

CHALLENGES IN TEACHING AND LEARNING ACCOUNTING THROUGH TECHNOLOGY APPLICATION

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ABSTRACT:

With emerging technology trends, the requirements for the accounting and auditing industry have changed drastically. Universities around the world have begun to integrate their courses into the online learning management system and apply blended classrooms. In the case of accounting, as the nature of the industry requires hands-on practice, current technology support for e-learning courses does not prove to be sufficient. As a result, the content of accounting lectures and teaching methods need to be adjusted to reflect and respond to the needs of industry and interested learners. Universities should investigate developing simulated courses and teaching material closely tied to AI and data processing and analysis.

Keywords: AI, big data, Pythons, LMS, curriculum development, blended learning, e-learning.

1. Introduction:

In the Industry 4.0 era, the evolving needs of financial information users have transformed accounting practices. As people become familiar with technologies like artificial intelligence, big data, and machine learning, the demands on the accounting and auditing industry have shifted significantly. Additionally, education has seen a major transition, with universities offering online and blended classrooms through learning management systems to provide flexibility to students from various aspects. These changes require adjustments in accounting curriculum and teaching methods to align with industry needs and cater to learners.

The changes in the needs of financial information users stemming from the Industry 4.0 era make accounting work different from previous decades. Most of the people who are living in this era have known about artificial intelligence technology, big data, deep learning, machine learning, etc., and learned the impacts of Industry 4.0 on our lives.

With this rapidly emerging trend, the requirements for the accounting and auditing industry have changed drastically. Universities around the world have begun to include their courses in the online learning management system (learning management system) and apply blended classrooms in the hope of making it accessible to

bigger student audiences. In contrast to the traditional classroom environment, these online classes change the pedagogy approach, and this creates a potential challenge for educational institutions. In the case of accounting, as the nature of the industry requires hands-on practice for financial transactions, current technology support for e-learning courses does not prove to be sufficient.

As a result, the content of accounting lectures and teaching methods need to be adjusted to reflect and respond to the needs of industry and interested learners. Universities should develop simulated courses and teaching material closely tied to AI and data processing and analysis.

2. Industrial 4.0's developments

To comprehend the significant transformation in today's accounting industry, we must first grasp the key factors influencing Industry 4.0. In general terms, the fourth industrial development was an evolution from the steam engine in the first industrial revolution, followed by the invention of electricity and mass in the second, and digitization, the internet, and automated computing from the third revolution (Scherman, 2018; Marr, 2018; Hoang, 2018). The Industry 4.0 is an upgrade of the third revolution. It has a strong focus on the Internet of Things (IoT), specifically the industrial Internet, with cyber-physical embedded systems, Industry 4.0 leads to the creation of computer-based smart factories (MIT, 2019).

The Internet of Things also describes the interconnection network between the Internet and any Internet-enabled devices. This creates a system in which information is being exchanged freely and rapidly over the network (Hart, 2017). In addition, this network will allow users to analyze data and use this information to take more intelligent actions in real life (Deloitte Insights, 2019). When data is collected and stored on a real-time basis, it leads to a significant amount of data that the system will need to process. This is what is called big data in Industry

4.0. The IoT facilitates rapid information exchange between internet-enabled devices, enabling users to analyze real-time data for intelligent decision-making (Deloitte Insights, 2019). When data is collected and stored on a real-time basis, it leads to a significant amount of data that the system will need to process. This phenomenon is called big data in Industry 4.0, which allows users to analyze data and use this information to make more intelligent business decisions (Deloitte Insights, 2019).

The framework of Industry 4.0 is Artificial Intelligence (AI). They are computer systems capable of performing tasks that would normally require a human (McCarthy, 2019). This type of system applies deep learning, which is a branch of machine learning, to work. Deep learning describes the ability of a system to learn from a large amount of input data and perform the same task repeatedly each time modifying the action for better results (Hardesty, 2017; Marr, 2018). This is like how humans learn from their own mistakes and improve their actions the next time they perform a similar task. Some examples of artificial intelligence are self-driving cars, chatbots, or service bots (Marr, 2018).

With its rapid change, Industry 4.0 has revolutionized business operations by integrating technologies. Business leaders must consider how accessing real-time data and leveraging artificial intelligence (AI) will transform their companies. Moreover, the development of technology also shifts the method of delivery for educational institutions. The traditional face-to-face classroom has been transformed into the application of various e-learning methods.

3. Development of e-learning:

E-learning refers to the use of systems of electronic education such as computers, the internet, multimedia disks, electronic magazines, and virtual newscasts whose purposes are to reduce time and expenses and achieve better, faster, and easier learning (Shiru, 2020). The best thing about

e-learning is that individuals can take a course from the comfort of their offices or homes.

In e-learning classes, the learner is not directly interacting with the faculty. When learners have any questions, they may find it difficult to ask their online instructor, as communication is often very impersonal. However, e-learning often offers alternatives to life query resolution like online forums, e-mails, and chat rooms (Shiru, 2020).

3.1. Learning management system

With the proliferation of online learning, the use of Learning Management Systems (LMS) in higher education institutions is also becoming more popular. They provide tools for instructors to interact with learners through online lectures, discussions, and assessments (Michigan, 2010; WSU, 2019). The learning management system allows learners to have access to course materials, and assignments and to contact instructors from anywhere at any time they want. This will remove the limitation of the traditional classroom, where only a certain number of students can attend the class.

An example of this would be EDX, a website founded by a partnership between Harvard University and the Massachusetts Institute of Technology (MIT, 2017). They are offering high-quality courses from over 130 elite universities around the world, such as Hong Kong Polytechnic University or Harvard University, for learners from a variety of levels: university students, graduates, and working people. These types of courses are called Massive Open Online Courses or MOOCs. They allow an educational institution to provide learning content to an unlimited number of learners who can access the course through a defined online system. (MOOC, 2019; Anon, 2019). Some courses from MOOC providers such as EDX offer a certificate of completion when learners complete the courses.

For example, EDX offers MicroMaster Certification for Core Business Curriculum from the University of Maryland, USA.

3.2. Blended learning

Another notable trend is blended learning. This is a combination of traditional teaching (face-to-face) and the use of information technology in teaching (Bonk 2012). The application of information and communication technology (ICT) has driven the development of online education, and the integration of online courses with face-to-face instructions, i.e., blended classroom teaching, has gained popularity (Syler & Venkatesh, 2018). This helps the learner overcome the isolation of a traditional online class with LMS alone. Students will feel that they are getting constant support from the teachers along the way.

In blended classroom teaching, the online courses prepared by teachers from developed regions can transmit virtually pedagogical ideas and experiences, teaching methods and materials, or in short, educational resources across regions.

4. Challenges of teaching and learning accounting through e-learning

4.1. Expert systems

The idea of using artificial intelligence in the accounting field is not new. The idea of a system that could collect and process information like an expert began in the early 1970s (Murphy, 1994). This is an artificial intelligence system with the ability to mimic the way human experts think and solve problems. The system uses verbal and/or qualitative and quantitative analysis to generate intelligent answers with narrowed criteria (Murphy, 1994; Arnold, 2004 cited in Omoteso, 2012). In this case, the system is operated by processing input data based on preset rules and trying to answer certain types of questions or queries from system users. An early study by David Yang and Miklos Vasarhelyi in 1995 determined that expert systems can already be found in various areas of accounting such as auditing, financial planning, financial accounting, taxation, and management accounting with many areas of expertise. Some examples of expert systems are E&Y Decision Support with audit planning at EY;

VATIA supports value-added tax or FINEX deals with Proportional Financial Status (David, 2019).

With the growth of the Internet of Things, the input data for these types of expert systems will increase dramatically. Business leaders will be able to question and make better decisions on a real-time basis with the help of systems across different aspects of the business. The profession will require accountants who can understand and apply this type of system to provide financial intelligence. This is quite a challenge as the foundation of most accounting professionals in today's world is built around compliance, recording, and analysis of business transactions rather than information technology.

4.2. Accounting information system

Another widely used system is the accounting information system. An accounting information system focused on the collection, storage, and processing of financial and accounting data, which will be followed as financial statements to third-party users based on rules and principles of accounting (Aaahq.org, 2019; Accountingedu.org, 2019). Simply put, system users will input financial and accounting data into the system, which will then compile and generate useful reports to managers for decision-making purposes. To utilize this system, the accountant will need to be trained hands-on based on real-life transactions. This requires a lot of hours from the instructors to provide instruction and support along the way.

4.3. Coding languages

Coding for accounting is a new area for accountants. 57% of respondents did not know coding, but 40% expressed an interest in learning, based on an ACCA survey of 992 members in November 2020. As big data is being implemented in accounting information systems, the need for knowledge and understanding for coding for data analysis become very important. ACCA also stated some important benefits of coding to the modern accountant: (1) Better understanding of how data is organized, analyzed, and flows through the

organization, (2) more informed strategic conversations on technology use and adoption due to a better understanding of what needs to happen in the background, (3) gain valuable skillsets that improves market value and career opportunities.

Python and R are the two programming languages both heavily used in data science. Both support all modern machine-learning methods and visualization practices (ICAEW, 2022). With the understanding and application of these types of programming languages, the modern accountant would be able to utilize the raw data provided to its fullest potential using scripts, and methods to communicate with software through its language. This includes but is not limited to data setup, clean up, and simplification of complex sets of data for the modern accountant to audit or provide any suggestion for improvement on these expert systems as needed.

4.4. Challenges of teaching and learning modern accounting through technology application

Even with LMS and blended learning in today's online learning environment, teaching accounting is still very challenging. Online courses allow learners, especially working professionals, to fill in necessary knowledge gaps by taking only the required courses, rather than the entire program. However, a huge challenge posed by the rapid change in the market is that the demand for accounting professionals will have to be able to use and apply modern technologies to process data to produce useful information.

The current LMS learning system only restricts users from uploading assignments, managing grading, lectures, and creating discussions, so accounting knowledge can only be presented. presented in a very traditional way, heavy on theory and case analysis. We can incorporate blended learning into the teaching process, but it makes students concerned about the purpose of distance and online learning. In blended learning, students have to spend time going to class or attending virtual classes making online and

distance learning difficult and it loses the biggest advantage of this learning. Moreover, in accounting subjects, blended learning only ensures that students receive additional guidance from the instructors but does not guarantee that they will have more time to practice. Moreover, with courses requiring detailed instruction, it is more beneficial for students to be accompanied by instructors along the way to address any concerns and issues with the interacted technology or the software.

5. Recommendations

The author believes that for learners to acquire knowledge effectively, programs designed by educational institutions will need to aim for a minimum level of application of Bloom's Taxonomy (Vanderbilt University, 2019). This means that learners will be able to apply their knowledge to address practical workplace problems. The authors believe that if learners reach the applied level, they will begin to better understand the knowledge, which will pave the way for other upper levels of the taxonomy. With the current LMS and blended learning methods, this can be ensured using various materials and methods of assessment.

However, the author finds that the use of

blended learning can be applied but still does not meet the minimum requirements in teaching accounting in the modern era. With the current technological developments, students need to be facilitated for them to access and practice these new technology applications in real-time with live guidance from the instructors. This is to ensure the student will be able to receive hands-on support for the training as needed. As a result, the author recommends that there should be a construction of integrated simulated corporate environments with built-in expert systems to allow learners to learn and practice directly. This simulated company will have activities along with financial information that is constantly updated for students to refer to and handle as in real situations.

Moreover, with an integrated expert system, this simulation will also provide detailed instruction and support to the learner with preset questions and information with a monitored database. As the number of learners in this simulation increases, the expert system will be able to gather more data for the administrators through existing questions and issues. Therefore, allows the administrators to provide more detailed instructions and support for future learners of the system ■

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CÁC THÁCH THỨC TRONG VIỆC DẠY VÀ HỌC KẾ TOÁN THÔNG QUA CÁC ỨNG DỤNG CÔNG NGHỆ

● **Th.S NGUYỄN ANH HOÀNG SƠN**

Trường Đại học Mở TP.Hồ Chí Minh

TÓM TẮT:

Yêu cầu đối với ngành kế toán, kiểm toán đã có sự thay đổi mạnh mẽ trong bối cảnh xuất hiện các công nghệ mới. Các trường đại học trên thế giới đã bắt đầu tích hợp các khóa học vào hệ thống quản lý học tập trực tuyến và áp dụng các lớp học theo mô hình kết hợp (trực tuyến và trực tiếp). Tuy nhiên, với đặc thù của ngành kế toán, đòi hỏi phải được thực hành nên các công nghệ hiện tại chưa cung cấp đủ sự hỗ trợ cho việc tổ chức các khóa học kế toán trực tuyến. Do đó, nội dung bài giảng và phương pháp giảng dạy kế toán cần được điều chỉnh để phản ánh và đáp ứng các nhu cầu mới của người học. Các trường đại học cần nghiên cứu việc phát triển các khóa học mô phỏng và tài liệu giảng dạy dựa trên ứng dụng trí tuệ nhân tạo (AI) và ứng dụng xử lý, phân tích dữ liệu.

Từ khoá: trí tuệ nhân tạo (AI), dữ liệu lớn, Python, LMS, xây dựng khóa học, học tập theo mô hình kết hợp, dạy học trực tuyến.