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Training and Manpower Development in Public Research and Development Organizations

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Abstract

The study examined the policies, effectiveness and the constraints to training and manpower development (TMD) in public research and development (R&D) organizations in southwest Nigeria for enhanced performance. Data from a study of twenty-two (22) public R&D organizations in the study area was used in this paper. Findings showed that Public R&D has high scientific R&D content and requires availability of highly qualified manpower who could handle very sophisticated equipment and processes. Funding and training policy decision posed major constraints to TMD. The study concluded that while some may argue that government's development plan should map the direction of training and research. It is equally important that every stakeholder including management be involved in training policy decision. The study recommended the development of a proactive approach to TMD in Nigeria.

Key Words

Manpower Development, Training, , Organization, Research and Development

I. INTRODUCTION

Research and Development (R&D) can be defined as creative work undertaken on a systematic basis to increase the stock of scientific and technical knowledge and to use this stock of knowledge to device new or improve applications [1]. R&D organizations exist in different content and are established for a wide variety of purposes. Development is the systematic use of knowledge or understanding gained from research which is directed towards the production of useful materials, devices, system or methods, including design and development of prototypes and processes [2]. Therefore, in R&D organizations, the challenge is to provide a mix of activities to achieve organizational goals and sustain the researcher's motivation and curiosity, which are essential to scientific breakthrough and product development [3].

Research and Development plays a significant role in technological innovation and economic development. R&D is the key ingredient for generating a continuous stream of innovations, which determine productivity gains as well as the main determinant of international competitiveness [4]. The other factors that contribute to economic productivity include education, manpower development of labour force, an efficient industrial infrastructure (such as transportation and communication network), capital investment and management skills [3]. The activities of these R&D organizations for its clients and beneficiaries form the basis of its existence. Research and Development is a technique, when fully implemented, produces goods and services for the benefit of mankind. It is therefore essential for any modern nation that aspires to develop to invest in R&D. This is in recognition of the value of Research and Development in improving socio-economic development. In order to achieve this, emphasis should be on manpower development to enable staff acquire relevant professional skill and knowledge for effective performance. When steps are to be taken to improve the quality of employee and overall organizational performance, attention naturally turns to the process of training [5].

The inability of the Research and Development system to make impact on the economy of a nation can be linked to the inherent deficiencies in the system. The performance of R&D organizations can be influenced by factors which can be external or internal. The major external factors comprise overall technological climate in a country, financial resources devoted to Research and Development, infrastructural facilities and availability of knowledgeable staff. The internal factors include management practice, staff remuneration, staff motivation, and research facilities [6].

To improve economic and efficiency in the operations of the research institutes and raising the standard of performance, attention should also be given to training of employees [7]. The realization that manpower development activities are imperative for enhancing performance in Research and Development institutes is not a recent development. Development of skills and its optimal utilization constitute one of the basic elements of economic growth. However, in the process of growth, such opportunities will be highly dependent on both deepening and widening of human skills [8].

There is the view by researchers that training of future researchers provides the opportunity

for cross fertilization of ideas and the dissemination of scientific and technological information. Therefore, there is a need to ensure appropriate training for staff in the research institutes and to ensure that there is a pool of highly qualified manpower for the management of the national economy for development. The availability of trained manpower is critical for generating growth and development. Any nation therefore, which is serious about igniting and sustaining broad-based accelerated development must find an effective mechanism for getting the research institutes to become an essential part of the process of technological change.

In recognition of the importance of R&D to the national economy, the Federal Government of Nigeria (FGN) has consistently formulated appropriate science and technology (S&T) related policies. One of the basic elements of these policies is to encourage research and development through the establishment of R&D organisations with different mandates. For instance, the development of an implicit science and technology policy to support and guarantee the production and supply of export crops led to the establishment of agricultural research stations at Ibadan, Umudike, Umuhia and Zaria in the early 1920s [9]. Subsequently, other R&D institutes were later established to address the problems of the industrial sector. These R&D institutes are the source of knowledge production and dissemination as well as the key to unlocking the technological and productivity capabilities of the national economy.

II. LITERATURE REVIEW

There is a correlation between training, manpower development, professionalization and performance. The linkage hinges on the fact that training and manpower development activities, if specifically directed, brings about the acquisition of professional competence, attitudes and behaviours which in turn contributes extensively to improvement in job performance. However, for the purpose of highlighting the intrinsic content of training and manpower development in R&D organization, it is proper to proceed by clarifying that training and manpower development do not constitute distinct processes. As [10] explained, manpower development is a generic concept which covers an array of activities concerned with informing employees of organizational policies and procedures, training them in job skills, motivating and evaluating performance and providing counseling as it is needed.

Similarly, manpower development is defined by [11] as a process concerned with altering the work behaviour of employees in order to increase organizational goal attainment. The process, [12] observes, prepares the employee so that he can move with the organization as it develops and grows, resulting in new jobs for the employees at a higher level. The overall purpose is to produce a viable and flexible work force for the organization as it moves towards its future. Thus, the very essence of manpower development is to improve the effectiveness of the employee beyond the job currently held. That is, although the need for job training is still there, emphasis is on the worker who is being prepared for a place in the organization different from that which he currently holds. As [13] observed, the direction of effort shifts from job training to workers training.

The direction of manpower development cannot be stated in specific behavioural term as it is

not possible to identify the jobs that would be done in the future, under what conditions and what standards of proficiency would be required. Thus to equip employees for the future, it becomes necessary to identify the possible skills, knowledge and job attitudes which would be required in positions at higher levels in the organizations and to assist them to acquire such attributes in preparation for new roles and functions.

Arising from the foregoing, a good number of scholars on organization effectiveness have identified training and development of employees as the undisputed and most useful mechanism for increasing effectiveness in organization. In the same vein, [14] identified the activities as also imperative for preventing shortfalls in performance which could result from the possible advent of the problem of obsolescence.

Given the truism that training and development of staff is useless if no one has a clear idea of training, in what and for what, training and manpower development should be objective oriented. In addition, the objectives must be compatible with those of the organization, be realistic and clearly stated. To ensure this, there is need for a policy to guide action. Such a policy must, among other things, cover the basic issues of responsibility for training and development of staff.

Therefore, if training and manpower development activities are to improve performance in any organization, the training policy must be adequate to determine who should be trained, in what, where, when and how. In summary, an organized approach to training and manpower development function should be viewed as a process. In this regard, most management literature on the subject have identified the process as consisting of five components phases as follows:

i. Determination or identification of training needs;

ii. Establishment of training objectives;

iii. Designing or development of training programmes;

iv. Implementation of training programmes; and

v. Evaluation of training programmes.

The identification of training and development needs is usually the first phase and the fundamental pivot of the training and development process since the adequacy and appropriateness of every other activity depend on how successfully this first phase is executed. Reference [15] defined training and development needs as the gap between the kinds of performance or competence an employee has and the kind of performance and competence he is expected to have. The gap or needs grow out of operating problems. For the purpose of identifying this gap, a framework of three sets of analysis has been suggested. These are:

i. Person analysis which has to do with an assessment of individual performance through the instrument of performance evaluation;

ii. Operational analysis which relates to the determination of the specific ability needs of jobs through job description and job specification; and

iii. Organizational analysis which indicates the process of determining where in the organization training is needed.

The three sets of analysis follow the sequential order of person analysis, operational analysis and organizational analysis. The first level of analysis is concerned with identifying the deficiencies in particular job skill, knowledge and attitudes of individual employees which training and development actions would seek to address. Proceeding from this, the employees who require training and development in the organization and the type of training needed are identified.

At the second level of operational analysis, the group of individuals performing similar jobs and functions are assessed with a view to identifying what are needed in terms of jobs knowledge, skills and attitude to carry out the various duties and tasks related to the particular jobs. Similarly, at the level of organizational analysis which flows from the persons and operational analysis, the shortfalls in organizational objectives and priorities and the particular department, division or unit responsible for such occurrences and whose problem(s) could be addressed through training are identified. An important point to note here is that the sequential order of persons, operational and organizational analyses would only be appropriate under the current dispensation.

From the various levels of analyses, specific result are obtained which are then expressed in definite time frame and the medium through which the needs determined are to be addressed. Thereafter, training and development needs are categorized into present and future training needs. According to [15], the present training and development needs of workers constitute the job knowledge, skills and attitudes which they require to perform their current jobs as expected. Similarly, future training and development needs entail those needs required by employees to perform future job duties and responsibilities which may result from promotions to higher position.

It is equally important to discuss the phases of establishment of objectives and the designing of programmes together as both activities dovetail. Specifically, the importance of the designing phase lies in the fact that it is the link between the identification of training and development needs and the fulfillment of the needs. Furthermore, the objectives for undertaking training and development programmes, that is the desired job knowledge, skills or attitudes, should be stated in such a way that the success or failure of the programmes undertaken can be ascertained through reference to the stated objectives. In this regard, the expected results required to be stated in clear terms so that the content of training and development activities could specifically address the expected results.

To ensure that training and development objectives are clearly stated, [16] suggested that an evaluation scheme need be built into the programme design process. This requirement is

necessary because as [17] rightly observes, unless programmes are properly and adequately designed, it will be difficult to ascertain whether or not the training and development needs are achieved. Another crucial element which the designing phase of training and manpower development process should deal with is the estimation of costs.

Similarly, [10] identifies training and development activities as a very big investment venture in terms of time, effort, money and inconvenience. Therefore, top management should be presented with a comprehensive costs proposal justifying the reason for training and development programmes in order to facilitate support and decision-making. Thus, it is very important that programme design in the training and manpower development process in the R&D organizations should reflect costs estimates of the various programmes proposed. The importance of costing flows from the fact that the level of resources available is a major factor in embarking on training and manpower development activities.

The implementation of training and development programmes follows after the training and development needs have been identifies and programmes designed for achieving them. The activities concerned in the implementation phase include the selection and scheduling of programmes. To help the choice of programmes, it is useful to ask relevant questions such as: do external courses really meet our needs? Can we buy a ready-made package for our needs? What is the cost of external consultants? How do we measure on-the-job training?

It is a popular view that on-the-job training is probably the most widely used method of training and development of staff. The success of the method depends almost entirely on the immediate superior who usually follows a set of procedures in training and developing subordinates in particular tasks. Many opportunities for training and development are found on the job. The trainees learn and at the same time contribute to the realization of the aims and objectives of the organization. This explanation aptly demonstrates apprenticeship training, which is a variant of on-the- job training. However, in many organizations, apprenticeship training reflects a combination of on-the-job-training and off-the-job training when the programmes is designed for a higher level of skill.

Another variant of on the job training is the vestibule training which is a specialized endeavour of personnel departments. Under vestibule training, the staff training school trains the employee and turns him over to the supervisor. This is when the training involved is beyond the capacity of the supervisor and it becomes imperative for a portion of it to be undertaken by the staff training school. In vestibule training, the trainee learns the job in an environment which simulate the work environment as much as possible.

Other variants of on-the-job training and development are job rotation, special projects, coaching and creation of 'assistant to positions'. The basic purpose of job rotation is to broaden the knowledge of employees, particularly managers or potential managers. The trainees learn about the different functions by rotating into different position in the organizations on a planned basis. However, instead of job rotation, employees, particularly managers or potential managers, are required to undertake special projects which set for them a challenge and from which they

could acquire new knowledge and skills.

Coaching on the job is a never-ending process. It is an active process in which the boss provides feed-back on performance to subordinates and gives advice and encouragement which foster their development. Effective coaching depends on mutual trust and confidence between superiors and trainees and it could develop and strengthen the potential of the latter as well as enable them overcome their weakness. The on-the-job method of creation of assistance to position is used to broaden the viewpoints and ability of trainee by allowing them to work closely with experienced managers who can give special attention to the development needs of trainees.

Another variant of on-the-job training are temporary promotion and committee and Junior Boards. Under temporary promotion, an individual may be appointed in acting capacity when, for example, the incumbent of the position unexpectedly retires, falls ill, proceed on vacation or dies. Though temporary promotions constitute a device of convenience, to organizations, the training opportunities offered with respect to decision-making skills are tremendous and the experience invaluable. Committee and Junior Boards are also sometimes used as development techniques. The constitution of such committees and Board, gives trainee an opportunity to interact with experienced superiors, become acquainted with a variety of organizational issues and learn about the relationship between different departments as well as the problems created by the interface of these organizational units. This method of training and development assist trainees to learn and demonstrate analytical and conceptual abilities.

Off-the-job training and development programmes relates to educational courses and programmes offered by various professional bodies, independent management centres, polytechnic and universities. The programmes range from short courses lasting from one week to a few weeks, to diploma and postgraduate programmes of various duration. Management staff are most often the beneficiaries of off-the-job training and development programmes which usually emphasize the acquisition of relevant job knowledge, skills and attitudes. Over time, there has been an increased attention to competence which [18] defines as relating to a broader concept than skill. There is also a need for managers to acquire relevant competences off-the-job. Reference [19] suggested that mangers should be offered opportunities to undertake doctorate programmes as many skills implicit in research processes are vital to effective management.

In practice, however, the implementation of training and development programmes usually involves the use of a combination of on-the job and off-the-job strategies. Often, on-the-job strategies should be supplemented by off-the-job strategies in order to foster the acquisition of experience, abilities and managerial attitudes. This recommendation has been informed by inherent problems in on-the-job training and development strategies. As [20] observes, off-the-job training and development of staff introduce new ideas and increase effectiveness in organizations. However, effective off-the job training and development require a positive attitude towards self-improvement by employees themselves.

Evaluation of training and development programmes is the last phase of the training and manpower development process. Evaluation, according to [21], is a systematic means of

assessing the extent to which training and development programmes have been carried out and programmed objectives attained. Similarly, [22] defines evaluation as the systematic collection of descriptive and judgmental information necessary to make effective training decisions in terms of the selection, adoption, value and modification of instructional activities. Essentially, evaluation entails a comparison of training and development results with the objectives of the programmes that were designed on the basis of identified training and development needs. Similarly, [23] specify a wide range of aspects of training which could be evaluated. These are:

i. the purposes and goals of training;

ii. practice, performance and methods;

iii. programme content;

iv. aptitude of employees; and

v. product quality.

The various aspects outlined above have been categorized by [24] into four levels of evaluation, namely; the reaction level, the learning level, the job behaviour level and the functioning level. Similarly, [21] also categorized them into three typologies of levels, namely immediate level, intermediate level and ultimate level. However, of greater utility value and clarity is the categorization of [24] which is explained in the reaction level and assessment of trainees' reaction to training in terms of opinion and attitudes formed about the trainers; methods of presentation of subject-matter; the usefulness and interest of subject-matter, and trainee enjoyment and involvement.

The learning level involves an assessment of the knowledge, skills and job attitudes learned by trainees in relation to the subject-matter of training programmes which trainees are able to translate into behaviours within the training situation. The job behaviour level involves an assessment of the ability of trainee to apply learning in the form of new knowledge, skills and attitudes back on the job. Lastly, the functioning level deals with the assessment of efficiency and costs. That is how the changed behaviour affects the functioning of the organization or the behaviour of individual other than the trainee.

The timing and instruments used for evaluation at the various levels vary with individual assessors and organizations. Information about trainee reaction may be obtained during training, immediately after training or some other time. The instrument used include observation and listening to trainees conversation. However, this unsystematic information gathering method could be supplemented by the use of a rating scale on which trainees are asked to place a tick on a number of seven-points or five points scale rating the training receive on point ranging from very well presented to very badly presented.

Information on long-term reaction could be obtained from trainees through the use of questionnaire or interviews. Evaluation of learning could be carried out through various forms of

tests such as that involving response to multiple choice questions, before or after training, to measure the changes caused by training if the knowledge to be assessed contains a large element of intellectual understanding, the use of examination of the academic type becomes imperative. This could either be written or oral examination. However, for the evaluation of the skill and attitude, the use of practical test and rating scale are most valuable. In regards to the evaluation of job behaviour, it is usually carried out on the job. The instrument used includes annual evaluation report or a combination of any of the identified techniques. Lastly, any index of functioning which is related to the training and development objectives could be used for evaluation at the functioning level. In this respect, once the effect of training and development on the functioning of a department or the organization has been isolated, it becomes relatively easy to assess the costs and benefits resulting from training and development programmes.

In some literatures on training and manpower development, the reaction and learning levels of evaluation are referred to as internal criteria for evaluating training and development programmes while the levels of jobs behaviour and functioning are referred to as external criteria [14]. However, the criteria adopted for assessing the effectiveness of training and manpower development programmes should be a logical outgrowth of the stated objectives which are set out to be achieved. Thus it is imperative, from the onset to establish generally acceptable criteria before the commencement of training and development programs.

III. Methodology

The sample frame covered all the public research and development institutions in Southwest Nigeria (Table 1). The management and professional staff of the 22 research institutes in the study were categorized into the following groups: chief executives, directors, heads of department and researchers. The choice of these groups of staff was based on the perceived level of their participation in management decision making process. Also, they are directly involved in policy formulation and implementation within the public research and development institutions. The choice of respondents also informed the distribution of ten questionnaires per R&D institute bringing it to a total of 220 questionnaires distributed.

Structured and unstructured questionnaire were employed to elicit information about the objectives of the study. The questions focused on effectiveness of the current training; job information; training information and effect of science and technology policy on manpower development. The questionnaire was pre-tested using three public R&D institutes. Pilot testing of data collection instruments was carried out so as to reveal whether the instrument can reliably produce the required data for analysis. The pilot test from the R&D institutes assisted considerably in modifying the questionnaire for final distribution and retrieval. Quantitative analysis techniques such as simple tables, bar charts, pie-charts, percentage distribution and statistical analysis for establishing relationships between variable such as Chi-Square test were used.

TABLE I: RESPONSE RATE FOR THE QUESTIONNAIRE ADMINISTERED

S/n	Name of Institution	No. of Respondents			
		Male	Female	Total	%
1.	Central Medical Library, Lagos	5	3	8	5
2.	Centre for Black & African Arts and Civilisation	-	-	-	-
3.	Centre for Energy Research &Development, Ile-Ife	5	4	9	6
4.	Centre for Management Development, Lagos	6	1	7	5
5.	Centre for Space Science and Technology	4	4	8	5
6.	Cocoa Research Institute, Ibadan	7	3	10	6
7.	Engineering Materials Development Institute, Akure	6	3	9	6
8.	Federal Institute of Industrial Research, Oshodi, Lagos State	8	2	10	6
9.	Forestry Research Institute, Ibadan	4	4	8	5
10.	Institute of Agricultural Research and Training, Ibadan, Oyo State	4	3	7	4
11.	National Centre for Economic Management and Administration, Ibadan	6	2	8	5
12.	National Centre for Genetic Research and Biotechnology, Ibadan	5	2	7	5
13.	National Centre for Technology Management, Ile-Ife	4	5	9	6
14.	Technology Business Incubation Centre, Lagos	3	4	7	5
15.	National Institute for Educational Planning and Administration, Ondo	4	3	7	5
16.	National Institute for Horticultural Research, Ibadan	5	2	7	5
17.	National Institute for Sports, Lagos	-	-	-	
18.	Nigerian Institute for Oceanography and Marine Research, Lagos	3	4	7	5
19.	Nigerian Institute for Advanced Legal Study, Lagos	3	1	4	3
20.	Nigerian Institute of International Affair, Lagos	6	2	8	5
21.	Nigerian Institute of Medical Research, Lagos	4	2	6	4
22.	Nigerian Institute of Social and Economic Research, Ibadan	6	2	8	5
	TOTAL	98=63%	56=27%	154	100%

IV. RESULT AND DISCUSSION

The response rate to the questionnaires administered in the 22 research institutes in the study area is presented in Table 4. It shows that 154 (77%) of the questionnaires administered were retrieved from the respondents. On the whole, 91% of the R&D organizations completed and returned the questionnaire. Majority (63%) of the respondents were male while 27% were female.

Table 2 shows that majority of the respondents (34%) were between the age of 41-50 years; 24% were above 50 years; 20%, 15% and 7% were between 31-40, 21-30 and below 20 years respectively. The result showed that the most active researchers were within the age bracket of 41-50 years. This is at variance with findings by [10] that the best age for creativity is between 30-40 years. The age group of 30-40 years was termed the "golden age". However, the variance observed could be due to the differences in the study areas. It is to be observed that [10] study was carried out in Europe which has a different set up in terms of level of development, enlightenments, cultures, values and the development of science and technology. In Nigeria, the age bracket of 40-49 years represents the peak of scientists' activities in the field of research. In addition, most researchers within the age bracket of 50-59 years are usually saddled with

administrative responsibilities while those between 20-29 years are usually in the process of gaining experience.

TABLE 2: DISTRIBUTION OF RESPONDENTS BY AGE

Age	Frequency	Percentage of Respondents %
Under 20	10	7
21-30	24	15
31-40	31	20
41-50	51	34
Above 51	38	24
Total	154	100

The qualification of respondents and their area of specialization are shown in Tables 3 and 4 respectively. The result indicates that majority of the respondents (44%) had M.Sc while 36% has Ph.D degrees as their highest qualifications. This trend is expected because public R&D has high scientific R&D content and requires availability of highly qualified manpower who could handle very sophisticated equipment and processes. This outcome shows that most of the R&D institutes in the study area are staffed with highly qualified research officers.

TABLE 3: QUALIFICATION OF RESPONDENTS IN PUBLIC R&D

Qualification	Frequency	Percentage of Respondents %
HND/B.Sc	31	20
M.Sc	68	44
1) Ph.D	55	36
2) Total	154	100

Table 4 shows that majority of the respondents (48%) work in the area of sciences; 28% specialized in Engineering; 10% were from Management/Humanity while 14% specialized in health and other related fields. The greater percentage 48% and 28% respectively of the staff in the organizations that specialized in sciences and Engineering carried out the research activities. The result is consistent with government policy which place emphasis on scientific research.

TABLE 4: DISTRIBUTION OF RESPONDENTS BY AREA OF SPECIALIZATION

Area of Specialization	Frequency	Percentage of respondent %
Sciences	74	48
Engineering	44	28
Management/Humanity	16	10
Others	20	14
Total	154	100

TABLE 5: SUMMARY OF RESPONSES TO ITEMS ON JOB INFORMATION

Items	Yes %	No %	Neutral %
Job schedule	97(63.0)	30(19.5)	27(17.5)
Changes occurred in the handling of your job duties	59(38.3)	88(57.1)	59(38.3)
Require improvement in knowledge and skill	121(78.6)	29(18.8)	4(2.6)
Sufficiently equipped with knowledge, skills and attitudes to perform adequately in higher level of responsibility	45(29.2)	107 (69.5)	2(1.3)

A. Job Knowledge, Skill and Attitudes

The responses to the enquiry (Table 5) revealed that the respondents have job schedules which clearly spelt out the job duties and responsibilities they were expected to perform. This conclusion arises from the responses of 63% of the respondents who indicated that they have written job schedules. Only 19.5% stated that they do not have written job schedules while 17.5 abstained from responding to the item. The credibility of these positions was confirmed by the information which emanated from interviews and discussion held with the Directors of Personnel. Although, it was gathered from the said interviews and discussions that existing schemes of services clearly spelt out the job duties and responsibilities of every cadre of staff in the service. Information gathered from those who do not have written job schemes was that they are responsible to their heads of department and as such do not have definite schedule. The result of the foregoing is that in most of the Department the schedule of duties and responsibilities of the staff were not explicitly stated and described in written form for purpose of distribution to staff with a view of fostering their familiarity with the detail of their respective job, duties and responsibilities.

Perhaps, this explains the responses obtained from respondents on the enquiry regarding job information relating to changes in job duties and responsibilities. While majority, 57.1% of respondents claimed that no changes have occurred in their job duties and responsibilities 38.3% indicated that changes have occurred in theirs and 4.5% were neutral. Part of the information gathered from the majority was the high rate of changes occurring in written job schedules. The bottom line of the discussion is that a reasonable percentage of staff in Public R&D Institutions were possibly not fully knowledgeable about the essence and new demands of their purview of duties and responsibilities.

Following from the professionalization process and public demand, the expectation would be that staff would recognize their immediate need for improvement in knowledge and skill in relation to the various facets of their duties and responsibilities. Our finding however, revealed that many public R&D staff were fully aware of their need as 78.6% of our respondents maintained that they require improvement in knowledge and skill in relation to many areas of their job duties and responsibilities. Only 18.8% were of a contrary opinion while 2.6% were neutral to the enquiry.

It is obvious, that acquisition of professional knowledge, skill, attitudes and ethical norms of

behaviour by the staff will go a long way to achieve the high level of effectiveness now expected in job performance. To this extent, the majority of respondents claimed the need for immediate improvement in many areas of their purview of duties and responsibilities. The claim is further stressed by the responses obtained on our enquiry on the sufficiency of the current endowment of staff for job performance at higher level of responsibilities. While 69.5 % disclosed their need for additional competences and attitudes, only 29.2% claimed to currently possess sufficient competence and attitude to cope adequately at higher levels of responsibilities in their cadre and 12% declined to state their position.

In the light of foregoing, the logical inferences deducible is that most staff in the Public R&D Institutions need immediate improvement in their current job competences and attitudes to enable them achieve and sustain the high level of performance now desired in the R&D Institutions. In relation to the needs of most of the respondents to facilitate their job performance at higher levels of responsibility, current improvement in the knowledge and skills of staff would, of course, serve the purpose of preparing them for future duties and responsibilities. Indeed, it is a generally acknowledged fact that competences, attitude and behaviours for future job performance usually result from an incremental build-up of such attributes.

B. Evaluation of the Effectiveness of Manpower Development Programmes

Our perception of the development process is that it involves two sets of issues. These are: (i) those concerned with technological growth and (ii) those concerned with the aftermath or consequences of technological growth-economics, social and political relationships. It explains why those who do not understand the nature of technological growth cannot promote sustainable economic growth.

Technological growth is a learning process. Every man and woman is born as crying babies. The healthy baby soon begins to babble, that is, learning how to talk, acquire the capabilities to talk and then talks [25]. Every other capability including those for producing the modern goods Nigeria and other African nations import is acquired through learning. All types of societies must learn and acquire technological capabilities to be able to solve the common problems.

TABLE 6: EFFECTIVENESS OF MANPOWER DEVELOPMENT IN ACHIEVING ORGANIZATIONAL GOAL(S)/ OUTPUTS

Very Effective	Effective	Not effective
Frequency (%)	Frequency (%)	Frequency (%)
127 (82.4675)	27 (17.5324)	-

From Table 6, the finding relating to the effectiveness of learning and manpower development programmes in achieving organizational goal shows that 82.5% agreed that regardless of how unrealistic objectives of any organization seems to be that proper training and manpower development will bring about positive effect since one common indicator of effectiveness is related

to customer satisfaction . On the other hand, 17.5% reluctantly agreed with the issue of manpower development as a means of achieving organization goal. We can also infer from the above aforementioned that skill and competency are developed by individuals after a period of time of which learning must have occurred. This invariably distinguishes the output of producers in the same line of production and creates a variance in time of producing the same unit. Following from the foregoing, performance could be viewed as the results which arise from skill, knowledge and attitudes deployed by a worker in executing his job or tasks. Of course, results produced by a worker would only be acceptable if they effectively and efficiently contribute to the attainment of organizational goals. Accordingly, effectiveness and efficiency constitute the components elements by which performance could be determined. The major thing about effectiveness and efficiency is that they are fundamental to organizational success. It is therefore expected that as managers and indeed all other employees use their resources, they must strive to be both effective and efficient. In the same vein, the lower the resources consumed in the attainment of organizational goals, the more efficient employees are said to be. Accordingly, effectiveness exists in a continuum ranging from "inefficient" to efficient".

With regards to the ability to impact gained knowledge from training and development programmes to others; information gathered revealed that 50.6% were optimistic of the possibility while 2.6% were of a negative opinion. From the foregoing, we can conclude that if proper attention is giving to training and manpower development many people can be benefited apart from the organization. On adequacy of the training programmes, less than half (42.9%) said it was adequate. Further enquiry through interview/discussion revealed that the programmes were ready-made packages designed to address the training and developmental needs of the staff. It also had the advantage of being tailored to suit identified and specific needs of the system. However, there were some who commented that many times training organized was just an interactive session which have no bases and that it was organized because of the selfish interest majorly because of financial benefit. Meanwhile, a high percentage of respondents (51.9%) indicated high level of performance after training. From this point of view, when training is organize is an efficient manner and for developmental purposes, it provides a medium where knowledge can be shared together on the best and easiest way to tackle challenges faced by staff in their respective jobs.

TABLE 7: RESPONSES TO THE EFFECTIVENESS OF THE CURRENT MANPOWER DEVELOPMENT PROGRAMMES.

Characteristics	**Excellent Frequency(%)**	**Very good Frequency(%)**	**Good Frequency(%)**	**Fair Frequency(%)**	**Poor Frequency(%)**
Level of fund	33(21.4)	6(3.9)	25(16.2)	50(32.5)	73(47.4)
Impartation of gained knowledge	53(34.4)	78(50.6)	41(26.6)	4(2.6)	-
Adequacy of the training	80(51.9)	66(42.9)	28(18.2)	7(4.5)	-
Level of performance	67(43.5)	53(34.4)	19(12.3)	2(1.3)	-
Application of knowledge gained		53(34.5)	29(18.8)	5(3.2)	-

C. Policy on Training and Manpower Development

The weak base of policy initiation and evaluation makes it difficult to deliver well articulated and sound policy proposals. As most, 47.4% of the respondents agreed that policy relating to manpower development should be reviewed every five 5 years while 19.5% indicated 3 years. Only 33.1% indicated others. The respondents related their mind that due to time and financial involvement, policy review should be done once in 6-10 years. They also stated that provision must be made for future occurrences in terms of technology advancement, inflation etc. while some people said due to the dynamic nature of public Research and Development institutions and challenges ahead of them that policy should be reviewing every 3 years. On types of policy process suitable in public R&D 13.6% indicated minor (restructuring of existing policies) 35.7% indicated major (Re-design and implementation of new policies) while 30.5% agreed with (Developing and explicit strategy) only 20.1% indicated (complete restructuring of the public research institutes system and their mandate). Among the latter category, many clarified that most research institutions were product of political gimmick with unjustifiable bases for their establishment. Among those in the minority, they expressed interest in the prevailing policies being modified to achieve its purpose. While those in the majority confirmed that there were problems in the current policies deterring training and manpower development and thereby constituting obvious threats to the acquisition of the relevant professional knowledge, skills attitudes and ethical norms of behaviours required by staff to enhance their job performance.

TABLE 8: RESPONSES TO THE FREQUENCY OF POLICY REVIEWS

3 Years Frequency (%)	5 Years Frequency (%)	Others Frequency (%)
30(19.5)	73(47.4)	51(33.1)

TABLE 9: NATURE OF POLICY PROCESS ADOPTED

Minor (Restructuring of Existing Policy) Frequency (%)	Major (Re-design and Implementation of New Policy) Frequency (%)	Integrated (Developing New Explicit Strategy) Frequency (%)	Complete Restructuring of the Public Research Institute System Mandate Frequency (%)
21(13.6)	55(35.7)	47(30.5)	31(20.1)

Findings on the level of government's involvement in the training policy decisions in public research and development institutions was somewhat controversial as 40.9% of respondents claimed that decisions on training policy was predominated by government while some 38.3% concluded that the decision was left for the respective institutions. Nonetheless, some 20.8% disclosed that it was more or less a joint decision by the two parties. When it comes to policies formulation, the contribution of those who will implement it is highly vital in the decision process. If they are side lined, such policy will suffer major setback. From the above aforementioned, the highest number concluded that most of training policies and decision were formulated for them. While, some may argue that government's development plan should map the direction of training and research. It is equally important that every stakeholder including management should be centrally involved.

Of most importance, however is that a preponderance of staff maintained that the process of training and manpower development in public R&D constituted a charade and that it would not facilitate the acquisition by staff of relevant professional knowledge, skills attitudes, and behaviours nor would it bring about the attainment of the high level of effectiveness now desired in the job performance. At this junction, it should be underscored that the findings of this study underscore inherent problems in the current approach to training and manpower development in Southwest Nigeria which constitute obvious threat to the acquisition of the relevant professional knowledge, skills, attitudes and ethical norms required by staff to enhance their job performance. However, it was also clear from the findings that the importance of staff training and development is recognized in the system which gives credence to individual and collective efforts towards manpower development and the mapping of future direction for research.

TABLE 10: LEVEL OF GOVERNMENT INVOLVEMENT IN TRAINING POLICY DECISION MAKING IN PUBLIC R&D INSTITUTIONS

Characteristics	Totally governmental Frequency (%)	Partly Governmental Frequency (%)	Hardly Governmental Frequency (%)	Never governmental Frequency (%)
What is the level of government's involvement in the training policy decisions in your organization	63(40.9)	22(14.3)	10(6.5)	59(38.3)

D. Constraints to Manpower Development in Public R&D Organization

Findings from the study revealed that almost all the respondents (90.2%) indicated that there were constraints to manpower development in their organization. Only 5.4% abstained from the question while 4.4% agreed that there was no constraint to manpower development. Among the constraint mentioned by the majority (73%) was funds and budgetary allocation. Moreover, 47.4% of respondents mentioned that government needed to look into the inadequacy of funds rocking public R&D organizations. Only (3.9%) indicated that budgetary allocation to manpower development was very good. Some 29.9% of respondents mentioned that inability to lobby successfully posed as constraints to manpower development. Lobbying may be considered as an unhealthy practice and may not be needed in a developed economy; however, it is a virile tool in developing economy politics especially because of limited resources. During the interviewing, majority of the trainees or training beneficiaries claimed to have been selected based on influence and interventions by known superior who decided to favour them. This practice has restrained training and human resource development to only a selective few who knows someone in authority while some rightful personnel have been denied from participating in training. Some (22.1%) indicated that the budget allocated for manpower development was dwindling yearly which made it difficult to select as many as possible to participate in training.

However, 61.2% claimed that all the constraints had been presented to the management for special consideration. Since all issues are usually tabled before the management of each organization for corresponding action. From the above discussion, we realize that majority of the respondents had discussed the issue with the management. Some recommendations were made

by the authors in respect of the situation in the concluding section.

V. CONCLUSION

This study sheds light on the effectiveness, policies and the constraints to training and manpower development in public research and development (R&D) organizations. The assessment of the effectiveness shows that there is much to be done to make training and manpower development produce the desired results and benefits such as assisting staff to acquire the relevant knowledge, skills, attitudes and ethical norms of behaviour requisite to enhance their job performance to the high level of effectiveness desired in the public research and development institutions. Accordingly, performance in the public R&D Institutions in southwest Nigeria will be enhanced to a high level of effectiveness if training and manpower development is given priority to enable staff to acquire relevant skills. The major constraint to training and manpower development was lack of fund as a result of poor budgetary allocation and policy inadequacy. In line with the findings, some workable recommendations have been proffered to assist in enhancing the effectiveness of training and manpower development in public R&D organizations.

It is recommended that additional avenues be explored for satisfactory funding of manpower development in general. This could include enterprise taxation, venture capital and public-private partnership. It is critical that this be done immediately. Also researchers in public R&D institutions should intensify their search and subscription to foreign grants and calls for research proposals.

It is also advisable that individual and organizational inputs should be sought during policy making for training and manpower development as this will ensure that skill-gaps are closed and on-the-job performance improved when such policy are eventually implemented.

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