Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

CONTENTIOUS ISSUES IN SPONSORED RESEARCH IN UNIVERSITY-INDUSTRY PARTNERSHIPS

O. Akaranta [1] and C. M. Uche [2]

[1]*onyewuchi.akaranta@uniport.edu.ng*
Science Institute
University of Port Harcourt

[2]*chineze.uche@uniport.edu.ng*
Department of Educational Management
University of Port-Harcourt

Received: 16-12-15
Accepted:28-01-16

ABSTRACT

In the face of growing recognition of the importance and complexity of relations between universities and the private sector there is increasing need for guidelines to back such relationships. University-industry partnerships are beneficial to both parties but require clear understanding of fundamental university policies and procedures and of the complimentary but differing goals of the university and industry. Sponsored research activities can provide faculty members with experience and knowledge valuable to teaching and research and also help students gain educational opportunities and experience. Such activities also facilitate the transfer of technology to improve the well-being and productivity of society and offer research opportunities through which a faculty member can make a contribution to knowledge. As important and beneficial as sponsored research is in a globalized knowledge economy, university-industry partnership is burdened with some contentious issues (university, researchers and sponsors) from all parties. These issues may be peculiar to a particular situation and time but need to be identified and handled through careful planning, management and administration. Therefore quality data is required to provide a basis for legislation, policy and programs. Other issues that need to be addressed are moral and ethical matters, ownership of research results (patent), researchers' right, publication of research results and conflict between teaching and research. This study is a descriptive survey designed to identify and proffer solutions to the contentious issues in sponsored research. Interviews and document analysis are instruments used to gather information from the parties involved in the sponsored research activities. Based on the findings appropriate recommendations are made to minimize if possible remove contentious issues completely. The study will be useful to both faculty, researchers, university administrators who work closely with the industry as well as the industry which need to improve its products and services through quality research.

Key words: Sponsored research; contentious issues; University-Industry Partnership

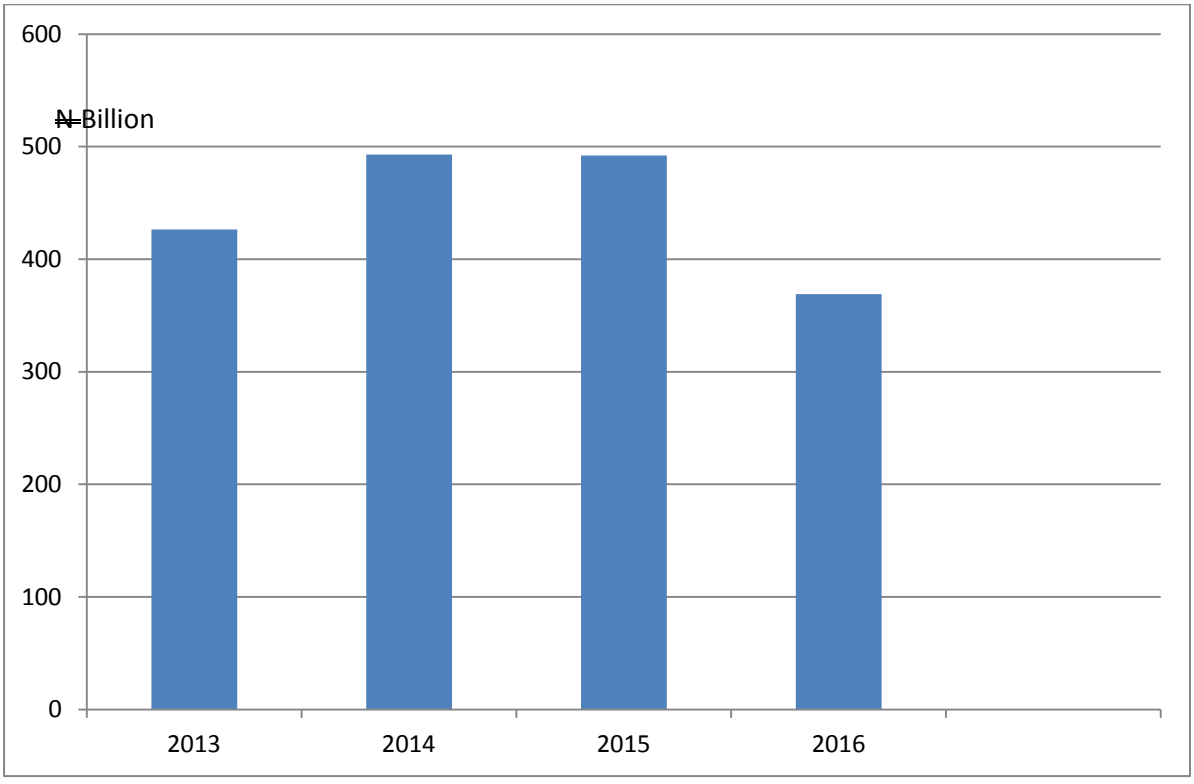
INTRODUCTION

The university system is the third tier or tertiary level of formal education in Nigeria, and many nations of the world. In Nigeria the public university system is funded exclusively through the government subvention. Teaching and research are the cardinal functions of the university system.

There is an over dependency on government subvention. Government subvention as used here denotes ways and means of obtaining resources in cash and kind that are necessary for the performance of the cardinal functions of the university. The funding of university system both in the area of research and other university activities require different strategies for improving university funding in Nigeria. For instance the studies on alternative strategies for university funding identify increasing school fees, endowment/donations and business ventures as the most viable strategies (Gravenir (1982:446; Nnabuo & Uche 1998).

The escalating cost of education has ignited the need for diversification of the funding base of the university system. Many universities have introduced students' fees with increasing formula at all levels. But critics on school fees (Gravenir 1982 and Strosnider 1997) warn that increasing school fees as a way of raising fund in institutions may lead to decrease in enrollment and may reduce the course offerings.

In Nigeria, endowment and donations from government and private bodies, which have always had a place in the history of financing universities, have been very scanty in recent years (fig 1). This is due to poor economic conditions in the country. Since people are encouraged to donate when there is boost in their business, the present economic setbacks in the country have really dampened the spirit of giving in the potential donors.



Source: Omole (2016). Fig.1 showing budgetary allocation to education in Nigeria

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

Business ventures with a view of generating fund have been identified in the face of the present financial crisis. Such viable business activities include but not limited to: printing press, laundry, catering services, running shop centers – and petrol stations. By investing in these business ventures in which universities spend heavily annually, they cut down expenses and generate income from them. The limitation of these business ventures is where the money generated is not managed well and in most cases it can be embezzled by few individuals, causing the university to operate at a loss. Generally, people who object to the idea of seeking fund from outside are of the opinion that fund raising using these strategies should not be part of educational institutions' preoccupation (Jack in Strosnider (1997). Rather, teaching, research and dissemination of knowledge should be their preoccupation.

The Concept of Sponsored Research in the University System

In the face of the present poor economic condition, governments all over the world are cutting back on their levels of funding their universities. Consequently, many universities have found themselves in a desperate search for ways to either make savings in their budgets, or to increase their funding from other sources. One proposal widely canvassed and has received considerable popularity globally, especially in the developed countries, is for universities to capitalize on the skills and expertise of their academic staff and market them to the outside community. The proposal has been given a number of names by different authors, such as "Collaborative Research" (Campbell, 1997; Rejean & Landry, 1996); or "Contract/sponsored Research", (Crawshaw, 1985; & Odegard, 1989). However the concept is the same, no matter the term used.

According to Etzkowitz (1983), the idea of sponsored research may be traced back to nearly two hundred years before the beginning of the nineteenth century when Chemists at some German universities began to undertake private work and established their own companies to market their inventions. Crawshaw (1985) reveals that, with varying degrees of popularity, the concept has existed ever since in Britain, America and other developed countries. However, the renewed interest is a direct result of government cuts in the funding of the tertiary education sector and research. Bach and Thornton (1983) argue that the decline in funding of medical research in the United States by the National Institute of Health (NIH) made it inevitable for universities to look to the private sector as a source of research funding, "especially for biomedical research which has considerable potential for commercial applications". Heagerty (1997) in his commentary on industry-sponsored research indicates that the dwindling government research support has necessitated the universities in the UK to seek partnership with the industry for commercial consideration. He is optimistic that if this is "carefully nurtured, university & sponsors may develop a successful symbiotic relation" which will help to augment the research activities and enhance other aspects of university development. Blumenstyk (1996) also reports that in Arizona, government has formulated a new policy to encourage companies to put money into university research through contracts. Under the new policy, companies that sponsor research and pay the universities' related costs for salaries, equipment, and other overhead can easily

own the inventions and patents that might result. This differs from higher education's approach in which universities own their research results and patents and charge fees for the rights to use the findings for commercial products. Astrom and Fryklund (1996) believe that this is because the costs in sponsored research cover all these. The Swedish government also makes frantic effort to support the university-industry collaboration in order to generate more funds for the university research activities. Research findings reveal that university/industry partnership has also gained ground in Nigerian university system though not fully supported by the government (Agabi & Uche 2004; Uche (2010); Uche (2011).

Generally, a concern of many governments in the 1980s has been to shift some of the financial burden of higher education away from the public purse. Williams (1990) reporting on higher educational development programme, observed similar developments in many Western European countries. According to Williams (1990) "the first and most widespread motivation is the hope that the private sector can be a source of supplementary funding and thus relieve governments of some of the cost burden". Apart from raising fund for university research, most of these government initiatives are to encourage university-industry partnership aimed at accelerating development of new technologies and their adoption by industries. Thus, many writers and researchers (Dike, 1985; Abacha, 1996; Alele-Williams, 1991; Amiche, 1997 and Enaohwo, 1980; Tornatzeky, 1990; Tither, 1990; Webster, 1992) have called upon the universities to "engage in research themes with foreseeable commercial exploitability in order to attract a sponsorship of such research by the industries".

Despite the current popularity of the concept of sponsored research, there has been little debate on the issues involved. A flurry discussion occurred in 1982/83 when Hoechest, the giant West German chemical company, signed a US $23.5 million 5-year deal with Washington University. The sheer size of these deals, attracted interest and comment. Culliton (1982) and Tatel and Guthrie (1983) from their investigation raise issues that mainly concerned the academic freedom to publish research results and the ownership of patents deriving from researches funded by outside bodies. Etzkonitz (1983) reveals that these issues attracted public debates by the United States Congress, as far back as 1982. In Britain, the debate over sponsored research has arisen from time to time. But according to Reid, (1983); and Jobbins, (1985) the main issues have been the quality of research "because it is tied to a timetable and the career prospects of the contract researchers".

Definitely, academic and business are unlike partners. The two kinds of organization as observed by Powers et al (1988:3), to "differ in fundamental ways that, at first glance, seem to preclude, or certainly hinder cooperation". One key difference lies in their attitudes towards discovery of knowledge. Traditionally, university system has sought knowledge as an end in itself, whereas business has operated under the profit motive. Powers et al (1988:3) show that an implication of this difference is: "Whereas many academics have preferred basic to applied research and are inclined to publish results, business people have valued product-oriented research and are not

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

inclined to make research results public – until the benefits of seeking patents outweigh the risks of disclosures that accompany the filing of patent application".

Brown (1985) points out that many university's researches are characterized as long-range programmatic effort. But American industry has, during the past few decades, focused on relatively short-range research objectives, closely related to current product lines and foreseeable strategic variables such as raw materials availability and energy costs. However, Brown opines that there is an emerging recognition that, to maintain technological superiority in the long run, it is essential to make substantial investment in the basic research that will support the 'next generation' technology. It is indeed perhaps this factor more than any other that will provide the rationale for more extensive industrial sponsorship of university research that is of great benefit to the university, industry and the entire society.

Heagerty (1997) strongly believes that contract research has become a reality in the university system. He reveals that as far back as 1954, the tobacco manufacturers gave the Medical Research Council in UK (£250 000) (two hundred and fifty thousand pounds) for research and later sponsored health-education campaigns. But with the shift of emphasis from public to commercial funding, Heagerty expresses some concerns that industrial interest linked to profit creation may not lead to 'balanced development'. Inevitably, it is difficult to reconcile the independent research aspirations of a department with the focused needs of a commercial sponsor, system with the attendant drive towards exploitable ideas and the products of research incubators. Research proposals without relevance and commercial viability are disadvantaged or discouraged (Heagerty, 1997). Thus, sponsored research (partnership between universities and industry), has come to stay (though not without limitations) and its awareness is spreading fast. To this effect Blumenthal and co-workers, (1996) from Boston collected data by telephone from senior executives of a number of American companies in the fields of agriculture, chemicals and pharmaceuticals. The result shows that 90% of the companies surveyed had life-science links with universities, 59% supported research providing around US $1.5 billion or 12% of all research and development received in the year examined. Agreement with universities tended to be short-term and to involve small amounts, suggesting that most were for contract research. Over 60% of companies providing research support had received patents, products and sales as a result of interactions with universities.

Sponsored research, is therefore the most plausible alternative to generating fund for the university system that is within their area of preoccupation. Business partnership with industry, government and other private organizations would definitely augment the fund-raising efforts and enhance facilities to the universities through research activities. Again Amiche, (1997; Okorie and Uche, 2004; Peters and Fusfeld, 1983 and Peter, 1990) stress that such partnerships with industry in consultancy services encourage entrepreneurial discovery and alleviate research budget constraints. Another advantage of sponsored research that makes it more viable than any other alternative strategy for fund-raising in universities is the mutual benefits derived from it. Other strategies subject the universities to begging

and succumbing conditions before donations are given and having to spend a lot of money in advert and publicity to draw public and private attention and help on their problems and needs, thereby leading to over-dependence on donors. But sponsored research creates a mutual interest and understanding to both the sponsors of the research and the university. The university in this case is being paid for the service it is rendering and the industry is paying for services it is receiving in agreement with the terms of the contract on sponsorship and research activities. Furthermore, such research furthers the educational scholarship and research objective of the university as a non-profit educational institution. The industries on the other hand have their products improved upon and production of new ones are embarked upon. With the improvement of commercialization of university research activities, university programs and research proposals will begin to match with the needs of the society and the industrial sectors. This type of research, therefore, benefits both the sponsor and the university through the creation or discovery of new inventions and their utilization.

Above all, the equipment, laboratory animals/tools or any other materials made or acquired with the funds provided under the agreement of sponsored research are vested to the university and such equipment and materials remain the property of the university at the completion of the contract. This will help the improvement of research facilities and lead to the development of the entire university system.

Theoretically Pfeffer and Salancik (1978) propagated the Concept of Interdependency **(**a social exchange theory) to guide the mutual relationships and agreement of both of individual and organizations. "Interdependency is a situation in which another has the discretion (power) to take actions which affect the focal organization's (or person's) interests". Similarly, Kelly (1991: 199) states that "university/industry relationship involves a social exchange relationship between the two organizations, in which the power of each relation to the other determines the outcome of the exchange". Thus, in sponsored research, the relationship of the university and the client (industry or government agents) is based on the ability of each party to exercise its power to mutual interest and benefit of the other party. Based on this, sponsored research in the university system involves 3 groups of people: (1) research coordinators, (university research administrators), (2) university research scholars (lecturers) and (3) clients who may be the industry, government agent or any other organization sponsoring research. In this case, the interdependency (mutual) relationship is in two facets; (1) relationship between the university research administrators and the client and (2) relationship between the university research administrators and the university academics.

Thus for work on sponsored research to commence, continue normally on the contracted research, (a) there must be a properly written and signed contract agreement between the sponsor or client, the university and the lecturers; (b) the research should be of mutual interest to both the client and the university; (c) the research should further the educational scholarship and research objectives of the university as a non-profit educational institution; (d) the research should benefit both the client and the university.

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

This relation can be explained with a tri-dimensional model (as a tripod)

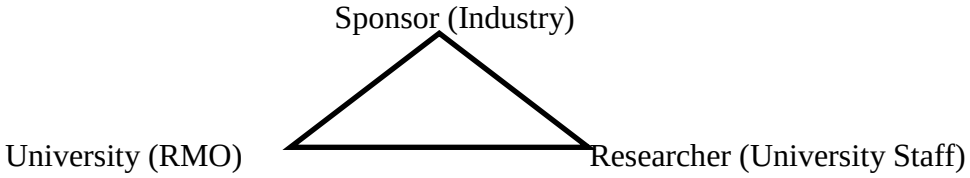


Fig. 1. *Fig 1: A Tripod (Triple Helix) model of University/Industry Partnership. (For a sponsored research to run smoothly, there should be mutual cooperation and understanding between the entities at the three legs of the tripod).*

The model in fig. 1 indicates that sponsored research cannot work unless there is mutual co-operation and understanding between the three groups involved; the university, the university academics and the clients. The contract is signed between the university and the client quite well, but it is the university scholars who carry out the research. If the academics involved in the contract research are not committed and cannot perform their role to the expectation of the client, there will be a loss of interest by the client and the university may not be able to win their confidence and patronage in another business. This seemingly failure to perform will also affect the psychological and scholarly standard of both the academics and the university and even the product of the client, where the client uses wrong result to take a decision. Also, if the universities do not consider the interest of the academics when sharing the benefits of the sponsored research, they will feel cheated. This will affect their performance in the subsequent research.

Again if the client fails to make payment when the job is completed or decides to give the already assigned contract to another university without the prior consent of the former, the breach of agreement may lead to legal action which costs money too. Thus, the law of interdependency on which the present paper is based, demands the three parties involved in sponsored research to use their discretion and their best ability to work in order to meet each other's interests and expectations.

The Contentious Issues in Sponsored Research

All the benefits of sponsored research notwithstanding, there are some costs which are at times unavoidable part of the contract and agreements. Some of these contentions may be alleviated by careful planning, management and administration. Some are peculiar to particular situations or times. Nevertheless, they all need to be carefully considered before a university, department or individual rushes into the agreement on sponsored research activities.

Crawshaw (1985) enumerated some of the commonest contentious issues that can emanate from sponsored research and these include: (1) Moral and Ethical Problems; (2) Legal Liability and Responsibility; (3) Problem of Ownership of Research Results; (4) Infringement of Staff Rights; (5) Status of Contract Researchers; (6) Publications; (7) Authority, Responsibility and Social Justice; (8) Conflict between Teaching and Research Activities.

Moral and Ethical Issues

Traditionally, there are ethical aspects involved in a university entering the market

place which have to be carefully considered. Academics view such approach as deploring the loss of pure research and academic freedom. They contend that research which has been paid for by the market place is, by definition, biased research. The Science and Technology Committee of United States Congress held hearing in 1982 to determine whether academic-industry relationships are compromising the scholarly independence of university scientists.

According to Totel and Guthrie (1983), the Massachusetts General Hospital agreement sparked further hearings to examine the potential impact the agreement might have on academic traditions such as open publication of research. Most academic-industry relationships in United States now specifically include the rights of academics to publish the research results, although it is usual to delay publication for a limited period to permit the filing of patent application.

Totel and Guthrie (1983) are also concerned that sponsored research will distort university programs under the influence of the profit motive. Traditionally, universities have undertaken basic research but critics of sponsored research, like Amiche (1997), argue that pressure may be brought to bear for staff to do work of more commercial importance and that university researchers may go beyond basic research to the development of products.

From Crawshaw's experience in Australian universities in contract research departments, there is a strong skewing towards research and researchers concerned with short-term practical problem. The problem is that little research gets done on purely theoretical work, and few contract researchers take a long-term view of problems, or analyze their work at a deep theoretical level. Clients do not like long-term projects, but rather want quick results to immediate problems. Another moral problem pointed out by Crawshaw (1985), concerns the types of research undertaken and the clients who are accepted. Many clients are attracted to a university based contract research organization because they want the prestige of university attached to the research findings to make them more prestigious. Thus it is often the research abilities, which is being sold. For example, often it is assumed that non-profit, charitable organizations would always be acceptable clients, but this ignores the fact they want the "right" result from research just as much as any capitalist industrialist, and thus may be no more or less acceptable as clients to a university which wishes to maintain its good name.

Legal Liability and Responsibility

A major problem of sponsored research is that of legal responsibility. The answers to such questions asked by Crawshaw are farfetched:

What are the rights of a client if work is not completed to his satisfaction? Who is liable for work not done or badly done? Who is the legal responsibility to ensure that all the conditions of the research contracts are fulfilled? Who even has the right to sign a research contract? In effect, when things go wrong, who can be sued?

And because universities are such obvious juicy targets, the possibility of legal action is always there (Tatel & Guthrie, 1983). Normally some of these problems may be avoided with advice from a good solicitor with knowledge of company and civil law. But then the nature of the university system

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

makes this difficult. For example, in the normal university research situation one's research is judged by one's peers, thus ensuring that one's research is up to an acceptable standard and thereby safe-guarding one's reputation. If one does work as a private individual, then of course one is personally liable for any failures or shoddy work. "But in a sponsored research situation, how does one ensure that one's work is up to an acceptable standard, when the standard is set by a budget, a contract, and a client who is more often than not naïve about the way research is conducted?" Crawshaw (1985) wonders.

As stated earlier, the university's solicitor usually checks the contract when such legal problems arise. But contracts for consultant research pose special difficulties. As Odegard (1989) explains, research, by its nature, means results unknown. Thus "how can one write into a contract what shall or shall not be found? How does one provide legal coverage for the blind alleys, failure of theory, or unanticipated results, which are the very nature of research? A client pays money for results, results which he cannot guarantee. Who is to determine whether the client got value for money? Is the researcher personally liable for faulty research, or the department, or the university? Who is responsible for incorrect predictions bought from a university-based sponsored research organization?" Obviously if the research money went directly to the researcher, then he would be personally responsible for the quality of the research, but if his research is just part of his paid employment, then that makes the university responsible for the quality of the research sold to client. This leads to the problem of ownership of research results.

Issue of Ownership of Research Results

Several authors, (Bach and Thornton, 1983; Culliton, 1982a; Ruscio, 1984; Sadlack, 1992 1982b; 1982c; Etzkowitz, 1983; Shills, 1992), have shown concern for the problem of ownership of the results of research conducted under contract. Though most universities refuse to accept conditions of confidentiality being written into research contract, some clients try to prevent researchers either from publishing the research results or from using the results of one piece of research to undertake further research. To expatiate on this point Crawshaw (1985: 165-166) writes: "One can sympathize with the client's point of view. Within their own research organizations there is no question of who owns the research results – the company does. Thus if the results of their own research are potentially harmful to them they can choose whether to release them or not. But universities are built on the idea of academic and research freedom. There is no doubt that in those situations where the researchers insist on publishing their results, even though they might harm the client, the client sees such action as a case of biting the hand which (literally) fed the researchers, and the resentment rankles". An even greater fear, Crawshaw continues, "which most clients have (including government departments, interestingly enough) is the paranoia that researchers might use the research from one piece of contract research to enter into negotiations with a client's competitor. From the point of view of the researcher of course, the results of his own research, regardless of who actually provided the funds for it, belong to him and he may do with them as he wishes. If the client does not like it, then that is unfortunate, but in that case the client should not have contracted a university to

do his work for him. A university researcher's attitude is (and must be, if academic freedoms are to be maintained) to investigate and publish so others may also know".

Thus, Odegena (1989), Nora and Olives, (1988) insist that externally funded research definitely pose more problems especially in terms of ownership of the results.

However, the conflict over ownership of research results also involves the university itself, and as Etzkonitz (1983) points out, university administrators are trying to reassert the privacy of the university by instituting, where they did not already exist, and new patent policies to give control over the deposition of the financial benefits arising from research done in the university. Blumenstyk, (1996); Blumenthal et al (1996); and Astrom & Fryklund, (1996) are also of this opinion.

Infringement of Staff Rights

Academic freedom and financial gain of the academics are some of the aspects where the rights of academics are tampered with when they are involved in sponsored research. Infringement of academic freedom, according to Crawshaw's experience, revolves around the question of whether the head of department (or sponsored research organization within the university) has the right to demand that a researcher engage in a line of research which is against his or her wishes or interest.

In sponsored research, the sponsor makes demand of the researchers that a particular work must be done and for a particular objective. This means that they have the power to choose or reject a particular researcher and this infringes the rights of tenure of academics. Thus, since contract research relies on outside funding, Bogler (1994) warns that it would definitely affect the sort of research which one does, and also the academic freedom.

The second infringement of staff rights concerns their financial remuneration. Most American and European universities as explained by (Heagerty, 1997; Crawshaw, 1985), have the principle that academic staff may engage in private consulting work for their own private financial gain so long as it is kept within reasonable bounds (what in the United States is often termed as "one-fifth rule", that no more than one-fifth of the academic's time will be spent on private consulting) and does not bring the good name of the university into disrepute. But sponsored research brings into conflict with this right, because one's skills are being sold in the market place, with university reaping the benefits in sponsored research situation. Thus the academic cannot legitimately take the money for himself. So it is unfair for such an academic to see his academic colleagues making substantial extra income from sources which are denied him.

Publications

As noted above, contract research by itself is rarely suitable for the types of publication which count for promotion or appointment. Clients and the general community want results to specific problem, not theoretical discussion of underlying causes buried deep in the fabric of the society. But Fairweather (1988) says specific research is usually not of interest to the international, refereed journals. Thus Crawshaw (1985) writes that, "Theoretically it may be possible to use proceeds from contract research to buy time to turn sponsored research results into good publications but in practice that is rarely

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

feasible". Few sponsored researchers are so confident of the market that they are prepared to gamble that work will come in after one has taken time out to publish a journal article or scholarly monograph. Some scholars believe that if they publish their research finding without first of all patenting it, someone may use it without paying for it.

Authority, Responsibility and Social Justice

In the sponsored research activities major problems may occur over the responsibility for obtaining new contracts, for ensuring that contracts remain profitable and that work keeps to the budget, and for the disposition of any profit made. Roessner in Blumenstyk, (1996) argues that because contract research organizations in universities need to adopt practices similar to those of businesses if they are to be successful and survive, some companies would like the universities to be 'job shops' – "doing research that helps to refine a product but doesn't advance the field."

Another major problem is who should be responsible for getting a new contract, the directors of the research organization or the principal researchers? All researchers actually need to look out for contracts which do not come when clients think they have problems with which university can help. This is because research contracts are closely tied to the general economic situation, and to a firm's or department's internal budgeting arrangements. Thus a flood of contracts tend to come when the economy is generally buoyant.

Socially, those who worked hard at projects often feel that they should have some rights in deciding how the fruits of their labors should be spent. But this is not so with sponsored research. Thus, how funds are disposed and who has the right to make this decision has the potential to cause major dissatisfaction and dissension within sponsored research organization.

Conflict between Teaching and Research Activities

One of the advantages of sponsored research as stated above and as Patton and Marver (1979) show is that it can improve the quality of teaching. Nevertheless, studies such as (Campbell, 1997; Wasser 1990; Crawshaw, 1985; Williams and Lorder, 1990), show that there are real conflicts between sponsored research commitments and teaching which may be so great that the two should not be mixed. The most obvious of these is that of time. Time spent in the classroom or with students is time not spent earning the sponsored research money, or looking for more of them. Sponsored research, if it is to run smoothly, must run to a timetable. But the contract research timetable never coincides with the timetable for lectures, tutorials or student consultations. Clients have little sympathy with pleas for the need to spend time preparing lectures, correcting student assignments or marking exams. Very often sponsored research necessitates long periods spent doing field work, or in consultation with clients. It is not always possible to arrange this so that teaching commitments are also met. Students complain that staff are never available for consultation; staff complain that students take up too much time with trivial problems. Crawshaw (1985: 167-168), in analyzing the negative effects of sponsored research on students writes:

It has often been suggested that sponsored research can have a role in teaching by

directly involving the students in sponsored research activities. This is not wise. Aside from the moral question of using unpaid students' labor in what is an essentially profit-oriented activity, the objectives of the two activities are diametrically opposed. Student assignments are, or should be, learning exercises, in which they should make mistakes and learn from them. Sponsored research involves the production of a finished product, produced by a professional who has already learnt the skills, and so it should be as free of mistakes as possible.

But student work is rarely up to standard, acceptable for sponsored research. In those cases where it is an acceptable standard, it is usually on drawing skills, which the students had perfected prior to the particular exercise and thus serves no useful learning experience. Consequently, despite the attractions of combining teaching and sponsored research activities, this is difficult if both are to be done as well as they should be – usually one of the activities suffers. Because the demands from sponsored research clients are more obvious, the measure of success is more basic and the status of the organization more at risk in the event of failure, it is usually the students who lose out.

Wesser (1990), summarize the problems of sponsored research priority; conflicts with respect to the allocation of personal and material resources; social conflicts which are the results of incommensurability of value scale; conflicts over the disciplinary nature of academic research; conflicts concerning free communication and secrecy; conflicts over property rights; and conflicts which are the product of the organizational incompatibility found in university-industry relationship.

Odegard (1989) in his study of sponsored research activities in Norwegian universities supports the evidence that sponsored research reduces the percentage of basic research. He warns that this is a major problem because, "industrial funds are on the increase in all the fields which receive external funding. Those fields which receive the most industrial funding do less basic research than other fields receiving external funding". Thus Odegard's point of argument is that sponsored research supports basic research less and this may not augur well with the university system in future.

Another consequence of sponsored research which emerged from Odegard's study is that sponsored researchers have more administrative burdens and loads as expressed thus: "One problem with external funding, programme packages etc is that it takes terribly much time to fill out the application, to terminate the projects". There are therefore many costs connected to this way of distributing research funds in comparison to regular basic appropriations.

Prospects of Sponsored Research in Nigerian Universities

The future of sponsored research activities in American, European and other developed countries' universities is as promising as habitation in space by human beings. This is because of the strength of these universities to adapt to changing circumstances. The alternative view of the universities changing from traditionally non-profit, service oriented institutions mainly for teaching and research to economic enterprise in the knowledge industry is the basis of the above statement. Wasser (1990:41), writing from

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

the perspective of the USA and several continental European countries, is in no doubt that a change is taking place: "Obviously the university as a long-lived institution has survived by constantly adjusting to changing social and political needs. Yet the present rapid and radical move to a university adapting in a major fashion to an entrepreneurial university, would appear to go beyond modification to a sufficiently changed structure that no longer for many institutions fits the time-honor definition of a university".

Just as universities in the nineteenth and early twentieth centuries adapted to the need to prepare people for employment in the civil service and liberal profession, so the universities of the late twentieth century need to adapt, and is adapting to the needs to promote and to prepare people for the high technology, information-rich society of the twenty first century. Viewed in these terms by (Williams & Loder, 1990), sponsored research activities in universities will become analogous to links between university medical schools and teaching hospitals or between professional associations and specialist departments in universities. Thus, in future, the emphasis laid on sponsored research activities in universities will be more on technical, scientific as well as social success, rather than on economic success alone. Thus if emphasis is on productivity as evidenced in publications and development patented and unpatented (Geisler and Rubenstein, 1989), more lecturers will explore ways of being productive in their field.

Again, the prospects of sponsored research become more when structures like industrial science parks being attached to universities, industries having their branches located near universities (as is the case in Swedish universities) have become trendy. This as Wasser (1990) suggests, will alleviate difficulties by shortening the time lag between discoveries and industrial applications thereby solving the problem of necessary confidentiality of scientific results since a sponsored research organization within the confines of a university must be open. Moreover the parks, it is hoped will create respect for basic research and prevent industry in the interests of applied and technological activities, from absorbing seed money for university research. For instance in 2013, the university of Ibadan entered into a partnership with Flour mills Nigeria ltd to establish the flour mills research center at the university in a bid to strengthen the weak industry-university collaboration and enhance the capacity of the students in food science and technology (Omisade, 2013).

Despite all the prospects that the future has for sponsored research in universities in advanced countries, the future of sponsored research in less developed countries is still oblique. In Nigerian universities most especially; the concept is a very new idea and due to poor economic situation in the country, not many industries are willing to go into collaboration with university. Such needs as food, water, housing, good health, relevant education, environmental protection, functional organization for purposes of government, appropriate technology etc. call for collaborative efforts. However some companies in the country are beginning to cooperate with the universities, to sponsor some researchers especially in the area of environmental protection, health and Agriculture. Examples of such sponsored research activities include Environmental Impact Assessment, Rural Electrification Study, Population Dynamics, Nomadic Education, River-Blindness Project, to mention but a few. Some examples of sponsored research in Nigeria are listed in Table 1.

Table 1: Sponsored Projects in Nigerian Universities

Projects	Universities Involved	Industry/Government./Agency	Date	Source
Marine pollution monitoring in Nigeria	University of Calabar, institute of oceanography	Federal Government of Nigeria/ International atomic energy commission (IAEA)	2011	www.unical.edu.ng/institutes/oceonography/funding
Gender based violence in Nigeria	University of Ibadan, college of medicine	World bank- Enabling HIV/AIDS + TB and social environment (EHANSE) project	2009	http://com.ui.edu.ng/index.php/dr-yusuf-o-bidemi?id=601
Nomadic education research center	University of port-harcourt/	Nigerian national commission for nomadic education	1999-2008	http://www.uniport.edu.ng/centres/127-nomadic-education-centre.html
Family health and wealth study	University of Ibadan, center for population and reproductive health	Bill and Melinda gates institute, John Hopkins university, USA	2011	http://cprh.com.ng/Research.html

The growing financial dependency and oneness of universities on corporations is clear and the consequence is a concern to university traditionalists. Harvard University has a well-articulated policy which protects the integrity of researches conducted by the university and its faculty; even though the federal government mandates research integrity policies for activities it funds, individual institutions still have the responsibility to prevent and detect its occurrence. At Harvard, each school creates, implements, and enforces its own research integrity and misconduct policies, consistent with federal requirements (Harvard, 2016). This is very important to ensure that the results of sponsored research is for the benefit of society and advancement of knowledge.

In the same cautionary vein Broide, President of Duke University pointed out that since universities serve the public, there is a tendency for business to view them as "being similar to public libraries, filled with free information to be tapped" (Wasser, 1990). Business/industry also bring their context and values with them, not recognizing that in universities, "making money is only a secondary reality – a means rather than an end". Nevertheless, partnership between industry and the university research are here to stay, and "the once abhorred substitution of private sector finance is widely accepted" (Webster, 1992; Etzkowitz, 1991).

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

How far this concept has gone in this direction and the consequences for academic communities has only recently begun to be investigated. Blumenthal et al (1996) from Boston collected data by telephone from senior executives of a series of American companies in the fields of agriculture, chemicals, and pharmaceuticals. About 90% of the companies surveyed had life-science links with universities. Another 59% supported researches providing around 12% of all research and development received during the year examined.

It is clear that sponsored research will never substitute completely for dwindling government research support. But it is obvious that carefully nurtured universities and sponsors will develop a successful and beneficial symbiotic relation.

To resolve the contentious issues and challenges, Crawshaw (1985) cautions that for sponsored research to be successful, there are several ground rules which should be considered by any university intending to engage in the sponsored research game. These include:

1. Debate the moral problems involved in sponsored research activities well before any other steps are taken. Ensure that, as far as possible, all the people likely to be affected by the sponsored research activities have a chance to air their views, including the administrative, secretarial and technical staff as well as the academic staff, as their jobs or future prospects may even be more affected. Be sure that everybody is fully informed in the cause of this debate of the likely benefits and costs to both themselves and to the organization of which they are a part. Any staff member who for whatever reason, cannot accept sponsored research as a legitimate activity for either themselves or the institution should not be pressured into the situation against his/her will.

2. Obtain good legal advice always, especially when establishing the sponsored research activities and also when entering into new contracts, to ensure that as far as possible, the legal situation and responsibility is clear to all parties.

3. Ensure beforehand that all staff are prepared to abide by any loss of rights which may be necessary in order to enable the sponsored research activities to be conducted successfully.

4. Be very clear in all discussions with clients, and especially before any contracts are signed, as to who owns the research results obtained as part of the contract. It is best to insert a clause to this effect in every research contract signed, if appropriate wording can be found which is acceptable to the client, the researcher, the institution and the solicitor.

5. If a university is going to encourage sponsored research, then it must do so wholeheartedly, and recognize that sponsored research activities are legitimate for purpose of promotion, appointment to other positions and all leave entitlements.

6. If sponsored research activities are to be successful, then it is probable that certain business practices, including the right to hire, fire, and promote, need to be invested in whoever is in charge of the sponsored research organization.

7. Overheads and profits should be used for the benefit of the researchers and staff as well as the university. In particular they

should be used to encourage researchers to upgrade their research work for publication in the international literature, or else engage in those personal research activities, which will help their careers or give them personal satisfaction. One of the major traps which should be avoided is the use of overheads and profits to maintain staff who cannot or will not work on the research. Contract organization should be open for discussion amongst research staffs, who should have some right in deciding how funds should be disposed. Some formulae to allow researchers' rights of call on funds in direct proportion to the funds they have brought into the organization should be determined.

8. It is necessary for one person in the organization to be primarily responsible for obtaining new contracts – either this person or another should have responsibility for monitoring sponsored research work to ensure that terms of work stay within budgets and timetables. These positions should be recognized by the university in terms of promotion and for appointment to other positions.

9. No department should be solely dependent on sponsored research to fund all of its research activities. Other sources of funds are necessary to fund those research activities, which are unable to attract outside sponsors.

10. It is necessary to devise some system of staff veto over types of research undertaken on a contract basis. Some researches, and some clients, are obviously not suitable for a respectable university. However staff may also have personal moral objections to some research or to some clients and within reason, these should be respected.

11. Teaching and sponsored research should be mixed with care. Respect of these rules and proper management will guarantee a brighter future for better university/industry partnership through sponsored research activities in the university system.

For Nigeria to overcome the challenges of these contentious issues and benefit from sponsored research the following are recommended:

1. The Nigerian government should promote industry sponsored research by allowing tax waivers for companies and organizations that are outstanding in funding university research.

2. More funds should be made available by government to encourage university research that will position researchers for industry sponsored research.

REFERENCES

Agabi, O.G. & Uche, C.M. (2000). Management of contract research activities in Nigerian Universities for Alternative Funding for Nigerian Universities System. Nigerian Journal of Empirical Studies in Psychology and Education. Vol. 1.No. 3, 91-98.

Ahunanya S. & Uche, C. M**.** (2011). Commercialization of University Inventions: Benefits and Challenges in Southern States of Nigeria. International Journal of Education Research (USA). Fall 2011. Vol.6, No. 2. 109-121.

Alele-Williams (1991). Funding the University System. Proceedings, 14th

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

Annual Committee Seminar, University of Benin. March 6 & 7: 125-141.

Amiche, E. (1997). University and Economic Development. Guardian News Papers; Monday, March 3: 35.

Astrom, H. and Fryklund, L. (1996). The Industry/University Interface. THE LANCET. Vol. 3-7. March. 2, 590-591

Bach, M and Thornton, R. (1983). "Academic-industrial partnerships in biomedical research: inevitability and desirability,"*Education Record*, Spring 1983: 26–32.

Blumenstyk, G. (1996). Arizona Patent Aims to Spur Collaboration of Universities with Business. *The Chronicle Of Higher Education* Vol. 10 august 16: 34.

Blumenthal, D., Causino , N., Campbell, E., Seashore, L. K. (1996). Relationships between academic institutions and industry in the life science- an industry survey. *National English Journal Medical.* Vol. 334. 368- 373.

Bogler, R. (1994). Universities Researchers' views of Private Industry: Implications for Educational administrators, Academicians and the funding sources. *Research in Educational Administration.* Vol. 32 No. 2.

Brown, T L (1985). University-Industry Research Relationships: Is there a Complict? Journal of the Society of Research Administrators Vol. 17 No.2: 7- 17.

Campbell, T. I. (1997). Public Policy for the 21st century: Addressing Potential Conflicts in University-Industry Collaboration. *The Review of Higher Education*. Vol. 20 No.4 357-379

Crawshaw, B. (1985). Contract Research; The University, and the Academic. *Higher Education*. Vol. 14. 166-168

Culliton, B. J. (1982a). "The academic-industrial complex,"*Science*, 216: 960–962.Google Scholar

Enaohwo, J. O. (1980). University Financing in Nigeria and Implication for Higher Education. *Journal of Educational Administration and History*. Vol. 12 No. 1:10

Etzkowitz, H. (1983). Entrepreneurial Scientist and entrepreneurial universities in American academic science, *Minerva* Vol.31 No. 2-3. 198-233.

Etzkowitz, H. and Peters, L.S. (1991). Profiting from knowledge: Organization innovations and the evolution of academic norms. *Minerva* Vol. 29. 133-166.

Fairweather, J.S. (1988). Entrepreneurship and Higher Education: Lessons for Colleges,
Universities and Industry. ASHE-ERIC Higher Education Report Washington DC: No. 6.

Gravenir, F. O. (1982). Financing the Develoment of Universities in Nigeria: Locating the Supplimental Sources of Revenue for Education and Development. *Journal of the Nigerian Education Research Council.* Vol 2. 440-446

Harvard university(2016). Research policies and guidelines. Retrieved from http://vpr.harvard.edu/pages/research-integrity. Accessed 22nd October, 2016.

Heagerty, A. M. (1997 March). Industry-Sponsored Research In University. *THE LANCET*. Vol. 349: 588

Kelly, K. S. (1991). Fund Raising and Public Relations: ACritical Analysis. Hillsdale, New Jersey: Lawrence Erlbaum Associations.

Landry, R., Traore, N. and Godin, B. (1996). An econometric analysis of the effect of collaboration on academic research productivity. *Higher Education*. Vol. 32. 283-301

Nnabuo, P.O.M. & Uche, C.M.(1999). "Contract Research in Nigerian Federal Universities: Alternative Strategy for Funding Education" Journal of Educational policy& Administration; Vol. 16-24.

Nora, A. and Olives, M.A. (1988). Faculty attitudes toward industrial Research or companies. *Research in Higher Education*. Vol. 29, No. 2: 145-150

Okorie, N.C. and Uche, C.M. (2004). " University-Industry Interface Activities Awareness of Sponsored Research Among Nigerian Academics" *Ghana Journal of development studies,* Vol. 1 No. 2 (December) 101-117.

Odegard, E. (1989 March). Contract Research and External Funding. *Higher Educational Management.* Vol 1 No 1: 42-44.

Omisade, M.O (2013). University advancement center: Flour mills Nigeria ldt partners with university of Ibadan on Research. Extracted from; http://advance.ui.edu.ng/news8.phb. Accessed 10th march,2016.

Omole I. (2016). Budget: Education sector remains underfunded. Education Rights Campaign (ERC). Retrieved from http://educationrightscampaign.blogspot.my/2016/01/2016- budget-education-sector-remains.hhtml

Patton, C. and Marver D. (1979). Paid consulting by American academics. *Educational Records.* Spring. 175-184.

Peter, W.G. (1990) (Ed). Industry and Higher Education Collaboration to Improve Students' Learning and Training. London: Open University Press

Peters, L. S. and Fusfeld, H.I. (1983). Current US University-Industry research connections, in National Science Foundations. University-Industry Research Relationships: selected studies Washington:NSG.

Pfeffer, J. and Salancik, G. R. (1978). The External Control of Organizations: A Resource Dependence Perspective. New York: Harper and Row.

Power, D.R. and Power, M.F., Betz, F. & Aslania, C. B. (1988). Higher Education in Partnership with

Scientia Africana, Vol. 16 (No. 1), June 2017. Pp 89-107
© Faculty of Science, University of Port Harcourt, Printed in Nigeria *ISSN 1118 – 1931*

industry. Opportunities and strategies for training, *Research and Economic Development*. London: Jossey-Bass Publishers.

Report on Sponsored Research Agreement. 5th April version. Philadelphia: University of Pennsylvania.

Ruscio, K. (1984). University-Industry cooperation as a problem in inter-organizational relations, in Bozeman, B., Crow, M. & Link, A. (eds), Strategic Management of Industrial R & D. Lexington Books.

Sadlack, J. (1992). New reality in University-Industry relationships: a search for foundations and formal Interchange. Vol. 23 No. 2/2: 111-122.

Shills, E. A. (1992). Intellectual Traditions and Traditions of Intellectuals. Daedalus. Vol. 101: 21-30

Strosnider, K. (1997). A Public-College President Focuses on Raising Fund from Privatesources. *The Chronicle of Higher Education.* March 14: 31-33

Tatel, D. and Guthrie R. (1983). The Legal ins and outs of university-industry collaboration.
Educational Records. Spring: 19-25.

The New Encyclopaedia Britannica (1997) vol. 9 Chicago: 1036

Tornatzeky, L.G. and Fleisher, M. (1990). The Process of Technological Innovation. Lexington: M.A: Lexington Books: 236-237.

Tither, D. (1990). A case study of technology transfer and funding mechanisms in an industrially supported multi-centered university research initiative: Technovation Vol. 10 No. 1: 39-46

Uche, C. M. (2010). *Contract Research in Nigerian Universities: Alternative strategy for Funding Higher Education*. Verlag: LAP Academic Publishing GmbH &Co. KG (Germany)

Uche, C. M. (2011). *Management of Academic Research Activities: Evidence of Knowledge Creation in Nigerian Universities*. Verlag: LAP Academic Publishing GmbH &Co. KG (Germany)

Uche, C.M. (1999). "Organization and management of Academic Research in Nigerian Universities" . Research In Education. Vol. 6 No. 1& 2. 47-65.

Wasser, H. (1990). Changes in the European University: From Traditional to Entrepreneurial.
Higher Education Quaterly. Vol. 44. No 2, Spring. 111-122

Webster, A. (1992). University-corporate ties and the construction of research agendas.
Sociology Vol. 28. 123-142.

Williams, G (1994 May) Women Managers in Higher Education. Conference Proceedings of the Association of Common Wealth Universities (ACU) Common Wealth Higher Education Support Scheme (CHUSS) Steering Committee Meeting London 6-13