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Microlearning Strategy in ICT Education

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Abstract: The purpose of this paper is to clarify how young people in developing countries can achieve their ICT (Information and Communication Technology) skills and get a job. This study focused on the system that covers from their ICT skill learning to job matching. In many countries and regions, there is still a noticeable lack of ICT educators as well as little demand for ICT engineers. Additionally, e-learning often requires significant tuition fees. Studying a one-off course will not lead directly to a job. On the other hand, when taking a comprehensive courseware course, the content is too overwhelming to start a career. Given this background, the following are desirable environments in ICT education. First, it is effective to break down the skills into smaller parts that match the needs of companies thusly supporting microlearning for both companies and young people. The next step is to map the skills that have been already achieved by layering the smaller parts, and then match applicants with job openings. The accuracy of skill improvement records will be ensured by blockchain. This will enable a system that allows for anonymous verification and search of each. Based on this strategy, it is expected that young people in developing countries will be able to acquire skills efficiently and quickly and be able to participate in the global software development sector.

Keywords: Microlearning, e-learning, blockchain, offshore development, global software development, skills map, job matching

1. Introduction

Young people in developing countries face big problems if they want to get a job in the ICT sector (Jouni, et al., 2016; Cook, et al., 2023). There is a shortage of educators, a shortage of learning content, and few job opportunities. On the other hand, companies in ICT advanced countries are facing a shortage of BPO (Business Process Outsourcing) and offshore development.

A major challenge is for young people to be able to recognize the skills that companies want, and for companies to better understand what skills people in developing countries have. As a mechanism to connect both sides, it is important to divide the necessary skills and their e-learning contents through micro learning. Microlearning here does not refer to courseware constructed based on a qualification system or IS (Information Science) curricula, but rather learning content that breaks down the skills required by companies into smaller categories.

This idea is expected to create an efficient environment for young people, especially for offshore development between people in remote locations.

2. Structure of the Microlearning Method

2.1 Roles and Main Components

Especially in offshore development, it is difficult to find the necessary young talent by relying on specific ICT-related qualifications or courseware. The reason is that the skills required for a specific project are actually limited to a certain area of ICT, and they change from moment to moment, making it difficult to focus on the necessary competencies.

The first point of this structure is to break down skills into smaller pieces. The coordinator analyzes the requests of the company representative and breaks down the required skills (See Figure 1). The guideline for breaking them down is to make content 15 minutes or less in an e-learning format. The reason for limiting the length to a few minutes is to allow for more efficient preparation on the part of applicants and to reduce the burden on content creators.

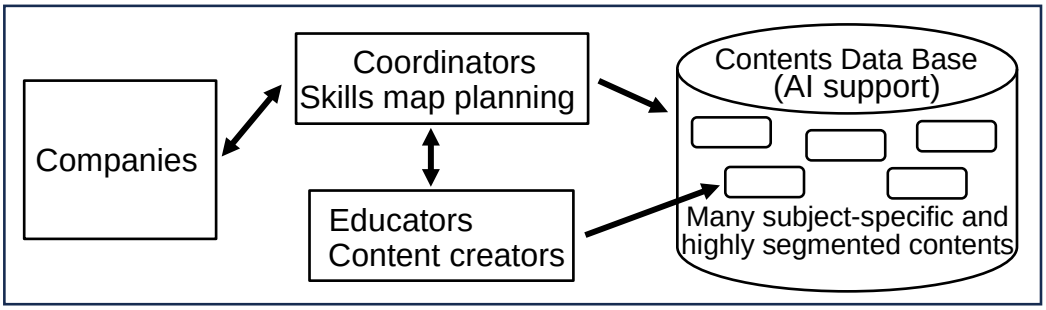

Figure 1. Break Down the Required Skills

The next key point is a system that allows young people to select the learning content they need from a skills map that takes job matching into consideration (See Figure 2). Each learning content is blocked off along with a completion quiz and is then linked to the next learned content via blockchain technology. This history is useful for employers searching for candidates and for users themselves to plan their studies in a skills map. The history is anonymized, and both employers and users can discuss with each other about the next steps, which can lead to effective job matching.

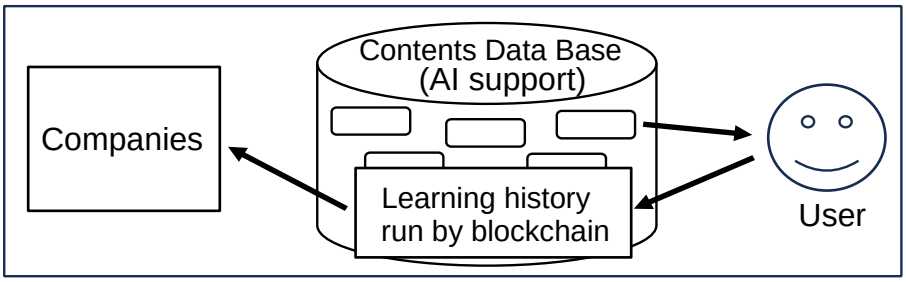

Figure 2. Content Selection Based on Skills Map

2.2 Characteristics and advantages of Microlearning over Microlesson, etc.

Microlearning strategy differs from other methods in that it has a mechanism for matching users with offshore companies. In Microlearning and Nanolearning, content ranging from a few minutes to a dozen minutes is provided, and learners use it in the order of the relevant course. The content of these courses is provided either as courseware depending on the field or topic, or as one-off educational content for personnel development, etc. However, the next step after these learning outcomes does not go as far as to consider providing new jobs. Content is also often created in such a way that, for example, a qualification or complete course in a particular subject is provided. On the other hand, for example, offshore software development companies need to efficiently secure human resources for their global expansion, but they do not link up with online learners. These are major obstacles for young people in poor environments in developing countries, and I believe that the method defined as microlearning is a useful mechanism for solving poverty and promoting economic development around the world.

2.2.1 Skills Map System

The premise for creating learning content is a skills map. The initial system will consist of several dozen titles of content compiled by a coordinator. The big difference between this and other online learning content is that it is directly linked to jobs. For example, in languages such as SQL, Python and Java, login authentication procedures are important learning content, but they are only taught at an introductory level in course content and are not given priority. The same can be said for input data checking and defining the screen layout of a web page. To address these issues, Microlearning strategy creates learning blocks and constructs a map that makes it easy for offshore companies to submit projects and for young people to apply for them. As more companies participate and as technological requirements change, this map will be continually updated, and new content will be created. In the future, it will be possible to post content with incentives using a system similar to that of a video sharing website.

2.2.2 Blockchain and AI

A user's learning history and project development work history are accumulated as blocked data. There are two important points in job matching: first, users can observe the demand and plan their skills accordingly to get a job, and second, offshore companies can find young people who meet or nearly meet the requirements for the job. Blockchain developed between coordinators and educators will maintain user's blocks and make them viewable anonymously by the company side. Users can participate by paying a very small registration fee, which is paid in cryptocurrency. This is also an important verification process for verifying the user's online environment and receiving rewards from the company. The cryptocurrency block information will then be linked to each user's block.

AI (Artificial Intelligence) provides important support for matching participants with companies. For beginners finding and applying for jobs with low difficulty is essential for their future step-up. For those who have acquired skills, it is expected that they will be able to develop in line with the trends and demands of the times. On the other hand, when companies are asked to take on development projects, they can request them. It is also effective to develop and discover human resources by showing the additional skills required from each user's learning history. AI matches while keeping both sides anonymous, empowering both sides who have little information about each other's current situation.

3. Conclusion

There are four roles that appear in this system. These include companies, coordinators, content creators, and participants. There are great benefits to be gained from each position. Companies can search for candidates who meet their requirements and request the future skill development needed to hire them. Coordinators can accurately grasp the everchanging skill requirements and create up-to-date skills maps. Content creators, including educators, can complete a single piece of content with little effort. Furthermore, they can receive comments from users in their subject field. Young people can understand what companies want, acquire the necessary skills at a low cost, and sell themselves. If more companies join this initiative, it is expected that the current prototype system will bring more effective AI based functions to companies and users.

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