecting performance. *Journal of Business Venturing*, 12(4), 315-339.

Mohieldin, M., Iqbal, Z., Rostom, A. & Fu, X. (2012). The role of Islamic finance in enhancing financial inclusion in Organization of Islamic Cooperation (OIC) Countries. *Islamic Economic Studies,* 20(2), 55-119.

Nahapiet, J. & Ghoshal, S. (1998). Social capital, intellectual capital and the organizational advantage. *Academy of Management Review*, 23(2), 242–266.

Okojie, C., Monye-Emina, A., Eghafona, G. & Ehiakhamen, J. O. (2010). Nigeria Strategy Support Program. International Food Policy Research Institute. Abuja, Nigeria.

Pinho, J. C. & DeSa, E. S. (2014). Personal characteristics, business relationships and entrepreneurial performance: some empirical evidence. *Journal of Small Business and Enterprise Development,* 21(2), 284-300.

Rao, S. (2014). Nurturing entrepreneurial women: Insights from a developing country. *Journal of Entrepreneurship in Emerging Economies*, 6(3), 268-297.

Rhodes, J., Lok, P., Hung, R. Y. & Fang, S. (2008). An integrative model of organizational learning and social capital on effective knowledge transfer and perceived organizational performance. *Journal of Workplace Learning,* 20(4), 245-258.

Rice, G. (1999). Islamic ethics and the implications for business. *Journal of Business Ethics*, 18(4), 345-358.

Said, J., Ahmad, M. & Yusuf, S. N. S. (2014). Effectiveness of capital assistance program: Evidence from Malaysia. *Research Journal of Applied Sciences, Engineering and Technology,* 8(4), 488-495.

Shane, S. (2003). A General Theory of Entrepreneurship: The Individual-Opportunity Nexus. UK: Edward Elgar.

Still, L. V. & Timms, W. (2000). Women's business: The flexible alternative work style for women. *Women in Management Review,* 15(5/6), 272-282.

Suberu, O. J., Aremu, O. S. & Popoola, E. G. (2011). The impact of microfinance institutions on the development of small scale enterprises in Nigeria. *Journal of Research in International Business Management,* 1(8), 251-257.

Suresh, D., McKenzie, D. & Woodruff, C. (2008). Returns to capital in microenterprises: Evidence from a field experiment. *Quarterly Journal of Economics,* 123(4), 1329-72.

Tharenou, P. (1979). Employee self-esteem: A review of the literature. *Journal of Vocational Behavior,* 15(3), 316-346.

Ullah, H., Ahmad, Z. M., Manzoor, S. R., Hussain, M. & Farooq, M. A. (2012). Problem faced by women entrepreneurs in Kohat City of Khyber Pakhtunkhwa, Pakistan. *International Journal of Human Resource Studies,* 2(1), 1-14.

Verheul, I., Stel, A. V. & Thurik, R. (2006). Explaining female and male entrepreneurship at the country level. *Entrepreneurship and regional development*, 18(2), 151-183.

Wells, L. E. & Marwell, G. (1976). *Self-esteem.* London: Sage.

Zainul, N., Osman, F. & Mazlan, S. H. (2004). E-Commerce from an Islamic perspective. *Electronic Commerce Research and Applications*, 3(3), 280-293.

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The Effect of Early Child Introduction to Pre-Vocational Subjects at the Primary School Level to Enhance Technological Growth in Developing Nations

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Abstract: Technology is the power of development in many nations economy in this 21st century. Many developed nations in the western world have viable economy and strong technological background because of good educational foundation that was enhanced from the elementary stage of a child. Elementary education equips a child with good future background that will help to groom and prepare a child for future technological development and challenges. Nigeria as one of the developing countries in the world was used as a case study because of its poor educational background, which is the reason of this research on how to impart technological skills into children at the primary school level to enhance technological growth. To carry out this study three research questions were raised to guide the study with three hypotheses. All the primary schools in Nigeria were used as the population of the study. Questionnaire was the major instrument used for data collection. Data were analysed using mean and t-test analysis. Findings and recommendations were made to enhance the implementation of pre- vocational subjects in the developing Nations.

Keyword: *History of education in Nigeria, Primary Education in Nigeria, Pre- Vocational Education in Nigeria*

1. Introduction

Education is the most vital tool that is used in the development of a child future, education has transformed the life of man in this 21st century by making man to be socialized and civilized within his environment and beyond. Man was able to do this because of early exposure to education from early childhood. Early education from childhood has distinct man from other classes of animals because man has been able to demonstrate skills or talents that are not common with other class of animals. Education has helped to bring fast development and transformation in the different life stages of a man starting from the early life stage of a child that is called early childhood education. Early childhood education makes a child to be focused and well developed in his or her mental ability, because a child can develop his mental reasoning by learning through play. Bodrova and Leong (1996) states that during the early stages of a child development, children learn by playing in a well developed environment that inspires them to relate with that environment. Intellectual development and skill acquisition is faster in children during playing process when they are early introduced. Children learn fast when they play and interact within the environment in which they live. Many researches carried out on early childhood education has shown that high quality child care experience support the development of social and academic skills that will facilitate children success in the school (Rebekah, Caitin, Jacqueline, and Elizabeth, 2013). From research and philosophy of a popular psychologist Jean Piaget that was carried out in children that was centred on the "Power of play" observed that children learn more efficiently, effectively and gain more knowledge through play activities. This was supported by Elkind (2008) who from his own study stated that children learn more and faster when they interact and play together. Jean Piaget theory and study was centred on the epistemology that has to do with the cognitive developmental stage in children. Kendra (2013) summarized Jean Piaget cognitive development of children in to four stages.

- The sensor motor Stage: In this stage children acquires knowledge through sensory experience and manipulation of objects.
- The pre operational Stage: During this stage children learn through pretend play, but still struggle with logic and taking the point of view of other people.
- The Concrete Operational Stage: At this stage of development in children they think more logically, but their thinking may be very rigid. Here they tend to struggle with abstract and hypothetical concepts.
- The formal operation Stage: This is the final stage of Piaget's theory which involves children increase in logic, the ability of children to use deductive reasoning and understanding of abstract ideas.

The important thing to note about Jean Piaget theory of cognitive development in children is that development in children was not based on quantitative process, but based on information and knowledge that they add to their existing knowledge as they grow older. Jean Piaget in 1934 stated that "only education is capable of saving our societies from possible collapse whether violent or gradual" (Alberto, 2000). Education is an investment that pays at any time, investment in education has become even more paramount in the recent times, because education is the bedrock of knowledge (Amodu, 2014). To make this research more elaborate and well focused, the general history of education in Nigeria as one of the developing countries that was used as a case study will be discussed, Education at the primary school level in Nigeria and Pre-Vocational education in Nigeria will also be discussed, to enable this research achieve its set goals and objectives.

2. Literature Review

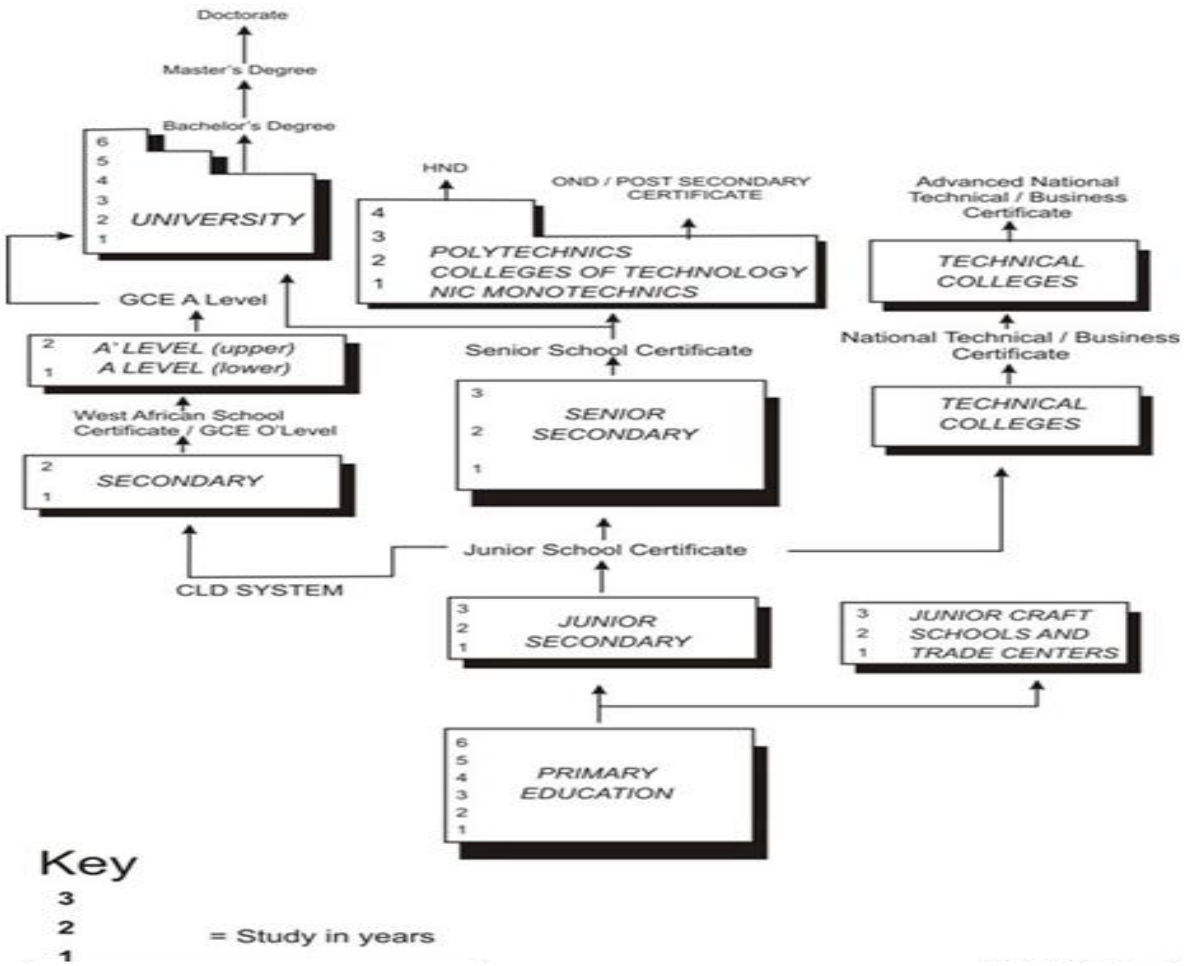
History of Education in Nigeria: Education as a weapon of development in any nation is defined by many authors from different perspective or view. Parankimalil (2012) described education as a systematic process through which a child or an adult acquires knowledge, experience, skills and sound attitude. Orobosa (2010) define education as the process by which an individual acquires many physical and social capabilities demanded by the society in which he or she has been born into to function. This agrees with Schofield (1982) quoting lodge that says "education is acquired through experience" experience that is acquired every day at home, in the street, farm land and schools etc. Nduka (1964) refers to education as the process of transmitting people's culture from one generation to the other. Conclusively, it can be said that education is a life-long process that helps a child to be developed in to manhood to become self-reliance and dependents, by acquiring knowledge and skills that will make him performing tasks in the workshop. Education provides the sum total of all the ways by which a child can develop his abilities, attitudes and all forms of behaviours that will make a child to be a good workman in the future.

The Nigerian National Policy on Education (1981) state that basic education covers education that is given to children between the ages of 3 to 15yrs of age, which includes pre-primary programme from the ages of 3-5yrs, and nine years of formal compulsory education that consist of six years of primary education before spending three years at the Junior secondary school. After the basic education as designed by the Federal Government, at the age of 15 years, the child is expected to write a qualifying examination that will enable him or her qualify to proceed to senior Secondary School, where the child is expected to spend another 3 years before writing qualifying examination, where the child will be awarded a Certificate that qualifies him or her into tertiary institutions like colleges of education (NCE), polytechnics or Universities. Below is an Organo-gram of Educational structure of Nigeria as designed by the Federal Ministry of Education in Nigeria (Onyukwu, 2011).

Primary Education in Nigeria: Primary education in Nigeria is free and compulsory for children from the ages of 6-12yrs. Primary school education curriculum is geared toward the providing of permanent literacy, laying a sound basis for scientific, critical and reflective thinking and also equipping children with the core life skills to function effectively in the future. Under the new Universal Basic Education (UBE) system of 9-3-4 that replaced the formal Universal primary education scheme of 6-3-3-4 of Nigeria system of education were children spend six years at the primary school level. The Universal Basic Education (UBE) was introduced by President Olusegun Obasanjo on September 30th 1999 (Amanze, 2008). The Universal Basic Education (UBE) at the primary school level was designed to equip children with knowledge of knowing how to read and write, acquire social skills, technological skill, mental development, and self stability etc. There are so many challenges facing Nigerian primary school education. According to Egwu (2009) the problems facing primary school education are wide disparity between the expected school enrolment and their actual enrolment. Poor management of information has lead to conflicting statistics about the number of primary schools, one source put it as 54,434 public primary schools another source from school census put the number at 87,941 and enrolment figure of 24,422,918. Out of which males are 13,302.202 (55%), while female figure is 11,120,649 (45%), which indicate gender imbalance of 83.6%, (Sofowora, 2010). The above statistics revealed that there is a short fall of 10.5million from the expected target of 34.92million. The inability of the country not to meet the target according to late Fafunwa, was caused by financial problems, incompetent teachers, overcrowded classrooms, narrow curriculum content, high rate of drop-out and lack of quality control of children at

primary school level (Omotayo, Ihebereme, Maduewesi, 2008). These problems has caused decline in the standard of primary school education in Nigeria. The major cause of the above problems in primary school education in Nigeria is that Nigeria as a country like every other developing nation still operates the old model type of educational system that was inherited from the colonial masters.

Presently, the management of primary school education in Nigeria is entrusted to the National primary Education Commission that performs the following functions, the body prescribes the minimum standard for primary education throughout Nigeria. Makes inquiries and gives advice to the Nigerian government on how to fund primary school education as established by the federal government. The presidential summit meeting held at Abuja in October 2012, delegates representing each state called for immediate action on how to compress the curriculum of offered subjects at all levels of basic education (Dayo, 2012). It was at this summit meeting, that recommendations were made that the number of subjects offered at the primary school level should be reduced. Summarily, it can be concluded from all the statistical data, records, observations made by different authors, over the challenges facing primary school education programme in Nigeria that primary school education has not been able to achieve its aims and objectives like it has also affect other developing nations in the world. The aim and objectives of every government of any nation is to make education free and compulsory for every child within the ages of 6-12 years to enable every child learns how to read and write, acquire skills that will be of help to them in the society in which they live like it is practice in Nigeria. Therefore primary education in most developing nations requires overhauling and reformation like it is done in Nigeria where the federal government changes educational policy from time to time to find solutions to educational problems. This study will assist every child in the developing countries to acquire good basic knowledge, mental development, stability, social skill, technological skill as they grow into adult, to face future challenges.



Pre- Vocational Education in Nigeria: Many authors in the past have not being able to state clearly the definition of pre-vocational education. All their definitions are centred on vocational and technical education as it applies to people from the ages of 16yrs and above. Technical and Vocational Education (TVE) has been an integral part of national development strategies of many nations, because of its impact on productivity and economic development. Despite its contributions the leaders of Nigeria have not given this aspect of education the attention required (Dike, 2009). But in a clear context; pre-vocation is the elementary stage of full vocational education, where children and youth are exposed to the acquisition of elementary skills while in school or job training for future use. Vocational and technical education has been defined by different people. Okolocha (2012) defined vocation education as an education that encompasses knowledge, skills, competencies, structural activities, abilities, capabilities and all other structural experiences acquired through on the job , that is capable of enhancing recipients opportunity for security jobs in various sector of the country. Manfred and Jennifer (2004) advocated that vocational and technical education comprises of a more organized or structured activities that aimed at providing people with the knowledge, skills and competencies necessary to perform a job. Vocational and technical education facilitates the acquisition of practical and applied skills as well as basic scientific knowledge; it is therefore a planned program of courses and learning experiences that begins with exploration of career options that supports basic academic standard, leadership and preparation for industry. Claude (2003) stated that there is ample of evidence that better qualifications and skills protect individual from unemployment. To support this statement it is very clear that an average workman in the society that lacks qualification of performing any job or does not have any good skill of carrying out any job cannot be reckoned with among his age groups in Nigerian society, because he cannot be identified for any skill.

A change in a country economical growth requires preparation of able body young people that are trained from childhood for jobs that exist in the society for the future. It is the vocational and technical education that has integral part of national development (Nuru, 2007). According to Van Ark (1992) the Dutch school system pays more attention to higher standards performance in mathematics and technical education among children from the age's 14-16yrs of age. This is to enable children at that age to develop their interest in technology and mathematics that will help to develop the mental reasoning of children at that age, also to equip them with good skill acquisitions. May (2006) observed that the neglect of vocational and technical education in the area of adequate personnel, financial support, and facilities to encourage technical and vocational education in Nigeria has robbed the nation of graduate contributing their quarter in terms of skill acquisition to the nation economy. Furthermore, Asogwa and Diogu (2007) assert that there is an urgent need for people's attention to be redirected towards self-reliance and sustainable means of livelihood that vocational and technical education can provide to the society, individuals for economic growth of the society. Developed countries in the western world like America, Britain, France, Germany, Canada etc., they are great today because of their involvement in technological reformation from the grass root brought about their greatness in vocational and technical education. Michael (2002) outlined some of the efforts of European Union member states in reforming and repositioning of vocational and technical educational programme in their countries to bring about high technological advancement. Most of the developed countries in the western world were able to bring vocational and technical education to the grass root to help build good skills into their children at their tender age in life when they are still developing. At this stage of children development school teachers can prepare children for Jobs, which are within their abilities by helping them to develop skills related to safety, personal care, time management and endurance.

Pre-vocational and technical education is built on mathematical skills that prepare children for possible vocational opportunities after high school. The mathematics skill helps to develop child mental reasoning and thinking. Another vital skill needed in the development of pre-vocational and technical education program is a motor skill that is described as gross motor skill. This skill helps children to perform tasks. Organizational skill is another vital prerequisite for a child development in pre-vocational and technical education program. This type of skill helps children to prepare for various job responsibilities regardless of the type of job they are being trained for. Example of an organizational skill is time management on a task that is being performed. A social skill is very important in the child development because it is social skill that helps to develop ones social level of interaction in any work place or environment. Social skill is an important device that helps to bring peace and orderliness in a work place. In pre-vocational and technical education children can be exposed to public interaction, making them to buy things on their own, transporting

themselves through public means of transportation, to expose them to social interaction. It is very necessary and important to expose children undergoing pre-vocational and technical education training to safety rules in the workshop because in the workshop Children work with tools, clean workshop surrounding, move within the workshop environment. A supervised excursion of outing to visit established industries can help to reinforce safety skill in pre-vocational education, within an industrial certain. Shivani (2012) stated that pre-vocational and technical educational courses at the elementary stage life of children within the society helps children to identify their interest at an early stage and also able to pursue their future when they get out of school. Education contributes to better health, higher incomes and increase enrolment in the community life (Kenya Institute of Education 2012). President Barack Obama government is focused on early child education for children in America. Millions of dollars was approved to support early child education in America presently. Early child funding program in America was sponsored by the secretary of state's Arne Ducan who moved from state to state, allocating fund to states to help fund early child education program in United State of America. Among the six state that received the fund where California, Colorado, Illinois, New Mexico, Oregon and Wisconsin. The purpose of this grant was to support early child educational programme by Barack Obama administration to provide solid educational background to every child in America who are the leaders of tomorrow.

Pre-Vocational and Technical Education in Nigeria and other developing countries compared to the developed nations like America, Britain, Germany, France and some developing countries like Kenya, south Africa who showed interest in pre-vocational and technical education, Nigeria as a country cannot compare her level of technology with the western world. The technology of any country rest upon the solid foundation that is prepared for the young children that starts their educational carrier from the elementary stage of their life, because of this reason the president of America Barack Obama, despite all the technology America still see the need to invest in early child education which is the bedrock of man development and countries technological advancement. It is very important to note that early child education brings about child development in terms of skill acquisition, mental and social skills development in children at the primary school level. The early introduction to pre-vocational and technical subject in some of the developed countries in the western world gave children solid foundation in their educational background which they build on in the nearest future. Almost all the developed countries where pre-vocational and technical education is given attention that children are being exposed to the use of computers that helped to facilitate the training of a child in technological area. Hence Ohwojero (2013) stated that computer education will make an impact in the study of Automobile technology in Nigerian Secondary schools if well implemented in schools at the elementary stage of children. It therefore means that when pre- vocational subjects are introduced at the primary school level in developing nations, it will help to better the foundation of technological development in developing countries Nigeria which can also be implemented in the developing nations to enhance technological advancement.

Statement of the Problem: A quality assurance is a good mechanism that helps to evaluate the effectiveness, efficiency and appropriateness of teaching and learning process in any educational system. Quality assurance helps to evaluate children level of intelligence, skill acquisition, brain development and social skills. A good quality education has that assurance of building in to children how to develop confidence of trying to discover new things around them and how to make new discovery a reality in their life. When a child is well developed through teaching and learning process the zeal to know more will be developed. Quality assurance is seen as a holistic method of identifying and resolving educational problems to ensure improvement in educational system. Bateman (2006) states that a good quality assurance includes well defined standard of achievement, established means of responding to issues, accountability for outcomes and documented procedures for all identified processes to provide good quality education to children at the primary school to attract good enrolment of children at the primary schools. The challenges of having access to quality teaching and facilities must be resolved to provide good, sound and quality education to children at the primary school level (Birdsell, Levine and Ibrahim, 2006).

Educational system in most developing countries like Nigeria is facing a great challenge. These challenges had adverse effect on the economy and technological advancement of the countries. Hence from the past history, since 1960 Nigeria as a developing country has nothing to show in area of technology like other developing nations. Almost all the Automobiles, Computers, Electrical Appliances etc, are imported. One can hardly see

Nigerian made technological goods like other developed countries. The poor technology advancement in Nigeria could be caused by poor educational background from the grass root, as a result of poor primary school educational background that was given to the children at the primary school level, it is clear and tested that the strength and weight of a building depend on how solid is the foundation. So any educational system that has a good policy, but not well implemented by either the government or organizations cannot stand but rather crumble like a house or building that has a poor foundation, because of the challenges facing that educational system in Nigeria. This research tends to state some research questions and hypotheses that will guide the study.

Research Questions: The study will provide answers to the following three research questions:

- How will the introduction of pre-vocational subjects at the primary school level, provide children with basic skills?
- How will the introduction of pre-vocational subjects at the primary school level, help in the development of technology?
- How will the introduction of pre-vocational subjects at the primary school level build children interest in the study of technology?

Hypotheses: Three null hypotheses were formulated and tested at 0.05 significance levels.

- There is no significant difference between children studying pre-vocational subjects at the primary school level and skills acquired.
- There is no significant difference between children studying pre-vocational subjects at the primary school level and development of technology in Nigeria.
- There is no significant difference between children studying pre-vocational subjects at the primary school level and their interest.

3. Methodology

The experimental research design was used in this study to gather good data. Gay, (1976) refers to experimental research as the most valid approach to solution of solving educational problems. The experimental research design method is also generally regarded as the most sophisticated research method for the testing of hypotheses. To use the experimental research design all the pupils in the selected schools were used as control group by first administering the instruments to the pupils to carry out a pre-test for two (2) months, before the teaching of the pupils for a period of six (6) months, before carrying out a post-test test as an experimental group for another two (2) months. A curriculum was design for a period of six (6) months by the researcher to teach the pupils.

Population of the study: The population of the study comprise of all the primary schools in Nigeria as a case study for the developing nations. All the primary schools were grouped in to zones 1, 2, 3, and 4 according to the four cardinal points of North, East, West and South.

Sample and Sampling Technique: Since the population of the study is large the researcher is compared to zone all the primary schools in Nigeria into four (4) zones as earlier mentioned by using intact class group. Two primary schools were selected from each of the zones making the selected primary schools used in the study to be eight (8) primary schools, with a population of not less than three hundred (300) pupils from each schools, giving a total population of two thousand four hundred (2,400) pupils. All the primary schools used in the research are public government registered schools. The names of the selected schools and their zones are enlisted as follows:

Zone I: Northern part of Nigeria

Name of School	Population
(a) Yahaya Gusau Model Primary School, Sokoto. Dange Shuni Local Government Area. Sokoto State	300
(b) Badon Barade Model Primary School Bado, Sokoto. Wammaho Local Government Area, Sokoto.	300

Zone 2: Eastern part of Nigeria

Name of School	Population
(a) Constitution Crescent Primary School. Aba North Local Government Area. Abia State	300
(b) Omogu Primary School Ikelangwe South Local Government Area Owere-Orinta Abia State.	300

Zone 3: Western part of Nigeria

Name of School	Population
(a) Ibadan District Council Primary School Olu badan. Egba Local Government Area Ibadan, Oyo State	300
(b) Ibadan Municipal Government Primary School Academy. Ibadan South East Local Government Area, Ibadan, Oyo State.	300

Zone 4: Southern part of Nigeria

Name of School	Population
(a) Abraka Model Primary School Abraka, Ethiope East Local Government Area Delta State	300
(b) Calvagina Primary School Warri. Warri South East Local Government Area,Delta State.	300

From the eight selected schools used in the study, it was observed on the enlisted chart that the number of pupils used in each school was three hundred (300) pupils. This is to easy data collection, equal representation to give accurate analysis of data.

Instrumentation: The instrument used in the study was the questionnaire; the questionnaire was designed based on the curriculum used in the study. The simple structured questionnaire was used to gather data. The questions contained in the questionnaires were asked in form of objective questions that demand simple response of yes or no considering the age and class of the children at the primary school level. Three different questionnaires were designed for the six classes, primary one to six that was used for the study based on the curriculum that was designed.

- Primary 1&2 used instrument (A) that contains questions on natural objects and manmade object.
- Primary 3&4 used instrument (B) that contains questions on technological objects and their uses.
- Primary 5&6 used instrument (C) that contains questions on branch of technology, products and raw materials for metal extraction. The questionnaire contains twelve (12) items that was represented in pictures and real objects and in simple question form in each of the instruments.

Reliability of the Instrument: The three instruments A, B and C was given content and construct validity to test for the internal constituency and reliability of the instruments. Sixty pupils were selected from the schools that were used for the study; the sixty pupils are not part of the sampled population used for the study. The Cronbach Alpha (α) and the Factor Analysis was used to check for the content and construct validity of the three instruments used for the study. The Cronbach Alpha (α) was used to analyse and select quality of items in the pool of items that were designed for the construction of the instruments. The sixty students that were selected for the pilot test of the instrument were exposed to seventy items, from which a total of thirty six items were selected based on factor analysis .The average measure of all the items as contained in the instrument was determined and tested for level of significant at $p<0.05$ and the alpha (α) value of instrument A was 0.65, alpha (α) value of instrument B was 0.71, and alpha (α) value of instrument C was 0.79, the three alpha (α) values show the reliability of the three instruments. All the items that has low coefficient of alpha (α) value were eliminated, to estimate the instrument for content and construct validity the factor analysis was used by first applying the descriptive statistics to find the initial communalities of all the items showing the mean and standard deviation of each items as contained in each of the instrument. The difference in the initial communalities of the items factored the items to thirty six (36) items. Eigen value of above 1 was used to select the factor of each item to get there square loading. The factor matrix of each item was rotated to get the weight of each item; the total sum of the square loading was computed to get the through Eigen value of each component or factor. This gives a total Eigen value of 68.4% for instrument A that was used for Primary I & 2, Eigen value of 67.8% for instrument B that was used for Primary 3 & 4, while instrument C has an Eigen value of 70.0% which was used for Primary 5&6. Since the three instruments have

an Eigen value that is above 50%, therefore it means the three instruments have a content validity. Since each of the items has a factor matrix value that is between 0.49 and 0.86 therefore one can conclude that the instrument has construct validity.

Administration of Instrument: The instruments were administered directly to the pupils in their different classrooms for a period of two (2) months for pre-test excises and were used as control group. After the pre-test excises the pupils were exposed to teaching for a period of four (6) months after the pre-test excises through the effort of the class teachers and they were post-tested, after the teaching for another two (2) months they were used as experimental group. Each of the instruments was administered in each school for a period of one week. Going by the population of pupils in each of the schools in the four regions that was used for the study, three hundred questionnaires (300) were administered in each of the schools. Considering the three level of pupils that was involved in the study, primary I and 2 in each of the schools were given one hundred (100) questionnaires which they responded to. Primary 3 and 4 one hundred (100) questionnaires were also administered to the pupils in each of the schools selected for the study. While in Primary 5 and 6 were also given one hundred questionnaires which they also responded to. The researcher and the teacher try to read and interpret the content of the questions contain in the questionnaire to the pupil for the purpose of understanding. The questionnaires were retrieved back from the pupils through the effort of their classroom teachers who assisted in the administering of the instruments. The retriever of the questionnaires after the administering was 100%, because the pupils were well monitored and well guided. The total retrieved questionnaires were two thousand four hundred (2,400). This makes the administering of the questionnaires to be 100%.

Data Collection: Data were collected based on the response from the pupils that was used for the study. The collection of data was grouped into three, based on the class level of the pupils and the instrument used. The response of pupils in primary I and 2, 3 and 4, 5 and 6 in the instrument used from the eight selected are in table 1, 4 and 7, according to the research questions and the hypotheses used when carrying out the study. [

4. Data Analysis

Data collected from the three groups of pupils in the selected schools, primary I and 2, primary 3 and 4, primary 5 and 6 after the pre-test and post-test exercise. The data were analysed using descriptive statistic analysis to know the difference in mean and t-test to analyse the data to know the level of significant difference at 0.05 significant levels. Data were analysed based on the research questions and hypotheses stated in the study.

Research Question I: How will the introduction of pre-vocational subjects at the primary school level provide children with basic skills?

Data collected as shown in table (1) was used to analysed research question 1 and hypothesis 1 as shown on table 2 and 3.

Table 1: Raw scores of pre-test and post-test data collected from primary I and 2 respondents

S/N	PRE-TEST SCORES PRIMARY I & 2	POST-TEST SCORE PRIMARY I & 2
1	1800	2000
2	1500	2300
3	1400	1990
4	2000	2390
5	1600	2220
6	1540	2150
7	1900	2111
8	1720	2335
9	1300	1980
10	1676	2015
11	1100	2340
12	900	2168

Table 1 above shows the raw data scores of primary I and 2 of pupil response that was pre-test and post-tested before and after their exposure to natural objects and manmade objects. To find out if the pupil were able to identify natural objects and manmade objects after the post-test.

Table 2: Data analysis of pre-test and post-test scores of research question 1 and hypothesis 1 that was based on data collected from primary I and 2

Group	N	Mean	Std Deviation	Std Error Mean
Pre-test	12	1536.3333	322.65020	93.14109
Post-test	12	2166.5833	150.48253	43.44057

From table 2 the mean value of post-test 2166.5833 is > greater than the mean value of pre-test 1536.3333. Therefore there is a significant difference in the mean value of pre-test and post-test scores of children taught using natural objects and manmade objects.

Hypothesis I (Ho_1): There is no significant difference between pupil studying pre-vocational subjects at the primary school level and skills acquired. In testing hypothesis I (Ho_1) the t-test analysis was used to decide the level of significant difference in table 5.

Table 3: Summary Table of t-test Analysis of Hypothesis I

Skill		Lever's Test for equality of variance		t-test for Equality of Means							Remark
		F	Sig	T	Df	e.g.(2-tailed)	Mean Difference	Std Error Difference	45% confidence Interval of the Difference lower	Upper	
Score	Equal variance assumes			6.132	22	000	630.25000	102.77327	843.38872	417.11128	
		4.108	0.005	5.132	15.519	000	630.25000	102.77327	843.38872	417.11128	Ho_1 is rejected
	Equal variance not assumed										

T-Cal→6.132
Critical → 2.09 df at 0.05 significant level

From the values shown in table 3 it was observed that t-cal value of 6.132 is > greater than t-crit. value 2.07. Therefore, there is a significant difference between children studying pre-vocational subjects at the primary school level and skills acquired. Conclusively Ho_1 is rejected meaning if pre-vocational subjects are introduced at the primary school level it will make an impact on the children skill.

Research Question 2: How will the introduction of pre-vocational subjects at the primary school level help in the development of Nigerian technology?
Data collected as shown in table 2 was used to analyse research question 2 and hypotheses 2 as shown in table 5 and 6

Table 4: Raw scores of pre-test and post-test data collected from primary 3 and 4 respondents.

S/N	PRE-TEST SCORES PRIMARY 3 & 4	POST-TEST SCORE PRIMARY 3 & 4
1	1100	2300
2	1500	2160
3	1630	2320
4	1300	2300
5	1400	1980
6	1700	2350
7	2000	2360

8	2150	2380
9	1550	2390
10	1300	2257
11	1420	2305
12	1350	2275

The data presented in table 4 above shows the response of pupils that were pre-tested and post-tested before and after they were exposed to the teaching of technological objects and their uses. To find out if the pupils were able to identify technological objects and differentiate between them when they were post-tested.

Table 5: Data analysis of pre-test and post-test scores of research question 2 and hypothesis 2 that was based on data collected from primary 3 and 4

Group	N	Mean	Std. Deviation	Std Error Mean
Pre-test	12	1533.3333	301.12919	86.92851
Post-test	12	2281.4167	113.35981	32.72416

From Table 6 the mean value of post-test 2281.4167 is > greater than the mean of pre-test value 1533.3333. Therefore there is a significant difference between the pre-test scores and post-test scores of children taught. The children did better when they were taught after their pre-test.

Hypothesis 2: There is no significant difference between the studying of pre-vocational subjects at the primary school level and technological development in Nigeria.

Table 6: Summary table of t-test analysis of hypothesis 2

Development		Lever's Test for equality of variance		t-test for Equality of Means							Remark
		F	Sig	t	Df	e.g.(2-tailed)	Mean Difference	Std Error Difference	45% confidence Interval of the Difference Lower	Upper	
Score	Equal variance assumes			8.154	22	.000	748.08333	92.88399	940.71285	555.45372	
	Equal variance not assumed	6.33	0.017	8.054	14.519	.000	748.08333	92.88399	947.22482	548.84185	Ho_2 is rejected

T-Cal→8.054
T-Critical → 2.09 df at 0.05 significant level

From the table value 6 the t-cal value 8.054 is > greater than t-crit. value 2.01. Therefore there is a significant difference between children studying pre-vocational subjects at the primary school level and the development of Nigerian technology, Ho_2 is rejected. Therefore conclusively if pre-vocational subjects are introduced at the primary school level there will be development in Nigeria technology.

Research Question 3: How will the introduction of pre-vocational subjects at the primary school level increase children interest in the study of technology?
Data collected as shown in table 7 was used to analysed research question 3 and hypothesis 3 as shown in table 8 and 9.

Table 7: Raw scores of pre-test and post-test data collected from primary 5 and 6 respondents.

S/N	Pre-test Scores of Primary 5 and 6	Post-test scores of Primary 5 and 6
1	750	2010
2	1200	2390
3	1050	2320
4	600	2400
5	1100	2115
6	1500	2316
7	1003	2019
8	1270	2375
9	1772	2280
10	1110	2270
11	1050	2380
12	1431	2335

The raw data in table 7 above shows the response of pupils that were pre-test and post-tested before and after they were exposed to the teaching of types of technology and how metal can be extracted. To find out if the pupils will be able to explain how metal is produced after the post-test exercise.

Table 8: Data analysis of pre-test and post-test scores of research question 3 and hypothesis 3 was based on data collected from primary 5 and 6

Group	N	Mean	Std. Deviation	Std Error Mean
Pre-test	12	1153.0000	318.14033	91.83920
Post-test	12	2267.5000	140.75029	40.63110

From table 8 above it shows that the mean value of post-test 2267.5000 is greater than (>) the mean value of pre-test 1153.0000. Therefore there is a significant difference between the post-test value scores and pre-test value scores of children taught by exposing them to the use of raw materials in the production of metal to motivate pupil interest toward technology.

Hypothesis III (Ho_3): There is no significant difference between children studying pre-vocational subjects at the primary school level and their interest.

Table 9: Summary table of t-test analysis of hypothesis 3

Interest		Lever's Test for equality of variance		t-test for Equality of Means							Remark
		F	Sig	T	Df	e.g.(2-tailed)	Mean Difference	Std Error Difference	95% confidence Interval of the Difference Lower	Upper	
Score	Equal variance assumes	3.917	.060	11.098	22	.000	1114.50000	100.42572	906.22980	1322.77020	Ho_3 is rejected
				11.098	15.147	.000	1114.50000	100.42572	900.62869	1328.37131	
	Equal variance not assumed										

T-Cal→11.098
T-Critical → 2.09 Df at 0.05 significant level

From table 9 shown above in the t-test analysis, t-cal value 11.098 is greater than (>) t-crit. value 2.09. Therefore there is a significant difference between the studying of pre-vocational subjects at the primary school level and pupil interest. Conclusively Ho_3 is rejected; this means the introduction of pre-vocational subject at the primary school level have effect on pupil's interest in the study of technology in Nigeria.

4. Findings

In the cause of carrying out this study, the following findings were observed:

- Pupil interest was generally motivated because from the scores obtained after the post-test the mean post-test scores are higher than the pre-test scores across the three levels of pupils used for the study. Which shows that pupil showed great interest in the studying of pre-vocational subjects after the post-testing excises.
- Primary I and 2 pupil were able to identify and differentiate between natural objects and manmade objects after teaching them with objects and materials.
- Primary 3 and 4 pupil where able to identify and state the function of some technological objects after, the post-test test.
- Primary 5 and 6 pupil where able to describe the stages of carrying out the production of metal extraction using the blast furnace.
- The eight selected primary schools lacked instructional materials for the teaching of pre-vocational subjects, because the teaching aids used in this study was provided by the researcher.
- The selected schools used for this study lacked manpower that will teach the pre- vocational subjects at the primary school level.
- Pupils from the eight selected primary schools used for the study were able to demonstrate some of the skills they acquired after the post-test test.

Recommendations: Based on the findings observed in carrying out this research the following recommendations were made:

- The ministry of education of most developing nations should design a curriculum that will be built into primary schools to help build up pre-vocational skills at the early stage of children.
- Children should be encouraged or motivated to study pre-vocational subjects at the primary school level in developing nations to enhance technology.
- Government should fund and equip primary schools with instructional materials that will help to assist in the teaching of pre-vocational subject at the primary school level in most developing countries.
- Government should train teachers in the areas of pre-vocational study in most developing nations to help in the development of teacher skills.
- Children should be exposed to field trips; to help practice what they have learnt in the classroom to help motivates pupil interest in the study of pre-vocational subjects.
- The study of pre-vocational subjects at the primary school level should be made compulsory to help build technology in many developing countries.
- Children at the primary school level should be allowed to demonstrate their talents on what they can design or produced in the cause of teaching pre-vocational subjects at the primary school level.
- Scholarship grants should be given to children at the primary school level as incentives to help motivate their interest in the study of pre-vocational subjects at the primary school level.
- Community where primary schools are located should help to support the study of pre-vocational subjects by assisting primary schools with local materials to encourage the children in the study technology from the grass root in the developing countries.

5. Conclusion

It can be concluded from this study that based on the data gathered and analyzed, findings made about the study and recommendations. It can be concluded that if the studying of pre-vocational subjects is introduced at the primary school level curriculum in many developing nations, it will make a great impact on pupils' skill acquisition level. That will bring about good technological development in many developing nations around the world.

References

Alberto, M. (2000). JEAN PIAGET 1896-1980. *UNESCO: International Bureau of Education*, xxiv, 311-327.

Amanze, O. U. (2008). Implementing Universal Basic Education (UBE) Through the strategic provision of school literary services. http://www.webpageuuidoho.edu/mbolin/amanze.htm. Retrieved 19/11/2013.

Amodu Foundation (2014). Educational System in Nigeria: http://bffa-online.org/education.html. Retrieved 20/2/14.

Asogwa, O. & Diogwu, G. O. (2007). In Oledinma Nwanna- Nzewunwa Challenges of the Development of Vocational Education in Nigerian Universities: Implication for National Development. University of Port Harcourt Nigeria.

Bateman, P. (2006). Quality Assurance Mechanism open distance e-learning. A paper presented at a workshop that was organized by African Virtual University Kenya. In collaboration with carregie, corporation and Information Technology and Communication Unit. Obafemi Awolowo University Ile-Ife.

Birdsell, N., Levine, R. & Ibrahim, A. (2006). Building gender equality in urban, life. *Global Urban Research Development Magazine*, 2(1), 9-14.

Bodrova, E. & Leong, D. J. (1996). Tools of the Mind: A case study of implementing the Vygotskian Approach in American Early Childhood and Primary Classrooms, International Bureau of Education.

Claude, J. B. (2003). Education and Vocational training, a mainstream solution for all groups across all number states? Impulse for European Employment Policy Impulses for Germany BMWA, Berlin.

Dayo, A. (2012). Nine-year Basic Education Curriculum takes New Shape. www.vanguard.com. Retrieved 5/112/2013.

Dike, V. E. (2009). Definition of Education, Attitude Services www.teachi-kids-attitude-1st.com retrieved 14/12/2013.

Egwu, S. O. (2009). Roadmap for Nigeria Educational Sector Abuja, Federal Ministry of Education Abuja.

Elkind, D. (2008). The Power of Play: Learning what comes naturally. *American Journal of play*: http://www.journalofplay.org Retrieved 18/1/2014.

Federal Republic of Nigeria. (1981). National Policy on Education (2nd Education) Lagos Nigerian Educational Research and Development Council Press

Gay, I. R. (1976). Educational Research Competencies for analysis and application, Ohio: Charles E. Merrill Publication Company.

Kenya Institutes of Education. (2012). contributes to better health higher incomes and increased http://www.com.ng. retrieved 8/1/2014.

Kendra, C. (2013). Piaget's Stages of Cognitive development. Background and key Concept of piaget's Theory. Psychology.about.com/od/piagets theory/a/keyconcepts.htm

Manfred, T. & Jennifer, W. (2004). Vocational Education and Training key to the Future. Greece Colibri Ltd.

May. (2006). Oledinma Nwanna-Nzewunwa. Challenge of the Development of Vocational Education in Nigerian Universities: Implication for National Development. University of Port Harcourt Nigeria.

Michael, A. (2002). Okolocha C.C. Vocational Technical Education in Nigeria: Challenges and the way forward. *Business Management Dynamics*, 2, 01-08.

Nduka, A. O. (1964). Western Education and the Nigeria Cultural Background Ibadan OUP.

Nuru, A. (2007). The Relevance of National Vocational Education Qualification (NVQS) in TVE in Nigeria UNP.

Ohwojero, C. (2013). Impact of Computer Education on Students Interest and Performance in Automobile Trace in Nigeria www.iiste.org.

Okolocha, C. C. (2012). Vocational Technical Education in Nigeria: challenges and the way forward. *Business Management Dynamics*, 2(6), 01-08.

Omotayo, D. M., Iheberume, C. & Maduewesi, B. U. (2008). Management of Universal Basic Education Scheme for Qualitative education in Nigeria. www.questia.com/pm.qst;Jessioni. Retrieved 18th December, 2013.

Onyukwu, J. (2011). The Educational System of Nigeria World Education News and Reviews WENR.htm. Retrieved 28/12/2013.

Orobosa, U. (2010). Education and National Development in Nigeria Vanguard Newspaper. Retrieved 10/12/14.

Parankimalil, J. (2012). Meaning Nature and Aims of Education. Parankimalil World press .com.

Rebekah, L. C., Caitin, M. l., Jacqueline, S. & Elizabeth, V. (2013). Early Education and Care Experiences and Cognitive Skill Development: A Comparative Perspective between Australian and American Children. Family matters. No 93 AIFS Journals.

Schofield, H. (1982). The philosophy of Education: An introduction. London: George Allen & Unwin Ltd

Shivani, Y. C. (2012). Pre-Vocational training to be given to children with special needs. ARCHIVE journalism courage. Retrieved 23/1/2014.

Sofowora, O. A. (2010). Improving the Standard and Quality of Primary Education in Nigeria. *International Journal for Gross Disciplinary in Education (IJCDE)*, 1(3).

Van-Ark, B. (1992). Vocational Education and Productivity in the Netherland and Britain National Institute Economic Review.

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A study of transferable skills for Work based Learning (WBL) Assessment

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Abstract: Transferable skills are learnt abilities which are mainly acquired when experiencing work. University students have the opportunities to develop the knowledge and aptitude at work when they undertake WBL placement during their studies. There is a range of transferable skills which students may acquire at their placement settings. Assessing the achievement of students on practice learning based on the transferable skills is regarded as being complex and tedious due to the variability of placement settings. No attempt has been made in investigating whether these skills are assessable at practice settings. This study seeks to define a set of generic transferable skills that can be assessed during WBL practice. Quantitative technique was used involving the design of two questionnaires. One was administered to University of Mauritius students who have undertaken WBL practice and the other was slightly modified, destined to mentors who have supervised and assessed students at placement settings. To obtain a good representation of the student's population, the sample considered was stratified over four Faculties. As for the mentors, probability sampling was considered. Findings revealed that transferable skills may be subject to formal assessment at practice settings. Hypothesis tested indicate that there was no significant difference among male and female as regards to the application of transferable skills for formal assessment. A list of core transferable skills that are assessable at any practice settings has been defined after taking into account their degree of being generic, extent of acquisition at work settings and their consideration for formal assessment. Both students and mentors assert that these transferable skills are accessible at work settings and require commitment and energy to be acquired successfully.

Keywords: *Knowledge, Skills, Assessment, Placement, Mentors*

1. Introduction

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Academics have to cope with increasing issues as regards to the assessment of competences of students due to the exigencies of employers about skills capabilities of fresh graduates. Nabi (2003) showed it is the portfolio of skills which a graduate could offer to an employer that makes the differentiating factor in gaining employment. This is causing a re-examination of assessment practices to include assessment of students' transferable skills besides the academic content of what students are studying. All of this is leading to the development of new assessment methods, giving rise to the need for greater than ever ingenuity and flexibility, while still monitoring and assuring the quality of the process. Many Universities are thus considering the importance of assessing transferable skills which students acquired when they are undertaking WBL practice. New teaching and learning strategies are being developed to ensure that students become more aware of the demands of future employers for graduates who are able to display a range of personal transferable skills. Employers required individuals who possess a variety of competences in addition to intellectual ability. Communication and presentation skills, problem-solving and time management, teamwork and leadership skills are now being given due consideration to be incorporated into degree courses. Several studies have tried to identify a core set of transferable skills which students can acquire at their placement settings. However, the different lists proposed have often been criticized for being exhaustive and duplicative. While Universities recognized that these transferable skills are more accessible at placement settings rather than thru on-campus courses, they experienced difficulty in setting the proper structure for assessing these skills. The workplace is found to be the best site where students can acquire transferable skills to make them fit for purpose and practice (Zegwaard & Coll, 2011). The challenge is to establish a set of generic core transferable skills on which assessment may be based whist taking into account the tremendous variation in placement settings with differing employers and mentors.

2. Literature Review

In recent times there has been an emphasis on embedding generic skills development into teaching programs within degree studies (Oliver et al., 2008), given the increased emphasis on the importance of generic skills in gaining employment (Finch et al., 2013). There is general agreement that generic transferable skills are those skills that are required to be competent in any discipline, including analytical and problem solving skills (Nunan et al., 2000). However, there is still a widespread debate on what constitutes generic transferable skills (e.g. Barrie, 2006; Bridgstock, 2009; Fallows and Stevens, 2000). Fallows and Stevens (2000) defined transferable skills as those skills that someone has acquired and developed through one situation and are useful when transferred into another (next career). In fact, transferable skills are those versatile skills acquired during WBL practice which students initially developed, applied and made use of in a number of different ways. Harvey et al. (1997) and Te Wiata (2001) found that students' ability to integrate and demonstrate generic skills was linked to the development of confidence in their application to new and different contexts, including the workplace. The Department for Education and Skills (DfES, 2005) has defined the transferable skills as "essential skills which people need in order to function effectively as members of a flexible and competitive workforce". The DfES, identified six key skills which are: communication, application of number, information technology, working with others, improving own learning and performance, problem solving. But, this list is found to be inadequate for assessment as students are exposed to a greater range of transferable skills on practice. Kelly (2001) described the key skills as generic transferable skills that contribute to individual effectiveness, flexibility and adaptability within the labor market. Student learning in placements has been described as being problematic and influenced by a myriad of contextual factors (Eames, 2010; Johnston, Angerilli, & Gajdamaschko, 2004). The learning environment differs, but yet Universities and Employers wish to see rigorous application of assessment in WBL practice (Coll, Taylor & Grainger, 2002). Defining what skills are to be assessed is paramount. It is argued that, unless there is explicit assessment of generic skills, the teaching of these skills is unlikely to be given the required attention. A discipline-embedded approach to developing generic skills is favored, but with explicit assessment and reporting of the outcomes.

Binks and Exley (1992) have established a list of twenty-five skills to be considered for WBL Practice. However, the list has often been criticized as some of the skills are seen as being duplicative and confusing. Several other researchers have tried to improve the list (e.g. AGR, 1995; Harvey et al., 1997; Watts and Hawthorn, 1992; Dunne et al., 2000; Lees, 2002). The most widely used one today is from HEA (2006) which identified a list of fourteen transferable skills consisting of (1) imagination/creativity;(2) adaptability/flexibility;(3) willingness to learn;(4) independent working/autonomy; (5) working in a team;(6) ability to manage others;(7) ability to work under pressure;(8) oral communications; (9) communications in writing for varied purposes/audiences;(10) numeracy;(11) attention to detail;(12) time management;(13) assumption of responsibility and for making decisions; and (14) planning, coordinating and organizing ability. The few Universities which attempted to assess transferable skills on WBL practice based themselves on the list developed by HEA. However, they complained that the work is tedious due to the complexity of placement settings rendering the application of the list difficult. However, Hager (2011) were convinced that assessment can make its way in WBL practice based on well referenced competencies and standards. This study envelops the transferable skills defined by previous researchers and attempts to define a fine list of generic transferable skills that may be subject to assessment.

3. Methodology

To extract information about acquisition of transferable skills at practice settings and its relevance to assessment, two sets of questionnaires were developed. One was administered to students to extract relevant information about the transferable skills they had experienced during their WBL practice. The second set of questionnaire was destined to mentors who had coached and assessed students during their WBL training. Both questionnaires contained section that included Likert scale questions to rate the degree of importance of transferable skills at practice settings (rating scale 1-5: 1: not important (NI), 2: a little important (LI), 3:Neutral (N), 4:Important (I) – 5:Very Important (V)). The extent students have acquired those skills have also been rated (rating scale 1: Not acquired at all, 2: Acquired a little, 3: Neutral, 4:Acquired to some extent, 5: Acquired Fully). The degree to which those skills are being considered as being generic was also being

measured using Likert scale as well as their consideration for being subject to assessment. Open-ended questions were also provided for enabling respondents to share their experiences and insights. The mentor's questionnaire was administered to mentors based on probability random sampling technique. The mentors were sorted on a list in alphabetical order and the selection was made by using an integer random generator. On the other hand, the student's questionnaire was stratified over four Faculties of (1) Faculty of Law & Management (FLM), (2) Faculty of Science (FOS) and (3) Faculty of Social Studies & Humanities (FSSH) and (4) Faculty of Engineering (FOE). This ensured a good representation of students across the different Faculties.

4. Results and discussion

The quantitative data were analyzed using SPSS version 21. Table 1 shows the mean rank of the extent of transferable skills acquisition as experienced by the students and the mentors. Skills such as 'Team Working', 'Planning', 'Listening', 'Oral Communication' have been highly rated by both students and mentors which mean that they are easily accessible at practice settings. While other skills such as 'Negotiation', 'Innovative' and 'Leadership' are not found to be adequately available.

Table 1: Extent transferable skills are being acquired

Extent of Acquiring	Students Mean Rank	Mentors Mean Rank
Team Working	4.13	4.18
Planning	4.32	3.96
Listening	4.30	3.95
Oral Communication	4.15	3.88
Information Technology	4.07	3.89
Self Learning	4.19	3.68
Time Management	4.17	3.63
Problem Solving	4.14	3.59
Professional Development	4.00	3.71
Numeracy	3.98	3.64
Organizational	3.98	3.62
Written Communication	3.87	3.55
Decision Making	4.03	3.38
Negotiation	3.86	3.27
Innovative	3.82	3.25
Leadership	3.77	3.27
Enterprising	3.25	2.85

Table 2: Degree transferable skills are generic

Degree of being generic	Mean (Students)	Mean (Mentors)
Team Working	4.38	4.36
Oral Communication	4.37	4.29
Planning	4.36	4.26
Professional Development	4.32	4.20
Time Management	4.29	4.23
Listening	4.28	4.19
Information Technology	4.19	4.27
Planning	4.23	4.22

Written Communication	4.19	4.18
Self Learning	4.26	4.04
Problem Solving	4.26	4.04
Decision Making	4.21	4.04
Innovative	4.22	3.90
Numeracy	4.06	4.02
Leadership	4.07	3.88
Negotiation	4.10	3.82
Enterprising	3.80	3.48

As regards to the degree of being generic, it was observed that both mentors and students rated highly skills such as 'Team Working', 'Oral Communication', 'Planning', but provided a lower ranking for skills such as 'Leadership', 'Negotiation' and 'Enterprising' as shown in Table 2. The results obtained were found to match the study conducted by Brown and Ahmed (2009) where the transferrable skills communication, problem solving, team working and time management were ranked high whereas decision making, planning and organising, and management skills were given low ranking. Results were also seen to be compatible to what HEA (2006) proposed where oral communication, written communication, team working and time management form part among the set of transferable skills which are accessible at practice settings. Consideration for assessing these transferable skills under formal assessment was rated by students and mentors. The means and standard deviation of the different transferable skills under test are illustrated in Table 3. Skills such as 'Oral Communication', 'Team Working', 'Planning' were ranked in the first positions while 'Innovative', 'Leadership' and 'Negotiation' were poorly rated. This demonstrates close similarity to the previous two tables indicating that there is close correlation among those transferable skills that may be subject to assessment. The means being higher than 4 indicates in each case as illustrated under Table 3 indicates that both students and mentors were found to be fully agreeable for the application of assessment on these transferrable skills.

Table 3: Consideration for assessment

Consideration for assessment	Student		Mentor	
	Mean	SD	Mean	SD
Oral Communication	4.35	0.754	4.38	0.737
Team Working	4.35	0.713	4.35	0.731
Planning	4.25	0.784	4.23	0.883
Written Communication	4.20	0.806	4.25	0.882
Problem Solving	4.21	0.852	4.23	0.816
Time Management	4.20	0.840	4.18	0.845
Information Technology	4.11	0.960	4.26	0.828
Organizational	4.10	0.789	4.14	0.946
Professional Development	4.17	0.800	4.01	0.923
Listening	4.24	0.775	3.91	0.861
Numeracy	4.01	0.923	4.09	0.896
Self Learning	4.20	0.835	3.87	0.901
Decision Making	4.10	0.841	3.89	0.953
Innovative	4.09	0.853	3.75	1.047
Leadership	4.07	0.799	3.74	1.056
Negotiation	3.95	0.854	3.64	1.056
Enterprising	3.66	1.034	3.37	1.119

In addition, the order of importance of the different transferable skills was rated by both students and mentors. Factor analysis was used to analyze the importance of these skills in the assessment process. All the items were observed to correlate fairly well with no singularity (p values < 0.05). Factor extraction revealed that there were three factors that were found to have Eigen values > 1 which accounted for the total variance as illustrated under Table 4. Varimax Orthogonal Rotation was considered to optimize the factor structure thereby equalizing the importance of the three factors. Based on the rotated component matrix which was obtained after 7 iterations as illustrated in Table 5, the lower rating skills such as listening, professional development and organizational ones were eliminated leaving a concise list of ten transferable skills that was important and accessible at practice settings and what might be subject to assessment. The list derived through factor analysis in fact confirmed what students and mentors found as regards to these transferable skills that may be subject to assessment.

Table 4: Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.316	37.155	37.155	6.316	37.155	37.155	4.348	25.579	25.579
2	1.523	8.960	46.115	1.523	8.960	46.115	2.464	14.494	40.073
3	1.105	6.498	52.614	1.105	6.498	52.614	2.132	12.540	52.614
4	.991	5.830	58.444						
5	.969	5.701	64.145						
6	.769	4.522	68.667						
7	.741	4.360	73.027						
8	.683	4.018	77.044						
9	.592	3.482	80.526						

Table 5: Rotated Component Matrix

	Component		
	1	2	3
Oral communication skills.			.698
Written communication skills.			.792
Listening skills.			
Team working skills.		.678	
Self learning skills.		.583	
Problem solving skills.	.636		
Numeracy skills.		.649	
Information technology skills.		.622	
Professional development skills.			
Time management skills.	.519		
Decision making skills.	.765		
Organizational skills.			
Planning skills.	.675		

In addition, there was also need to assess the variability in skills acquisition. This was achieved by considering two hypotheses which were tested to investigate whether transferable skills acquisition (i) differ from public, private and parastatal practice settings and (ii) differ according to gender.

Hypothesis 1
H_o: There was no significant difference in transferable skills acquired by students among public, private and parastatal bodies
H_1: There was a significant difference in transferable skills acquired by students among public, private and parastatal bodies

Kruskal Wallis which is a non-parametric test was used as the data was not found to be normal. The result revealed that p-value = 0.063 > 0.05 indicating that there was no significant difference in skills acquisitions among the various types of practice settings. This provides further evidence that the core transferable skills are accessible at any practice settings which demonstrate further that the application of formal assessment is plausible. In addition, hypothesis was also tested as to whether there was a difference in skills acquisitions as experienced by male and female students.

Hypothesis 2
H_o: There was no significant difference in transferable skills acquired by male and female students
H_1: There was a significant difference in transferable skills acquired by male and female students

The result depicted that p-value = 0.471 > 0.05 indicating that there was no significant difference in skills acquisitions between male and female students indicating uniformity in skills acquisitions. The result obtained from both hypotheses further consolidate that these transferable skills may be subjected to assessment as they are found to be location independent i.e. irrespective of the type of practice settings, the assessment made will be similar and in addition it is not influenced by gender i.e. male and female students experience similar acquisition of skills. The following ten transferable skills can therefore be retained for assessing students on their WBL practice (1) Oral communication; (2)Written communication; (3)Team working; (4)Self learning; (5)Problem solving ; (6)Numeracy; (7) Information Technology; (8)Time management; (9)Decision making; (10)Planning. The study provides an improved list over the HEA proposed one. The accessibility and generic nature of these transferable skills will facilitate Universities to standardise assessment in WBL practice. It also helps in meeting the expectation of potential employers as Lowden et al (2011) reported that employers wish that graduates demonstrate a range of broader skills and attributes that include team-working, communication and problem solving.

5. Conclusion

The study demonstrates that assessment of WBL practice may be based on transferable skills, as there is a set of skills that are generic, accessible and assessable at practice settings. The list of transferable skills derived from this study has been obtained after considering features such as extent of acquisition, generic nature of skills at practice settings together with the views from those who have experienced formal assessment in WBL practice. The findings have shown that the skills acquisitions are acknowledged by students and mentors. The integration of assessment based on these transferable skills into the undergraduate curriculum is therefore feasible. In fact, it should be encouraged as it reinforces the commitment of students in acquiring the right skills. WBL Practice with assessment adds more value to the knowledge obtained. Based on the outcome of this study, it can be deduced that standardized assessment can definitely make its way in WBL practice.

References

AGR. (1995). Association of Graduate Recruiters. Skills for Graduates in the 21st Century, Cambridge: AGR.

Barrie, S.C. (2006). Understanding what we mean by the generic attributes of graduates. *Higher Education*, 51(2), 215-241.

Binks, M. & Exley, K. (1992). Observing the Output of Institutions of Higher Education: The Case of Student Competence, proceedings from Innovative Assessment in Higher Education, pp.51-58

Bridgstock, R. (2009). The graduate attributes we've overlooked: enhancing graduate employability through career management skills. *Higher Education Research & Development*, 28(1), 31-44.

Brown, G. & Ahmed, Y. (2009). The value of work placements. *Enhancing the Learner Experience in Higher Education*, 1(1), 19-29.

Coll, R. K., Taylor, N. & Grainger, S. (2002). Assessment of work based learning: some lessons from the teaching profession. *Asia-Pacific Journal of Cooperative Education,* 3(2), 5-12.

DfES. (2005). Department for Education and Skills, Report of the End to End Review of Careers Education and Guidance, London: Department for Education and Skills.

Dunne, E., Bennet, N. & Carré, C. (2000). Skill development in higher education and employment. In: Coffield, F. (ed.) Differing visions of a learning society. Research findings, volume I. The Policy Press & ESRC

Eames, C. (2010). Learning through work placements in science and technology. Unpublished PhD thesis. The University of Waikato, Hamilton, New Zealand.

Fallows, S. & Stevens, C. (2000). Building employability skills into the higher education curriculum: a university-wide initiative. *Education + Training*, 42(2), 75-83.

Finch, D. J., Hamilton, L. K., Baldwin, R. & Zehner, M. (2013). An exploratory study of factors affecting undergraduate employability. *Education + Training*, 58(7), 681-704.

Hager, P. (2011). Theories of workplace learning, in Malloch, M., Cairns, L., Evans, K. and O'Connor, B.N. (Eds), The SAGE Handbook of Workplace Learning, SAGE Publications Ltd, London, pp. 17-31.

Harvey, L., Moon, S. & Geall, V. (1997). Graduates' Work: Organizational Change and Students' Attributes. Centre for Research into Quality.

HEA. (2006). Higher Education Academy, York, retrieved from: www.heacademy.ac.uk/resources/publications/learningandemployability, Oct 2015

Johnston, N., Angerilli, N. & Gajdamaschko, N. (2004). How to measure complex learning processes: The nature of learning in cooperative education. In P. L. Linn, A. Howard & E.Miller (Eds.), Handbook for research in cooperative education and internships (pp. 157-190). Mahwah, NJ: Lawrence Erlbaum Associates.

Kelly, A. (2001). The evolution of key skills: towards a Tawney paradigm. *Journal of Vocational Education and Training*, 53(1), 21-35.

Lees, D. (2002). Graduate Employability – Literature Review. LTSN Generic centre. University of Exeter. http://www.palatine.ac.uk/files/emp/1233.pdf

Lowden, K., Hall, S., Elliot, D. & Lewin, J. (2011). Employers' perceptions of the employability skills of new graduates, Glasgow: Edge Foundation

Nabi, G. R. (2003). Graduate employment and underemployment: opportunity for skill use and career experiences amongst recent business graduates. *Education + Training*, 45(7), 371-82.

Nunan, T., George, R. & McCausland, H. (2000). Implementing Graduate Skills at an Australian University, Integrating Key Skills in Higher Education, Kogan Page, London, pp. 57-66.

Oliver, B., Tucker, B., Gupta, R. & Yeo, S. (2008). E VALUate: an evaluation instrument for measuring students' perceptions of their engagement and learning outcomes. *Assessment & Evaluation in Higher Education*, 33(6), 619-630.

Te Wiata, I. (2001). A big ask: To what extent can universities develop useful generic skills? In F.Bevan, C. Kanes, & D. Roebuck (Eds). Knowledge Demands for the New Economy. Brisbane: Australian Academic Press, pp. 290-297.

Watts, A. G. & Hawthorn, R. (1992). Careers Education and the Curriculum in Higher Education. NICEC Project Report. Cambridge: Careers Research and Advisory Centre

Zegwaard, K. & Coll, R. (2011). Using Cooperative Education and Work-Integrated Education to Provide Career Clarification. *Science Education International*, 22(4), 282-291.