Application of Information Technology in Employee Training

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Abstract. This paper presents the application of information technology in employee training of the State Grid Corporation of China (SGCC). It focuses on the construction and function of online learning platform, the development of Corporate Massive Open Online Courses (MOOCs), and employees learning method. The Corporate MOOC platform is built on the enterprise cloud server and plays a critical role in the construction of enterprise culture, the publicizing of enterprise policies, the recruitment and training of employees, and the appraisal and promotion of employees' abilities. The Knowledge Integration Center organized staff teams to build competency models and create MOOC contents based on industry skill requirements, maintain consistency between MOOC contents and competency models, and place them on a cloud-based MOOC platform. By using digital technology, instructional services are supplied to employees and assessment systems have been built, and assessment systems make great contributions to employee recruitment, training, appraisal and promotion. The Corporate MOOCs provides a good opportunity for those employees who can't leave their jobs to learn at their own pace and have a positive relationship with the improvement and innovation of employees' abilities.

Keywords: Cloud-based platform, Massive Open Online Courses (MOOCs), Competency model

1. Introduction
Competent people are the key to future success and offer organizations their only sustainable competitive advantage[1]. Encouraging professional growth for the staff can improve work efficiency and lead to greater employee satisfaction and retention[2]. An organization provides training to its employees to improve their competence and eventually improve the organization. With the development of digital technology, computers, networks and interactive VR experience[3] have been widely used in higher education and employee training.

Among the plethora of available tools to enhance employee competencies, Massive Open Online Courses (MOOCs) are an emerging phenomenon[1]. MOOCs officially entered the field of learning in 2008 and were widely used in higher education environments in 2012, and in recent years, many companies use MOOCs to recruit and train employees. MOOCs can be beneficial for learners who do not have opportunities to access campus learning and can be a valuable tool for professional learning, especially in technology-oriented domains where a quick access to up-to-date knowledge is crucial[4].
The State Grid Corporation of China (SGCC) ranks fifth among the Global top 500 enterprises. There are more than 1.58 million employees in SGCC[5]. Some of the employees are experienced and some are newly recruited. SGCC is a knowledge-intensive and technology-intensive enterprise, new technology applications are constantly emerging. Both experienced employees and novices need to keep learning to ensure that they are up-to-date with skills and professional knowledge. Employee training must be of the highest quality and always focus on the specific needs of company, SGCC often holds various forms of training courses to improve the overall and professional quality of employees. Staff of the Network University Operation Management Center (also known as Knowledge Integration Center) are responsible for developing MOOCs to provide online learning for employees to help them enhance their capability in specific job roles.

2. Academic MOOCs and Corporate MOOCs
The number of MOOCs has grown rapidly in recent years. By the end of 2018, over 900 universities around the world had launched 11.4k MOOCs, and MOOC learners achieve a total of 101 million[6].

Now, the top five MOOC providers by registered users are: Coursera, Edx, XuetangX, Udacity, and FutureLearn. Coursera and Udacity emerged from Stanford University, EdX was founded by Harvard University and MIT, XuetangX is a top-quality Chinese MOOC platform initiated by Tsinghua University, and FutureLearn is a private company owned by the UK’s Open University[7].

In addition to high education, MOOCs are playing an increasing role in corporate training. There are many professional development courses that take the form of microcredentials. For example, FutureLearn launched Microcredentials and programs that allow learners to deepen their understanding of a subject, with the chance to earn an academic or professional credential(https://www.futurelearn.com/). Recently, The online Wanmen University in China uses a snowball method to promote its MOOCs which include various professional development courses with micro-certificates as well as courses for multi-level students. (www.wanmen.org).

Karnouskos’ study indicates a positive contribution of MOOC related factors such as culture, knowledge, communication, technology, and cost to innovation in modern enterprises[1]. MOOCs can be seen as promising alternative in technology-enhanced professional learning, which can save costs and promote lifelong learning. Many large companies work with agencies to develop MOOCs and conduct employee training. Some companies establish their own training platforms, MOOCs and assessment systems to form their own Enterprise MOOCs or Corporate MOOCs, Such as SAP(https://www.sap.com/), Microsoft(https://www.microsoft.com/),etc. Enterprise MOOCs are open to relevant stakeholders like suppliers, customers, the government, and the general public. Corporate MOOCs are mostly limited to employees and the contents are mainly about professional subjects[1].

3. Development of Corporate MOOCs in SGCC
In order to reduce training costs and improve pertinence, SGCC built its own Corporate MOOCs. The staff team of the Knowledge Integration Center built a website platform running on the enterprise cloud server to manage the development of employees training and assessment. Based on the MOOC platform, they built technical and business online courses, and provided instructional services offering free learning opportunities to all employees of SGCC.

3.1. Competency models and MOOCs development
Competence Based Education (CBE) is the fastest growing model in higher education today[8], and can also be used for corporate training.

The power grid is a very complicated system; no one will know everything about the power grid. An employee needs to know knowledge and skills relative to his specific job role, so there is a need to build competency models for specific job roles to guide employees’ development. A team of experienced experts and technicians from various professions throughout SGCC, organized by the Human Resources department, has classified and sorted the professional work, and designed a
competency model framework for each position. A multiple-job approach was used to create multiple competency models depending on jobs and levels.

The competency model framework lists expected knowledge, skills and attitudes that lead to successful performance. The competency framework has two major components: General competencies and Technical competencies. General competencies are a set of related knowledge, skills and abilities that are essential for everyone in SGCC. Technical competencies are a set of specific job-related knowledge, skills and abilities, which are different according to different jobs, for different professions have different details that are tailored to specific circumstances and needs. Each competency has a brief definition.

A simplified view of a sample competency model framework is shown in table 1. The table is just for demonstrating, not an actual competency model, the actual competency model is much more complex.

**Table 1.** A simplified view of a sample competency model framework.

| Types of competencies       | Competency items                  |
|-----------------------------|-----------------------------------|
|                             | Basic knowledge                   | Reading and writing | mathematical reasoning | Security knowledge |
| General competencies        | Basic skills                      | Leadership          | Organizing             | Problem-solving    |
| Relevant skills             | Management skills                 | Professional        | Stress tolerance       | Team work          |
| Basic abilities             | Responsibility                    | quality              | Network security       | Optical            |
| Professional knowledge      | Electrical safety                 |                      |                          | transmission       |
| Specific competency        | Job specific skills               | Operate machine      | Data analyzing         |                      |
| Professional abilities      | Use equipment                     | Troubleshooting      |                          |                      |

Developing competency models and developing MOOCs both require a lot of time and effort, so these two processes are performed simultaneously. When the HR department organized teams to build competency models, the staff of the Knowledge Integration Center invited outstanding experts to design MOOCs and launched a series of large-scale course development competitions in SGCC. Many experts and professionals developed courses to participate in the competition. In this way, professional knowledge are converted into user-friendly courses that promote professional development, and a lot of courses are developed and gathered. The excellent works selected by peer review and evaluation were placed on the MOOC platform. Through the competitions, experts and professionals in the industry field learned the method of developing MOOCs. Competition activities also encourage excellent faculty to provide generalized open online courses. The first-class MOOCs are those created by cooperation of industry experts and teachers and special MOOC developers. Figure 1 shows the development process of MOOCs.
Figure 1. The development process of MOOCs

When finished the Competency model, the competency model was used as a guideline to align MOOC content with competencies, goals, and assessments. According to the competency models, the staff team of the Knowledge Integration Center compared the MOOCs catalog, eliminated similar MOOCs and retained the quality MOOCs, and provided supplements to existing MOOCs if there were any deficient. By learning the MOOCs, learners can achieve the desired outcomes.

3.2. Resources online and instructional services
All the jobs in SGCC are classified into 14 professional fields, including Leadership, Human Resources, Financial Auditing, Power Grid Operation, Information and Communication, Security, etc., and are divided into 80 work posts. For every work post there is a competency model and related MOOCs.

MOOC resources are divided into three categories: corporate culture and policies, which are developed to timely publicize the company's policies and strategies; professional knowledge, which is developed separately for different disciplines to improve the theoretical knowledge of employees; working skills, which are mainly developed by experienced technicians to improve the ability of employees to solve practical problems.

Some MOOCs are self-paced while others run on a schedule with due dates and hard deadlines. Most MOOCs are designed as micro courses, which can be completed in a short time and only focus on specific topics such as “How to Wire Ethernet Cables”, “Tips for Writing a Good Report”. Many MOOCs are designed as situational teaching videos in the workplace to demonstrate production safety, troubleshooting and workflow. Such courses are very popular. The platform also provides discussion forums for learner to interact with peers and experts, and assessment system for learners to take self-assessment and formal assessment. Based on the platform and assessment system, SGCC successfully carried out National Cyber Security Skills Competition and many vocational skills competition in the corporation, and held many recruiting and appraising examinations.

MOOC contents are available in abundance on the MOOC platform homepage included categories as: Special Training, Live Class, Knowledge Center, Article Database and the State Grid Encyclopedia, which are rich and show all kinds of knowledge through various forms. Under each category, the ranking list can be sorted according to different needs of learners, the default sorting method is according to popularity (i.e. number of learners).

There are Online Learning Communities and Virtual Classrooms, where learners from all over the SGCC can form groups according to their specialty and learning interests.

The platform also presents other information of learning activity such as the number of online learners rank, personal points, ranking of the year to show the overall status of corporate learning.

A key issue with MOOCs is that of course recognition, certification and accreditation, the long-term effect of MOOCs in higher education will be limited if no credits are given for courses[9]. This is
the same in corporate learning. Now SGCC are creating their Skill Level Professional Certification Program to increase learners’ motivation, achievement, and empowerment. The Program is a series of courses designed by industry leaders and experienced specialists, which enables learners to deepen their understanding of professional subjects, develop and improve work-related skills, and have the opportunity to obtain professional qualification certificates recognized by SGCC.

3.3. How employees learn MOOCs

Every employee has a unique ID and can log into a MOOC to learn freely, by using a desktop computer via the Intranet or using a tablet or smart phone in a wireless environment. All employees in SGCC are required to enroll MOOCs to learn pushed courses and take part in schedule online class and some online assessment. SGCC encourage employees to take self-learning, self-assessment and participate in MOOC learning and Certification Programs to improve their competencies. An employee can take courses related to his work position at his own pace, or take courses that interest him.

Online resources can also be used for off-the-job training class. Based on the integration with laboratory hands-on projects, campus instructors design blended courses that combine online and face-to-face learning experiences[10]. Employees’ feedback indicates that the MOOCs are beneficial for them.

4. Conclusion

In order to effectively and efficiently deliver meaningful and relevant training to its employees for the development of organization, SGCC built a cloud-based MOOC platform and developed a large amount of MOOCs and learning materials and Certification Programs. Experiences are gained from design and implementation of Corporate MOOCs. According to the job classification, competency models are designed and used as a standard for MOOCs development, professional skill appraisal, and professional qualification certificate. The competency model is not static, it will be updated according to the technique development of industry, so MOOCs will also be updated and improved. The Corporate MOOCs will offer a lot of benefit to employees’ competence enhancement. The research will continue to evolve and be upgraded to optimize the MOOCs quality and explore the potential of using MOOCs to create flexible, high quality, and scalable training solution in modern enterprise. All the employees in SGCC are enrolled in MOOCs learning, and their feedback shows that Corporate MOOCs are positively related to the improvement of employees' competencies and innovation. The conclusion is that MOOCs play an increasingly important role in the development of enterprises and will be developed on a larger scale.

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