Reform and Innovation of College Undergraduate Accounting Courses in the Intelligent Era

Author's Details:
Shunhua Yang(1)*  Habin Yang(2)  Winfred Okoe Addy(3)  Jessie Magonziwa(4)
(1)(3)(4) School of Economics and Finance, Jiangsu University, 212013, China  (2)Jiangsu University Press, 212013, China  Correspondent Email: yangshunhua@ujs.edu.cn

Funded BY
This is funded by project of Jiangsu university's 2019 higher education reform research project "The teaching reform and innovation of undergraduate fundamental accounting courses in the intelligent era" (project number 2019JGZD013) 、 "build research on the quality assurance system of overseas education undergraduate teaching" (project no. 2019JGYB094) and National First-Class Course Accounting.

Abstract
Traditional accounting professional courses focus on the cultivation of students' accounting ability, while the intelligent age needs to cultivate students' ability of analysis, prediction, and decision-making, and improve their professional judgment ability. In view of this, the accounting professional curriculum has to be reformed from the aspects of adjusting teaching objectives, optimizing teaching content, reshaping professional judgment ability, and innovating horizontal statements model to meet the needs of the intelligent age, and solve the contradiction between traditional accounting education in colleges and universities and the practical application of the intelligent age.

Keywords: Intelligent Era; Accounting Course; University Undergraduate; Reform; Innovation

1. Introduction
Dai Bohua, Assistant of the Minister of Finance, proposed at the 2015 China Finance and Accounting Summit: “We should adapt to the new normal, integrate and promote development, and actively promote the reform and development of accounting under the "Internet+". "Internet+" provides new ideas for the development of accounting technology. Director Gao Yibin of the Accounting Department of the Ministry of Finance also pointed out at the forum: “Accounting is organically integrated with technologies such as the Internet and big data, and the accounting industry is following the path of innovation, transformation, and integration, and is welcoming the great accounting era”. Against the background of modern information technology centered on big data, artificial intelligence, mobile Internet, cloud computing, and Internet of Things (“Big Smart Cloud Things”), accounting theory and practice are facing huge challenges. Computers, as a modern data processing technology that can replace humans, have developed rapidly(Zhou Weihua, 2019). It is believed that accounting robots have had a huge impact on the traditional accounting model with accounting as the core, and the rule-oriented and repetitive accounting work will be increasingly replaced by accounting robots. Faced with the advent of the era of accounting intelligence, it does not mean that accountants are no longer needed with accounting robots, but new requirements are put forward for accountants. Traditional accounting courses must be reformed and innovated to meet the needs of the intelligent age. The teaching objectives of accounting courses in the college undergraduate level, should be repositioned accurately in the intelligent age, and organically integrate knowledge, abilities, and literacy, and cultivate students' comprehensive ability to solve complex problems and higher-order thinking skills, and improve their professional judgment ability, in order to solve the contradiction between traditional college undergraduate accounting courses’ teaching and actual applications in the intelligent age.

2. The orientation of teaching objectives of college undergraduate accounting courses in the intelligent age
Under the background of major changes in the Internet intelligence era, college undergraduate accounting professional education requires corresponding adjustments in teaching goals, focusing on cultivating students' high-level ability to solve problems and good professional judgment in complex environments.

(1) Cultivation of high-level abilities in analysis, prediction, and decision-making

The teaching objectives of accounting courses can be divided into six levels: bookkeeping, settlement, report, analysis, forecasting, and decision-making. The first three levels are the shallow education of traditional accounting, and the latter three are the deep education of accounting in the intelligent age. In-depth analysis, forecasting, and decision-making are the functions that accounting professional courses will realize in the future. Cultivating students with the ability of comprehensive analysis, evaluation and decision-making is the key goal to be achieved in the undergraduate accounting professional courses of colleges and universities in the intelligent age. In the intelligent age, a large number of accounting processes, including bookkeeping, settlement, and report, are completed accurately and efficiently in real time through the intelligent accounting system. Accountants only need to manage and control in advance and set up standardized processes to achieve the preliminary accounting report work. Therefore, the orientation of the teaching objectives of accounting courses in the intelligent age should be adjusted from accounting ability to training students' analytical, forecasting and decision-making ability. In the future, the programmatic accounting record in debit-credit system can be handed over to accounting robots, and accountants will shift to analysis, forecasting and decision-making.

(2) Cultivation of professional judgment ability

Zhang Danlei (2019) believes that with the continuous development of informatization and intelligence, accountants need strong subjective professional judgment ability. Even in the highly intelligent future, accounting robots can only do standardized accounting by setting the procedure in advance. The real world is extremely complex and new things are constantly appearing. Due to the fixed nature of artificial intelligence in one period, it cannot replace the unpredictable ability of accountants and non-procedural professional judgments accumulated in practice by accountants, such as business mergers, tax planning, financing and investment decision-making, risk management and control, inter-company mergers and acquisitions, equity incentives, and judgments on domestic and international economic trends. In fact, accounting procedures also require accountants to identify operations to a certain extent, especially when accounting standards are changed, the confirmation and measurement of some events exceed the scope of software and reasoning, in which artificial intelligence cannot make accurate judgments. This requires accountants to mobilize the professional theoretical knowledge, experience accumulation and cultural literacy they have learned to make professional judgments, promptly convert the guidelines from text to practical operations, adjust and correct the artificial intelligence system, and accountants should be both professional and proficient in business, and can creatively propose relevant accounting and analysis methods. Not only that, there are often a lot of things in the real world that cannot be applied to existing established laws and regulations, and need to be analyzed and judged in actual operations based on actual conditions. Therefore, flexible and creative good professional judgment ability is an important direction for the cultivation of accounting students in the intelligent age. Good professional judgment ability is inseparable from a solid theoretical foundation, rich experience accumulation and profound cultural literacy.

3. The contradiction between the traditional accounting professional course teaching and the actual application in the intelligent age

Traditional accounting professional courses cultivate students how to keep accounts, settle accounts, and report, and cultivate the generators and providers of accounting data, and emphasize the accounting process; but as an accountant in the intelligent age, you must become an analyst and applicant of accounting data. Analytical ability and comprehensive judgment ability will be the main one to judge a qualified accountant. In the future, the application of digital currency, electronic invoices and electronic files, and the accounting work of accountants can be efficiently completed by accounting robots in real time. Accountants should focus on the financial analysis, forecasting and decision-making. Therefore, the contradiction between the traditional

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accounting professional course teaching and the actual application in the intelligent age is mainly manifested in the following aspects:

(1) The teaching content of traditional accounting courses is based on accounting equation, ignoring the analysis of the impact of each transaction on financial statements. The teaching mode of traditional accounting professional accounting courses, including fundamental accounting and intermediate financial accounting, are based on the accounting equation, and use double-entry bookkeeping system to account for business transactions, and then sort and summarize information to prepare financial statements. Traditional accounting courses emphasize the application of debit - credit bookkeeping for each transaction, while ignoring the impact analysis of each transaction on the income statement, balance sheet and cash flow statement. They pay more attention to post-event accounting, that is, the programmatic accounting work such as bookkeeping, settlement, and report after business transactions occur. The accounting work in the intelligent age is to standardize and process all accounting steps. The standardized process is to define the rules for the preparation of accounting entries, input the data into a pre-set computer system, and the accounting robot will follow the pre-set procedure of the accounting engineer and select the corresponding accounts to record transactions, and accountants only inputs the data once in the whole process, and the financial statements are automatically prepared in real time by accounting robots, which is fast and convenient, saves time and effort, and realizes the intelligent accounting of record and report. The application of intelligence has improved the speed and accuracy of accounting work.

Traditional accounting includes a series of procedures of accounting confirmation, measurement, recording, and reporting. Each procedure is highly repetitive and low in efficiency. More importantly, there are too many human factors. A small error of one accountant may cause major errors in the report, and it is time-consuming and laborious to find the cause after the error is discovered. The standardization of accounting in the intelligent age will be completed by accounting robots. It is foreseeable that it is only a matter of time before artificial intelligence fully enters the accounting field, and accounting robots will definitely change the way accountants work in all directions. As accounting students in the intelligent age, they should strive to become analytical and decision-making accounting talents. Teachers should teach students to pay more attention to impact on financial status, operating results and cash flow of each transaction when students learn accounting courses. This method will improve students' analysis, synthesis, evaluation, and decision-making abilities, so that students can better meet the requirements of accounting talents for analysis, forecasting and decision-making in the intelligent age.

(2) Traditional accounting courses do not analyze and evaluate the impact of cash business on cash flow. It is difficult for students to truly understand the difference between accrual-based accounting and cash-based accounting, and it is easy for students to be confused. Cash flow occupies an important position in the company’s daily operations. However, in the traditional accounting professional courses including fundamental accounting and intermediate financial accounting, the accounting equation is used as the teaching mode, but it has not analyzed and evaluated the impact of cash business on three types, operating activities, investing activities and financing activities, and this leads to students not being able to truly understand the essential difference between income and cash flow, only knowing what is happening, but not knowing why. Benjamin Bloom, a famous American psychologist and educator, divided people's cognitive goals into six levels: knowledge, understanding, application, analysis, synthesis and evaluation. Among them, the lowest-level goal is knowledge, and the highest-level goal is evaluation. However, the cultivation of students' ability in traditional accounting courses is limited to the understanding and application of low-level knowledge, and the cultivation of high-level analysis and evaluation ability is rarely mentioned. And the professional judgment ability in the intelligent age needs the support of high-level analysis and evaluation ability.

(3) The traditional teaching mode of accounting courses neglects the cultivation of students' in-depth knowledge and innovation ability. The traditional teaching mode of accounting professional courses focuses on accounting, emphasizes the application of debit and credit bookkeeping to accounting transactions, and ignores the analysis of the impact of each transaction on the company's financial statements. Whether it is fundamental accounting
or intermediate financial accounting and other accounting courses, the "one-to-many" "crawling", "indoctrination" and "injection" teaching methods are used to force students to memorize what account to be debited and what account to be credited. Passive memory and acceptance are all required, so that many students lose their interest in learning accounting. This kind of teaching method emphasizes the transfer of "single direction" of knowledge. Students are only passive executors, controlled and dominated in a passive position, and ignores the cultivation of students' deep-level knowledge and creative ability. What is needed in the intelligent era are accountants who have the ability to analyze, predict, and make decisions, and have good professional judgment ability to innovatively solve the complex problem in a complex environment that cannot be solved by accounting robots.

4. Teaching reform and innovation of college undergraduate accounting courses in the intelligent age

Human society has entered the era of intelligence, and computers, data and networks have become essential resources and tools in people's work and life. The modern information processing technology represented by Dazhiyiyunwu promotes the transformation of accounting informatization. The accounting robot makes the accounting process intelligent, which will greatly reduce the accounting personnel's requirements for accounting knowledge, can easily convert business language into accounting language, and improve the efficiency of accounting work. While the intelligentization of accounting reduces the requirements of accountants for accounting knowledge, it has greatly increased the requirements for accountants' analysis, forecasting, decision-making and professional judgment abilities. Therefore, students majoring in accounting in the intelligent age should transform from traditional accounting information generators who focus on accounting to analytical, predictive, and decision-making compound talents. The teaching of undergraduate accounting courses in the intelligent age should focus on teaching students how to use accounting information to facilitate decision-making.

Through teaching, students should understand how accounting is related to real-world decision-making. How to use conceptual teaching methods to make it easier for students to understand the essence of accounting, and students ultimately become users, analysts, evaluators, and decision makers of accounting information in the future. It is imperative to achieve this goal for the teaching reform and innovation of accounting courses for undergraduate accounting majors in the intelligent age. Specifically, the teaching reform and innovation of college undergraduate accounting courses in the intelligent age are manifested in the following aspects:

(1) Adjust the positioning of teaching objectives. The teaching objectives of traditional accounting courses are mainly based on the accounting work of enterprises, institutions and administrative units. After the application of accounting robots, a large number of accounting calculations, whether accounting document filling, general ledger and subsidiary ledger registration, or report preparation, etc., these daily basic and repetitive tasks can be automatically and accurately completed by accounting robots. While ensuring efficiency and accuracy, the accounting robot greatly reduces the workload of accountants, avoids some boring tasks, and frees up time for accountants to spend a lot of repetitive work in programmatic and standardized accounting work. Accountants use the precious time saved for analysis, forecasting, decision-making and other deeper and more subjective management accounting business activities, the value created by these activities is much greater than the integration of accounting business, so as to truly play the role of accounting in economic management. The focus of accounting in the intelligent age should be on the basis of comprehensive financial analysis and forecasting, formulating financial strategic planning, effectively carrying out capital market operations, and timely risk control and performance management, so as to realize the transformation of accounting to value management. Therefore, the orientation of teaching goals in the intelligent age should be adjusted from traditional accounting to the training of high-level talents for analysis, forecasting and decision-making.

(2) Optimize the arrangement of teaching content. Combining the work characteristics of accounting posts in the intelligent era and the requirements for accounting personnel to have good professional judgment ability, the curriculum system is sorted out and the teaching content is optimized. First, reduce the hours of accounting
courses and adjust the hours of management courses. The traditional teaching plan of accounting professional courses tends to emphasize accounting and neglect management. More class hours are distributed on fundamental accounting, financial accounting, cost accounting and other accounting courses, while less class hours on financial management, management accounting and other management courses. According to the requirements of the era of accounting intelligence, the class hours and credits for management courses should be increased to help students learn more management courses and lay a solid foundation for employment. Second, enrich practical teaching links and gradually cultivate management awareness. The practical teaching of accounting in the intelligent age does not need to emphasize the traditional manual accounting, but needs to participate in the whole process of business management in the form of corporate research and business internships to help students have a preliminary and comprehensive understanding of corporate management. Third, combined with the characteristics of intelligence, IT and artificial intelligence elective courses such as machine learning, data analysis, data mining, logic and other courses can be open, besides the fact that students have mastered a wide range of knowledge and skills in the accounting field, they can also understand relevant IT knowledge, which can help them initially establish a procedural thinking mode and be familiar with the working principles of accounting robots. When emerging new positions such as authority administrators, system operators and maintenance personnel, and knowledge engineers, accountants who have comprehensive knowledge can easily transform into a new field, which increase essentially the irreplaceability of accountants in the intelligent era.

(3)Reshape professional judgment ability. In order to meet the requirements of the transformation of accounting personnel in the intelligent age, the professional judgment ability should be emphasized in the teaching of accounting courses. Accounting robots can only process and transform the entered information into various accounting vouchers, accounting books and financial statements in accordance with system requirements. This is a procedural and standardized operation process. But in fact, accounting robots only use intelligence to change the way of corporate accounting, replacing accountants to complete standardized, rule-oriented, and highly repetitive accounting tasks, and lack a certain "self-judgment" ability. How to make better use of financial data in complex economic management, analyze and evaluate the data, and make predictions and decisions is the top priority of accounting work. And these must rely on the good professional judgment ability of accountants who have a solid accounting theory foundation and rich experience and cannot be replaced by Accounting robots.

(4)Innovate the horizontal financial statement model and reshape the content of accounting courses. Accounting courses in the intelligent age must realize innovative changes in teaching mode, and realize the transformation from "accounting information generator" to "accounting information analyser and evaluator". Whether it is necessary to adopt the traditional double-entry bookkeeping method in the computer environment once caused the doubts and conjectures of accounting scholars. Accounting researchers have tried to introduce software engineering object-oriented modeling, E-R modeling and other methods to re-identify and build accounting models. COLANTONI C S. (1971) proposed the use of binary coding and multi-dimensional data storage technology to enhance and improve the double-entry accounting system. MCCARTHY WE (1979,1982) once constructed an accounting model based on the E-R view, based on the E-R model method, and proposed a REA accounting model under the shared data environment on this basis. LINTW, KANDELIN N (1992) constructed an object-oriented accounting information system model. This article proposes a horizontal financial statement model instead of accounting equation as the main teaching platform for accounting professional accounting courses including fundamental accounting and intermediate financial accounting. This model arranges the balance sheet, income statement and cash flow statement on a horizontal line. It helps students understand how every transaction of a company affects financial statements. The horizontal financial statement model is below:

**Horizontal financial statement model**
Table 1: Financial Statements Effects Tables

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th>Income Statement</th>
<th>SCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets = Liabilities + Equity</td>
<td>Revenues - Expenses = Net Earnings</td>
<td>Cash Flow</td>
</tr>
</tbody>
</table>

I = Increase  D = Decrease  N = No effect

For the Statement of Cash Flows (SCF):

O = Operating Activity
I = Investing Activity
F = Financing Activity

For example, the company paid an advertising fee of $1,000, then the impact of this transaction on the financial statements is shown in Table 2.

Table 2: Horizontal statements model

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th>Income Statement</th>
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<tbody>
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<td>Cash Flow</td>
</tr>
<tr>
<td>D($1,000)</td>
<td>N</td>
<td>D($1,000)</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>$1,000</td>
</tr>
</tbody>
</table>

An asset cash has decreased by 1,000, so why does owner’s equity decrease by 1,000? It turned out that the expense increased by 1,000, which caused the profit to decrease by 1,000, and the profit decreased by 1,000, which caused the owner’s equity to decrease by 1,000. Cash flow from operating activities in the cash flow statement decreased by 1,000. After analyzing the impact of accounting transactions on the balance sheet, income statement, and cash flow statement, accounting entries are made according to rules of debit and credit in the double-entry bookkeeping system. Sales expenses are debited by 1,000 and cash is credited by 1,000 to achieve the organic combination of the innovated horizontal statements model and traditional double-entry bookkeeping. This horizontal statements model enables students to understand how accounting is related to real-world decisions. When students use the horizontal statements mode to record accounting transactions, they can clearly see the impact of each accounting transaction on financial statements. Students are set in the position of decision-makers, so that they can apply the concepts that they have studied in the teaching process to the decision-making for financing, investing and operating activities. Learning is no longer purely possessive learning, but more of exploration and practice based on understanding, which demonstrates the educating value of accounting courses in the intelligent age and the significance of cultivating top-notch innovative talents. Ask students to think about "If I take this measure or investment decision or accounting transaction, how will it affect my company's financial statements?" This method allows students to think first instead of memorizing the rules of debit and credit, because the emphasis here is on the relationship between accounting transactions and financial statements. The goal of this horizontal teaching model is to train students to be able to easily explain how accounting transactions affect the income statement, balance sheet, and cash flow statement? Has the asset increased, decreased or remained unchanged? What is the impact of each transaction on liabilities, owner's equity, income, expenses and profits? Furthermore, how does this transaction affect cash flow? Does it affect...
the cash flow of operating activities, investing activities or financing activities? The innovation of this teaching model is that it is easy for students to understand how each accounting transaction impacts financial statements and help them make an analysis and decision-making. Therefore, compared with the traditional accounting professional courses, the horizontal statement model provides a more intuitive and relevant learning experience, which can fully mobilize students' interest in accounting, thereby training students analysis, evaluation, decision-making ability in a true sense, which is exactly required by the intelligent age. On the one hand, this innovative teaching model makes it easier for teachers to break away from the traditional debit-credit accounting teaching paradigm, and focus on the understanding of important concepts; on the other hand, it will stimulate students' interest in learning accounting and help to develop key exploratory thinking skills, let each student learn from the heart, which helps to cultivate the innovative accounting talents needed in the intelligent age.

The horizontal statement model integrates the impact of accounting transactions on cash flow throughout the entire teaching process of accounting. When students first learn fundamental accounting, they are introduced the impact of accounting business on the three types of cash flow, and run through the entire teaching activities to the entire intermediate financial accounting learning. From this, students can directly and easily learn how to prepare cash flow statement by analyzing the changes of cash flow on cash account and the classification of operating, investing and financing activities, simplifying complex issues and making it easier for students to understand and master. And the biggest advantage of this logical method is that it can help students understand the essential difference between net cash flow of operating activities and net income of income statement.

The rapid development of big data, cloud computing, mobile internet, smart technology, etc. has promoted the corporate financial model from accounting to management, and put forward new requirements on the knowledge and capabilities of accountants. In response to the needs of practical applications in the intelligent age, the teaching mode of accounting courses including fundamental accounting and intermediate financial accounting must be reformed and innovated to achieve an effective combination of horizontal statements mode and traditional double-entry bookkeeping teaching mode. It is hoped that this can provide exploration for the future reform of the accounting education industry that will lead the intelligent era, and provide some reform ideas for the undergraduate accounting education of colleges and universities in the intelligent era.

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