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# Digital reporting in accounting: XBRL and integration to accounting department curriculum*

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**ABSTRACT**

This study discusses the necessity of integrating XBRL into the accounting curriculum in Turkey and makes some practicable suggestions on how XBRL can be integrated into accounting curriculum. In this context, the sample includes the accounting departments of universities that provide a 4-year undergraduate degree during the 2019-2020 academic year in Turkey. Thus, the data set of the research consists of accounting curriculum of 13 universities (state universities:8 and private universities:5). The course programs and course contents of the relevant universities and departments were accessed and analyzed over their websites. Findings reveal that the courses in the curriculum do not incorporate information about XBRL. Thus, the study suggests how XBRL can be integrated into the existing curriculum at the compulsory courses.

# Muhasebede dijital raporlama: XBRL ve muhasebe bölüm müfredatına entegrasyonu

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**ÖZ**

Bu çalışma, XBRL'nin Türkiye'deki muhasebe müfredatına entegre edilmesinin gerekliliğini tartışmakta ve XBRL'nin muhasebe müfredatına nasıl entegre edilebileceği konusunda bazı pratik önerilerde bulunmaktadır. Bu bağlamda çalışma örneklemi, Türkiye'de 2019-2020 eğitim-öğretim yılında 4 yıllık lisans derecesinde eğitim

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**Anahtar Kelimeler:** Genişletilebilir İşletme Raporlama Dili, Taksonomi, Finansal raporlama, Muhasebe müfredatı, Muhasebe Eğitim Standartları.

veren üniversitelerin muhasebe bölümlerini içermektedir. Nitekim araştırmanın veri seti, 13 üniversitenin (devlet üniversiteleri: 8 ve vakıf üniversiteleri: 5) muhasebe müfredatından oluşmaktadır. İlgili üniversite ve bölümlerin ders programları ve ders içerikleri web sitelerinden erişilerek analiz edilmiştir. Bulgular, müfredatta yer alan derslerin XBRL ile ilgili bilgileri içermediğini ortaya koymaktadır. Bu nedenle, çalışma XBRL'nin mevcut müfredatteki zorunlu derslere nasıl entegre edilebileceğini önermektedir.

## 1. Introduction

In the second half of the 18th century, the Industry 1.0 revolution started with the use of steam-powered machines in production and the establishment of factories in England. After the developments, when it comes to the age we live in, the concept of Industry 4.0 was announced at the Hannover Fair in Germany in 2011 (Schwab 2016 and Schlaepfer et al. 2014). As a result of the stunning developments in technology, the start of computerization and the widespread use of the internet have resulted in the use of intelligent systems called new generation technologies such as RFID, GPS, IoT in production. These developments, called Industry 4.0, have included the concept of digitalization in our lives and made it necessary to redesign all functions of businesses. With digitalization in accounting, is one of the essential business functions of the companies that provides information and enables the use of information in decision making, will ensure data, documents, records, reports, archives, and audit processes that provide communication are fast, easy, accurate and accessible to all information users with minimal cost. It is clear that these developments will affect the accounting discipline, the accounting profession, and those who perform the profession and accounting education that prepares for professional life (Dursun et al., 2019).

Along with today's digital age affecting the processes related to human life and thus the flow of life, it is aimed to keep up with the accounting transaction. The process of recording and reporting each economic transaction that companies realize is carried out in digital media due to the development of information technologies. Furthermore, financial statements are published on the internet to inform the users of the financial statements and comply with the principle of transparency.

Considering the digitalization process in terms of accounting, it makes sense to mention about the entry of XBRL into our lives as of 2001. As a result of the developments in the economic and business world affecting the education life and the necessity of these two cases to be parallel to each other, the digitalization process affects not only the business life but also the education life. According to the accounting education standards, professional accountants need to adapt themselves to changing systems and constantly improve themselves. Therefore, it is necessary for professional accountants to meet XBRL before business life, in education life. Based on this idea, this research has been studied directly related to digital life.

In the first part of the article, information about XBRL has shared. Since the purpose of the study is based on the relationship between XBRL and accounting education, basic information about XBRL has tried to be explained. It is worth remembering that the study's purpose and scope are not to describe the operation of XBRL in detail. In the second part of the study, the relationship between XBRL and accounting education will be emphasized. The necessity of XBRL to be included in the curriculum will be mentioned. This requirement will take us to the research part of this study. The course programs and course contents of accounting departments that provide a 4-year undergraduate degree have been examined, and the current situation has been revealed in Turkey. Thus, the data set of the research consists of the accounting curriculum of 13 universities (state universities:8 and private universities: 5) during the 2019-2020 academic year. It is concluded that the current curriculum does not incorporate any information related to XBRL. As a result, the necessity of integrating XBRL into the accounting curriculum will be mentioned, and a sample curriculum will be proposed.

## 2. XBRL (eXtensible Business Reporting Language) and taxonomy

The fact that businesses use different programs at the stage of data input creates problems in comparing the data. Accordingly, the need for creating a common accounting reporting language at a worldwide level has arisen to eliminate these differences. By researching the XML technology, Charles Hoffman produced a data encoding language project of which the current name is XBRL.

Hoffman presented the project he developed to AICPA (American Institute of Certified Public Accountants). After AICPA supported and funded the project, a board of directors was created. This board started to form taxonomies. After SEC (Securities and Exchange Commission) also supported this project, the XBRL commission published the first draft of the taxonomy in 2001. In parallel with the development of published specifications, taxonomies were also developed. Today, taxonomies are available in different languages.

XBRL (eXtensible Business Reporting Language) is a digital data coding language that is standard and free of the platform and used by financial information producers and information users for data exchange (Yardımcıoğlu and Özer, 2011, p.79). XBRL International is a hub for XBRL studies. It is mentioned that XBRL is a revolutionary language in commercial reporting globally and is an open standard developed by an international non-profit consortium free of license fees (https://www.xbrl.org/the-standard/what/an-introduction-to-xbrl/). The use of XBRL is widespread in the world. Some countries in America, Europe, and Asia continents have started to use XBRL, and some have started preparations to use it. XBRL is used by regulators, companies, governments, data providers, analysts – investors, and accountants.

XML, specifications, taxonomies, and sample documents can be called the main components of XBRL. We can define XML (eXtensible Markup Language) as an application basis. The vast majority of internet-based services are built on this basis. XBRL also uses this base.

Taxonomy is a classification science. In terms of XBRL, taxonomies define and classify the financial information hierarchically prepared by businesses. This prepared financial information is recorded within the standard brought by the taxonomy, thereby creating a common system.

Taxonomy enables mathematical relationships between elements. It allows a suite of human-readable labels for elements and enables each element to become a tag. Taxonomy providers can increase taxonomies according to their needs. Therefore, the reporting language has an extensible feature. In this way, it provides standardization and automation.

There are two basic specifications in the technical definitions made by XBRL International; XBRL FR (Financial Reporting) and XBRL GL (Global Ledger). XBRL FR standardizes reporting in the financial reporting system and enables data analysis, transfer, and data comparison. XBRL GL is the taxonomy to be followed in the general journal and ledger preparation within the scope of electronic ledger application (e-Defter Uygulama Kılavuzu, 2019, p.6). The sum of the tagged data, according to the taxonomy, made up the sample documents. Sample documents are created once, and then reports can be produced in different formats and contents with these documents.

In Turkey, the practice of electronic notebooks started in 2013 with a notification issued in 2012, and taxonomies have been published for this system by the Public Oversight Accounting and Auditing Standards Authority. As of 2016, electronic books are obliged to be kept for public companies except for banks.

It is possible to mention many benefits of using the XBRL system for different information users. Firstly, in terms of those who prepared the reports, as the data can be easily converted to various formats, there is no need to prepare the new formats again. This creative opportunity saves time and costs by providing faster preparation. Secondly, in terms of lenders and investors, obtaining data quickly and easily becomes decision-making more effortless. Finally, in terms of the state that has the role of a tax collector, the system-based storage and control of information become even credible.

The explanation of the features of XBRL and the issues that create information confusion about XBRL is given in the table below.

Table 1

*What XBRL is and What XBRL is not?*

| What XBRL is | What XBRL is not |
|---|---|
| • XBRL is relevant to any organization or individual that either produces or uses financial reports.<br>• XBRL is flexible and accommodates individual preferences.<br>• XBRL facilitates the preparation and reuse of financial data.<br>• XBRL improves the quality of the information being used.<br>• XBRL increases the speed and frequency with which information can be prepared, reported, and used.<br>• XBRL makes information more useful and more useable.<br>• XBRL makes it easier for companies and governments to report and for stakeholders and regulators to access and analyze information quickly. It will therefore lead to increased transparency and demands for additional information.<br>• XBRL automates the time-consuming, manual, error-prone tasks of translating corporate information from whatever format it is provided into whatever format a user wishes to employ.<br>• XBRL frees information from time and places constraints, as stakeholders anywhere in the world only need an internet connection to get access to company information. | • XBRL is neither a set of accounting standards nor a detailed universal chart of accounts, nor does it change financial reporting standards. It creates a tagging scheme based on existing standards.<br>• XBRL is not a reporting template. Indeed, it frees users from the need to follow any specific format since each bit of data is tagged with its own context.<br>• XBRL does not change what is reported. It will not have any effect on the numbers.<br>• XBRL is not a US-based effort but an international effort.<br>• XBRL is not proprietary technology. It is freely licensed and available to the public.<br>• XBRL is not a transaction protocol. It is designed to address issues related to the production and consumption of information contained within business reports and begins at the accounting classification level. XBRL is about business reporting.<br>• XBRL is not a magic wand that solves all your accounting issues and converts your ledgers to new requirements such as IAS, Basel, UCITS III, etc. |

Source: PWC, Trusted and Efficient Financial Reporting, p. 7

## 3. The necessity to integrate XBRL into the curriculum within the scope of the relationship between accounting and education

Accounting is a dynamic information system that records, classifies, summarizes, reports, analyzes, and interprets the financial events faced by businesses. In other words, accounting is an information system that produces, analyzes, and interprets financial information. Both the company and its interested parties that the company has direct or indirect in relationships utilize the financial information of the accounting process. In this context, financial reports are a communication tool in which the business shares its financial information to information users (Karapinar and Zaif, 2018). It is almost like the language of the company.

When financial information is produced and financial reports prepared, the importance and needs of a trained, quality, and qualified workforce continue to increase in the digital age. To meet this need, the quality of accounting education should be improved. In accounting education, the quality is related to the course programs and the course contents in which knowledge and skills related to the profession are taught, the content of the course, the teaching method and tools, and the contributions of the lecturers and students (Zaif and Ayanoglu, 2007, s.116-117).

It is a fact that the business world, which is rapidly affected by globalization and digitalization, can keep up with these changes depends on the knowledge and skills of its employees. Besides the ability to collect data and produce information from employees, it also required the ability to analyze, interpret, and use it in decision-making. All these knowledge and skills can be provided with a high-quality education at the university.

The effect of globalization and digitalization in accounting is to prepare and present financial statements on the internet. The use of the internet has led to the start of a new accounting process in the traditional methods followed from the preparation stage to the presentation of financial information. This process has introduced businesses and employees to XBRL. Adopting and implementing XBRL, which provides cost and time savings, ensure that financial statements are presented to financial information users by means transparently. With this perspective, the new generation reporting language increases comprehensibility and reliability. It allows more straightforward and more meaningful comparisons to be made. The ability of businesses to continue their existence in a competitive environment advantageously to adopt and implement XBRL depends on the level of knowledge of their employees. Accounting staff to keep up with this new process is closely related to the educational life and work-life being parallel to each other. In other words, for an employee to become an XBRL practitioner, it is necessary to learn theoretically and practically in this field at the university. Providing the required education at the university will be possible only if the accounting curriculum includes XBRL.

The development of accounting both as a science branch and a profession depends on the quality and recency of accounting education and the existence of practical and theoretical courses. The element affected by these factors, which play a role in the development of accounting, is the accounting department curriculum covering the functioning of the education process. We believe that the development is only possible by adapting the curriculum to changing world technology.

Many studies have been carried out at the international level for accounting education. IES (International Education standards), one of the necessary arrangements related to education, is published by IAESB (International Accounting Education Standard Board), one of the IFAC (International Federation of Accountants) affiliated boards. According to Handbook of International Education Pronouncements 2019 Edition published by IAESB, as of 2020, there are eight education standards (Handbook of International Education Pronouncements, 2019).

Table 2

*International Education Standards*

| Number of Standard | Name of Standard |
|---|---|
| IES 1 | Entry Requirements to Professional Accounting Education Programs (2014) |
| IES 2 | Initial Professional Development – Technical Competence (2015) |
| IES 3 | Initial Professional Development – Professional Skills (2015) |
| IES 4 | Initial Professional Development – Professional Values, Ethics, And Attitudes (2015) |
| IES 5 | Initial Professional Development – Practical Experience (2015) |
| IES 6 | Initial Professional Development – Assessment of Professional Competence (2015) |
| IES 7 | Continuing Professional Development (2014) |
| IES 8 | Professional Competence for Engagement Partners Responsible for Audits of Financial Statements (2016) |

The existence of global standards in accounting education is vital for the competence of accounting employees and the development of the profession. In other words, the quality of accounting education is regulated by international standards so that accounting professionals can have the technical competence and that the profession can keep up with changes. When standards are examined, it will be seen that it covers topics such as how accounting education should be, content, scope, the intensity of the education, and educational tools and methods. IES 2 and IES 3 relate to the scope of this research. Because IES 2 "Initial Professional Development - Technical Competence" deals with the required course programs, course contents, and learning outcomes to ensure and maintain quality in accounting education. The standard IES 3 "Initial Professional Development - Professional Skills" addresses the professional knowledge and skills required in professional life.

We suggest that the preparation phase of the curriculum should comply with the standards prepared in the field of education. Because these standards are designed on the professional and technical skills that the accounting staff should have and the quality of the training processes, and therefore they are a guideline.

According to IES 2 and 3, it is essential for accounting professionals to follow the developing technologies. Indeed, XBRL has also emerged as a result of digital developments. In order to ensure the continuity of professional development, the future members of the profession should also follow the developments closely and have the necessary level of knowledge. On one hand, Kurnaz et al. (2020) are of the opinion that new generation technologies and digital tools are not sufficiently included in current accounting education. They also believe that the current accounting education does not contribute to the training of accounting professionals who can meet the requirements of the digital age in the business world. Additionally, they concluded that participants were aware of the importance of digitalization in accounting education. They applied the questionnaire to the professional accountants registered Union of Chambers of Certified Public Accountants of Turkey. According to the results of the questionnaire, 81% of the participants think that the current accounting education is not in a structure that will provide the competencies to adapt to the technological developments to be experienced in the future. While 80% of the participants think that it is important to equip students with advanced computer skills, coding languages, accounting software, and cybersecurity in accounting education, 86.4% of them think that the accounting curriculum needs a radical reform when new technological developments are taken into account.

On the other hand, Carıkcı and Ozturk (2019) determined that there are no courses for teaching programming languages in the current curriculum of universities in the questionnaire was applied to the undergraduate and graduate students. As a result of their questionnaire of independent auditors in business life, it is necessary to teach coding software languages such as XBRL due to the programming of the university curriculum. They stated that it should include courses that will lead their language. This lack of knowledge, of which the members of the profession are also aware, can be overcome by integrating XBRL into the curriculum according to International Education Standards.

## 4. Literature review

Since there is not any research related to the integration of XBRL into the accounting curriculum in Turkey, worldwide studies have been examined. Few studies in the literature have argued that XBRL should be included in the accounting curriculum. We have investigated the suggestions for integration into the curriculum in these studies and the reasons for which these suggestions are based. We observed that the recommendations discussed were different from each other.

While Fedorowicz (2003) has stated that XBRL's educational impacts and its incorporation into an Advanced Accounting Information Systems course, Debreceny, and Farewell (2010) argued that the integration of XBRL into the curriculum should be compatible with Bloom's Learning Objectives Taxonomy. According to Debreceny and Farewell (2010), XBRL should be integrated into typical courses, considering different faculties have different courses due to undergraduate curriculum differences in the states. In addition, they pointed out the levels of the courses in the field of accounting and stated that in the context of XBRL integration, more superficial information should be given in the introductory courses, and a deeper scope should be created in advanced courses. When they formulated a program to adapt XBRL to the curriculum, they suggested what should be explained on a course basis and situations to avoid in narrator and supportive assignments. Rahwani (2013), in her study, accepted the curriculum design of Debreceny and Farewell's (2010) research as an ideal curriculum design during the integration of XBRL into the accounting curriculum. Inspired by this design, the author has explained how to integrate XBRL into the 2011-2012 academic year curriculum. Rahwani has alleged that all course planning included in the curriculum design in the study of Debreceny and Farewell should not be accepted simultaneously to the relevant courses in the current curriculum. The author has proposed that the phased approach should be adopted, and the scope of integration should be expanded for each year's academic curriculum.

Although there is no suggestion regarding integration into the curriculum, studies investigating whether XBRL is included in the curriculum and questioning the necessity of XBRL from the eyes of academics are also included in the literature. Deshmuk et. al. (2006) examined the opinions of academicians who taught Accounting Information Systems (AIS) courses in terms of the integration of XBRL through a questionnaire. With this study, the authors have concluded that 79% of the participants stated that some XML / XBRL should be added to the curriculum. At the same time, they have signified that the academics agreed that there was a severe lack of educational material for teaching the topic of XBRL. Based on these results, the authors have argued that the materials currently available for XBRL training are insufficient, and improvements should be made in these aspects. Besides, in their study, Cable and Healy (2013) determine whether undergraduate accounting students were exposed to XBRL and to what extent they were exposed. In their studies, they have collected data from multiple sources and used the triangulation approach. In this context, they conducted a questionnaire with the chairs of accounting departments, reviewed the AIS textbooks and AIS course syllabi. They alleged that accounting students should be exposed to the topic of XBRL through AIS courses.

## 5. Analysis

### 5.1. Purpose of the research

The research aims to determine whether the academic curriculum of universities that provides 4-years accounting education in Turkey covers the subject of XBRL. The study develops suggestions on the integration of XBRL into the accounting curriculum. In this context, it was mentioned that XBRL should be integrated into the accounting education curriculum.

### 5.2. Method and scope of the research

Accounting education in Turkey is given intensively in the accounting departments. These departments are usually in faculties of Applied Sciences, Business, and Administrative Sciences, Business Science, or school of Applied Science. In our research, therefore, we have examined the accounting departments of universities that provide a 4-year undergraduate degree during the 2019-2020 academic year in Turkey. Two hundred five universities continue their activities in the relevant academic year. The data set of the research consists of the accounting curriculum of 13 universities; 8 of them are state universities and the rest are private universities. In this scope, the course programs and course contents of the undergraduate degree accounting departments have been investigated. Curriculum contents are accessed from the information packages of the relevant universities and departments' websites.

We have determined universities to be included in the research; in other words, which universities have 4-years of accounting from the Council of Higher Education's Program Atlas and Measurement, Selection and Placement Center's reference guide.

### 5.3. Research findings

The data set related to the accounting department in both state and private universities that provides 4-years accounting education is shown in Table 3.

Table 3

*Data Set*

| UNIVERSITY | FACULTY/SCHOOL (4-year-accounting education) | Department |
|---|---|---|
| Afyon Kocatepe | Bolvadin School of Applied Sciences | Accounting and Finance Management |
| Başkent | Faculty of Commercial Sciences | Accounting and Finance Management |
| Burdur Mehmet Akif Ersoy | Bucak Zeliha Tolunay School of Applied Technology and Business | Accounting and Finance Management |
| İstanbul Arel | Faculty of Economics and Administrative Sciences | Accounting and Finance Management |
| İstanbul Aydın | Faculty of Economics and Administrative Sciences | Accounting and Financial Management |
| İstanbul Okan | Faculty of Business and Administrative Sciences | Accounting and Auditing |
| İzmir Ekonomi | Business Administration | Accounting and Auditing |
| Kayseri | İzzet Bayraktar Faculty of Applied Science | Accounting and Finance Management |
| Kütahya Dumlupınar | Kutahya Faculty of Applied Science | Accounting |
| Muğla Sıtkı Koçman | Seydikemer School of Applied Sciences | Accounting and Finance Management |
| Necmettin Erbakan | Faculty of Applied Science | Accounting and Finance Management |
| Trakya | Uzunköprü School of Applied Sciences | Accounting |
| Uşak | School Of Applied Sciences | Accounting Information Systems |

* At the preparation stage of this table, Higher Education Council (YÖK) Undergraduate Atlas was used (https://yokatlas.yok.gov.tr).

During the 2019-2020 education and training period, all of the curriculum contents have been reached and analyzed. As a result of the research, the current courses and curriculum contents are summarized in Table 4. Current courses and their contents are primarily similar to each other. Moreover, there is not any course that contains information about XBRL. In other words, it has been determined that the current accounting curriculum in Turkey does not cover XBRL.

Table 4

*Current curriculum*

| COURSES | CURRICULUM CONTENTS |
|---|---|
| **1ST GRADE** | |
| FINANCIAL ACCOUNTING I | • Definition, purpose, functions, types of accounting<br>• Basic accounting concepts<br>• Basic financial statements<br>• Principles of balance sheet and income statement<br>• Basic accounting equation<br>• Account concept in accounting and opening and closing accounts<br>• Recognition to journal and ledger<br>• Trial balance<br>• Periodic process in accounting<br>• The process of detailed recognition of current assets accounts and their secondary accounts and their recognition in journal and ledger |

| | |
|---|---|
| FINANCIAL ACCOUNTING II | Accounts of Non-Current Assets, Current and Non-Current Liabilities and Equities and accounts of Income Statement with the related application |
| **2ND GRADE** | |
| INVENTORY AND END OF PERIOD TRANSACTIONS | • Basic concepts related to inventory valuation<br>• Ending period transactions in income and expenses<br>• Period separator accounts<br>• Preparation of ending period financial statements<br>• Transactions related to end of the period of assets and liability accounts |
| COST ACCOUNTING I | • Basic concepts of cost accounting<br>• The importance and purpose of cost accounting in the accounting organization<br>• Its relationship with financial and management accounting<br>• Cost items<br>• Cost accounts and their functioning<br>• Distribution (allocation) methods of expenses<br>• Determining unit and total cost |
| COST ACCOUNTING II | • The principles and operation of job order costing and process costing<br>• Concepts of joint product and by-product and their accounting<br>• Issue of Wastage<br>• Cost and profit analysis |
| **3RD GRADE** | |
| MANAGERIAL ACCOUNTING | • Contribution margin and break-even-point analysis<br>• Budgeting systems<br>• Product mix<br>• Variance analysis and their accounting<br>• Decision-making function of management<br>• Strategic decision making (whether to continue production, to produce new products) |
| FINANCIAL REPORTING AND ANALYSIS | • Users of financial information<br>• General information about financial statements<br>• Definition and objectives of financial analysis<br>• Financial analysis techniques and interpretation of the results obtained with these techniques |
| COMPUTERIZED ACCOUNTING I-II (Packaged Software in Accounting) | • Types of documents<br>• Modules, usage, and application of accounting package software<br>• Data transfers<br>• Transactions of ending period<br>• Back-up operations |
| CORPORATE ACCOUNTING | • Concept of corporate<br>• Types of corporate<br>• Accounting practices of corporate types<br>• Profit distribution and loss offsetting<br>• Liquidation and merger transactions |
| RECOGNITION OF FOREIGN TRADE OPERATIONS | • Arrangement of documents related to foreign trade<br>• Delivery and payment methods<br>• Customs legislation<br>• Accounting practices of import and export transactions |

| **4TH GRADE** | |
|---|---|
| AUDITING | • Concept of auditing<br>• Types of audit and auditor<br>• Generally accepted auditing standards<br>• Auditing process<br>• Auditing evidence and techniques<br>• Internal control system<br>• Internal control<br>• Auditing of accounts |
| INTERNATIONAL ACCOUNTING AND FINANCIAL REPORTING STANDARDS I-II | • History of accounting and financial reporting standards<br>• Legislation that gives direction to the accounting practice in Turkey<br>• Examining IASs and IFRSs |
| ADVANCED ACCOUNTING | • Concept and process of accounting<br>• Financial events and their recognition<br>• Implications of tax legislations and other regulations for accounting process<br>• Specific transactions with the rules and their regulations in the accounting period |
| TAX ACCOUNTING | • Accounting of tax liability, tax incentive and tax advantage arising from various activities of businesses<br>• Disclosure of Tax Procedure Law (TPL) and IAS-IFRS valuation terms with financial statements<br>• End of period transactions with tax laws |

* At the preparation stage of this table, information packages of the relevant universities and departments' websites are used.

As can be seen in the undergraduate degree in Turkey, in 4-year accounting programs, accounting education is carried out theoretically with compulsory and elective courses.

5.4. Integration of XBRL to Accounting Curriculum and a sample curriculum

According to Debreceny and Farewell (2010), the study of XBRL should be incorporate the accounting curriculum to make possible teaching and learning. Also, XBRL should be taught in a format compatible with national and international reporting with transactional data. The scope of XBRL is integrated into the accounting curriculum as the width and depth of accounting concepts increase**.**

In the research, we have determined that the curriculum of the accounting departments, which provided accounting education for 4-years in the undergraduate degree during the 2019-2020 academic year, does not cover XBRL. We have prepared the curriculum in Table 5 as a recommendation because of the need to integrate XBRL into the accounting curriculum. We have suggested integrating XBRL into the degree of the compulsory course in the current curriculum at accounting departments in the undergraduate degree. At the same time, it has been tried to explain how much information at what level and how to taught also related to XBRL in the table.

Basic concepts are explained in the introductory level courses. In the following classes of the program, the curriculum expands, and its content deepens. In this context, the explanation of XBRL should be increased in terms of scope and depth from the beginner level to the courses in the advanced classes. The curriculum that we offer as a suggestion in the table has been prepared according to this principle. In addition, the table is arranged according to the order in which the students took the courses during the education process. Therefore, the courses in the table proceed from the basic level to the advanced level. In this way, it can be seen that the integration and scope of XBRL in terms of content and depth have increased towards the last lessons at the table.

Table 5

*How we can integrate XBRL to Accounting Curriculum*

| COURSES | CURRICULUM CONTENTS |
|---|---|
| Financial Accounting I and II | These courses include the role of accounting in the functioning of companies and the economy. So, these courses have appropriate points to introduce XBRL. Faculty members may emphasize the role XBRL plays in the consumption of accounting information.<br>On one hand, the definition, purpose, brief history, and purpose of XBRL can be taught because these courses are entry-level. Therefore, they should not be explained intensely; only the big picture should be shown. On the other hand, the impact and current status of XBRL can be mentioned.<br>Students can only be directed to relevant websites (such as www.xbrl.org) for purposes of familiarization. |
| Inventory and End of Period Transactions | This course is based on Turkish tax laws and other legal regulations related to accounting. It covers the preparation of financial statements in depth. Thus, information can be given about the production of financial statements with XBRL. In this process, it is useful to mention the contributions such as transparency and timeliness that XBRL will provide. Concepts such as specification, taxonomy, and instance documents related to XBRL can be introduced. At this point, the taxonomy may contain some more information by mentioning the relationship of financial statement preparation. |
| Financial Reporting and Analysis | This course includes the preparation and presentation of the financial statements of the business and the techniques used in the analysis of the financial situation, and the interpretation of the results. On one hand, it is critical to integrate XBRL into this course, which is vital in all aspects. On the other hand, this course is an advanced level. So, the coverage can be increased in XBRL teaching on the purpose for students can be given a perspective both for information producers and information users. The contribution of XBRL can be described in the data collection and analysis of the collected data.<br>The vital role of XBRL in incorporating transparency, including institutionalism and capital markets, can be described.<br>Since financial statements are widespread globally, the benefit of easier comparison of data with XBRL should be emphasized. |
| Computerized Accounting I-II | In this course, students are taught different package software in which accounting data entries are made. It is appropriate to explain that the difficulties experienced will be overcome thanks to XBRL because these programs operate differently, and businesses use different programs.<br>There are relevant aspects of XBRL that should receive coverage in this course. So, the course includes more detailed knowledge of the technical aspects of XBRL.<br>This course requires students to develop more expertise in the construction of instance documents. At this point, the data tagging process can be introduced to students.<br>It is essential that students have learned in previous lessons with taxonomy and financial statements and their relations. In this way, the student can establish the necessary connections. |
| Managerial Accounting | Introduction to XBRL as transfer of management accounting data between disparate accounting systems is convenient in this course.<br>XBRL has the potential to affect intra-entity, and inter-entity information flows significantly. Developments such as emerging risks and new taxonomies related to both financial and non-financial information will provide a basis for reporting both financial and non-financial performance and risk data. Therefore, this function of XBRL can be mentioned in teaching decision-making processes. The role of XBRL in internal reporting can be |

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| | taught. However, students can be directed to focus on the use rather than the production of XBRL for purposes of important achievement information that will affect decision-making. |
| International Accounting And Financial Reporting Standards I-II | Because IASs and IFRSs guide the preparation and presentation of financial statements, in this course, it should be mentioned that XBRL is prepared in compliance with IASs and IFRSs. Moreover, the taxonomy proposed by IASB, the taxonomy proposed by the Public Oversight Accounting and Auditing Standards Authority (UPS) and taxonomies belonging to different countries can be introduced to students because it allows students to see different taxonomies, to make comparisons, and to comprehend them better. |
| Tax Accounting | The state collects taxes from businesses as a tax collector in line with their earnings, and the related accounting records form the content of this course. As a result of the adaptation of the declaration system to the electronic environment, the tax collector units of the state started to make a process with XBRL. Therefore, the relationship between XBRL and tax returns can be explained in the content of this course.<br>In this course, as a result of XBRL facilitating access to data and facilitating data storage, tax transactions of businesses and governments should be mentioned. |
| Advanced Accounting | In this course, the implementation part of the standards, which is explained in the financial reporting standards courses, is illustrated. The content of this course can differ from faculty to faculty, but in general, the aim is to teach specific transactions in accounting applications according to particular regulations. In this course, it should be mentioned how businesses and users of financial statements will use and interpret XBRL in terms of these specific situations. This course is at an advanced level so that the coverage can be increased in XBRL teaching, such as both users and producers of information. Examples of applications related to the standards, arranged according to taxonomy, can be described. |
| Auditing | The subject of this course is the audit processes of financial statements. In this course, it should be mentioned that auditing keeps up with digitalization as a result of using a common language thanks to XBRL. As a common language, XBRL will ensure that the financial statements also have common features. In this course, the benefits of speeding up the audit process of XBRL and providing easy access to data can be mentioned. |

* This table, which explains the suggestions for integrating XBRL into the existing accounting department, was prepared on the basis of both the Turkish accounting and education system, inspired by the research of Debreceny and Farewell in 2010.

Graduate and doctorate programs are programs in which the scope of the courses is extended by adding more expertise details to the information gained at the undergraduate level. Undergraduate education (or bachelors' degree) is the basis of these programs. Integration of XBRL initially in primary education will enable the enhancement of information and the transfer of more advanced XBRL knowledge in graduate and doctorate programs. After integration at the undergraduate level and observing the outcomes, integrating into graduate and doctorate programs can eliminate concept confusion and lack of knowledge. In the research, therefore, the integration of XBRL into the curriculum is at the undergraduate degree.

Business departments etc. are not included in the scope of the research. The reason is that business departments contain fewer accounting courses than accounting departments. In other words, accounting courses comprise the majority of the courses in the curriculum in accounting departments. Therefore, we argue that it may be easier to integrate information about XBRL into the accounting departments in terms of scope and content. Another reason for this idea is that the accounting departments incorporate applied courses such as "Computerized Accounting". We allege that it would be more appropriate to explain the technical information about XBRL to the students with these and similar applied courses.

According to international education standards, the current accounting courses and the curriculum contents are possible and sufficient for education. Regarding consolidation of the course programs, we have asserted that it is more appropriate to integrate XBRL into the existing courses rather than to create a separate course.

In 4-year accounting programs, accounting education is carried out with compulsory and elective courses. The courses included in the research and in the curriculum suggesting the integration of XBRL are compulsory courses. Elective courses focus more on specific areas of accounting (e.g., healthcare business accounting, corporate accounting), and students choose these courses based on their interests. Moreover, these courses vary from university to university. We do not consider it appropriate to integrate XBRL into the elective courses since every student doesn't choose the same elective course. There are differences between universities in these courses. Thus, the research incorporates compulsory courses.

The extent of the study is limited to universities in Turkey. It could be compared with the current situation in other countries, or it could be revealed worldwide. Listed by THE (Times Higher Education) according to specific criteria, some of the top 500 universities in the world, which are announced every year, have been examined. Departments that provide 4-year accounting education in these universities and their accompanying faculty / high school system have not proved such a system in Turkey. Because the units to be compared are not the same, it will not give meaningful results in the case of comparison. Therefore, the current situation of XBRL coverage at the universities in Turkey and other countries has not been compared with each other. The scope of this study consists of the accounting departments that provide 4-years university accounting education in Turkey.

## 6. Conclusion

Change, which is a necessity of our age, becomes more and more important as digital innovations emerge. Both education life and business life have to do their part in this process for change. The relationship of accounting with digitalization affects both professional accountants and the students of the department of accounting that will take part in this profession in the future.

It is necessary for XBRL to be included in the accounting education curriculum for two reasons. Firstly, we are in a period in which financial statements are prepared according to taxonomies in Turkey and the world and declared to relevant government institutions in this way. It was observed as a major deficiency that a student who is graduated from the accounting department was not aware of the situation. Secondly, since International Education Standards address specific issues such as how accounting education should be, content, scope, the intensity of the education and educational tools and methods, and state that should improve themselves in this direction, it reveals the necessity of integrating XBRL to education.

We thought it would be beneficial to examine the enormous and beneficial change that XBRL has created in accounting from an academic perspective. There are many studies about the XBRL system and its operation in Turkey and the world. However, the situation is different for research on the curriculum. There is no study on integrating XBRL into the accounting department curriculum in Turkey. There are very few studies in other countries. We put forward that studying the integration of this system, which finds application in business life as a result of digitalization, to education will contribute significantly to the literature. We investigated how much accounting education involved the digital transformation process and, while being a professional accountant, the status of the information that students should learn to have competencies as stated in the education standards.

We have incorporated the accounting department of universities that provide a 4-year undergraduate degree during the 2019-2020 academic year in Turkey. Thus, 8 state and 5 private universities are included in the research scope, and the sum of 13 universities' accounting curriculum is the data set of the research. We accessed and analyzed the course programs and course contents of the relevant universities and departments on their websites. We have determined that compulsory courses such as Financial Accounting, Cost and Managerial Accounting, Financial Reporting and Analysis and Auditing, and elective courses such as Corporate Accounting and Foreign Trade Transactions Accounting, and applied courses such as Computerized Accounting are in the curriculum

similarly. We have concluded that the courses in the curriculum do not incorporate information about XBRL and asserted that XBRL can be integrated into the existing curriculum at the compulsory courses.

It was observed that students learn basic knowledge of accounting in the first year and take more comprehensive courses in upper classes as the courses progress. We put forward that brief information about XBRL can be given in introductory courses and that XBRL should be handled in a more detailed dimension in upper-class courses. We consider the courses of upper classes as courses in which information about XBRL and taxonomies can be integrated. We assume that the content of these courses should include information about the benefits of XBRL and taxonomies and the purpose of ensuring that the financial statements are common at the global level in terms of their functioning. Considering that the 4-year-universities are mostly gathered under the same roof of the Faculty of Applied Sciences / School, we envisage that after a joint study with computer engineers, practical training on XBRL and taxonomy may be extended by expanding the scope of the courses taught in accounting package software.

Our study is related to integration in the undergraduate curriculum. We suggest that a separate study can be conducted on the integration into graduate and doctorate programs. Another suggestion is about International Education Standards (IESs). IES 3 is related to the professional knowledge and skills that a professional accountant should have. These competence areas are grouped as intellectual, interpersonal-communication, personal and organizational, and their relationships with learning outcomes are established. IES 6 is related to assessment professional skills and abilities. In order to reach the proficiency level mentioned in these two standards, XBRL that one of the technical accounting skills in our age must be known and applied successfully. However, in the IES-2 part of the standard related to the education curriculum, XBRL knowledge is not incorporated in the courses of competence areas and the learning outcomes. The standards, which guide the accounting profession and education globally, should include XBRL in the content and scope of the educatıon curriculum, especially IES2 following IAS / IFRS.

It is useful to remind that in accounting education, quality does not depend only on the curriculum; but also it depends on, at the same time, the physical facilities of the university, and the place where the course is held, the knowledge and skills that the lecturer has, the ability of the lecturer to adopt and the ability of students to adapt, absorb and apply the subject with course processing methods and tools.

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