

Full Length Research Paper

Conceptual frameworks of university students regarding accounting

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This paper aims at ascertaining the conceptual frameworks of university students regarding accounting. In order to fulfil this aim, a word association test was applied to 119 students who had studied accounting before in Turkey. Ten key concepts (*accounting, balance sheet, account, cost, inventory, payable, receivable, profit, loss, finance*) were constructed for the word association test. Frequency tables were formed using the answers of the students and concept maps were drawn according to the values in these tables. On the concept maps it is observed that the correlations are mostly found between the concepts accounting and account. Furthermore, it is found that there is a convolute correlation between the concepts of accounting in the form of a network. Additionally, it is discovered that the students have some misconceptions about accounting. The research findings demonstrate that word association testing can be used to measure students' conceptual framework regarding accounting.

Key words: Accounting education, word association test, concept maps, misconceptions.

INTRODUCTION

Accounting education can be defined as educating the students in determining, collecting, recording, summarizing, reporting, analysing, and auditing the data that will steer the decisions in business. Rapid economic and technologic developments have affected the accounting profession. To meet the needs created by these changes and developments, an efficient accounting education is required (Steadman and Gren, 1995). No significant progress could be made in accounting education, despite the developments in accounting applications. For those who are concerned with accounting, the disconnection between the accounting applications and accounting education is a significant problem to be solved (Boyce, 2004; Parker, 2001). The rapid changes experienced by our world aggrandize the distinction between the application and education (Albrecht, 2002; Mathews, 2001; Mulford and Weirich, 1992). As a solution, the growth of this distinction might be hindered if accounting educators as well as accounting employees keep up with these developments (Pethley and Fremgen, 1999). Many studies have been carried out on meeting the deficit in accounting education by this time (Albrecht, 2002; Bedford and Shankir, 1987;

Mathews, 2001; Mulford and Weirich, 1992; Pincus, 1990; Sundem et al., 1990). Trade bodies in accounting, accounting employees, accounting firms, and universities are stated as the associates who are directly influenced by and work at the disconnection between accounting applications and accounting education. The resistance of these associates to the change and their expectations of the accounting education increase the dimensions and the deadlock of the problem (Beyazitli and Celik, 2004).

Examining the previous studies on accounting education, it can be observed that the developments below are of some importance in the construction of accounting education standards (Beyazitli and Celik, 2004; Burton and Sack, 1991; Chambers, 1999; Nelson, 1995; Oncu and Aktas, 2004; Ozbirecikli and Pastacigil, 2009).

- i) 1986: Bedford Report (Future Accounting Education: Preparing for the Expanding Profession).
- ii) 1989: The White Paper created by the eight major accounting firms in America (Perspectives on Education: Capabilities for Success in the Accounting Profession).
- iii) 1990: The project carried out by AECC (Accounting Education Change Commission) at 13 universities.

- iv) 1994: Assessment for the New Curriculum: A Guide for Professional Accounting Programs.
- v) 1995: The study "What Corporate America Wants in Entry Levels Accountants" carried out by IMA (Institute of Management Accountants) and FEI (Financial Executives Institute) association. The study entitled "Intentional Learning: A Process for Learning to Learn in the Accounting Curriculum".
- vi) 1996: The study entitled "Position and Issues Statements of the Accounting Education Change Commission".
- vii) 1998: The study "CPA (Certified Public Accountant) Vision: Focus on the Horizon" carried out by AICPA (American Institute of Certified Public Accountants).
- viii) 1999: The study entitled "The Accounting Education Change Commission: Its History and Impact". The study entitled "Accounting Education: Charting the Course through a Perilous Future" carried out by Albrecht and Sacks.
- ix) 2000: The Rose Institute Round Table Study at the University of New York.
- x) 2003: The studies that compile and assess the data of the period 2000 – 2002 carried out by Fogarty, Howieson, Beattie, Watson, and others.
- xi) 2005: Accounting Education Standards that should be applied by all the member accounting organizations of IFAC (International Federation of Accountants) were arranged by IFAC.

On the other hand, TURMOB (the Chambers of Certified Public Accountants and Sworn in Certified Public Accountants) performs various studies on accounting education in Turkey. The most important of these studies is the Continuous Vocational Education Directive accepted by TURMOB.

The more accounting education is compatible with contemporary methods and purposes, the more professional and up-to-date with changes the accountant will be. This situation is an outcome of the interplay between accounting applications and accounting education (Melancon, 1998; Sprouse, 1989). In this context, the components of the problem should be described in order to develop a solution to the problems put forward. This way, a more qualified and goal-oriented accounting education can be provided, using the sources appropriately (Beyazitli and Celik, 2004).

The WAT (Word Association Test) is an old and popular method widely used by researchers to designate the conceptual frameworks of students (Bahar et al., 1999; Cardak, 2009; Dikmenli, 2010; Moynihan, 1985; Shavelson, 1974). WAT is a technique used to analyse the cognitive structure of the students and the inter-conceptual connections in this structure, that is, the information network, and to determine whether the interconceptual relations in the long-term memory of the students are sufficient (Bahar and Ozatli, 2003; Shavelson, 1972). The greatest advantage of WAT is

that it can be applied during the education of the students (Bahar et al., 1999; Bahar and Ozatli, 2003).

In this method, the students give as answers the concepts that are recalled by a key concept about any subject during a period of time. It is presumed that, an answer that the students give to any key concept from their long-term memory presents the connections between the concepts in the cognitive structure and demonstrates the semantic proximity. According to the semantic proximity or semantic distance effect, the closer two concepts are to each other in distance in the semantic memory, the closer their relationship, and as the mental research will be faster during the recall process, the answers about these two concepts will come faster.

This research is carried out using the WAT method among students who have studied accounting before in order to explore the students' cognitive structures about the concepts used in accounting and to introduce their misconceptions about accounting.

METHODS

Ten key concepts about accounting are selected in order to construct the WAT. Then, a layout including each concept on a page is prepared (Table 1). Concepts selected for WAT are: accounting, balance sheet, account, cost, inventory, payable, receivable, profit, loss, and finance. These key concepts were determined by interviewing two faculty instructors, who are experts in the field of accounting education. A total of 119 students who had studied accounting at Selçuk University in Turkey voluntarily participated in the research. Participants were selected randomly among university students who has studied accounting before. The test was applied to students in a classroom environment during the spring semester of the academic year 2008/09. During the application of the test, the students were allowed 30 s for each key concept and were required to write down the concepts recalled by each key concept. The 30-s time period has been determined as the most suitable period of time in many academic researches (Bahar et al., 1999; Cachapuz and Maskill, 1987; Kempa and Nicholls, 1983). In this sense, the 30 s period of time was used in this research. The key concepts were written one under the other 10 times in order to prevent the risk of chain answering, because if the students cannot see the key concept again as they write down each concept, they may write down the concepts that are recalled by the concepts written as answers instead of by the key concepts and this may damage the reliability and purpose of the test. The students are allowed to write down as many concepts as they can within the allowed time period. The test was completed, checking the time provided for the students for each concept on each page. An initial declaration about the logic of the test and a couple of exercises were provided in order to make the students feel more comfortable with the technique.

After the WAT was applied, each answer for each concept from each student was determined in turn in order to evaluate the test results. A frequency table was prepared in order to determine how many different answers were given and how many times these answers were used for which key concepts. Concept maps were prepared for the results, making use of the frequency tables. The CP (cut-off point) technique put forward by Bahar et al. (1999) was used to prepare the concept maps. In this technique, in the frequency table, the lower value of the concepts of 3 – 5 mostly given as answers for any key concept in the word association test is used as the cut-off point, and the answers whose frequencies exceed

Table 1. Word association test: Page layout sample.

Accounting
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Accounting
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exceed this level are written in the first part of the map. Thereafter, the cut-off point is reduced by certain intervals and the procedure goes on until all the key concepts appear on the map. The concept maps in Figures 1(a – i) have been prepared by this method. Many studies have shown that this type of data analysis technique provides reliable results (Bahar et al., 1999; Bahar and Özatli, 2003; Cardak, 2009).

RESULTS AND DISCUSSION

The number of concepts given as answers to key concepts is one of the first methods used in this technique in order to analyse the data collected (Shavelson, 1974). The number and the quality of the other concepts that are associated with a concept can be used to determine whether that concept is comprehended, since the comprehension of a concept is related to the other concepts given as answers that are associated with the concept. It can be claimed that a concept associated with no other concepts is not significant and the significance of a concept increases as it is associated more with other concepts (Schaefer, 1979).

In the analysis of the results of WAT, not only is the variety of the concepts given as answers to key concepts used, but also the number and the order of concepts given as answers in common are of importance. This provides us with the opportunity to analyse the semantic proximity between key concepts and construct a map of these. The concept maps in Figures 1 to 9 were prepared using the answers given to key concepts according to the frequency table. The concept map was drawn in order, from the highest to lowest frequency as can be seen.

Figure 1 shows that the highest correlation is between two key concepts, accounting and account, in this research. It can be claimed that it is pretty significant for the accounting students that the name of the course is accounting and the concept of account is very important in accounting (Weygandt et al., 2008; Atabey et al., 2009; Lerner, 2004).

The correlations between 80 and 90 are seen in Figure 2. The concepts receivable and money can be found first in this frequency range. The correlation between these two concepts demonstrates that the students related the money concept with both the account and re-ceivable concepts to a high degree. The fact that there is a high correlation between the key concepts account and receivable shows that the students have misconceptions about these concepts.

Figure 3 indicates that the money concept expands the correlations and forms correlations with all other key concepts besides the profit concept. It is between the money concept and the accounting concept that the students form correlations at secondary level. It was expected that the accounting concept would have more correlations with the key concepts or with various concepts such as profession, transaction, recording, and so on than the money concept. One of the basic accounting principles is monetary unit assumption (Atabey et al., 2009; Brock et al., 2006). A basic accounting principle states that measurements in accounting systems must be done in monetary units (Dobija, 2003). The close correlations formed between the accounting and money concepts show that the students limit the accounting concept with only the money concept and see the accounting concept as just an instrument used to record the operations carried out with the money. This notion is a sign of a misconception.

It is seen in Figure 4 that the number of key concepts reaches five. Receivable and profit are important concepts in accounting education (Coe and Schildhouse, 2007; Weygandt et al., 2008). It is conceived that the correlations between the other concepts other than the money concept are significant for accounting students.

As is obvious in Figure 5, the number of key concepts reaches seven in this frequency range. The correlations between accounting and profession, balance sheet and active-passive, finance and money, and profit and income demonstrate the meaningful knowledge of the students. There are many studies about meaningful learning in the accounting education research literature (Chen and Ching, 2003; Hackner and Tschudi, 1994; Leaby and Brazina, 1998; Maas and Leaby, 2005; Simon, 2007). According to the findings of these studies, concept maps have a significant role in terms of improving students' conceptual learning in accounting education.

It can be observed in Figure 6 that all the key concepts appear in the range of cut-off points between 40 and 50. The correlations between balance sheet-result-table, finance and bank, and accounting and recording are samples of students' meaningful learning.

Many different but closely related concepts besides the key concepts can be observed in Figure 7. In this cut-off point range, there exist correlations between the concepts such as inventory-count-end of period, payable-payment-bad, accounting-ledger-business, and balance sheet-equation, and the correlations among the key

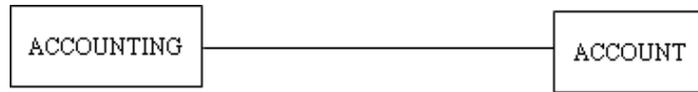


Figure 1. CP 90 and over.

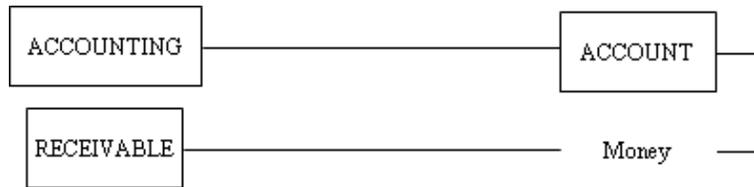


Figure 2. CP 80 – 90.

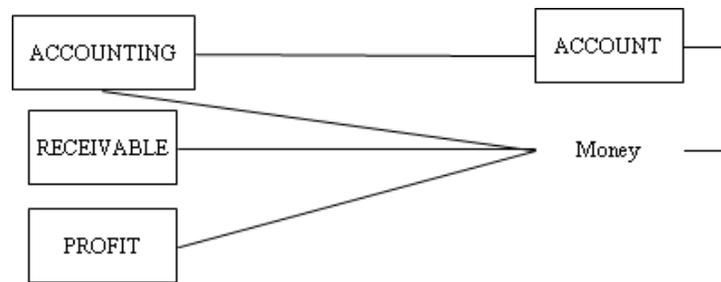


Figure 3. CP 70 – 80.

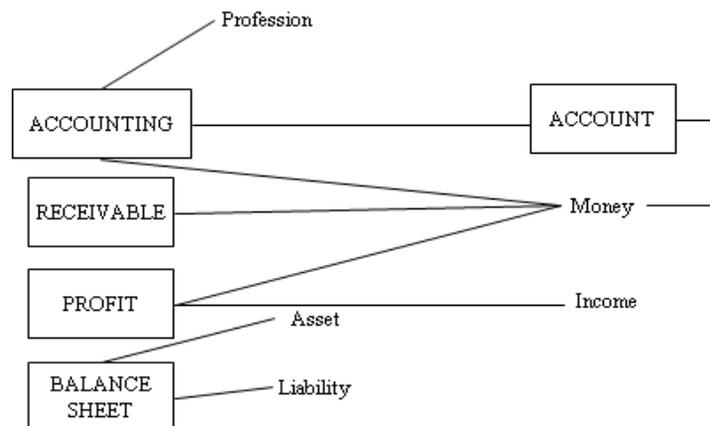


Figure 4. CP 60 – 70.

concepts increase. Lucas and Meyer (2004) investigated how educators might support students in developing a better awareness and understanding of themselves as learners. Bryne and Flood (2004) examined that the conceptions of learning of undergraduate and postgraduate accounting students at an Irish university. Byrne and Willis (2008) gathered that the evidences stem from incoming tertiary accounting students on their prior approaches to learning accounting. These studies are

related to due diligence about accounting education. It can be observed in Figure 8 that the convolute correlations start to appear in the form of a network. Many different concepts have correlations with the key concepts. It can be claimed for the students in this cut-off point range that the level of meaningful learning is high. The correlations between accounting-programmes, balance sheet-assets-resources, inventory-periodic-perpetual, and account-receivable-payable concepts

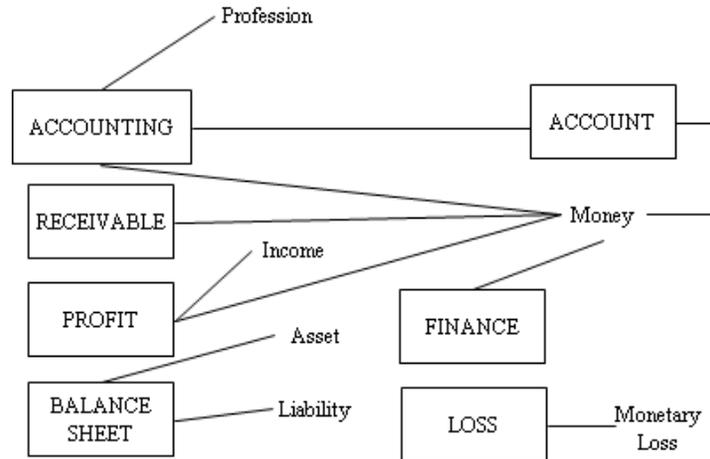


Figure 5. CP 50 – 60.

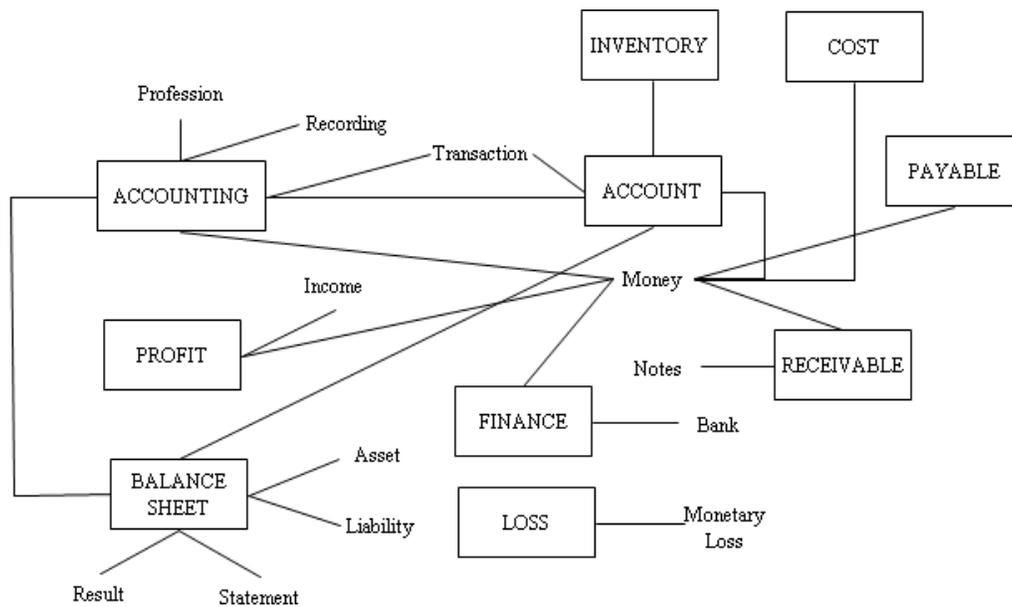


Figure 6. CP 40 – 50.

indicate the meaningful learning of the students.

Figure 9, the last cut-off point, reveals that all the concepts are intertwined and the conceptual correlations form a network. There are some misconceptions such as the machine concept given as an answer to the key concept account; however the correlations in this range are mostly significant.

Conclusions

In this research, accounting students’ cognitive structure and misconceptions about accountancy are studied in various aspects. It is observed that the misconceptions

exist especially between the money and accounting concepts. It is found that the money concept has correlations with almost all of the key concepts to a high level. In this context, the money concept has a greater part in accounting rather than important functions such as recording, classifying, reporting, analysing, and so on. Another misconception is the close correlation found between the account concept and calculating machine.

Samples of meaningful learning can be found in almost all of the concept maps when the cognitive structure of the students is examined. For example, that there is a high level correlation between the accounting and account concepts indicates that conceptual frameworks of the students regarding accounting are ground on a strong

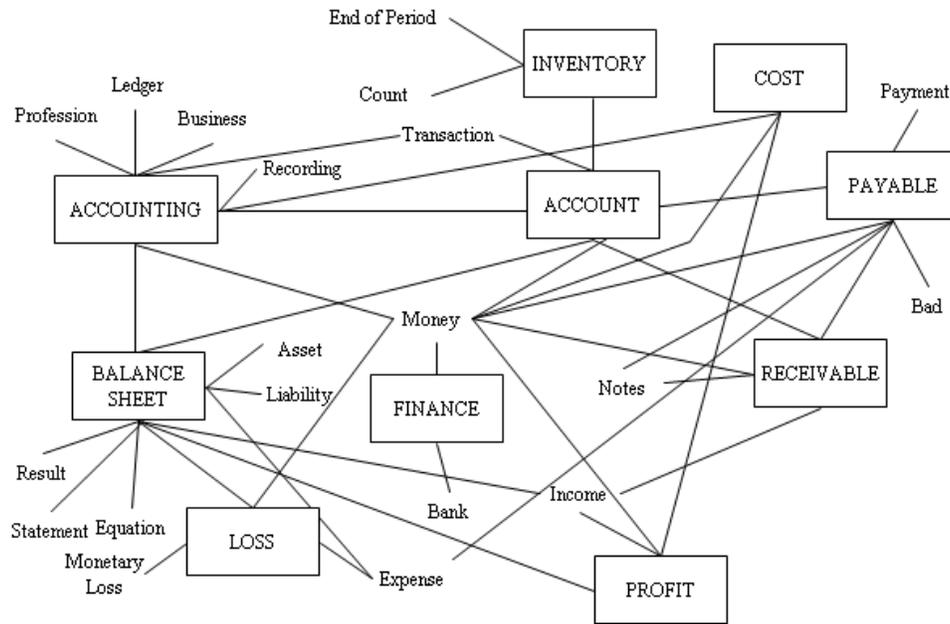


Figure 7. CP 30 – 40.

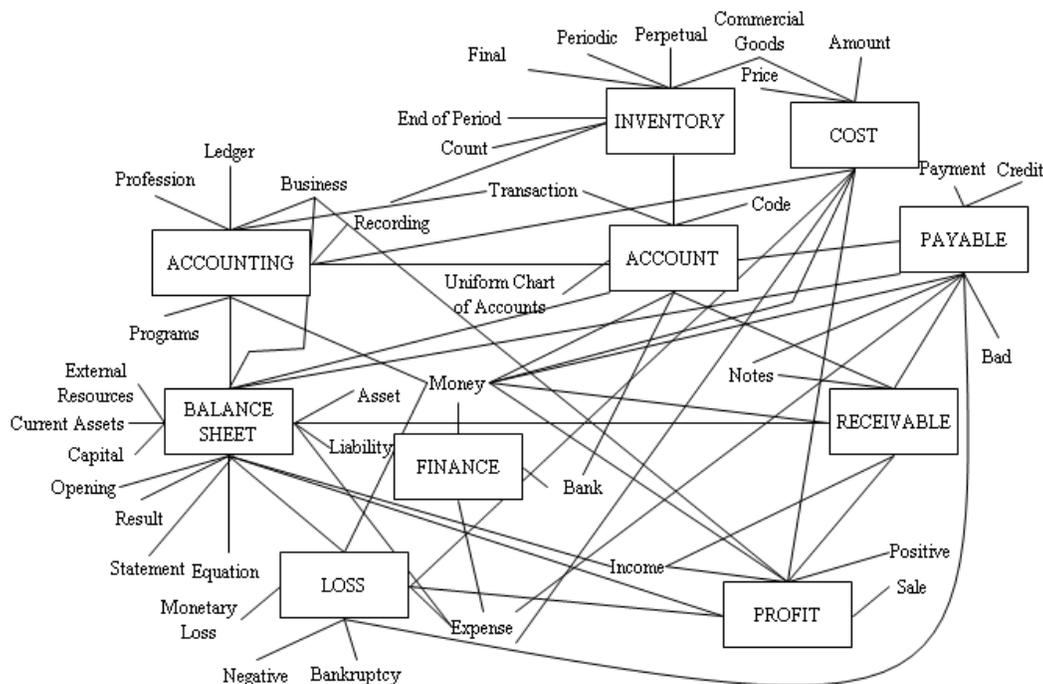


Figure 8. CP 20 – 30.

strong basis. Moreover, the correlations between accounting-profession, balance sheet-active-passive, loss-monetary loss, finance-money, and profit-income found in the high level frequency range indicate the meaningful learning of the students. The concept maps formed with the last two cut-off points show that the

students mostly structured a meaningful conceptual framework about accounting and formed correlations between the key concepts in the form of a network.

In contrast with the previous studies in science education and other fields (Bahar and Ozatli, 2003; Çardak, 2009), in this study about accounting, the

- 36(3): 241–251.
- Chen M, Ching S (2003). Using concept mapping in accounting learning. *Delta Pi Epsilon J.*, 45(2): 133 – 145.
- Coe M, Schildhouse RA (2006). *Accounting principles* (8th Edition). USA: John Wiley and Sons.
- Dikmenli M (2010). Biology students' conceptual structures regarding global warming. *Energy Educ, Sci, Technol.*, 2(1): 21 – 38.
- Dobija M (2003). Wage, money and accounting: theoretical relationships. *Argument Oeconomica Cracoviensia.* (2): 27 – 49.
- Hackner E, Tschudi F (1994). Note on cognitive mapping in the teaching of management. *Scandinavian J. Manage.*, 10(3): 281 – 289.
- Johnstone AH, Moynihan TF (1985). The relationship between performance in word association tests and achievement in chemistry. *Eur. J. Sci. Educ.*, (7): 57 – 66.
- Kempa RF, Nicholls CE (1983). Problem solving ability and cognitive structure – an explanatory investigation. *Eur. J. Sci. Educ.*, (5): 171 – 184.
- Leauby BA, Brazina P (1998). Concept mapping: potential uses in accounting education. *J. Account. Educ.*, 16(1): 123 – 138.
- Lerner JJ (2004). *Bookkeeping and accounting* (3th Edition). USA: McGraw – Hill.
- Lucas U, Meyer HF (2004). Supporting student awareness: understanding student preconceptions of their subject matter within introductory courses. *Innov. Educ. Teach. Int.*, 41(4): 459 – 471.
- Maas JD, Leauby BA (2005). Concept mapping — exploring its value as a meaningful learning tool in accounting education. *Global Perspect. Account. Educ.*, (2): 75 – 98.
- Mathews MR (2001). The way forward for accounting education? a comment on albrecht and sack 'a perilous future'. *Accounting Education.* 10(1): 117 – 122.
- Melancon BC (1998). Commentary: the changing strategy for the profession the cpa and the aicpa: what this means for the education community. *Account. Horiz.*, 12(4): 397 – 426.
- Mulford CW, Werich TR (1992). Bridging the gap between accounting education and practice: the sec academic fellow program. *Account. Horiz.*, 6(4): 86 – 93.
- Nelson I. T (1995). What's new accounting education change? an historical perspective on the change movement. *Account. Horiz.*, 9(4): 62 – 76.
- Öncü S, Aktaş H (2004). Uluslararası muhasebe eğitimi standartları. XXIII. Türkiye Muhasebe Eğitimi Sempozyumu. Antalya. 19 – 23 May.
- Özbirecikli M. and Pastacıgil A (2009). The development process of accounting education in Turkey: a comparative study with the standards ias. Faculty of Science and Research Association. January. *J. Account. Finance*, (41): 82 – 97.
- Parker LD (2001). Back to the future: the broadening accounting trajectory. *Br. Account. Rev.*, 33(4): 421 – 453.
- Pethley LS, Fremgen RI (1999). What's a name?. *J. Account.*, 188(2): 71 – 75.
- Pincus K. V (1990). Education accountants for the twenty first century: force for change in accounting education. *Govern.Account.J. Sum.*, 59 – 61.
- Schaefer G (1979). Concept formation in biology: the concept growth. *Eur. J. Sci. Educ.*, (1): 87 – 101.
- Shavelson R. J (1972). Some aspects of the relationship between content structure and cognitive structure. *J. Educ. Psychol.*, 63 (3): 225 – 234.
- Shavelson RJ (1974). Methods for examining representations of a subject-matter structure in a student's memory. *J. Res. Sci. Teach.*, (11): 231 – 249.
- Simon J (2007). Concept mapping in a financial accounting theory course. *Account. Educ.*, 16(3): 273 – 308.
- Sprouse R. T (1989). Commentary: The synergism of accountancy and accounting education. *Account. Horiz.*, 3(1): 102 – 110.
- Steadman M. E. and Gren R. F (1995). Implementing accounting education change. *Manage. Audit. J.*, 10(3): 3 – 7.
- Sundem GL, Williams DZ, Chironna JF (1990). The revolution in accounting education. *Manage. Account.*, 1(1): 49 – 53.
- Weygandt JJ, Kieso DE, Kimmel PD (2008). *Accounting principles* (8th Edition). USA: John Wiley and Sons.