

Effects of Professional Development on Productivity: Evidence from a Research Institution in Ghana

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Abstract

Employee professional development programs are one of the most important pillars for the survival of any organization as they help improve employees' skills, knowledge, and experience in terms of productivity. This study was conducted to examine the impact of professional development on employee productivity at the Ghana Atomic Energy Commission (GAEC), a research institution in Ghana. The study adopted the survey research design for both academic and non-academic staff. A total of 360 respondents were randomly selected from a population of 530 people. A questionnaire was used as a data collection instrument. Descriptive statistics such as means, standard deviations, frequencies and percentages were used to analyze the data. The study revealed that the majority of respondents have participated in some professional development programs and viewed the professional development programs as an effective tool to address their operational challenges upon joining GAEC. Furthermore, most respondents strongly agreed or agreed that they face the challenge of inadequate technological support to effectively implement the lessons learned from professional development programs. The study identified incentives, performance targets, encouraging employees to conduct research and development in their respective areas, encouraging collaborative research and ensuring effective monitoring and evaluation as the main factors driving productivity. It is recommended that management consider employee needs, provision of logistical support and fairness when selecting personnel for professional development programs. These will help improve the skills and competencies of employees, making them more willing to work harder and provide quality services for the success of the organization.

Keywords

Professional Development, Employee Productivity, Research Institution, Career Advancement

1. Introduction

Organisational success depends on the quality of available human resource which presupposes that employers must maintain standards by investing in employee development or constantly recruiting high calibre personnel to achieve set targets. Employee professional development has been recognised as essential in improving the productivity of employees in organisations (Ndidi et al., 2022; Fullan, 2000). In the phase of highly challenging and competitive global market economy, the professional life of employees should not be standstill, but need to change to meet changing trends in the working environment, thereby helping them adapt quickly to the continuous fluctuating business environment (Prasetyaningtyas et al., 2021). According to Hodgetts (2002), employees are affected by the ways in which the organisational system develops its employees or staff. There is therefore the need for organisations to put measure in place to help employees in professional development and training to enhance their performance and productivity.

Professional development is the internalization of knowledge, skills and processes that enable the formulation, implementation, monitoring and evaluation of set goals in an efficient manner (Guan & Frenkel, 2018; Haryono et al., 2020; Alao, 2010). Anyanwu (2002) also described professional development as a series of activities that an organization, a company or even a nation must undertake in order to continually provide for itself a skilled workforce to meet its current needs future needs. According to Alao (2010), employee's professional development is one of the most important formations of any competent management. This is attributed to the ever-increasing technological sophistication especially in this age of computer technology. In other words, ever-increasing technological innovation has made it compulsory for organizations to develop the skills and competence of their employees to effectively meet changing situations. Alavi and Leidner (2001) explain that the relationship between the professional development programmes organized by management, and the personal and career development plans of employees have significant influence on the productivity on employees. It is, therefore, necessary for organizational management to unite employees' personal and career development goals with professional development programmes (Bartel, 1994). According to Sanusi (2002), assessing employees' perception of the professional development programmes offered by management is the first step in measuring the likely impact of such programmes on the employees and eventually the organisation.

The relationship between employee development and productivity has been

fairly assessed. [Nda and Fard \(2013\)](#) conducted a comprehensive review of the impact of training on employee productivity. They concluded that, for any organizations to achieve optimum returns from their investment under stiff and dynamic competition, it is imperative to effectively manage training and development programmes. [Paradise \(2007\)](#) reported in his study that US companies alone invest more than \$126 billion per year in the training and development of their employees. Similarly, [Jelena \(2007\)](#) suggested that, in a high-risk environment, companies with competent employees who are knowledgeable and understand market formation tend to have a competitive advantage. Knowledge therefore becomes a fundamental capital that triggers development. However, since knowledge and skill can be eroded and become obsolete and need to be replenished over a period of time, hence, training and development of employees at all levels is very important ([Nishtha & Amit, 2010](#)).

Employee professional development has also caught up with both public and private organisations the world over including the Ghana Atomic Energy Commission (GAEC). The GAEC is a state organisation established by an Act of Parliament (Act 204) in 1963. The main functions of the Commission include the promotion, development and utilization of peaceful applications of nuclear and biotechnological techniques for economic and social advancement of Ghana. In pursuance of these objectives the Commission has established institutes and Centres which carry out appropriate research activities. The Act 204 has been superseded by Act 588 of 2000. The Commission has total staff strength of over 500 comprising research scientists, technical, administrative and supporting staff. Ghana is a member of UN and has benefited from development programmes organised by the various arms of the UN including International Atomic Energy Agency (IAEA) it deals with the various atomic agencies of the member state and in Ghana, GAEC is a mandatory body with which the IAEA establishes bilateral relations with respect to Atomic issues. Through this, Ghana benefits from training programmes and human resource activities organised by IAEA. One of such programmes is the AFRA which is specifically for African countries. Some benefits Ghana has enjoyed in collaboration since the establishment of the SNAS which has been designated as regional centre of excellence in nuclear science and education. Through this, significant number of scientists have been trained overseas in countries like Germany, Italy, Greece and Spain since 2006. With a broad spectrum of opportunities in science and technology, GAEC has positioned its research institutes at the frontier of science and technology to meet the nation's immediate and long-term research and development needs in Ghana's core mission areas of nuclear science applications to agriculture, energy, health and environment. GAEC's committed vision is to become a Centre of Excellence employing nuclear energy as a tool to provide world-class science, technology and service products with customer and stakeholder satisfaction in the region.

The responsibility therefore lies on the Commission to organise professional

developmental programmes for its employees to get them equipped and abreast with trending skills and tactics in order to meet its long-term target(s) of exploiting positive uses of atomic science including nuclear energy in support of research and development activities to the benefit of Ghana's economy. The study therefore aimed to assess the perception of GAEC personnel on professional development programmes available and their impact on their productivity, examine the challenges employees face in professional development and identify how management can develop programmes to meet employee needs.

2. Methodology

2.1. Description of Ghana Atomic Energy Commission

The Ghana Atomic Energy Commission (GAEC) is a statutory body set up by an Act of Parliament (ACT 204, 1963) as the national agency in Ghana responsible for all matters relating to the peaceful uses of nuclear and atomic energy. On December 8th, 2000, the Government passed a new Act (ACT 588, 2000) which superseded the original Act 204 of 1963. Its primary objectives were set out by the Parliament Act 588, which involve investigating the use of nuclear energy for Ghana and supporting research and development both in Ghana and abroad. The statutory functions as defined by the new Act 588 (2000) are to: 1) advise Government on policy issues relating to peaceful use of nuclear energy; 2) applied research and development; 3) Commercial application of research in the areas of health, agriculture, industry and commerce; 4) Fulfilling the state's obligation on nuclear safety, security and environmental care; 5) Contributing to building a sustainable future for Ghana by facilitating the introduction of nuclear power into Ghana's energy mix; 6) Development of the human resource base in nuclear science, biotechnology and related fields; 7) Satisfying stakeholder's expectations; 8) Building strategic partnership and alliances with national, regional and international bodies to enhance utilization of nuclear and related technologies for sustainable development.

GAEC is located North-West of University of Ghana. It is about 24 km from the Central Accra and 6 km off the Legon-Madina road towards Kwabenya through Haatso township. The Commission has a total staff strength of 530 comprising research scientists, technical, administrative and supporting staff (GAEC, 2012).

2.2. Research Design

The study adopted a descriptive research design. According to Fowler (1993), a descriptive research design involves the use of both qualitative and quantitative techniques to describe, record, analyse, and interpret conditions that exist. Burns (2000) indicates that descriptive research design involves gathering data that describe events and then organises, tabulates, depicts, and describes the data. As a result, the descriptive research design permitted the description of relevant issues concerning the effect of professional development on productivity at GAEC.

A questionnaires were distributed among the employees in order to achieve the objectives of the research (Appendix 1). The questionnaire was developed at 5-point Likert Scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree).

2.3. Sample, Sampling Procedure and Study Population

According to *Krejcie and Morgan (1970)*, a population of 530 requires a sample size of 225. In this study 365 questionnaires were administered. However, only 360 questionnaires were retrieved and used for the study. This constituted 67.92% of the actual sample size. Stratified sampling technique was used to sample respondents from the various staff categories. Thus, the study population was stratified into four strata i.e. research scientists, technical staff, administrative staff and supporting staff for sampling. Proportionate sampling was used to sample respondents from the various strata.

The staff lists for the various strata were obtained from the Human Resource Department of GAEC. The lottery method was used to sample respondents for the study.

The names of the employees were written on equally sized pieces of papers and folded into a bowl. The papers were shuffled to make sure they were not in any pre-determined positions. The first draw was made without replacement. The name and details of the person was taken. Subsequent draws were made until the sample size for that particular staff category was reached. The process was repeated for all the other three staff categories. As a result, 168 research scientists, 57 technical staff, 48 administrative staff and 87 supporting staff were sampled for the study.

2.4. Research Instrument

Questionnaire was used as the instrument for collecting data from the respondents. This was used because all the respondents were perceived as literates who could read and administer the instrument without the support of the researcher. The questionnaire was organized into four parts. The first part was on the demographic characteristics of respondents. Issues captured under this section included gender, educational level and number of years of working with GAEC. The second part was on the perception of respondents on professional development programmes available and their impact on employee productivity. Some of the issues considered under this section were effectiveness of the professional development programmes, professional development programmes enhancing one's understanding, and professional development programmes enhancing one's performance.

The third section of the questionnaire was on the challenges employees face in professional development. Some of the issues captured under this section were too much time spent on professional development programmes, spending too much time away from family, and professional development programmes have

little link with one's working operations. The fourth section was on programmes to be developed by management to meet the needs of employees.

2.5. Method of Data Collection

The researchers first secured approval from the management of GAEC for data collection. Second, the researcher identified the respondents and introduced herself and the purpose of the study to them. The researcher also sought for the consent of the respondents before carrying out the data collection exercise. After securing the consent of the respondents the questionnaires were handed over to them. They were asked to indicate the time within a period of two week that they are likely to complete administering the instrument. The times were recorded against their names and subsequent visits were made to retrieve the questionnaires. Some of the challenges encountered during the data collection exercise were delays in administering the instrument, misplacement of questionnaires, difficulty locating some of the respondents to retrieve the instruments, and reluctance of some of the respondents to partake in the exercise. In some of the cases, the researcher had to make more than three trips to retrieve the instruments. The researcher also had to reprint the instrument for respondents who had lost theirs.

2.6. Data Analysis

The data were first edited to correct all inconsistencies and grammatical errors. The data were then coded and entered into Statistical Product and Service Solutions (SPSS). Descriptive statistics such as means, standard deviations, frequencies and percentages were used to analyse the data. Statistical tables and frequency charts were used to present the data.

3. Results and Discussion

3.1. Background Characteristics of Respondents

The background characteristics of respondents with respect to gender, highest level of education and the number of years of working with GAEC are presented in **Table 1**. From the study, majority (80%) of the respondents were males, whereas 20% were females. **Table 1** shows that majority (55%) of the respondents had Postgraduate education, 30% had the University (First degree) as their highest level, whereas 10% and 5% stated Post-secondary education and basic schools respectively as their highest education levels. The implication is that all the respondents in GAEC had received some levels of formal education. In addition, the high number of respondents with Postgraduate education may be attributed to the technical, specialised and the scientific nature of the operations of GAEC. Thus, staff with Postgraduate education was to help GAEC to meet its specialised functions.

The study also assessed the number of years a staff worked with GAEC. This was critical because the number of years one had worked with GAEC determines

Table 1. Highest level of education of respondents.

Level	Frequency	Percentage
Basic	18	5.0
Post-secondary	36	10.0
University	108	30.0
Postgraduate	198	55.0
Total	360	100.0

the length with which one has experienced the professional development programmes of the Institution. It may also determine the number of professional development programmes they qualified for, and those they have benefited from. The study found that the respondents had worked with GAEC ranging from 1 to 16 years. The mean number of years respondents had worked with GAEC was 5.8 years with a standard deviation of 1.3. The implication is that majority of the respondents had worked for quite considerable number of years with GAEC. As a result, they are likely to give a clearer picture on the impact of professional development on productivity in GAEC.

3.2. Perception of Personnel on Professional Development Programmes Available and Their Impact on Productivity

The perceptions of the employees on professional development programmes have the tendency to influence their seriousness and commitment towards the programmes and its influence on the beneficiary's productivity. **Table 2** shows that 5.8% of the respondents had not received any admitted to have benefited from any of the professional development programmes of GAEC, majority (55%) have benefited from workshops, whereas 15% and 10% have benefited from training programmes and seminars, respectively. The implication is that majority of the respondents have undergone some professional development programmes upon joining GAEC. This shows that GAEC is committed to building the capacity of its employees to achieve organisational development goals as describe by **Armstrong (1996)** that the proportion of employees benefiting from organisational development programmes reflects the readiness and commitment of management to build their capacity.

Respondents were further asked to describe the effectiveness of the professional development programmes in addressing their operational challenges. This was to examine the responsiveness of the professional development programmes in addressing the operational challenges of employees.

Figure 1 shows that majority (60%) of the respondents stated that the professional development programmes were effective in addressing their operational challenges, 20% described it as very effective, whereas 5% and 15% described it as less effective and least effective, respectively. The implication is that the professional development programmes have empowered the beneficiaries to address

Table 2. Professional development programmes employees have been introduced to upon joining GAEC.

Programmes	Frequency	Percentage
None	18	5.0
Induction	21	5.8
Training	54	15.0
Mentoring	18	5.0
Workshop	198	55.0
Conference	15	4.2
Seminar	36	10.0
Total	360	100.0

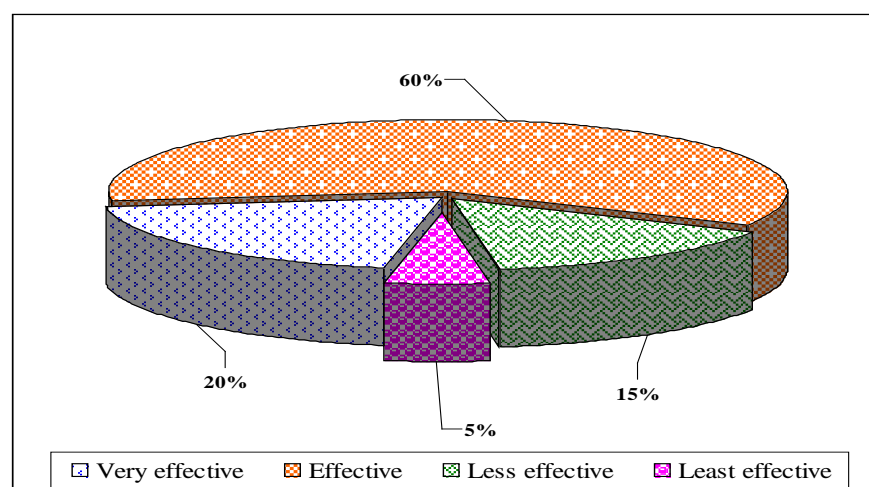


Figure 1. Effectiveness of professional development programmes in addressing operational challenges of employees.

difficulties in their job roles. This is likely to enhance their productivity through reduction in the time to deliver certain services which hitherto they had to rely on their superiors to perform.

Another issue assessed by the study was the effectiveness of the impact of the professional development programmes on the employees' morale to work. According to [Barney and Wright \(1998\)](#), employee morale to work is significant to ensuring improvement in productivity.

From [Figure 2](#), majority (64.2%) of the respondents indicated that the professional development programmes were effective on impacting on their morale to work, 10.8% said the programmes were very effective, whereas 20% and 5% described the programmes as less effective and least effective, respectively. The results imply that employees' morale would continue to increase as they benefit more from professional development programmes. Such increases in morale could help improve the productivity of employees as indicated by [Barney and Wright \(1998\)](#) that employees with high morale have higher productivity than those with low morale.

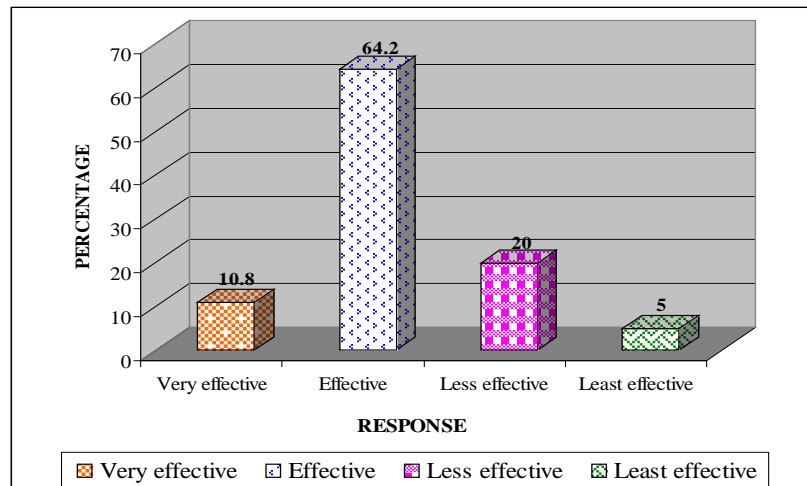


Figure 2. Effectiveness of professional development programmes on impacting on employees' morale to work.

The study also assessed the impact of the professional development programmes on the knowledge and skills of employees to work effectively. [Bartel \(1994\)](#) establishes a strong relationship between employees level of understanding about their job and the quality of their work.

From [Table 3](#), majority (55.8%) of the respondents agreed that the professional development programmes have increased their knowledge and skills to work effectively, 29.2% strongly agreed, while 12% and 5% disagreed and strongly disagreed, respectively. The implication is that majority of the respondents might have understood better their job roles as well as improved on the quality of their work through the professional development programmes.

The study further examined the impact of professional development programmes on the creativity and innovative skills of respondents. The study found that 70% of the respondents strongly agreed or agreed that the professional development programmes of GAEC have enhanced their creativity and innovative skills, whereas 30% disagreed or strongly disagreed. This is likely to enhance the development of new products at GAEC as stated by [DeSimone and Harris \(1998\)](#) that creative and innovative employees help organisations to develop new products to enhance their competitiveness.

The respondents were asked to indicate how the professional development programmes have helped them to improve the quality of their performance. This was important because improved quality of performance is one of the main objectives of organising professional development programmes for employees. [Table 4](#) shows that majority (75%) of the respondents strongly agreed or agreed that the professional development programmes of GAEC have helped to enhance the quality of their performance, while 25% disagreed or strongly disagreed. This is likely to enhance the quality of service provided by GAEC. According to [Dowling and Welch \(2005\)](#), the quality of performance of organisations is a reflection of the aggregation of the quality of performance of individual employees

Table 3. Professional development programmes increasing the knowledge and skills of employees to work effectively.

Response	Frequency	Percentage
Strongly agree	105	29.2
Agree	201	55.8
Disagree	36	10.0
Strongly disagree	18	5.0
Total	360	100.0

Table 4. Professional development programmes enhancing the quality of performance of employees.

Response	Frequency	Percentage
Strongly agree	36	10.0
Agree	234	65.0
Disagree	72	20.0
Strongly disagree	18	5.0
Total	360	100.0

Armstrong (1996) explains that the relationship between organisational professional development programmes and the career development plans of employees are critical for improving their commitment and seriousness towards the programmes. Consequently, the study examined how the professional development programmes of GAEC related with the career development plans of employees.

Figure 3 shows that 40% of the respondents indicated that the professional development programmes offered by GAEC relate with their career development plans, 30% said the programmes are very related to their career development plans, while 25% and 5% respectively said the programmes were less related and least related to their career development plans. The results show that majority (70%) of the respondents have their career development plans related to the professional development programmes they are exposed to by GAEC. This is likely to enhance the commitment of such employees towards the organisation as well increase retention. Evans and Lindsay (1999) argue that employees are more committed and willing to remain working with organisations which help them to achieve their career development goals.

Another issue considered under the first research objective was the impact of the professional development programmes on the competence of employees. From Table 5, majority (70%) of the respondents strongly agreed or agreed that the professional development programmes of GAEC have helped to improve their competence, while 30% disagreed or strongly disagreed. The implication is that majority of the respondents are currently able to handle difficult tasks which hitherto they were unable to handle. Thus, Fullan (1990) explains increased

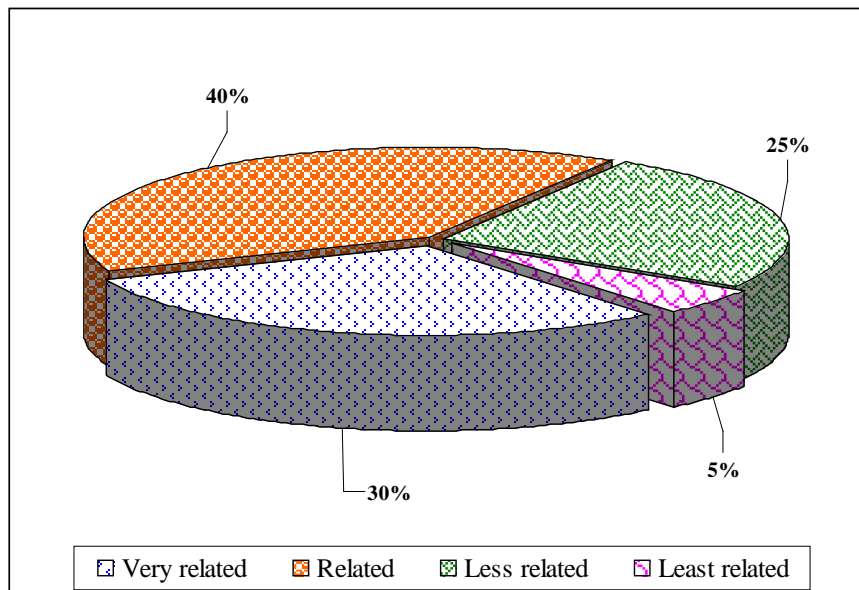


Figure 3. Relationship between professional development programmes and career development plans of employees.

Table 5. Impact of professional development programmes on the competence of employees.

Response	Frequency	Percentage
Strongly agree	57	15.8
Agree	195	54.2
Disagree	90	25.0
Strongly disagree	18	5.0
Total	360	100.0

competence as the situation where one has gained additional insight, understanding, and skills to handle tasks which hitherto he or she was unable to handle. This is likely to improve both organisational efficiency and effectiveness.

The study further examined the impact of the professional development programmes on wastage of resources among employees. **Figure 4** shows that majority (70%) of the respondents strongly agreed or agreed that the professional development programmes have enabled them to be less wasteful in terms of resources in their operations, whereas 30% disagreed and strongly disagreed, respectively. This is likely to reduce operational cost of the Institution since employees may use fewer resources to achieve the same or improved quality of work. Some of the reasons given as to how the professional development programmes have enabled employees to be less wasteful were exposure to more practical solutions, more explanations were given on the importance of making backups for information, and individual employees are now able to handle laboratory analyses by themselves. Others were provision of practical and in-depth knowledge to tackle problems, and ability to handle things which hitherto had to

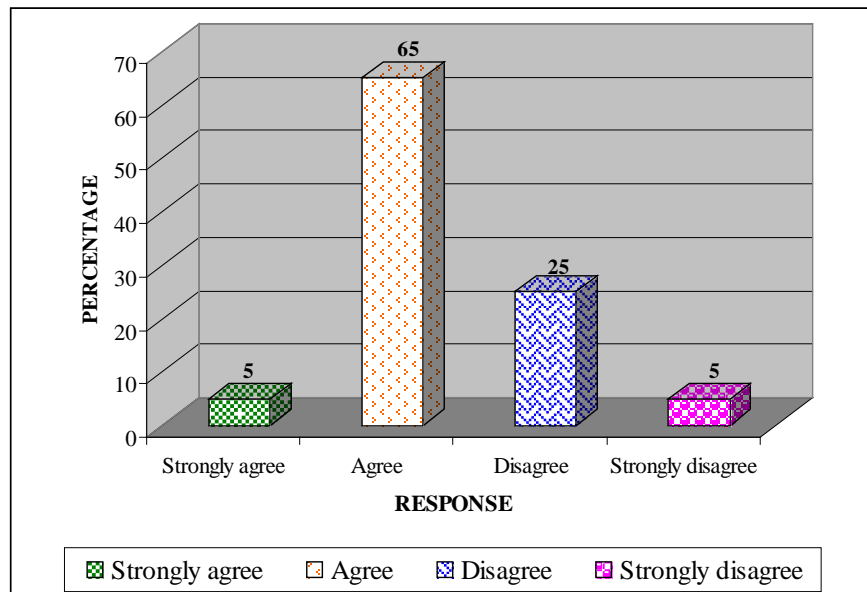


Figure 4. Professional development programmes enabling employees to be less wasteful in their operations.

rely on senior colleagues. On the other hand, reasons why the professional development programmes were unable to contribute to reduce resource wastage among employees were lack of the necessary tools and equipment to implement lessons learnt, and short time for the programme which impeded deeper understanding of issues.

3.3. Challenges Employees Face in Professional Development

The study also examined the challenges employees encounter with the professional development programmes of GAEC. This was essential to identify some of the issues reducing the effectiveness of the professional development programmes in addressing particular issues in employees' job operations. Some of the issues considered were inadequate technological support, spending too much time away from family, and staff selection for professional development programmes. Yoon et al. (2007) indicate that inadequate technology to support capacity building training programmes has been one of the major setbacks to professional development programmes in developing countries.

Table 6 shows that majority (85%) of the respondents strongly agreed or agreed that they encounter the challenge of inadequate technological support to effectively implement lessons learnt from the professional development programmes, while 15% less agreed or least agreed. This is likely to affect the spate of practicalising lessons learnt from the professional development programmes. The implication is that employees are likely to be more competent, effective, creative, innovative and less wasteful if management support them with the requisite technology to operationalise lessons from the professional development programmes. Thus, employees would continue to under perform in relation to their current capacity as long as they are denied of such technological support.

Table 6. Inadequate technological support to effectively implement lessons from professional development programmes.

Response	Frequency	Percentage
Strongly agree	216	60.0
Agree	90	25.0
Less agree	36	10.0
Least agree	18	5.0
Total	360	100.0

The time spent on professional development programmes has also been identified as one of the factors that can limit the effectiveness of professional development programmes. From the study, 5% of the respondents strongly agreed that they spent too much time away from their family during professional development programmes, 40% agreed, whereas 30% and 25% less agreed and least agreed, respectively. The results show that quite a significant proportion (45%) of the respondents were not comfortable with the quantum of time spent on professional development programmes. This may affect their concentration and commitment towards the programmes.

The study also found that 5% of the respondent strongly agreed that the timing for professional development programmes was not convenient, 25% agreed, whereas 55% and 15% less agreed and least agreed, respectively. The implication is that majority of the respondents were comfortable with the timing for the professional development programmes.

Furthermore, the respondents were requested to indicate how staff selection for professional development programmes reduces the effectiveness of the programmes. This was essential because unfair staff selection for training programmes reduces employees' morale and dents their perceptions on organisational management and their training programmes. About 20% of the respondents strongly agreed that there was unfair selection of employees for professional development programmes, 35% agreed, whereas 30% and 15% less agreed or least agreed, respectively (**Figure 5**). The results show that majority of the respondent perceived the staff selection process for professional development programmes as unfair. This is likely to reduce their morale and commitment in working under such supervisors who are perceived as being biased in the staff selection process for professional development programmes.

The study further examined whether professional development programmes were less related to job criteria of respondents. According to **Zaccarelli (1997)**, the perception of employees on the importance of professional development programmes to their working roles is essential in enhancing their commitment to learn new and improve issues from such programmes. **Figure 6** shows that 15% of the respondents strongly agreed that the professional development programmes were less related to their job criteria, 29.2% agreed, whereas 40.8% and 15% less agreed and least agreed, respectively. The results show that majority

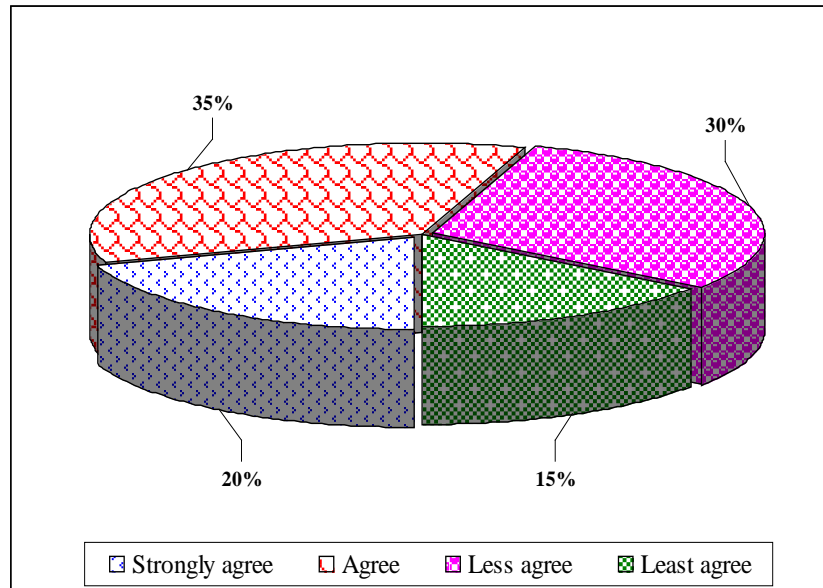


Figure 5. Unfair staff selection process for professional development programmes.

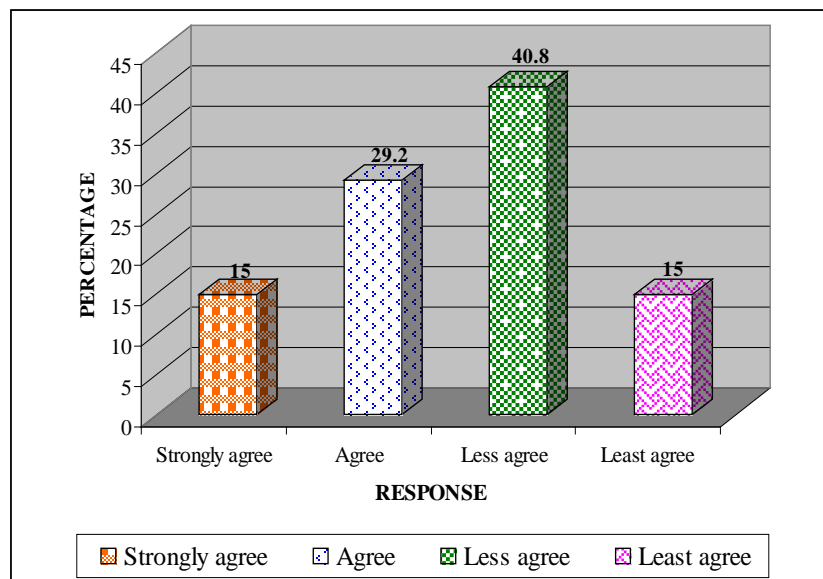


Figure 6. Professional development programmes are less related to job criteria.

(55.8%) of the respondents perceived that the professional development programmes relate to their job criteria. This is likely to enhance their commitment to learn new and improved issues as described by *Zaccarelli (1997)*.

3.4. Professional Development Programmes vs Employees Needs

Aligning provisional development progarames to the needs of the employees is important to identify other operational challenges of employees that need to be addressed through professional development programmes. From our study, some of the issues raised by the respondents to enable them meet their professional development needs were organising frequent training and seminars, iden-

tifying the specific training needs of workers, systematic mentoring for new staff and providing equal opportunities to employees to participate in workshops. The respondents further emphasized the need for providing the needed materials and logistics to aid practicalisation of lessons, creating good working environment.

The study further examined views on respondents on what management should do to enhance employees' productivity. Some of the issues raised were that employees should be given incentives to motivate them to increase productivity, employees should be given performance targets, encourage staff to pursue research and development in their respective areas, promote collaborative research, and effective monitoring and evaluation. Others were developing project work along specialised areas of the commission, properly addressing the challenges of employees, instituting best worker award system, defining a research path for workers, and ensuring fairness in the choice of employees for specific job tasks. The implication is that employees' productivity would be enhanced if management addressed the above issues.

4. Conclusion

The study empirically examined the effect of professional development on employee productivity in a research institution in Ghana. From the study, majority of the respondents have undergone some professional development programmes upon joining GAEC. Similarly, most of the respondents perceived the professional development programmes as effective tool in addressing their operational challenges. Majority of the respondents also strongly agreed or agreed that they encounter the challenge of inadequate technological support to effectively implement lessons learnt from the professional development programmes. Some of the issues raised by the respondents to increase their productivity were incentives, performance targets, encouraging staff to pursue research and development in their respective areas, promoting collaborative research, and ensuring effective monitoring and evaluation. The study therefore concludes that professional development programs significantly enhanced employees' productivity in Ghana Atomic Energy Commission.

Based on the summary of major findings, the following recommendations were made:

- GAEC should continue with its professional development programmes. This is because it has helped to address the operational challenges of majority of employees. The professional development programmes should however focus more on employees who have not benefited from the programmes. This would continue to help build the capacity of employees to effectively handle their operational challenges, improve their knowledge and skills to work, and reduce wastage in their operations.
- GAEC should provide the necessary material and logistical support to employees to promote the adoption of lessons learned from the professional devel-

opment programmes. This could be done by assessing the logistic requirements for addressing particular working challenges of employees and the possibilities of acquiring them before providing professional development programmes in such areas. This would help to fast track the rate at which certain capacity deficiencies in the operations of employees are addressed.

- GAEC management should ensure fairness in the selection of staff for professional development programmes. This would help to enhance the morale and commitment of employees towards the Institution. This could be done by instituting periodic assessment or identification of operation challenges of employees. This will help management to know the workers who qualify for particular professional development programmes. It would also help to improve the responsiveness of the professional development programmes towards operation challenges of employees.

- Supervisors should closely monitor and evaluate the improvements and the working achievements of workers. This could be done staff appraisal system. Assessment of progress would enable management to track the improvement or efficacy of the professional development programmes in addressing particular working issues of employees.

- Employees should be given annual and quarterly targets to be achieved. Assessment of the achievement of the working targets should be close to the kinds of professional development programmes workers have benefited from. Assessment of the achievement of the set targets would also enable management to examine changes in the level of productivity of employees as well as the extent of contribution of the professional development programmes to the change in productivity.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix

QUESTIONNAIRE GAEC EMPLOYEES

Dear Respondent,

This questionnaire is designed to examine the effect of professional development on productivity among the employees of the Ghana Atomic Energy Commission. It aims at assessing the perception of GAEC personnel on professional development programmes available and their impact on productivity, challenges employees face in professional development, and programmes management should develop to meet the needs of employees. This is in partial fulfilment for the award of a Master degree. As a result, any information given will be purely treated at the academic level.

Thank you

Section A: Background characteristics of respondents

- 1) Gender of respondents: [1] Male [2] Female
- 2) Highest level of education: [1] Basic [2] SHS [3] First degree [4] Post graduate
- 3) Number of years working with GAEC:

Section B: perception of GAEC personnel on professional development programmes available and their impact on productivity

- 4) What professional development programmes have you been introduced to since you joined GAEC?
[1] None [6] Workshop
[2] Orientation [7] Conference
[3] Induction [8] Higher level of education
[4] Training [9] Peer coaching
[5] Mentoring [10] Seminar
[11] Others.....
- 5) How would you describe the effectiveness of the professional development programmes in addressing your operational challenges?
[1] Very effective [2] Effective [3] Less effective [4] Least effective
- 6) How effective have the professional development programmes been in increasing your morale to work?
[1] Very effective [2] Effective [3] Less effective [4] Least effective
- 7) How do you agree that the professional development programmes have increased your knowledge and skills to work effectively?
[1] Strongly agree [2] Agree [3] Disagree [4] Strongly disagree
- 8) How do you agree that the professional development programmes have helped to enhance the quality of your performance?
[1] Strongly agree [2] Agree [3] Disagree [4] Strongly disagree
- 9) How do you agree that the professional development programmes have helped to enhance your creativity and innovative skills?
[1] Strongly agree [2] Agree [3] Disagree [4] Strongly disagree
- 10) How were the professional development programmes related to your ca-

reer development plan?

[1] Very related [2] Related [3] Less related [4] Least related

11) How do you agree that the professional development programmes have increased your competence to handle more difficult tasks which hitherto you were unable to handle?

[1] Strongly agree [2] Agree [3] Disagree [4] Strongly disagree

12) How do you agree that the professional development programmes have enabled you to be less wasteful in terms of resources in your operations?

[1] Strongly agree [2] Agree [3] Disagree [4] Strongly disagree

13) Reason(s) for the answer in question 12:

Section C: Challenges employees face in professional development

14) How do you agree to the following as challenges faced with professional development at GAEC? Using 1 = Strongly agree, 2 = Agree, 3 = Less agree, 4 = Least agree

Challenges	1	2	3	4
Inadequate technological support to effectively implement lessons learnt from the professional development programmes				
Too much time spent away from family				
Timing for professional development programmes not convenient				
Unfair staff selection process for professional development program				
Professional development programmes less related to job criteria				

Section D: Programmes management should develop to meet the needs of employees

15) What do you think Management should do to meet the professional development needs of employees?

.....

16) What do you think Management should do to enhance employees' productivity?

.....

17) Any additional comment:

Thank you