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The Challenge and Development of the Ethiopian TVET institute Under the Background of Artificial Intelligence

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Abstract.

With the growth of artificial intelligence, Ethiopian vocational education and training are confronting unprecedented development chances, including the support and guidance of national policies, and artificial intelligence technological assistance. The development of Ethiopian vocational education and training has faced new challenges concurrently with the advent of the artificial intelligence (AI) era, primarily in the form of vocational education, professional construction, and teaching content, as well as other aspects of transformation and innovation. Faced with the opportunities and challenges in the new period, Ethiopian vocational education should deepen its reform and reform from the angles of specialty setup, teaching material, and teachers, so as to satisfy the talent training objectives in the era of artificial intelligence.

Keywords: Vocational education and training, teaching content, Artificial intelligence.

1. Introduction

Vocational education and training are an educational program that focuses on learning through formal/informal training to produce the skilled workforce required for industries. The economy and world of skills are dynamic factors in the current era as many jobs that existed a couple of years ago are no longer available today. The changing needs of the knowledge economy and the influence of technology have changed the demand for higher-level skills in the digital industry [2].

The industrial revolution has enabled industries to adopt smart, digital manufacturing and to digitally transform themselves [3]. Many skilled workforce roles don't exist today which have been changed due to smart products and upgradations of the manufacturing industry using computer integrated. Nowadays the world can estimate that in the next decade, skilled jobs will shift towards artificial intelligence, data science, robotics, cloud computing, social media, etc. All these challenges demand the evaluation of the existing skilled TVET training system and infrastructure to meet the upcoming challenges.

Vocational Education is the training provided to tech students with talents to prepare them for employment work in an organization or enterprise. In order to train learners with high-skilled talents Vocational Education is very necessary. Many of the personalities can find their path of interest from this course.

There is a decrease in skills or talent due to the well-defined development of the Internet, Big Data, and Artificial Intelligence. For the moment, there is a difference between customary education (i.e. methods of training) and changing situation in vocational education. In order to increase the high-skilled talents and to meet with the changing situations.

Artificial Intelligence (AI) is one of the important keys in ensuring the needs in today's world with problems like this in the vocational educational field. Artificial Intelligence is been used by lots of organizations but the main purpose it is been used for is vocational education. Here, for vocational education to be reformed Artificial Intelligence plays a very vital role. Artificial Intelligence in Vocational Education is focused on the reformation, development of, evaluation of, and research into platforms. Artificial Intelligence is been used to perform various analyses of data in the learning platform to increase the efficiency of teaching and many other approaches. It focuses more on the personalized training of vocational students such as their creativity, problem-solving ability, disciplinary skills, capacity of learning new, research, and many other talents (5).

Ethiopia Federal TVET Institute was one of the higher vocational education in Ethiopia it was established in 2011 by The Council of Ministers Proclamation 245/2011 to produce highly professional and technically efficient TVET teachers and leaders. The driving force for establishing the institution, among other things, was that there was no institution to train competent and sufficient technical and vocational teachers and leaders based on the outcome-based system and occupational standards. the institute ran degree programs in 07 occupational sectors namely: automotive, construction, electronics/electrical, information and communication technology, textile, garment, and manufacturing technology,

The Ethiopia Federal TVET institute has shown a commitment to improving easy access and quality training in Vocational Education and Training. To end this, thus, high-quality TVET educational and training programs that meet standards and performance in accordance with standards are imperative and the cornerstone of quality assurance.

2. Development of Artificial Intelligence

The artificial intelligence of English is Artificial Intelligence, referred to as AI. Regarding the concept of artificial intelligence, no unified opinions have been formed at home and abroad. But it is generally believed that artificial intelligence is about the intelligent behavior of artifacts, including perception, reasoning, learning, communication, and behavior in complex environments. According to the strength of the function, artificial intelligence can be divided into three categories, namely "weak artificial intelligence, strong artificial intelligence, and super artificial intelligence" (3).

The development of artificial intelligence has gone through three stages. The first stage was mainly in the 1960s and was mainly represented by knowledge expressions such as propositional logic and predicate logic and heuristic search algorithms. The second stage was in the 1970s. With the gradual improvement of semiconductor technology computing hardware capabilities, artificial intelligence gradually began to break through; the third stage began in the late 20th century and began to enter the era of big data and self-learning cognitive intelligence in about 2006. With the rapid development of the mobile Internet, the application

scenarios of artificial intelligence have also begun to increase, and huge breakthroughs have been achieved in deep learning algorithms, voice, and visual recognition(6).

In 2021, China launched the Luban Workshop at the Federal Technical and Vocational Training Institute in Addis Ababa, Ethiopia with the aim of providing high-end technical skills training to help college students meet the requirements of the emerging global market.

The workshop was established by the Chinese Tianjin University of Technology and Education (TUTE), under the guidance of the Ministry of Education of China. It serves as a center of excellence across four major areas industrial sensor technology, mechatronics technology, industrial control technology, and industrial robotics technology.

"It will make our graduates familiar with 21st-century skills and knowledge. It will also be used as a training and research hub for industry practitioners to cope with rapidly changing industrial requirements.

3. Preparing Ethiopia TVET Institute for The Digital Age

Digital technologies have changed how organizations work, creating new jobs and replacing others. For workers, this means reskilling themselves in order to thrive in a high-tech working environment. For educators, this means integrating ICT in skills development, not just in the course materials but also in course delivery.

Technology can make it easier to deliver TVET to more people. More than 80% of the youth population is now online (link is external). Students can use their own digital devices to access courses through the internet. Skills for technology-oriented jobs are also best acquired in a high-tech learning environment.

Generally, the Ethiopian TVET institute is working on the development and preparation of all ICT infrastructures for the development of digital vocational education based on the institute is focused on four basic Steps to take in Integrating AI into the vocational education training system these are: -

i. Plan for technology-enabled learning
ii. Build smart buildings, outfit new laboratories, update old facilities
iii. Create courses and materials for digital delivery
iv. Teach for the new learning environment

4. Focus on Quality TVET Teaching

In Ethiopia TVET institutes a quality TVET teaching system as new tools and technologies are introduced for imparting new skills and vocational education and training, the role of teachers and trainers is also evolving continuously. Artificial intelligence might introduce newer learning paradigms but can never replace teachers and trainers. They should always be central to the introduction of artificial intelligence in learning environments. In recent years, an enormous amount of learning resources has become available online for teachers, trainers, and learners. At Ethiopia TVET institute we are working to identify emerging trends, new methods, and means of integrating TVET teaching whether in formal or informal settings including classrooms, workshops, or within companies. We are focusing on identifying the essential digital competencies and the skills for the teachers to always remain future-ready (4).

5. Open Educational Resources (OER) in Ethiopia TVET Institute

There is an enormous wealth of learning and training materials available online. Digital technologies and the internet allow for the easy sharing of such resources. The example of Wikipedia shows the power of collaborative editing to jointly create open knowledge resources. However, most educational materials are still published under restrictive traditional copyright which does not allow for legal sharing and re-editing. The idea of open licensing aims to turn the copyright restriction around: Instead of always having to ask the copyright holder for permission, an open license explicitly specifies under what circumstances and conditions a work can be used and reused - it thus encourages the sharing of resources. Ultimately, it leads to OER-enabled pedagogy (6).

In Ethiopia TVET institutions the potential of OER and Open Educational Practices is not yet realized. Access to high-quality teaching and learning can be improved considerably if high-quality content would be available under open licenses. OER can take many different forms: They range from textbooks to curricula, syllabi, course materials or lecture notes, assignments, tests, audio, video, and animation (3).

6. Research On the Problems of Ethiopian Vocational Education Development

The impact of artificial intelligence on Ethiopian vocational education is deep and long-term. Depending on the nature, artificial intelligence will have a great impact and challenge in the following aspects of Ethiopian vocational education.

6.1. Training Position of Vocational Education

According to UNESCO's forecast, artificial intelligence will replace 2 billion jobs by 2020. Most of these positions are positions for the training of vocational education. The reason is that the talents trained in vocational education are mostly engaged in basic work and have strong substitution. The skills of low-tech and repetitive skills cultivated by the vocational education model will be digitized and intelligent, and will eventually be replaced by industrial robots. At the same time, society and enterprises will have higher requirements for the quality of personnel training in vocational education. The original vocational education talent training model will be difficult to adapt to future industrial development needs. In the future, vocational education must re-distribute the job characteristics of vocational education and rebuild occupations. The talent training mode of education reconstructs the knowledge structure and knowledge system of professional talents (9).

6.2. Teaching Mode of Vocational Education

While artificial intelligence threatens the employment of vocational education, it also brings certain opportunities and challenges to vocational education itself. The development of artificial intelligence education will continue to break through time and space constraints so that quality education resources can be scientifically configured and integrated. In addition, artificial intelligence education will pay more attention to the personalized learning of vocational students, reflecting the higher value of vocational education, such as students' creativity, curiosity, multidisciplinary thinking ability, creativity, critical thinking, and problem-solving ability. In addition, the development of artificial intelligence education will be based on the analysis of

students' advantages and disadvantages and personality characteristics, correcting their study habits and behavioral habits, and being able to teach according to their aptitude, tailoring, advancing, and evaluating individualized according to their own characteristics. Study plans to enhance their hobbies (10).

7. Conclusion

The national plan, as well as social and economic development, are served by vocational education. It must actively alter and develop in order to meet the potential and challenges presented by artificial intelligence. To meet the demands of the expanding society and advance Ethiopia's artificial intelligence strategy and realization as the goal of producing a powerful nation, it is essential to learn artificial intelligence and artificial intelligence integrated vocational education to learn how to cultivate highly skilled international talent.

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