Training for the Future? A Case of Automotive Training in TVET Institutions in Kenya

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Author’s contribution
The sole author designed, analyzed and interpreted and prepared the manuscript.

ABSTRACT

Aims: To evaluate the opinions of the automotive trainers on the extent to which their training programs were futuristic in content and organization. To establish whether the training was in line with changes in technology in industry; the main emphasis of training and suggestions ways of improving the situation.

Study Design: Survey.

Place and Duration of Study: Technical training institutions in Kenya involving Automotive trainers in the year 2015.

Methodology: Data was collected by use of a questionnaire. Sample: The study involved 31 Automotive trainers in Kenya.

Results: The study established that the training programs are not fully aligned to the requirements for the future practice in automotive industry. A greater percentage 67.7% (21) of the trainers agreed that the automotive mechanics course was a sufficient preparation for work in the automotive industry while 29% (9) disagreed. A total of 64.5% (20) of trainers disagreed that the facilities at industry are different from those at the training institution. A large number 96.8% (30) agreed that the automotive mechanics course should be restructured to focus on work in industry. There were 55% (17) respondents agreeing they were able to cope with changes in industry while 42% (13) disagreed. There were 51.6% (16) trainers agreeing that training on the job is better for repair work than institute based training while 45.3% (14) disagreed. Collaboration with industry in program...
design was found to be inadequate. There were 93.6% (29) trainers who reported the view that the collaboration is missing.

**Conclusion:** Training at the Technical Training institutes should be designed for flexibility with key stakeholders being involved. Training facilities should be as close as possible to the work place facilities.

**Keywords:** Automotive training; automotive industry; stakeholder involvement; futuristic training; training organization; technology changes; technical training.

1. INTRODUCTION

The meaning and practice of work in knowledge economies and in a globalised network of production and trade is changing. The need for a highly skilled and productive workforce is shaping all nations’ economies [1,2]. In addition, making the link between the training and workplace helps learners to see the relevance of their learning and understand the contribution that they can make to their community and to the economy. In the challenge of changes in work and learning, Kenya is not left behind in these demands. This paper discusses the opinions by the trainers on the training that they facilitate. It is based on a research that set out to find the state of the automotive training in Kenya in relation to the relevance to the changing technologies in the world. The paper focuses on the following foundation questions:-

i) How sufficient the training arrangements are for the life after school?

ii) How relevant are tools equipment and machines at the training institutions compared to the work place?

iii) How is the trainees Preparedness to cope with the changes in technology at the work place?

iv) What is industry input into the content that is taught at the training institutes and the possible need for retraining?

v) How is the training program organised in relation to flexibility of training to allow for inclusion of new technology into training

vi) What restructuring of the training is required to suit the current trends in technology in the industry?

These foundation questions are informed by Stevenson [3] and Carl [4] views that teaching and learning should occur in a context of actual practice which is industry for this paper. In the same vein, part and purpose of post compulsory education and training is to help learners become ready for what is likely to be the main features of their lives - getting a job and staying in employment.

In this light Race [2] outlined seven factors underpinning successful learning that develop employability of the learners. These factors are closely related to the key questions that this paper addressed. They are also intertwined and do not stand independent of the others. They are:-

i. Wanting to learn: this is the motivation that employers highly value.

ii. Taking ownership of the need to learn: this is working towards targets which is necessary in the day to day life of being employed

iii. Learning by doing: this is extending practice, repetition learning through mistakes attitude to the real work situation.

iv. Making sense: helping learners to become aware of how best they can achieve the sense of what they are doing enables them to be better employees.

v. Learning through feedback: employers value the skills of good listeners who are able to adjust their actions to take care of feedback requirements.

vi. Learning through coaching, explaining, teaching is closely correlated with the skills needed for employability for a wide range of jobs.

vii. Learning through assessing and making informed judgements including self and peer assessment.

All the post compulsory education and training should have a clear focus on the general expectations of training provision for employability and training for the future.

1.1 Introduction to Kenya

Kenya is a country in the eastern part of Africa with a total population of about 41 million people. The current education system within the country is in the order of eight years of primary education, four years of secondary education and at least four years of university education (8-
4-4). It is referred to as the 8.4.4 system of education. This system describes education for those who progress up to the university level. However, within the education system, there are other institutions, which provide education to the students who do not necessarily go through to the university. These are the National polytechnics, which offer ordinary, and higher national diplomas, the institutes of science and technology, and the technical training institutes which offer ordinary diplomas and certificates.

Kenya has had several proposals in her educational system within a span of approximately 50 years. There has been the Ominde [5] the Gachathi [6], the Mackay [7], Kamunge [8] and the Koech [9] Commissions. This has been partly due to the emphasis the government and the people of Kenya have given to education and partly the way education has failed to respond to the various national needs [10,11]. All the commissions pointed at the issue of relevance in education. Specifically the Kamunge [8] and Koech [9] reports suggested that education in Kenya should place emphasis on the relevance and the quality to enhance development. As a result, the government of Kenya's policies and objectives on education and training as contained in the sessional paper No. 8 of 1988 based on the Kamunge Report stated that the future policies in education and training should lay emphasis on and give priority to; the quality and relevance of education and training, the eradication of illiteracy, the development of science and technology, the vocationalization of education, research, management and entrepreneurship training, the development of the handicapped, and the development of centres of excellence [8].

Quality, relevance and vocationalization of education, which are the concerns of this research, came out boldly. Up to now they still are precious goals to go for. However not much can be claimed to have been achieved since the time of the report. The issue of relevance is still being pursued at now 2016. The government has hatched a process for curriculum reform in order to overhaul the system from 8-4-4 to another one that will be responsive to the needs of industry. It is being changed to in cooperate programs that are market driven and also to reduce the excessive emphasis on summative evaluations the Kenya Certificate of Primary Education (KCPE) and Kenya Certificate of Secondary Education (KCSE). Establishment of pathways and vocationalization are being outlined as main goals to pursue. The key question to be addressed is to do with economic relevance. Through the new system, it is hoped that students would more easily find work when the leave school and become more productive and trainable. With quality and relevance being the main issues that all reforms address, this research aimed at finding out the views of the trainers in relation to quality of the programs that they facilitate.

1.2 Literature Review

Boud in the foreword to Billett [12] argues that the view that learning only takes place in schools and colleges is inadequate. He argues that initially, the workplace was seen as a place to work, to produce goods or offer services. It was assumed that learning occurred before employment or as part of special training. However, the demands of the workplace have now become more complex and no amount of initial training can prepare a person for a lifetime [3,13]. Precisely learning is something that the learner does and not something that is done to the learner. Meaningful; learning involves active cognitive restructuring where students are fully engage with the environment. They make their own inferences and experiences to resolve cognitive dissonance [14]. This is in line with Dewey's view of education for employment in that the only adequate training for occupations is training through the occupations [13,14]. Jobs are changing, new technologies are emerging and new opportunities are created. All these require learning and relearning. To add to this, Braddy [15] states that the automotive industry is undergoing many changes since rapid and ongoing technological changes are part of life in industry. This calls for changes in training to cope with the changes in the industry [2,13]. A skilled workforce is needed to maintain and increase a high level of customer demands and global advancement in the automotive industry. Relatedly Billett [12] proposes that learning should not be taken as the sole domain of institutions but a shared responsibility of the institution and workplace, with the workplace learning being more authentic and requiring consecutive approximations to the ideal level of task performance as displayed by the experts. This research focuses on cognition, learning and work performance with special interests on the modes that promote cohesiveness in the development of proficiency from a novice to an expert.
1.3 Theoretical Framework

The theoretical perspective is the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria [16]. The theories underpinning this research were the cognitive theories of learning and the transfer of learning. Theories which support learning in the school, workplace and as a lifelong activity, were emphasised. This paper is based on Vygotsky’s [17] theory for gauging learning potential. Vygotsky’s theory advanced the concept of the Zone of Proximal Development (ZPD) which he defined as:

The distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under guidance or in collaboration with more able peers [17 p. 85].

Lave and Wenger [17] further stretched this ZPD to highlight historical and social dimensions of learning hence contextualising it. Thus Vygotsky’s [17] combined with Lave and Wenger [18]) ideas form the basis for social theory of learning. On social learning theory, Guile and Young [19 p.159] state:

...such a theory could provide a way of linking work-based and school-based learning together as changes in work and society become the ideas of reflecting on the changes in pedagogic practice, and the disciplines of subject based-knowledge become the criteria for interrogating changes in work and society.

2. METHODOLOGY

The research methodology is the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of particular methods to the desired outcomes [16,20]. A methodology justifies the authenticity of the research. It is a philosophical inclination towards which the research is weighted. The research design is a conceptual structure within which research is conducted [21-23]. It informs the arrangement of the conditions for the collection and analysis of the data in a manner that aims to combine relevance to the research purpose [24]. The research design represents a logical set of statements that inform us of the dependability, conformability, credibility and trustworthiness of research findings [25-27]. These attributes have been referred by use of other terms such as reliability, objectivity, transferability or external validity, and internal validity [21,22,23,27,28].

The design for this research was a descriptive survey. A survey design provides a quantitative description of trends attitudes and opinions of a population by studying a sample of that population [20,29,30]. It is a research design which involves collection of primary data from all or part of a population in order to determine the incidence, distribution and interrelations of certain variables within the population [31,28]. Survey is a powerful and useful tool for collecting data on human characteristics, attitudes, thoughts, and behaviour [20,30]. Survey utilises data collection techniques such as questionnaires, interviews and observation. Surveys are useful when a researcher wants to collect data on phenomena that cannot be directly observed such as opinions. Surveys are used extensively to assess attitudes and characteristics of a wide range of subjects. Normally variables are not manipulated in survey research [30].

These key strengths fit well within the structure of this study since it was aimed at understanding and in the context with a view to generating lessons for key stakeholders. The lessons generated were looked at within the structural and the contextual frameworks for the training reforms and adjustments in Kenya.

2.1 Respondents of the Study

A total of thirty one (31) trainers were involved in this study. They were selected purposively. The only requirement applied was that one should have been practising Trainer in Automotive for at least five years in a technical institution in Kenya. The five years requirement ensured that the respondent was conversant with the syllabus and training offering and that he/she had trained people who were involved with industry. A senior member of the Technical training institutions offering at least Diploma in automotive Engineering was involved in this study.

2.2 Data Collection

Data for this study was collected using a researcher made questionnaire. The instrument was drafted by the researcher and circulated to members of the technology education
department at local university for validity. The questionnaire was also piloted at two Technical training institutions that were never used in the main study for reliability. This instrument achieved reliability index of 0.81 and hence declared fit for the purpose. The researcher together with two research assistants administered the instrument to the respondents. A transmittal letter with the request for participation and informing respondents of the researcher’s ethical responsibility was attached to the questionnaire for informed consent purposes. Data was collected within a span of two weeks.

2.3 Data Analysis Procedures

Data was analysed by use of descriptive statistics due to the nature of the design. The analysis was not targeting overall generalisation to all trainers but limited to the Kenyan population. Main statistics used were means and percentages for non-parametric data. Data was analysed by use of Statistical Package for Social Sciences (SPSS).

3. RESULTS AND DISCUSSION

3.1 Issue 1: The Automotive Mechanics Course is a Sufficient Preparation for Work in the Automotive Industry

The greater percentage 67.7% (21) of the trainers was positive about this aspect. Another large number 29% (9) disagreed with is statement. There was only one case of being undecided about this aspect.

3.2 Issue 2: The Tools, Equipment and Machine Used during Industrial Placement are Different from those that are used during the Learning Session in this Institution

In the questionnaire, there was a clear distinction made about tools equipment and machines. However they are combined in this case with the results of each being highlighted. The responses from the item on tools show that the tools used at the industry placement are not different from the tools at the training. This is because most 64.5% (20) of the respondents either strongly disagreed or disagreed with the statement. However there is another lot that agreed with the statement. The strongly agree and agree comprised of 35.5% (11) of the respondents. The distribution is positively skewed. All the respondents were confident with the response they gave for this item. This is depicted by the absence of a score for indecisiveness.

When it came to the item on the equipment, the responses were widely spread with majority of the trainers being of the opinion that the equipment was not different. However a large proportion of the trainers said that the equipment were different. There were 58% (18) of the trainers who said that the equipment at the training was not different from the equipment at the industry. Also there were 42% (13) of the trainers who were of the idea that the equipment was different.

The last section of this issue was to establish if the machines at training institutions were different from machines at the work place. The trainers were of the idea that the machines are the same. There were 71% (22) of the respondents who stated this view. The other percentage 29% (9) disagreed with the statement. The distribution of the responses is as shown in the Table 2.

The distribution is negatively skewed which can be explained by the fact that the question was the question sought to establish difference and not similarity.

3.3 Issue 3: The Automotive Mechanics Course Needs to be Restructured with a Focus on Work in the Automotive Industry to Make it Better

This item sought to clarify if there is need for restructuring of the course to make it more relevant to the work place. The result is striking since 96.8% (30) were in total agreement with the statement. Only one respondent was of the opinion that the course did not need to be changed. There was another item meant to reinforce the issue of reforming the course structure. It sought to find if there were changes in the course program and if the changes were adequate. This item is meant to outline the history of the changes that have taken place to the automotive training program. The distribution shows that the changes that may have taken place were inadequate. There were 84% (26) of the trainers who disagreed with the statement of adequate changes in the syllabus. Another 16% (5) of the respondents were satisfied with the changes that have taken place on the syllabus. These details are shown in the Table 3.
Table 1. Equipment training different from industry

|                | Frequency | Percent | Valid percent | Cumulative percent |
|----------------|-----------|---------|---------------|--------------------|
| Strongly disagree | 9         | 29.0    | 29.0          | 29.0               |
| Disagree        | 9         | 29.0    | 29.0          | 58.1               |
| Agree           | 5         | 16.1    | 16.1          | 74.2               |
| Strongly agree  | 8         | 25.8    | 25.8          | 100.0              |
| Total           | 31        | 100.0   | 100.0         |                    |

Table 2. Machines in training are different from the machines found at the work place

|                | Frequency | Percent | Valid percent | Cumulative percent |
|----------------|-----------|---------|---------------|--------------------|
| Strongly disagree | 9         | 29.0    | 29.0          | 29.0               |
| Disagree        | 13        | 41.9    | 41.9          | 71.0               |
| Agree           | 4         | 12.9    | 12.9          | 83.9               |
| Strongly agree  | 5         | 16.1    | 16.1          | 100.0              |
| Total           | 31        | 100.0   | 100.0         |                    |

Table 3. There have been enough changes in the training curriculum to suit changes in the work place

|                | Frequency | Percent | Valid percent | Cumulative percent |
|----------------|-----------|---------|---------------|--------------------|
| Strongly disagree | 13        | 41.9    | 41.9          | 41.9               |
| Disagree        | 13        | 41.9    | 41.9          | 83.9               |
| Agree           | 5         | 16.1    | 16.1          | 100.0              |
| Total           | 31        | 100.0   | 100.0         |                    |

When this distribution is plotted on a histogram with normal curve, the result shows a positively skewed output. All the respondents were clear of the item and made valid responses.

3.4 Issue 4: Automotive Mechanics Course Graduates are able to Cope with Changes in the Automotive Industry

This item here deals with coping with change in the industry. The mechanics are supposed to keep updating their knowledge with changes in the technology. The item was provided together with another one that sought to establish if the course syllabus is up to date with changes in technology at the work place and world in general. The distribution of the trainers in this item is close on the agreeing and the disagreement responses. There are 55% (17) of the respondents agreeing while there are 42% (13) disagreeing with the statement. Only one of the trainers was undecided about the response to this item. The distribution of the responses is shown in Table 4.

Table 4. Graduates able to cope with technology changes in industry

|                | Frequency | Percent | Valid percent | Cumulative percent |
|----------------|-----------|---------|---------------|--------------------|
| Strongly disagree | 1         | 3.2     | 3.2           | 3.2                |
| Disagree        | 12        | 38.7    | 38.7          | 41.9               |
| Undecided       | 1         | 3.2     | 3.2           | 45.2               |
| Agree           | 15        | 48.4    | 48.4          | 93.5               |
| Strongly agree  | 2         | 6.5     | 6.5           | 100.0              |
| Total           | 31        | 100.0   | 100.0         |                    |
3.5 Issue 5: The Syllabus is Sufficiently Flexible to Allow for Modification during Teaching to Encompass New and Emerging Technologies

Sometimes in training, it is possible to have the teachers with a provision that they can modify the training program to suit the need at hand. This is a case of flexibility where the trainer is able to leave out some of the content stated in the syllabus and go for others that be more applicable to the case at hand. This item here sought to establish how flexible that training program is for the mechanics training in Kenya. The results for this item show that trainers felt that there was no flexibility allowed to have modification. There is no provision to allow for the incorporation of the new technology into the teaching program. There were 64.6% (20) of the trainers who totally disagreed with the statement that the training curriculum is flexible. Another 6.5% (2) of the trainers were undecided about this article. The rest 29% (9) agreed that there was flexibility to have the inclusion of the new technology within the training program. There were 64.6% (20) of the trainers who totally disagreed that the training curriculum is flexible, 29% (9) agreed and the rest 6.5% (2) of the trainers were undecided about this article.

The positive skew of this distribution is clearly seen from the histogram with a normal curve as shown below. The distribution show that majority of the trainers were of the opinion that the training was rigid.

3.6 Issue 6: Training on the Job is better for Repair Work than Training at the Technical Institution

This item was meant to get information about the needs for the repair industry. The trainers were to state their views about the training organisation. The distribution of the responses is close to being balanced. There were 45.3% (14) of the trainers who disagreed with the item that training on the job is better for repair work than institute training. There were also another lot of trainers 51.6% (16) who agreed that it is better for repair training to be on the job. There was only one trainer who was not decided about this item. The Table 6 shows the distribution of the responses. Majority of the trainers are of the opinion that the statement about repair training is correct.

The balance is the distribution can be seen from the histogram with normal curve. The responses on both sides of the mean are almost the same.

3.7 Issue 7: Training Institutes Collaborate with Industry to Design what is to be taught

This item was to establish how much of collaboration exists between training institutions and the industry. There is a strong rejection of the statement with 93.6% (29) of the trainers saying that the collaboration is missing. This item was analysed together with another item that was aimed at determining the adequacy of industry participation in designing educational programs. It sought to find if the participation of industry in the design of educational program was enough according to the trainers. The response is that the participation is not enough. A large number 96.8% (30) chose either strongly disagree or disagree options. This is high consensus that the industry participation is lacking in educational issues. The responses are shown in the Table 7.

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| Table 5. Curriculum is flexible to allow modification to take care of new technological advances |
|---------------------------------------------------------------|
| Frequency | Percent | Valid percent | Cumulative percent |
| Strongly disagree | 10 | 32.3 | 32.3 | 32.3 |
| Disagree | 10 | 32.3 | 32.3 | 64.5 |
| Undecided | 2 | 6.5 | 6.5 | 71.0 |
| Agree | 7 | 22.6 | 22.6 | 93.5 |
| Strongly agree | 2 | 6.5 | 6.5 | 100.0 |
| Total | 31 | 100.0 | 100.0 |
Table 6. On the job training better for repair work than institute based training

| Frequency          | Percent | Valid percent | Cumulative percent |
|-------------------|---------|---------------|--------------------|
| Strongly disagree | 4       | 12.9          | 12.9               |
| Disagree          | 10      | 32.3          | 32.3               | 45.2               |
| Undecided         | 1       | 3.2           | 3.2                | 48.4               |
| Agree             | 7       | 22.6          | 22.6               | 71.0               |
| Strongly agree    | 9       | 29.0          | 29.0               | 100.0              |
| Total             | 31      | 100.0         | 100.0              |

Table 7. There has been enough participation of industry in educational issues

| Frequency          | Percent | Valid percent | Cumulative percent |
|-------------------|---------|---------------|--------------------|
| Strongly disagree | 14      | 45.2          | 45.2               |
| Disagree          | 16      | 51.6          | 51.6               | 96.8               |
| Undecided         | 1       | 3.2           | 3.2                | 100.0              |
| Total             | 31      | 100.0         | 100.0              |

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3.8 Key Findings

The key findings that are presented in the paper are that there is need for strong collaboration of the training providers with the industry for the training to be futuristic in nature. This result is attributed to the fact that

i) Industry is not involved in the design of educational program though the training is geared towards or along the industrial designs.

ii) The trainers are aware about the state of affairs, only that there is no known action to address their concerns about the mismatch.

iii) Training is not flexible enough to allow content variation and upgrading by the course trainers.

iv) There is need for retraining at the work place after institute based education.

4. CONCLUSION

The conclusion for this paper is anchored on the argument advanced by Race [2] that the following five factors are involved in successful learning: First is the want to learn. This is intrinsic motivation. If learner knows what they want and it is offered then powerful learning is probable to take place and success is likely to follow. For the Kenyan trainers, it is important that trainees have this need to learn for effective curriculum delivery. Second is the need to learn which involves taking ownership drive for the learning process. This is learning that is propelled by external forces that have significance to the life of the learner. This requires that the training programs should be well interrelated to the needs of the industry so that the transition from school to work is smooth. Third is learning by doing – this kind of learning develops the ability to perform independently and to transfer the operations to different set ups. It involves practice, experience, having a go, repetition, trial and error. It can also be thought of as simply as learning by doing. It may transcend from institution learning to the learning at work place. Fourth is learning through feedback: other significant people's reactions have great impact in promoting or deterring successful learning. Feedback such as confirmation, praise, and compliments and simply seeing the results facilitates learning. Constructive critical feedback helps too, particularly in the context of learning by trial and error. The quicker the feedback, the better it helps learning. Trainers should endeavor to offer effective and timely feedback on the learning tasks. Finally fifth is Making sense of things – This comes with reflection of the situation and an assessment of its applicability. It involves getting one's head round an issue or digesting it. This process is very important in learning situations. It focuses on gaining an understanding. Trainers should provide learners with the best possible environment in which they can achieve the making sense part of their learning. These critical attributes of a progressive learning facilitation were absent in part in the training of the Kenyan Automotive mechanics.
5. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made in order to minimise the negative effects the current situations have on the training-industry relationship and the future requirements for the work.

i) That curriculum development process should outline the roles and responsibilities of different stakeholders. The process should be consultative and iterative in nature.

ii) The education and training of the trainers should be broad based to include participation in industry in order to make their achievements relevant. In addition, education should be lifelong so that the trainees upgrade their knowledge to remain relevant and up to date with changes in technology.

iii) That training should be a combination of both on the job and institute based with focus on the practice even in examinations. A shared formal approach between industry and the institutes should be developed so that there is clear cut participation for these critical stakeholders.

iv) The current modular approach to training at the technical institutions should be refined to have clear standards of performance for approval as being competent. Examinations should not suffice as the only criteria for competence.

v) That the training programs should be geared towards the development of critical thinking and creativity in order to bridge the gap currently being experienced beside the programs should promote the acquisition of generic and transferable learning. For TVET to meet these diverse expectations by the industry, the programs should be reoriented to impart skills that meet the diverse cultural, historical and economic realities.

vi) That the training facilities and resources should be appropriate for the development of long term and transferable skills.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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