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Intellectual Property Policy as Factor Influencing Creation of Intellectual Property in Universities in South West, Nigeria

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Abstract

Universities in developed countries are benefitting more from Intellectual Property (IP) they create than those in developing countries especially Nigeria. There is also lack of, and adequate Intellectual Property Policy (IPP) in Nigerian universities. This study therefore, investigated the influence of IPP on creation of IP in universities in South-west, Nigeria. The s tudy adopted the descriptive survey design of the correlational type. Equal allocation sampling technique was used to select 864 (11.25%) from a population of 7,678 lecturers in the universities. Eight items were used to measure creation of IP and 15 were used to measure IPP. Reliability coefficient of creation of IP was 0.83 and IPP was 0.92. Percentage, mean, t test, correlation, multiple regression and analysis of variance were used to analyse the data at 0.05 level of significance. Findings revealed that creation of IP was high and significant. Intellectual property policy was also significant and it showed positive significant influence (r = .67) on creation of IP. Intellectual property policy (β = .78) made significant relative contribution to creation of IP in the universities. Therefore, creation of IP in universities in South-west, Nigeria can be enhanced if adequate intellectual property policy is available in the universities.

Keywords: **intellectual property, intellectual property policy, patent, copyright, universities, Nigeria**

Introduction

Creation of Intellectual Property (IP) in universities is a conscious effort that all lecturers should embrace. Lecturers can create intellectual materials that evolve into copyrights, patents, industrial designs, new plant varieties etc., in the course of their teaching and research. Orji (2009) asserts that the primary objective of a university lecturer is to get his or her work published to earn promotion but that popular slogan "publish or perish" has changed to "patent or perish" due to the importance of IP to lecturers today. This assertion is correct because publishing a journal article for the sake of promotion is not enough. Lecturers are expected to be innovative with new and current ideas that will enable them come up with intellectual materials that are patentable and copyrighted which industries can deploy into their production process. To achieve that, there should be adequate Intellectual Property Policy (IPP) in the universities.

Intellectual property policy is an instrument made to guide the creation, protection and effective management of IP. Intellectual property policy objective provides a framework within which the IP is developed, managed, and effectively harnessed for the overall benefit of the institutions, inventors, authors, and the general public. IP policy is an instrument for protecting IP, as well as facilitating optimal utilisation and dissemination of intellectual knowledge. IP policy should address seven basic issues: coverage of the policy, ownership, disclosure, marketing, commercialization and licensing of patents, distribution of income, rights and obligations of an inventor and the institution, and any other pertinent issues (WIPO, 2012). The value of IP policy is to ensure that the rights to IP are entrenched in the policy. Therefore, developing adequate and effective IP policy would have great implications on the creation of IP in Nigerian universities

Budgetary allocation to universities has drastically reduced due to the global economic recession. An alternative way of generating revenue internally is through IP creation as is the case in developed countries of the world. Despite the high number of qualified lecturers in universities in South-west, Nigeria, it appears that most intellectual creations and innovations developed by staff and students seem not to have been adequately harnessed, patented and commercialized. Available literature indicates that the level of IP creation in Nigerian universities is low. The IPP existing in most universities in South–west, Nigeria may not be supportive of IP creation. This study therefore, investigated the influence of IPP on creation of IP in universities in South-west, Nigeria.

Research questions

The following research questions were posed to guide the conduct of the study:

1. What are the types and level of IP created in universities in South-west, Nigeria?
2. What is the level of adequacy and coverage of IPP in universities in South-west, Nigeria?
3. What is the relative contribution of IPP to creation of IP in universities in South-west, Nigeria?

Hypotheses

Ho1: There is no significant influence of IP policy on creation of IP in universities in South west, Nigeria.

The study tested the null hypothesis at 0.05 level of significance

Scope of the study

This study covered universities in South-west, Nigeria and six cadres of the lecturers (from professor to assistant lecturers) in the selected universities. Seven IP: copyrights, performers' right, trademarks, patents, geographic indications, industrial design and trade secrets were the main focus of the study.

Literature Review

Intellectual property is a product of intellectual activities taking place in the universities and research institutions worldwide. Intellectual Property Office [IPO](2011) posits that the result of such activities include codified knowledge, research results, tacit knowledge, know-how, technology idea, publications and a huge range of copyright materials. Therefore, universities are the major producers of IP. Brown and Soderstrom (2007) reported that in the course of fulfilling university research and educational missions, faculty often create IP like patentable inventions, copyrightable works, and new products and services that can benefit society. Karytino and Ingham (2014) reported that there is a steady increase in patent filings by higher educational institutions over the last decade. Azmi (2014) posits that public universities and research institutes are instrumental in the creation of IP in Malaysia.

In Russia universities, Mingaleva and Mirskikh (2013) posit that IP are created by professors and lecturers during the educational process even without using the university's facilities or assistance. University of New England (2007) reported that IP created in the university include copyright, trademarks, registered designs, undisclosed inventions, patents, plant breeders' rights, trade secrets and know-how, semiconductor or circuit layouts, confidential information etc. In the Unites States of America, Mimura (2010) revealed that University of California, Berkeley was ranked seventh worldwide in biotechnology patenting. Al-Mubaraki and Busler (2012) also reported that Stanford University generated 8000 inventions between 1970 and 2010 and raked in $1.4billion from royalty in its IP technology transfer activities. In European Universities, Verspagen (2006) reported that patent is a source of finance for the universities while IPO (2011) revealed that universities in the UK generated 84 million pound in revenue from IP related activities in 2009-2010. In Africa, Kameri-Mbote (2005) reported that despite substantial investment in IP in Kenya, available statistics indicates that most intellectual property holders were foreigners and the IP developed in seeds and plant variety sectors were developed outside Kenya.

In an attempt to develop and protect IP created in different universities, IP policies have been developed by various universities. Intellectual Property Policy (IPP) according to IPO (2011) is a document that set the guidelines for the effective generation, management and commercialization of intellectual works and the policy is relevant to all categories of staff and students in the university community. The need for IP policies arouse from the conflict of interest of the various stakeholders involved in the generation, commercialization and distribution of income from IP sales. Today, universities in developed countries have entered many IP agreements with industries that need their research findings and inventions because they have IPP. However, this is not the case with universities in Asia and Africa as most of them are just entering the stage. WIPO (2004) posits that lack of IP policy is a major handicap in the effective transfer of technology and dissemination of research findings from universities in Africa as IPP is a prerequisite for the application of commercial activities related to innovation

and inventions, remove suspicion that may exist between the university administrations, researchers and industries.

In structuring IP policy for universities, IPO (2011) listed university's mission, ownership, ethical policies, conflict of interest, benefits and revenue sharing, awareness and communication, and monitoring policies as the key elements to the included in the policy. WIPO (2004) summarizes the policies of several universities in developed countries and came up with the following as the important aspects of the policies: an objective, coverage of the policy, ownership, disclosure, marketing, commercialization and licensing, income distribution, and rights and obligations of an inventor and the institution. They opined that these can be used as a model for African universities to develop their IP policies.

In the recent past, some African Universities have developed, amended or reviewed their existing IP policies to align with global best practices. For example, the University of Nairobi in 2013 amended its IPP. The new revised policy is aimed at making IP available to industry, recognition to individual inventors, and encouraging prompt and open dissemination of research results. It also repositioned the Intellectual Property Management Office (IPMO) to spearhead timely identification, protection, and commercialization of the university IP for the benefit of individual creators, university and society. Similarly, Mount Kenya University in 2012 developed their IPP in line with the objectives of Vision 2030 and the Millennium Development Goals aimed at creating awareness of IP rights, promote creativity and facilitate the development of a wide varieties of viable innovations for social and economic development such as patents, trademark and service mark, copyright and neighbouring rights, industrial design, utility models, new plant varieties, trade secrets and know how, industrial circuits or layout designs, geographic indications, tangible research property and genetic resources, traditional knowledge and folklore, domain names, etc.

In Nigeria, some universities have developed their IPP. For instance, University of Ibadan IPP was approved by the University's Senate on October, 16th 2012. It is perhaps the first of its kind by any university in Sub-Sahara Africa. The policy is an instrument for protecting IP; it facilitates optimal utilisation of intellectual knowledge generated from within and outside the country, harmonise conflicting interests of stakeholders relating to ownership of IP, distribution of income, commercialization, marketing, and licensing of patents and faculty, staff and students ownership of IP. At the Ahmadu Bello University (ABU), Article 3 of the University Research Policy, ABU (2010) dwells on IPP of the university. The policy defines ownership, commercialization, forms and patterns of association, encourage, promote, guarantee and preserve the rights and interest of staff and students of the university in facilitating research, productivity, discoveries, creativity and inventions geared towards the enhancement of the university, the nation and humanity in general. The policy protects inventions, copyrights, patents, and trademarks, promotes acquisition of knowledge, and provides incentives for creativities and inventions through rewards and other forms of recognitions.

All the universities may not have exactly the same IPP but they are expected to contain similar or basic elements common to all. This is because all the universities have different mandates, missions and business models. As business model of universities differ, their IPP will also differs in order to extract maximum benefits from their IP portfolios (IPO, 2011). Intellectual property policy will help universities to identify their intellectual materials, value and develop them into IP (Jain & Sharma, 2006). Therefore, IPP is very paramount in the creation of IP in universities in South-west, Nigeria.

Okamuro and Nishimura (2013) empirical investigation revealed that the Japan IP policy can enhance the creation of IP in their universities. Intellectual property policy formulation can help to create IP in most universities worldwide. Hoye (2006) reported that the result of empirical research in the US found that financial incentives that are governed by IP policies correlated with a variety of university-industry technology transfer outcomes. However a cross-institutional pattern in the number of patents held in Canadian universities using financial incentives and ownership control offered to faculty inventors by their university IP policies failed to yield statistically significant result. This implies that IP policy must fit with the organisational contexts in order to be productive.

Cambridge University (2016) IP policy revealed that the change from a "university-owns" to an "inventor-owns" policy appeared to have significantly and substantially increased the number of invention and disclosure submitted to the University of Toronto by its faculty staff thus indicating that university IP policies are effective levers with which to stimulate university-industry technology transfer. Lach and Schankerman (2007) using data from US universities to study incentives and inventions of patents found that universities that give higher royalty shares to faculty scientists in their IP policies generate greater license income, controlling for university size, academic quality, research funding and other factors. Azmi (2014) reported that their current IPP is responsible for creation of IP by academic institutions in Malaysia.

The foregoing review highlighted the importance of IPP on creation of IP in universities in developed countries. Therefore, investigating the relationship between IPP and creation of IP in universities in Nigeria South-west will fill the identified gap.

Methodology

The study adopted the descriptive research design of the correlational type. The population comprised of 11,759 lecturers in 36 federal, state and private universities in South-west, Nigeria. Equal allocation sampling method was adopted to select four universities from each of the three categories of universities amounting to 12 universities. Equal allocation sampling technique was further used to select 864 lecturers by cadre in the twelve selected universities amounting to 72 lecturers per university. The selected sample representing 11.3 % of the entire population would adequately represent the entire population of lecturers.

The questionnaire was the instruments for data collection. It consists of 73 questions arranged in five sections A – E. Section A dwelt on demographic information; section B on

creation of IP; section C centred on perception of IP while section D addressed IP policy. Section E covered management styles. The questionnaire adopted the four point likert scale technique for answering questions. Each degree of agreement or disagreement is given a numerical value from four to one (strongly agree (4), agree (3), disagree (2) and strongly disagree (1). For the weighted means to be significant, the decision rule was based on the mean being more than or up to 2.5. The questionnaire was assessed for face and content validity by five experts and pre-tested using 30 lecturers in McPherson University, Ajebe. The psychometric property of the questionnaire was assessed using the Cronbach Coefficient Alpha method. The reliability coefficient for the whole questionnaire was 0.87 alpha while the values obtained for Section B, creation of IP was 0.83 alpha; Section C, perception of IP was 0.79 alpha; Section D, IP policy was 0.92 alpha; and Section E, management styles was 0.91. These results are considered adequate for the study as they are above the acceptable value. Simple percentage, mean, t-test, multiple regression and analysis of variance were used to analyse the data using SPSS 17.0 at 0.05 level of significance.

Findings and discussion

Research question 1: What are the types and level of IP created in universities in South-west, Nigeria?

The lecturers were asked to indicate the kind and level of IP they create in their universities.

Table 1: Intellectual property created in universities in South-west, Nigeria

Items	SD	D	A	SA	$\bar{x}$	Std	Remark
Copyright	34(4.3%)	265(33.2%)	364(45.7%)	134(16.8%)	2.75	0.78	Agreed
Performers' rights	4(0.5%)	292(36.6%)	418(52.4%)	83(10.4%)	2.73	0.65	Agreed
Trademarks	10(1.3%)	332(41.7%)	386(48.4%)	69(8.7%)	2.64	0.65	Agreed
Patents	12(1.5%)	271(34.0%)	418(52.4%)	96(12.0%)	2.75	0.68	Agreed
Geographic indications	18(2.3%)	323(40.5%)	329(41.3%)	127(15.9%)	2.71	0.76	Agreed
Industrial Design	20(2.5%)	342(42.9%)	310(38.9%)	125(15.7%)	2.38	0.76	Disagreed
Trade secrets	26(3.3%)	263(33.0%)	384(48.2%)	124(15.6%)	2.46	0.75	Disagreed
	18(2.2%)	**298(37.4%)**	**373(46.8%)**	**108(13.6%)**			
Overall Mean = 18.42; Weighted Mean = 2.63; Criterion Mean = 2.50; N=797							**Significant**

SD-Strongly disagree, D-Disagree, A-Agree, SA-Strongly Agree

Results presented in Table 1 above revealed that majority of the respondents indicated that copyrights ($\bar{x}$=2.75> 2.50); patents ($\bar{x}$=2.75> 2.50); performers' rights ($\bar{x}$=2.73> 2.50), geographical indications ($\bar{x}$=2.71> 2.50) and trademarks ($\bar{x}$=2.64> 2.50) were IP created in the universities. Creation of industrial design ($\bar{x}$=2.39< 2.50) and trade secrets ($\bar{x}$=2.46< 2.50) were

not significant in the institutions. Overall, creation of IP in universities in South-west Nigeria had a weighted mean of 2.63 indicating that it was significant. The result also revealed that (60.4%) actually create IP in the universities. This result is very encouraging noting the level of research capacities obtainable in Nigerian universities. Mingaleva and Mirskikh (2013) obtained similar result at Perm State National Researches University (PSNRU) and Perm National Researches Polytechnic University (PNRPU) in Russia where more than 90% of professors and lecturers of both universities create IP while working at the universities. University of New England (2007) also reported the creation of copyright, trademarks, registered designs, undisclosed inventions, patents, plant breeders' rights, trade secrets etc. in the university

Research question 2: What is the level of adequacy and coverage of IP policies in universities in South-west, Nigeria?

Assessing adequacy and coverage of IP policy in universities in South-west, Nigeria, the lecturers were asked to answer 15 questions.

Table 2: Adequacy and coverage of IP policy of universities in the South-west, Nigeria

Items	SD	D	A	SA	$\bar{x}$	Std	Remark
University has adequate IP policy	45(5.6%)	308(38.6%)	187(23.5%)	257(32.2%)	2.82	0.95	Agree
I am aware of the university's IP policy	29(3.6%)	223(28.0%)	255(32.0%)	290(36.4%)	3.01	0.89	Agree
University IP policy is always available	155(19.4%)	341(42.8%)	187(23.5%)	114(14.3%)	2.33	0.95	Disagree
University IP policy is always accessible	45(5.6%)	245(30.7%)	256(32.1%)	251(31.5%)	2.19	0.92	Disagree
Ownership,	127(15.9%)	333(41.9%)	280(35.1%)	57(7.2%)	2.34	0.83	Disagree
Disclosure	103(12.9%)	263(33.0%)	228(28.6%)	203(25.5%)	2.67	1.00	Agree
Marketing	231(29.0%)	276(34.6%)	261(32.7%)	29(3.6%)	2.17	0.88	Disagree
Commercialisation	127(15.9%)	297(37.3%)	186(23.3%)	187(23.5%)	2.14	1.02	Disagree
Licensing	28(3.5%)	364(45.7%)	257(32.2%)	148(18.6%)	2.66	0.82	Agree
Revenue & profit	123(15.4%)	284(35.6%)	187(23.5%)	203(25.5%)	2.29	1.03	Disagree
Right/obligation of inventor	180(22.6%)	227(28.5%)	186(23.3%)	204(25.6%)	2.52	1.10	Agree

Infringement & legal issues	103(12.9 %)	252(31.6 %)	210(26.3%)	232(29.1 %)	2.72	1.02	Agree
Ethics/conflict of interest	-	284(35.6 %)	358(44.9%)	155(19.4 %)	2.84	0.72	Agree
Monitoring,	-	167(21.0 %)	285(35.8%)	215(27.0 %)	2.39	0.99	Disagree
Coverage	52(6.5%)	216(27.1 %)	325(40.8%)	204(25.6 %)	2.85	0.88	Agreed
	99(12.4 %)	**272(34.1 %)**	**243(30.5 %)**	**183(23%)**			
Overall Mean = 37.95; Weighted Mean = 2.53; Criterion Mean = 2.50; N=797							**Significa nt**

NB: With the use of a 4-point Likert scale type, the expected average (mean) response per item should be 2.50 (either in favour or disfavor of what is being measured).

Result tabulated in Table 2 above revealed that 53.5% of the respondents indicated that the university has adequate IP policy ($\bar{x}$=2.82 > 2.50) and that they are aware of the university's IP policy ($\bar{x}$=3.01> 2.50). The result also indicated that coverage of the IP policy was equally significant ($\bar{x}$=2.53< 2.50). However, the respondents disagree that the university's IP policies were readily available ($\bar{x}$=2.33< 2.50) and accessible ($\bar{x}$=2.19 < 2.50). Most of the respondents also dissented that the university policy adequately covered ownership ($\bar{x}$=2.34< 2.50), marketing ($\bar{x}$=2.17< 2.50), commercialization, ($\bar{x}$=2.14< 2.50), revenue and profit ($\bar{x}$=2.29< 2.50) as well as monitoring ($\bar{x}$=2.39< 2.50). The shortcomings indentified in this study should be of great concern to the management of the universities to address if IP are to be adequately created. This finding falls short of WIPO (2012) recommendation that IP policy should adequately address seven basic issues of coverage of IPP, ownership, disclosure, marketing, commercialization, licensing, and distribution of income as well as rights and obligations. Similarly, Okamuro and Nishimura (2013) found that universities IP policy that is equitable in sharing revenue and royalty from innovation and applied flexibly contribute to improving project performance thus the creation of IP in universities in Japan.

Research question 3: What is the relative contribution of intellectual property policy to creation of IP in universities in South-west, Nigeria?

Table 3: Relative contributions of perception, policy and management styles to the creation of IP in universities in South-west, Nigeria

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
		B	Std. Error	Beta			Remark
1	(Constant)	33.857	3.197		10.591	.000	
	Lecturer _perception	0.456	.055	.004	4.090	.030	Significant
	IP_policy	0.782	.033	.007	7.189	.000	Significant
	Management Style	0.675	.028	.053	6.380	.020	Significant
a. Dependent Variable: IP_creation							

Result of the relative contribution of IPP to creation of IP in universities in South West, Nigeria presented in Table 3 above showed that IPP: B=-0.782, t=-7.189, p=0.00<0.05 contributed significantly to creation of IP in universities in South-west, Nigeria. The result showed a variance of 78.2 percent. The result indicated that IPP contributed 78% to creation of IP in universities in south-west, Nigeria. In other words, IPP in the universities are catalyst for creation of IP in the universities. This result is supported by Malva, Lissoni and Llerena (2013) that after the innovation Act of 1999 in French University, creation of IP in the universities was enhanced. Zhang, Liu and Jin (2016) obtained similar result that IPP in China contributed to an increase in IP creation through their Intellectual Property Demonstration Programme (IPDC).

Hypothesis 1: There is no significant influence of policy on creation of IP in universities in South-west, Nigeria

Table 4: Relationship between policy and creation of IP in universities in South-west, Nigeria

Variables	N	Mean	Std.	r-cal	df	Sig. P	Remark
Creation of IP	797	37.96	5.35				
				0.67	796	0.00	Significant
IP Policy	797	29.80	5.98				

Table 4 above presents results of the data showing influence of IP policy on creation of IP in South-west universities in Nigeria. The table revealed that r calculated of 0.67 is significant at 5% (p<0.05). The results also revealed that there is a positive and significant relationship between IP policy and creation of IP in South-west universities. The null hypothesis is therefore rejected. This result therefore implies that IP policy significantly influence creation of IP in universities in South-west, Nigeria. Okamuro and Nishimura (2013) obtained similar finding that Japan IP policy enhances the creation of IP in their universities. Similarly, Azmi (2014)

suggested that the current IPP will continue to play a big role in churning intellectual property by academic institutions in Malaysia. In Spain, Gonzalez-Pernia, Kuechia and Pena-Legazkue (2013) also indicated that universities with clearly established rules and policies for creating academic startup and with higher patenting records are more likely to obtain better IP and university technology transfer results. On the contrary, Mingaleva and Mirskikh (2013) revealed that IP policy in Russia universities do not protect their intellectual creations. Consequently, scientists and researchers who work at the universities prefer not to take out patents for inventions through the university instead they use their individual commercial outfit.

Conclusion

This study investigated the influence of intellectual property policy on creation of intellectual property in universities in South-west, Nigeria. It is evident from the results of this study that creation of intellectual property was high and intellectual property policy positively influenced creation of IP in the universities. It is therefore important that management in universities in South-west, Nigeria should make adequate intellectual property policy, make them available and accessible to all stakeholders, if maximum creation of intellectual property is to be achieved.

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