

Indicators of Embedded Librarianship and the Effects on Practice by Librarians in Northeast University Libraries

Augustine Uzoma Madu¹ and Emmanuel Camble²

^{1&2}Department of Library and Information Science, University of Maiduguri, Maiduguri, Nigeria
E-mail: auspre@yahoo.com, emmanuelcamble2@gmail.com

Abstract - Concept of embedded librarianship has continued to attract attention in research and academic discourse globally, especially in the advanced countries. There is still growing interest to discovery of the perceived factors for a successful practice of the term among the developing countries. The aim of this study is to investigate the effects of Librarians' information literacy skills, professional development, academic engagement and learning management use on practice of embedded librarianship. The study used Questionnaire to generate information from 355 librarians from 11 universities in Northeast, Nigeria. The result revealed that academic engagement, professional development and information literacy skill has positive and significant effect on embedded librarian practice while learning management system use failed to pose significant effect. Moreover, information literacy skill had positive and significant effect on academic engagement and professional development but failed to affect learning management system significantly. Also, academic engagement posed the highest effect on professional development, while learning management system use failed to produce significant effect on embedded librarian practice. The study concludes that embedded librarian practice is bright within the study environment, however, the use of information technology by the libraries and skill among the librarians was recommended.

Keywords: Embedded Librarianship, Academic Engagement, Professional Development, Information Literacy Skill, Learning Management System.

I. INTRODUCTION

Concept of embedded librarian has become an area of research interest in the field of librarianship, with transformative tendencies to improve user services, reduction in the cost of running faculty and departmental as well as encouraging professional development of the librarians.

Studies on embedded librarianship are vast and environment related, this accounts for the disparities in definition of the term as mentioned by Drewes and Hoffman (2010). It is typically a programme and service in which the librarians become engaged with the clients' associates and locations, directly or via the technology, "in order to become a part of the users' culture" (Drewes & Hoffman, 2010). These remained the converging point in an attempt to define the term by most researchers (Shumaker, 2012; Sharma, Kamal Kumar, & Babbar, 2014; Talwar, 2014) etc. Some studies have underpinned embedded librarianship to certain

service(s), example include the use of Learning Management System (LMS) by the embedded librarian (Kvenild, Tumbleson, Burke, & Calkins, 2016), physical embedded in the department (O'Toole, Barham, & Monahan, 2016), online community and information literacy (Burgoyne & Chuppa-Cornell, 2015) among others. Embedded librarianship has further been regarded as a paradigm shift from the traditional mode to new agenda in librarianship based on "user-oriented, group centric, expertise etc., library services as attribute of embedded librarian, based on a relationship with the faculty, or user community" (Anitha, Rehana, & Vijesh, 2017). Embedded librarian programmes cuts across every facets of students' academic engagement, both online and face-to-face. Participation in instructional design and information literacy skill programme, collaboration in curriculum development and teaching, research assistance and academic communication through publication have advanced, especially in developed countries (Lin Wu & MisaMi, 2013; Landry-Hyde & Cantwell, 2013; Lysiak, Mross, & Raish, 2018). The use of "online, virtual, LMS, or Blackboard." Some studies have scaled embedded librarianship as one main aspect that is related to the model and context, which is both problematic and tagged at various service paradigm (Phelps-Ward, Mulvihill, Jarrell, Habich, 2015; Almeida, & Pollack, 2017). Such as integrating the librarian in the class all through the semester and making them a guide to in their projects through information search (Kirkwood, & Evans, 2012) entrepreneurial oriented librarian (Saunders, & Taylor, 2014). Irrespective of the perceptions of the concept, it has been seen as an innovation and a welcomed development in the field of librarianship and information science.

II. STATEMENT OF THE PROBLEM

There exist vast and limitless opportunities for the librarians to embed themselves and services within their users' space. But, in Nigeria, embedded librarianship seems to be taking foot due to inadequate research in the area. More so, technological and psychological constraints have placed limits on the librarians and make them complacent with traditional librarianship, which is composed of "information discovery, collection development and some elements of information management" (Auckland, 2012), and "information service delivery, rather than knowledge creation" (Inuwa & Abriza, 2018).

Among academic librarians in the Northeast, there is appreciable awareness and perception of the term which have shaped their attitude according to Madu and Dawha (2019), but the factors which determines librarian's embedded practice are yet to be studied empirically. Present economic situation which have resulted to low library budget, coupled with "systemic institutional disparities and a culture of exclusion" (Almeida, & Pollack, 2017) of librarians in academic grounds have left them grappling to overcome the situation through embedment. More so, previous use of the librarians for one-shot model of instruction for information literacy has been frowned at by the librarians (Mery, Newby, & Peng, 2012). It demands that to fully utilise the potentials of the librarian, they should be fully be embedded in the faculties, departments as well as in students 'online academic engagement and coordination. This study aims to highlight the current state of embedded librarianship programme, and investigate the effects information literacy, academic engagement, professional development and community information services on embedded librarianship practice among academic librarians in Northeast, Nigeria.

III. OBJECTIVES OF THE STUDY

This study aims to identify the effect of Librarians'

1. Academic Engagement on embedded librarianship practice, in northeast academic libraries, Nigeria.
2. Academic Engagement on librarians' professional development in northeast academic libraries, Nigeria.
3. Information literacy skill on librarians' academic engagement in northeast academic libraries, Nigeria.
4. Information literacy skill on embedded librarianship practice in northeast academic libraries, Nigeria.
5. Information literacy skill on librarians' learning management system use in northeast academic libraries, Nigeria
6. Information literacy skill on librarians' professional development in northeast academic libraries, Nigeria
7. Professional development on embedded librarian practice in northeast academic libraries, Nigeria
8. Learning management use on embedded librarian practice in northeast academic libraries, Nigeria

IV. RESEARCH HYPOTHESES

This study was guided by the following hypotheses

1. Academic Engagement will have positive and significant effect on embedded librarian practice in northeast academic libraries, Nigeria
2. Academic Engagement will have positive and significant effect on Librarians' professional

development in northeast academic libraries, Nigeria

3. Information literacy skill will have positive and significant effect on Librarians' Academic engagement in northeast academic libraries, Nigeria.
4. Information Literacy skill will have positive and significant effect on embedded librarian practice in northeast academic libraries, Nigeria.
5. Information literacy skill will have positive and significant effect on Librarians' Learning Management System use in northeast academic libraries, Nigeria.
6. Information literacy skill will have positive and significant effect on Librarians' professional development in northeast academic libraries, Nigeria.
7. Professional development will have positive and significant effect on embedded librarian practice in northeast academic libraries, Nigeria
8. Learning Management System use will have positive and significant effect on embedded librarian practice in northeast academic libraries, Nigeria

V. LITERATURE REVIEW

Literature has highlighted Information literacy skill haveas vital indicator of practice of embedded librarianship (Clyde, & Lee, 2011; Si, Xing, Zhou, & Liu, 2012; Helms, &White sell, 2013; Martzoukou, &Tramantza, 2014). Which is developed through collaboration in curriculum design and instruction. Nagarkar and Murari (2010) said that embedded nature of the librarians implies that they are located amid users to instruct research skills where and when teaching is necessary. They are versatile in the colleges, business and hospital environments to offer research and information services. The authors assert that embedded librarians should be responsible for information literacy training within and off campus. And serves as support to both faculty and faculty members in online and physical information resources retrieval. In an intensive information literacy model study of embed librarians in the classroom by Hearn (2005), the outcome revealed that the student could recognise available resources and conduct search on their own in addition to improved research skill. Potency of embedment was tested in information literacy study by Finley, MacMillan, Skarl, Bowler, & Street, (2008) with Students from five undergraduate History courses and two undergraduate Women's Studies. The aim of the study was to ascertain if varying levels of librarian embedding associated with better information literacy (IL) skills for undergraduates. Results revealed that remarkable

improvement in scores of students occurred when a librarian was visibly embedded in the academic classroom. On the other hand, there was little improvement when the librarian was embedded not as a specialist in information literacy. This was similar to the study by Knapp, Rowland, and Charles, (2014) in which the main areas of benefit of embedding librarians was determined. In a programmatic and conceptual approach, the authors discussed how embedding librarians in an increasing undergraduate research experience (URE) could create a framework in which libraries and librarians contribute directly to retaining undergraduate students. The results indicate that librarians are able to contribute directly to the student retention. This efforts cannot however be quantified because of the discrepancies in the bigger role of the administration in students retention compared to sparse role of the librarians. The roles of the embedded librarian in information literacy was highlighted by Paganelli and Paganelli (2017) in a study of online reference services through course management system. According to the authors, the embedded librarian introduces information literacy session within the course, and this is achieved through pre and post-test before and at the end of the course session. This was supported by (Henrich & Attebury, 2012; Sun, Liu, Wang, & Zuo, 2019).

Perceived academic engagement as role of embedded librarians defines their duties in physical and online academic environment. Embedded librarians collaborate with teachers and the faculty members in various academic programmes such as curriculum design and instruction, students' project supervision. The ideal embedded scenario requires the librarians to participate actively in teaching instruction in the department, curriculum design and students' project supervision in addition to information literacy practical classes (Andrews, 2015). To fully embed the librarians as collaborators with department and faculty members in academic programmes, the librarians should attend the departmental meeting on regular basis and teach full credit courses (Heider 2010), this will afford them the opportunity for integration and synergy. This begins with library and internet use instruction (Firmage, Tiegtenberg, & Cole, 2007), however, recent demand for expanded instruction has in trusted to the librarian the responsibility for extended teaching contrary to add-on to traditional course arrangement (Rowland & Knapp, 2015). Embedding librarians in the departments has been favoured to bring them closer to the main stream of faculty and departmental activities (Covone, & Lamm, 2010; O'Toole, Barham, & Monahan, 2016). In examination of embedded librarian and faculty partnership, Andrews, (2015) and ACRL, (2016) in 2016 Association for College and Research Libraries

Framework for Information Literacy enjoined the librarians to "collaborate more extensively with faculty." Studies indicate that embedding librarians in the faculty leads to increased student success (Andrews, 2014), "even as they acknowledge collaborative obstacles that librarians face" (Booth, Lowe, Tagge, & Stone, 2015).

To properly fit into the present perception of embedded librarianship, the librarians should necessary acquire certain skills and competencies (Anitha, Rehana, & Vijesh, 2017) such as further studies, ability to conduct and publish research, attend conferences of peers and subscribe to online academic groups. Such competencies can be summarised as professional development. Academic libraries in Northeast, Nigeria have adopted a policy which converted all librarians into academic status and require that all librarians must acquire successive academic degrees, produce research papers like their counterparts in the department. Prior to this time, a librarian could rise to the post of deputy librarian with a diploma in Library science. Embedded librarianship has hitherto awakened the librarian from passiveness to participate in "primary research by integrating into teams of researchers, which serves as another route to contribute to Engaged Scholarship" (Rowland & Knapp, 2015). Wu Lin & MisaMi (2013) "proposed five-level model of embedded librarianship within health sciences libraries". The authors identified various duties, skills, and competencies suitable "for health science librarians working as embedded librarians." For a clear understanding of the value of "information and knowledge", and skill to apply "knowledge and information" to enhance team performance (Nagarkar & Murari, 2010), the embedded librarians are expected to undergo professionally. The use of Learning Management System (LMS) to reach both immediate and remote library community has been regarded as one of the ideals of embedded librarianship (Burke & Tumbleson, 2011). Library's community comprises of users outside of the library building such as the departments, faculties, online and the physical environments where the library is located. To swerve the community effectively, the librarian ought to move from the building into the community, to understand the community's information needs, (Paganelli & Paganelli, 2017) and provide information services. This was similar to (Li Si & Wen-ming Xing, 2012; Li, Fangzhi, Qiqi, Xiaozhe, & Simin, 2013) in which the idea and practice of embedded librarianship were identified. Learning Management System (LMS), in various platforms are suitable for online and offline tutorial, through which the librarian can engage the learners, provide research, reference services etc. (Burke & Tumbleson, 2013)

Global trends in librarianship reveals a shifted from the traditional on the spot meeting with users to engaging the users wherever there is need for information and service irrespective of location and time. To fit into the current trend, a general upgrade in knowledge and competency becomes very necessary. The idea corroborated Creamer (2013), in which the author elaborated paths expected of an embedded librarian in relationships and ethics of collaborative teaching in research intensive classes.

VI. METHODOLOGY

The study utilised descriptive correlational method, self-designed questionnaire was used to collect data from 355 respondents which comprised 316 professional and 39 para-professional librarians drawn from ten (11) university libraries in North-east Nigeria through convenient sampling.

Inclusion of para-professionals was considered because majority of them are engaged in further study, this means that they will earn professional or academic status and get embedded eventually.

Section one of the questionnaire highlighted the demographic data of the respondents while section two is divided into four clusters according to the objectives of the study.

These include information literacy, professional development, Academic Engagement, Learning Management System use in five-point Likert scale 1, (very low) to 5 (very high).

Answers to respondents’ profiles were provided through a descriptive analysis while the hypotheses were tested through path analysis with Partial Least Square structural equation modelling (PLS-SEM) version 3.

VII. DESCRIPTIVE ANALYSIS

Three hundred and fifty-five valid questionnaire was screened out of four hundred and twenty distributed. Information in table 1 revealed the demographic information of the respondents. Frequency of the respondents’ Library showed Ramat library, university of Maiduguri had the highest respondents with 80(22.5%) while Abubakar Tafawa Balewa university Library, Bauchi and Ibrahim Badamasi Library, Modibbo Adama University of Technology, Yola followed with 41(11.5%) and 40(11.3) respectively. Others include Federal University Library, Wukari 32(9%), and Gombe state University Library 28 (7.9%), Taraba State University Library and Yobe State University Library had 26(7.3%). Adamawa State University Library has 25(7%) of the respondents while Bauchi State University Library and Federal University Kashere tied at 22(6.2%) each. Federal University Library, Gashua came last with 13(3.7%) of the respondents.

Descriptive result according to respondents’ academic qualification in table 2 indicated that bachelor of Library and Information Science had the highest count with 203(57%), Master in Library Science came second with 103(29%). It was followed at a distance by Diploma in Library Science with 39(11%) respondents while PhD had 10(3%).

This indicates that the potential for embedded librarianship practice is more within the mid-level carrier in the field.

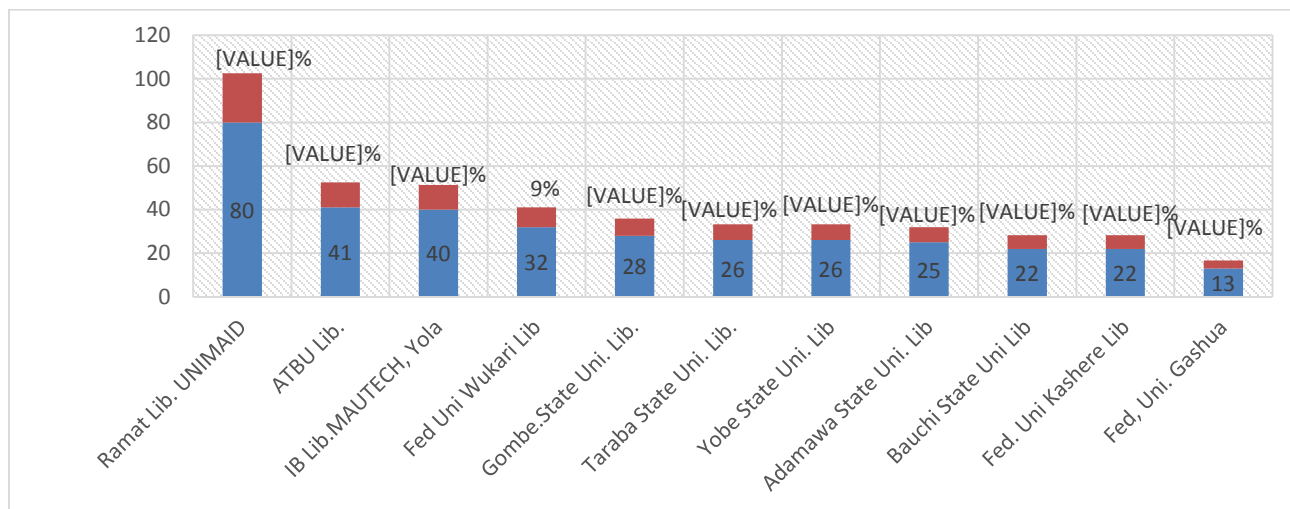


Fig.1 Respondents’ library

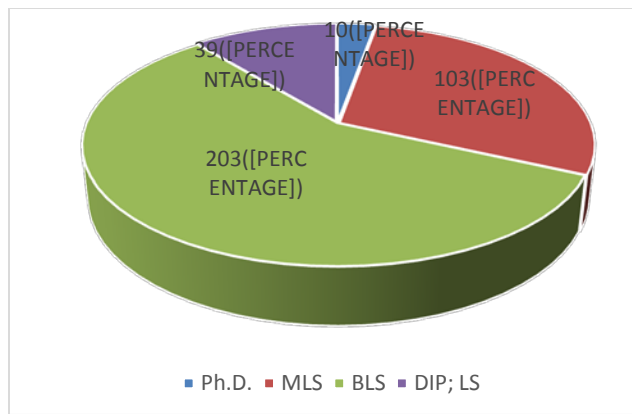


Fig.2 Respondents' academic qualification

VIII. DATA NORMALITY

First step in construct validation was the observation of factor cross-loadings for each variable, aim was to ensure that each item in the constructs measured what it was

intended to measure. the result in table 1 revealed that each factor is distinct from each other and had the potential to measure what it was intended to measure (Preacher & MacCallum, 2003; Mulaik, 2009).

TABLE I FACTOR LOADINGS

Items	Academic Engt.	Embedded Lib. Pract	Infor. Lit. Skill	LMS Use	Prof. Develop.
ACAENG1	0.823				
ACAENG2	0.792				
ACAENG3	0.683				
ACAENG4	0.765				
EMLP1		0.906			
EMLP2		0.813			
EMLP3		0.936			
EMLP4		0.922			
EMLP5		0.909			
ILS1			0.736		
ILS2			0.725		
ILS3			0.735		
ILS4			0.783		
LMSuse1				0.822	
LMSuse3				0.870	
LMSuse4				0.661	
LMSuse2				0.885	
PD1					0.834
PD2					0.831
PD3					0.811

IX. CONSTRUCT RELIABILITY AND DISCRIMINANT VALIDITY

Reliability and validity of the instrument was ascertained through a closer observation of the Cronbach’s alpha, rho_A, Composite reliability, Average Variance Extracted and the square root value for each variable.

Information in table 2 revealed scores between .767 and 940 for cronbach’s alpha. Rho_A scores exceeded the value of .7 according to Dijkstra and Henseler (2015a; 2015b), while

composite reliability showed acceptable values between .833 and 954. The average variance extracted (AVE) values exceeded .5 as recommended by Fornell and Larcker (1981), and Sahmer, Hanafi, & Qannari, (2006).

Discriminated validity of the data is ensured according to criteria by as each factor’s AVE is “higher than its squared correlations with all other factors in the model.” (Fornell & Larcker 1981; Sahmer, Hanafi, & Qannari, 2006).

TABLE II RELIABILITY AND VALIDITY

Constructs	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)	Acad. Eng.	Embedded Lib. Pract.	InfoLit Skill	LMS Use	Prof. Dev.
Acad. Eng.	0.768	0.784	0.851	0.589	0.767				
Embedded Lib. Pract.	0.940	0.948	0.954	0.807	0.357	0.898			
InfoLit Skill	0.733	0.735	0.833	0.555	0.32	0.317	0.745		
LMS Use	0.832	0.891	0.886	0.663	0.013	-0.055	0.119	0.814	
Prof. Dev.	0.767	0.772	0.865	0.681	0.614	0.351	0.315	0.018	0.825

X. MEASUREMENT MODEL

The model was measured to test the effect of the independent variables according to the objectives of this study. The measurement model was estimated with partial

least square structural equation modelling (PLS-SEM) version two. The result of the output is presented in figure 1.

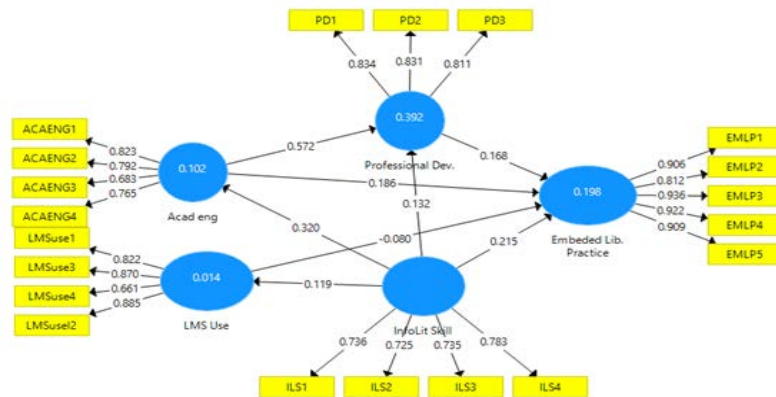


Fig.3 Measurement

Result in table one showed that librarians’ information literacy skill had positive effect on learning management use ($\beta=.12, p<0.05$), academic engagement, ($\beta=.32, p<0.001$), professional development ($\beta=.13, p<0.05$) and embedded librarianship practice, ($\beta=.22, p<0.05$). Librarians’ academic engagement has positive effect on embedded librarianship practice ($\beta=.19, p<0.05$) and professional development ($\beta=.57, p<0.001$). Librarians’ professional development pooled a positive effect on embedded librarianship practice ($\beta=.17, p<0.05$), while

learning management use failed to record a positive effect of embedded librarianship practice ($\beta=-0.080$).The combination of academic engagement, information literacy skill, professional development and learning management system use contributed 20% variance of embedded librarian practice. Information literacy skill contributed .014% of LMS use, 10% of academic engagement while it combined with academic engagement to contribute 39% variance in professional development.

XI. STRUCTURAL MODEL AND HYPOTHESIS TESTING

The path coefficient and the hypotheses in the study were identified in a structural model. The hypotheses which predicted positive and significant effect of the independent variables on the dependent variables was achieved through basic bootstrapping with 500 subsamples at 0.05 significant level with SmartPLS3 Algorithm. With the exception of the path between information literacy skill and learning management system use and embedded librarian practice and learning management system use which had $\beta=.12, t=1.809$, and $\beta=-.08, t=1.513$ effects respectively less than critical t values 1.96 threshold according to (Garson; 2016; Hair,

Hult, Ringle, & Sarstedt, 2017). On the other hand, Information literacy skill had positive and significant effect on academic engagement ($\beta=.32, t=5.725, p=0.000$), professional development ($\beta=.13, t=2.808, p=0.005$) and embedded librarian practice ($\beta=.22, t=3.773, p=0.000$). Professional development proved positive and significant effect on embedded librarian practice ($\beta=.17, t=2.853, p=0.006$). Also, other paths between academic engagement, professional development and embedded librarian practice indicated positive and significant effects at ($\beta=.57, t=9.989, p=0.000$ and $\beta=.19, t=2.959, p=0.003$). The bootstrapping output result is presented in figure 2 while summary of results are presented in table 5.

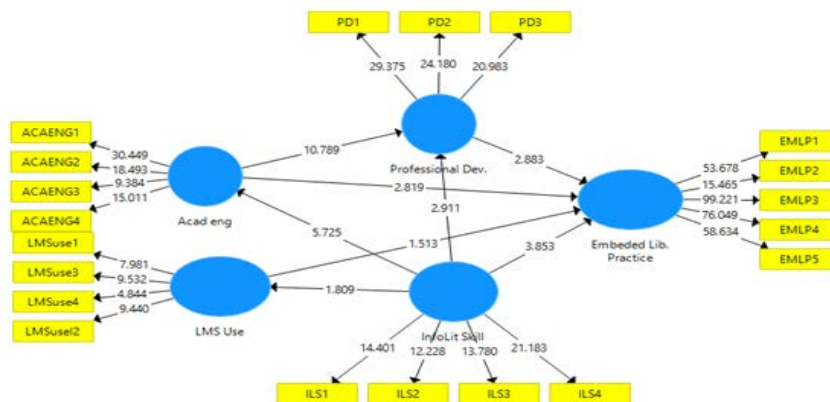


Fig.4 Structural model

XII. SUMMARY OF RESULTS AND DISCUSSION

Results in table 5 revealed that Ho1 and 2 which predicted positive and significant effect of librarians’ academic engagement on embedded librarian practice and professional development were accepted in this study. The librarians’ embedded status is measured on the bases of his roles in academic activities. Such as pedagogy, research collaboration, curriculum development etc. these have proved very useful in the librarians’ professional develop through its highest effects among other variables. This result is supported by Andrews, (2015) in a redefinition and exploration of best practices in embedded librarianship. It is further supported by Heider, (2010) on the strategies for implementation of successful embedded librarianship in Indiana University of Pennsylvania (IUP) Libraries.

Information literacy use by the librarians has proved to be a strong determinant of success of embedded librarian practice. It further revealed strong potential in enhancing other factors of embedded librarianship such as professional development and academic engagement and learning management use. The implication remains that ability to source, synthesise, evaluate and use which is the core of

information library have overriding positive impact on the practice of embedded librarian. It has been highlighted in studies such as (Helms, & Whitesell, 2013; Martzoukou, & Tramantza, 2014) that information literacy skill is useful for teaching, research, collaboration etc. Information literacy skill had positive effect on learning management system use, but the effect was not significant in this study. There is no supporting literature within the research setting, however, observed near absence of skill and availability of LMS infrastructure among the libraries cannot be unconnected to the issue. The hypotheses 3, 4 and 6 are therefore accepted while hypothesis 5 is rejected.

Professional development is predicted to have positive and significant effect on embedded librarian practice (Ho7). Professional development of the librarians is perceived to be one of the tonics for proactive embedded librarian practice. Literature have summed this up in activities such as ability to teach both in one offshoot IL classes to regular teaching in the department, research skill and publication, conferences, seminars. This finding has corroborated the study by Rowland & Knapp, (2015) which asserts that an embedded librarian should be embedded into research groups that function as a further way of contributing to “Engaged Scholarship”. The hypothesis was therefore

accepted with t value of $\beta=0.17$, $t=2.561$, $p<0.05$. It supported Wu Lin & MisaMi (2013) five model of librarian in which several competencies that are expected to sustain embedded librarianship were identified. These however can only be achieved through professional development of skills (Nagarkar & Murari, 2010).

Application of learning management system (LMS) by the librarians has been observed as important indicator of embedded librarianship. Studies such as (Burke

& Tumbleson, 2011; 2014; Paganelli & Paganelli, 2017). The ability to interact with users from remote area via LMS is seen as one successful step towards embedded librarianship. Notwithstanding, LMS has a positive effect but the effect was not significant on actual practice of embedded librarian in this study. There is not available literature that is connected to this finding in the study location; this cannot be unconnected to inadequate technology skill among the librarians, as well as dearth of facilities. Ho: 8 is therefore rejected.

TABLE III SUMMARY OF RESULTS

	Beta	T Statistics	P Values	Decision
Acadeng ->Embedded Lib. Prac.	0.186	2.959	0.003	Accepted
Acadeng -> Prof. Dev.	0.572	9.989	0.000	Accepted
InfoLit Skill ->Acadeng	0.32	5.268	0.000	Accepted
InfoLit Skill ->Embedded Lib. Pract.	0.215	3.773	0.000	Accepted
InfoLit Skill -> LMS Use	0.119	1.916	0.056	Not Accepted
InfoLit Skill -> Prof. Dev.	0.132	2.808	0.005	Accepted
LMS Use ->Embedded Lib. Pract.	-0.08	1.479	0.140	Not Accepted
Prof. Dev. ->Embedded Lib. Practice	0.168	2.853	0.006	Accepted

XIII. CONCLUSION

This empirical survey of the factors for practice of embedded librarianship among librarians in academic libraries in Northeast, Nigeria began by exposition of the term and trends in literature. Purview of the result indicates that practice of embedded librarianship is affected by the librarians' information literacy skill, academic engagement skills. Also, embedded librarianship activities involve certain level of professional development to enable successful practice, while ability to apply technologies such as learning management system has been earmarked as vital factor. Embedded librarian practice in the study area has bright prospect, however, the application of technology, such as learning management system need to be taken into consideration.

XIV. RECOMMENDATIONS

Based on the findings, this study recommends that:

1. The use of information communication technology should be encouraged in northeast academic libraries.
2. The need for librarians' training in the use of technology for teaching, learning and research very urgent as this a major reinforcement to information literacy skill.
3. Research with more factors are required to better reveal the larger percentage of variance of embedded librarian practice that is not predicted by the variables in this study.

REFERENCES

- [1] Almeida, N., & Pollack, J. (2017). In Bed with the Library: A Critical Exploration of Embedded Librarianship at the City University of New York. *Communications in Information Literacy*, 11(1), 122-146. doi:10.15760/comminfolit.2017.11.1.38
- [2] Andrews, C. R. (2014). An examination of embedded librarian ideas and practices: A critical bibliography. *Codex: Journal of the Louisiana Chapter of the ACRL*, 3(1), 69-87. Retrieved from <http://academicworks.CUNY.edu/> (12/08/2019)
- [3] Andrews, C. R. (2015). Embedded librarianship: Best practices explored and redefined. *The International Journal of Educational Organization and Leadership*, 22(2), 1-14. doi:10.18848/2329-1656/CGP/v22i02/48500
- [4] Anitha, B., Rehana, N. C., & Vijesh, P. V. (2017). From Traditional to the Futuristic: A Paradigm Shift towards Embedded Librarianship. *11th International CALIBER-2017 Anna University, Chennai, Tamil Nadu 02-04 August, 2017*
- [5] Association of College and Research Libraries. (2016). Appendix 1: Implementing the Framework. Framework for information literacy for higher education. Retrieved from <http://www.ala.org/acrl/standards/ilframework> (12/08/2019)
- [6] Auckland, M. (2012). Re-skilling for research: An investigation into the role and skills of subject and liaison librarians required to effectively support the evolving information needs of researchers. RLUK report. Available at <http://www.rluk.ac.uk>
- [7] Booth, C., Lowe, M., Tagge, N., & Stone, S. (2015). Degrees of impact: Analyzing the effects of progressive librarian course collaborations on student performance. *College & Research Libraries*, 76(5), 623-651. doi:10.5860/crl.76.5.623
- [8] Burgoyne, M. B., & Chuppa-Cornell, K. (2015). Beyond Embedded: Creating an Online-Learning Community Integrating Information Literacy and Composition Courses. *The Journal of Academic Librarianship*, 41(4), 416-421. doi:10.1016/j.acalib.2015.05.005
- [9] Burke, J.J. & Tumbleson, B.E. (2013). The Sustainability and Scalability of Embedded Librarian. In Daugherty and Russo (2013) eds., *Embedded Librarianship: What every Academic Librarian should know*. California Libraries Unlimited. P.163

- [10] Burke, J.J., & Tumbleson, B. (2011). A declaration of embeddedness: Instructional synergies and sustaining practices in LMS embedded librarianship. Paper presented at Association of College and Research Libraries meeting. Retrieved from <http://www.ala.org/>
- [11] Clyde, J., & Lee, J. (2011). Embedded reference to embedded librarianship: 6 years at the University of Calgary. *Journal of Library Administration*, 51(4), 389-402.
- [12] Covone, N., & Lamm, M. (2010). Just be there: campus, department, classroom... and kitchen? Public services quarterly, 6(2-3), 198-207. doi:10.1080/15228959.2010.498768.
- [13] Creamer S. (2013). Relationships and Ethics of Coteaching Research-Intensive Classes. In Daugherty and Russo (2013) eds., *Embedded Librarianship: What every Academic Librarian should know*. California Libraries Unlimited. P.41.
- [14] Dijkstra, T. K., & Henseler, J. (2015a). Consistent and asymptotically normal PLS estimators for linear structural equations. *Computational Statistics and Data Analysis*, 81(1), 10–23. doi:10.1016/j.csda.2014.07.008.
- [15] Dijkstra, T. K., & Henseler, J. (2015b). Consistent partial least squares path modelling. *MIS Quarterly*, 39(2), 297–316
- [16] Drewes, K., & Hoffman, N. (2010). Academic Embedded Librarianship: An Introduction. *Public Services Quarterly*, 6(2-3), 75-82. doi:10.1080/15228959.2010.498773
- [17] Fabrigar, L.R., Wegener, D.T., MacCallum, R.C., & Strahan, E.J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4, 272–299.
- [18] Finley, P., MacMillan, M., Skarl, S., Bowler, M., & Street, K. (2008). Investigating the efficacy of embedment: Experiments in information literacy integration. *Reference services review*. 36 (4), 438-449. doi: 10.1108/00907320810920397
- [19] Firmage, D. H., Tiegtenberg, T. H., & Cole, F. R. (2007). Research-based learning in an introductory environmental studies course. In K. K. Karukstis & T. E. Elgren (Eds.), *Developing and sustaining a research supportive curriculum: A compendium of successful practices* (pp. 87–101). Washington, DC: Council on Undergraduate Research.
- [20] Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. doi:10.2307/3151312.
- [21] Garson, G. D. (2014). *Partial least squares: Regression and structural equation models*. Asheboro, NC: Statistical Associates Publishers. 97
- [22] Hair, J. F., Hult, G.T.M., Ringle, C.M. & Sarstedt, M. (2017), *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) Second Edition*. Los Angeles: SAGE Publications, Inc. 168.
- [23] Hearn, M. R. (2005), Embedding a librarian in the classroom: an intensive information literacy model, *Reference Services Review*, 33(2), 219 – 227. doi: 10.1108/00907320510597426
- [24] Heider, K. L. (2010). Ten Tips for Implementing a Successful Embedded Librarian Program. *Public Services Quarterly* 6(2/3): 110–121. doi: 10.1080/15228959.2010.498765
- [25] Helms, M. M., & Whitesell, M. (2013). Transitioning to the embedded librarian model and improving the senior capstone business strategy course. *The Journal of Academic Librarianship*, 39(5), 401-413. doi:10.1016/j.acalib.2013.03.015
- [26] Henrich, K. J., & Attebury, R. I. (2012). Using Blackboard to Assess Course-Specific Asynchronous Library Instruction. *Internet Reference Services Quarterly*, 17(3-4), 167-179. doi:10.1080/10875301.2013.772930
- [27] Inuwa, S., & Abri zah, A. (2018). Embedded Librarianship in Research in Nigerian Universities: Practices and Sources of Practice Knowledge. *The Journal of Academic Librarianship*, 44(6), 738-746. doi:10.1016/j.acalib.2018.10.002
- [28] Jeffrey A. Knapp, Nicholas J. Rowland, Eric P. Charles, (2014), Retaining students by embedding librarians into undergraduate research experiences, *Reference Services Review*, 42(1), 129-147 doi:10.1108/RSR-02-2013-0012
- [29] Jeffrey A. Knapp, Nicholas J. Rowland, Eric P. Charles, (2014), Retaining students by embedding librarians into undergraduate research experiences, *Reference Services Review*, 42(1), 129-147 doi:10.1108/RSR-02-2013-0012
- [30] Kirkwood, H., & Evans, K. (2012). Embedded librarianship and virtual environments in entrepreneurship information literacy: A case study. *Journal of Business & Finance Librarianship*, 17(1), 106-116. doi:10.1080/08963568.2011.630583
- [31] Kvenild, C., Tumbleson, B. E., Burke, J. J., & Calkins, K. (2016). Embedded librarianship: questions and answers from librarians in the trenches. *Library Hi Tech News*, 33(2), 8-11. doi:10.1108/lhtn-11-2015-0078
- [32] Landry-Hyde, D., & Cantwell, L. P. (2013). Virtually yours: Online embedded librarianship in higher education. *Internet Learning*, 2(2), 22-37. <https://doi.org/10.18278/il.2.2.2>.
- [33] Li, S., Fangzhi, W., Qiqi, Q., Xiaozhe, Z., & Simin, W. (2013). The Success Factors of Embedded University Library Service in Teaching. *Library Journal*, 32(3), 50-54.
- [34] Lu, Bin, & Xiao-wei Zhang. (2012). Research of Library Embedded Services and Reference Service [in Chinese]. *Shanxi Library Journal* 133 (6): 35–37
- [35] Lysiak, L., Mross, E., & Raish, V. (2018). Across the campuses and around the globe: Reaching online learners through high-level embedded librarianship. *Journal of Library & Information Services in Distance Learning*, 12(1-2), 13-34. doi:10.1080/1533290x.2018.1502717
- [36] MacCallum, R.C. & Austin, J.T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology*, 51, 201–226
- [37] Madu, A. U., & Dawha, E. M. (2019). Analyses of Awareness, Perception and Attitude towards Embedded Librarianship among Librarians in North-Eastern Universities, Nigeria. *Asian Journal of Information Science and Technology*, 9(3), 37-43
- [38] Martzoukou, K., & Tramantza, E. (2014, October). Virtual Embedded Librarianship for Information Literacy Teaching. In European Conference on Information Literacy (pp. 446-455). Springer, Cham.
- [39] Mery, Y., Newby, J., & Peng, K. (2012). Why one-shot information literacy sessions are not the future of instruction: A case for online credit courses. *College & Research Libraries*, 73(4), 366-377. doi:10.5860/crl-271
- [40] Mulaik, S.A. (2009). *The foundations of factor analysis* (2nd ed.). Boca Raton, FL: Chapman & Hall.
- [41] Nagarkar, S., & Murari, D. (2010). Embedded Librarian : a new role for library and information professionals. In Proceedings of National Conference on Empowering library professionals in managing the digital resources and providing extension activities. St Agnes College, Mangalore.
- [42] O'Toole, E., Barham, R., & Monahan, J. (2016). The Impact of Physically Embedded Librarianship on Academic Departments. *portal: Libraries and the Academy*, 16(3), 529-556. doi:10.1353/pla.2016.0032
- [43] Paganelli, A., & Paganelli, A. (2017). The online embedded personal librarian approach to providing reference services via a course management system. *Journal of Electronic Resources Librarianship*, 29(1), 54-60. doi:10.1080/1941126X.2017.1270105
- [44] Phelps-Ward, R., Mulvihill, T., Jarrell, L. Habich, Y.B. (2015) Online Distance Education and Embedded Librarianship Integration. In Khosrow-Pour, M. *Encyclopaedia of Information Science and Technology*, Third Edition. Hershey PA: IGI Global, 2249
- [45] Preacher, K.J. & MacCallum, R.C. (2003). Repairing Tom Swift's electric factor analysis machine. *Understanding Statistics*, 2, 13–43.
- [46] Rowland, N.J., and Knapp, J.A., (2015), Engaged Scholarship and Embedded Librarianship. *Journal of Higher Education Outreach and Engagement*, 19(2), 15-33
- [47] Sahmer, K., Hanafi, M., & Qannari, M. (2006). Assessing unidimensionality within the PLS path modeling framework. In M. Spiliopoulou, R. Kruse, C. Borgelt, A. Nürnbergger, & W. Gaul (Eds.), *From data and information analysis to knowledge engineering* (222–229). Berlin: Springer

- [48] Saunders, H., & W. Taylor, R. (2014). The art and environment of embedded librarianship. *College & Undergraduate Libraries*, 21(2), 145-154. doi:10.1080/10691316.2014.906775
- [49] Sharma, P., Kamal Kumar, K. K., & Babbar, P. (2014). Embedded Librarianship: Librarian Faculty Collaboration. *DESIDOC Journal of Library & Information Technology*, 34(6), 455-460. doi:10.14429/djlit.34.6.
- [50] Shumaker, D. (2012). The Embedded Librarian: Innovative Strategies for Taking Knowledge where It's Needed. *Information Today*.
- [51] Si, L., Xing, W., Zhou, L., & Liu, S. (2012). Embedded services in Chinese academic libraries. *The Journal of Academic Librarianship*, 38(3), 175-182. doi:10.1016/j.acalib.2012.03.015.
- [52] Sun, H., Liu, Y., Wang, Z., & Zuo, W. (2019). Embedded librarianship in China: Based on a survey of university libraries. *The Library Quarterly*, 89(1), 53-66. doi:10.1086/700663
- [53] Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Boston, MA: Pearson.
- [54] Talwar, M. (2014). Embedded librarianship—new horizon of librarianship. *DESIDOC Journal of Library & Information Technology*, 34(6), 461-466. doi:10.14429/djlit.34.6.8043
- [55] Wu Lin & MisaMi (2013) Sustaining Librarian Vitality: Embedded Librarianship Model for Health Sciences Libraries, *Medical Reference Services Quarterly*, 32(3), 257-265, doi:10.1080/02763869.2013.806860