OBSTACLES TO THE PERCEPTION OF THE TRADITIONAL ACCOUNTING CYCLE IN THE LEARNING PROCESS

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Abstract

Purpose – The aim of this study is to investigate how students of entrepreneurship perceive the *traditional accounting cycle* in the learning process. While the evidence of the benefits of using spreadsheet models in accounting education has been studied, the use of the *traditional accounting cycle* from the process perspective is under-researched.

Design/methodology/approach – Action research is a quest for knowledge about how to improve. This study consists of two parts: theoretical underpinnings and systematic observations (2002-2012) with a special focus on the use of the *traditional accounting cycle* in a local setting. I teach entrepreneurship students to use two technologies (manual and computerized) and two models (*traditional accounting cycle* and spreadsheet model) and then ask them to reflect on how they perceive the different accounting processes. Observing students and their computerized home assignments, and gathering feedback serve as the sources of data that provide insight into my entrepreneurship students' thinking.

Findings – Research evidence identifies obstacles and adjustments to procedural knowledge of the *traditional accounting cycle* that will be needed to successfully integrate spreadsheet models. The conceptual accounting information system (AIS) develops the understanding of the effect of data (business activities) on knowledge (financial statements) so the accounting activities inside the conceptual AIS are visible to entrepreneurship students.

Research limitations/implications – This study is limited to procedural knowledge and skills of the *traditional accounting cycle* in a local setting.

Practical implications – The results indicate that abandoning outdated and irrelevant procedural knowledge of the *traditional accounting cycle* may foster the perception of interaction between entrepreneurial and accounting processes. Teachers become more effective when encouraged to assess both entrepreneurship students' needs and their own work and make evidence-based decisions for working differently.

Originality/value – The conceptual AIS enables to store data, process data into information and convert information into knowledge. Once the students understand the accounting process behind the financial statements, using different accounting software to facilitate their completion makes sense. Technology skills for data mining are important because it is physically impossible to observe business activities in their entirety.

Keywords: accounting process, conceptual model, procedural knowledge.

1. INTRODUCTION

This study is motivated by the fact that the previous entrepreneurship education studies have not investigated how entrepreneurship students perceive the accounting process in the learning process. In 1991, Robert K. Elliott and Peter D. Jacobson (1991, p. 54) drew attention to the fact that accounting must move into the information technology (IT) era. Today most accountants use computerized AIS. Accounting software is similar to a black box because entrepreneurship students do not see how it works. The present problem is that efficient accounting software is not an alternative to the *traditional accounting cycle* for students of entrepreneurship to acquire the accounting knowledge and skills that entrepreneurs need to understand financial statements and make knowledge-based decisions. For example, Mairura (2011) suggested that there is a need for further research to come up with simple and straightforward accounting systems, which any common person can understand. There is objective evidence that accounting training replicates the *traditional accounting cycle*. For example, Boulianne (2012) investigated the impact that accounting software utilization may have on students' knowledge acquisition of the *traditional accounting cycle*[20], a fundamental concept in business and accounting. The results indicate that the students who first

[20] According to Boulianne (2012), the accounting cycle is a series of steps in recording business events from the time a transaction occurs to its reflection in the financial statements. The steps are 1) collect and analyze data from

completed the case manually and then completed the same case using accounting software may have perceived learning more due to the amount of time and effort spent in the learning process. Boulianne (2012, p. 28) suggested that future research could examine, through interviews and surveys, the extent to which prior exposure to IT is relevant to students.

In short, although accounting software assists knowledge acquisition, computerization makes it more important to understand the accounting process. The *traditional accounting cycle* constructed over 500 years ago (in 1494) by Pasioli and taught to students for the development of accounting knowledge and skills can be an obstacle in entrepreneurship education that has received little attention. Sarasvathy (2004, p. 709) proposes that scientists should focus on the barriers that prevent some persons from becoming entrepreneurs. This study casts doubt on the benefits of the *traditional accounting cycle* in the learning process. The research question is "What are the perceived obstacles of the *traditional accounting cycle* in the learning process?" Experience from perceived obstacles can be used to make generalizations on how to improve the accounting process in the learning process by creating value for students of entrepreneurship. Eskola (2011, p. 12) argued that the need to direct research to examine what is experienced to be relevant knowledge in accounting has become urgent. Research can play an important role in creating discussion and understanding between different interest groups living in different accounting realms.

2. THEORETICAL UNDERPINNINGS

Theoretical underpinnings address accounting knowledge management by conceptual models.

Knowledge management

According to Petrides & Nodine (2003) knowledge management (KM) brings together three organizational resources – people, processes and technologies – to use and share information more effectively. Providing knowledge and skills, sharing information is one of the most important roles of educational organizations. IT can help to generate data and information. Knowledge has become the most valuable resource. For example, accounting process transforms inputs (business activities) into outputs (financial statements) and shows the relationship between data (low accounting value in making the decision) and knowledge (high accounting value in making the decision) (see Figure 1).

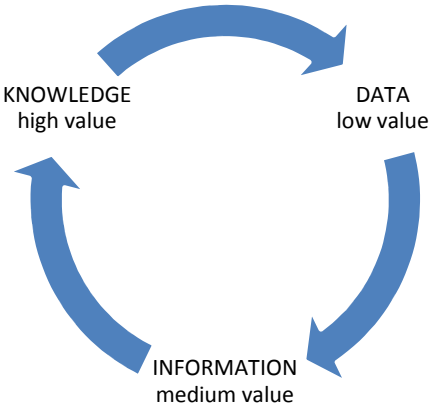

Figure 1. Data, information and knowledge

The goal of KM in education is improved decision-making throughout the educational organization to improve students' learning. Constructivist learning can be defined by four characteristics: knowledge construction, cooperative learning through interaction of the learner with others students and teachers; metacognition through the learning environment that allows them to exercise control over their learning

transactions and events, 2) prepare documentation, 3) record transactions in journals, 4) post to ledgers, 5) prepare the unadjusted general ledger trial balance, 6) prepare and post adjusting entries, 7) prepare the adjusted trial balance, 8) prepare financial statements, and 9) prepare closing entries.

experiences, meaningful learning through authentic learning tasks (Loyens, Rikers, & Schmidt, 2009). Eskola (2011, p. 89) reported that in constructivist learning environments assessment is not a separate examination at the end of the course, but assessment methods are integrated into the learning process (see Figure 2).

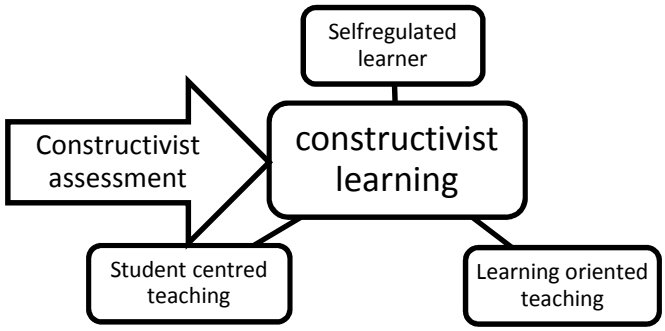

Figure 2 Assessment in line with learning and teaching conceptions
Source: (Eskola, 2011, p. 89 Figure 14)

Assessment in the constructivist approach is considered for learning while in the positivist approach it is relevant for accountability. The following

Table 2 summarizes the differences between constructivist and positivist educational approaches.

Table 2

Assessment for learning versus assessment of learning

Key differences	**Assessment for learning (Constructivist approach)**	**Assessment of learning (Positivist approach)**
Primary users	Learners	Teacher
Motivation	Intrinsic	Extrinsic
Purpose of information	Learners control learning	Teacher control learning
Verification	Authentic learning tasks	Examination
Purpose of feedback	How learners know what they know	How a teacher know what learners know
Focus	Relevance	Reliability, objectivity
Type of report	Detailed reports are not restricted	Summary report is restricted
Behavioral implications	Learners are more concerned with how feedback will affect their behavior	Learners are interested in adequacy of disclosure, behavioral implications are secondary
Time dimension	Focus on the future	Focus on the past

Conceptual models - shifting from memorization to understanding

Mepham (1988, p. 377) referred to the fact that models are fundamental to accounting: “A database information system is a physical model of reality but database theory emphasises the importance of a parallel conceptual model, the data model. In the past, accountants have not separated the conceptual accounting data

model from the techniques and tools that they use (the physical model)." According to Eskola (2011, p. 68) conceptual models are learning aids to help students develop their mental models. To be an effective learning tool a conceptual model must fulfil three criteria: learnability, functionality and usability. A conceptual model is not effective if it is too difficult to learn, does not explain the important aspects of the target system or cannot be easily used.

Hunton and Raja (1995) and Alexander (2006) emphasised that accountants and small business owners are familiar with Excel spreadsheet. Albrecht and Sack (2000, p. 57) results indicate that spreadsheet software is the most important technological skill. The responses showed a high degree of consensus between educators and practitioners. Albrecht and Sack (2000, p. 61) recommended assessing the environment and resources they have available. Albrecht (2002, p. 42) suggested abandoning outdated and irrelevant knowledge and adopting methods that reflect the new world order and creativity: "Accounting is no longer seen as a profession that is difficult to practice and understand. Today, almost anyone, armed with the right software, can be an 'accountant' and produce reliable financial information". Greenberg's (1997) results support the emphasis on information systems in accounting education. The systems framework involves the identification of objectives, users, inputs, and outputs, in addition to the calculation process.

Tynjälä (1999) points out that teaching is helping students to actively construct knowledge by assigning tasks that enhance this process. Eskola (2011, p. 114) has some evidence: "The need of higher order thinking skills was described in terms of different kinds of techniques or tools the students had used in order to learn well and to be able to control the learning process in a way that it became more efficient." Marriott (2004, p. 60) implied that the integrative use of spreadsheets as a computational tool serves to focus on higher level learning skills if used in a modelling environment. Helmi (1986, p. 106) described the modelling approach to spreadsheet integration advantages: "Besides the knowledge gained from using the spreadsheet, students have to acquire an understanding of the relationships existing in a problem, in order to build the model. This, in turn, helps them in the comprehension of the analytical method used."

There is little evidence how *to design* a conceptual accounting data model for possible effects either in the learning process or in the actual accounting by small enterprises. According to Akker et al (2006, p. 5) design researchers do focus on specific objects and processes in specific contexts, they try to study those as integral and meaningful phenomena. According to Sarasvathy (2010, p. 178) "design includes the creation of new alternatives, and the latter is particularly important not only for scholarship, but for the practice, pedagogy and policy of entrepreneurship. Scholars in entrepreneurship have begun to take notice of this importance. … in new methods and tools that we can bring to bear these, the key unit of analysis is interaction – interaction between entrepreneurs and their stakeholders, entrepreneurs and their external environment, and between entrepreneurs' own preferences, tastes and values". According to Albrecht and Sack (2000, p. 36) "Robert K. Elliott identifies five stages of the 'value chain' of information to illustrate the value that accounting should provide. The 1st stage is recording business events. The 2nd stage is summarizing recorded events into usable data. The 3rd stage is manipulating the data to provide useful information. The 4th stage is converting the information to knowledge that is helpful to decision makers. The 5th stage is using the knowledge to make value-added decisions. Mr. Elliott urges educators to prepare our students toward upper-end service. Because of the impact of technology, he believes that:

- Stage 1 activity is now worth no more than $10 per hour
- Stage 2 activity is now worth no more than $30 per hour
- Stage 3 activity is now worth $100 per hour
- Stage 4 activity is now worth $300 per hour
- Stage 5 activity is now worth $1,000 per hour"

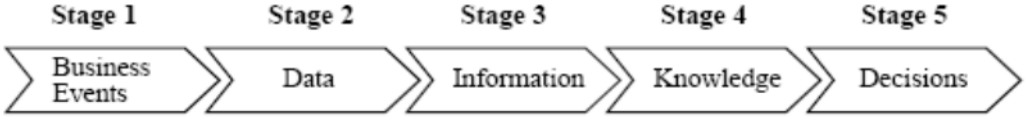

Figure 3 Value chain of information
Source: (Albrecht, 2002, p. 44)

In short, to align a financial accounting course with workplace realities spreadsheet software is a tool that matches the entrepreneurship students' resources and expertise in terms of modelling environment.

Spreadsheet software is great to track and manipulate small data sets and accounting software programs usually have the ability to import and export data to and from spreadsheet software.

3. ACTION RESEARCH

Action research is a process in which teachers do not separate the investigation from their own work. A teacher can remove barriers only if she/he tries something new and that is the idea of action research. I teach entrepreneurship students to use two technologies (manual and computerized) and two models (the traditional accounting cycle and the conceptual model) and then ask them to reflect on how they perceive the different accounting processes. The study looks at the amount of time and effort spent during the learning process, whether IT is absent or present, to improve the quality of learning. The results of action research help to develop the conceptual AIS. According to Tynjälä (1999) higher level instruction can be researched from the aspect of learning perspectives. Figure 4 emphasizes the direction in the action research process.

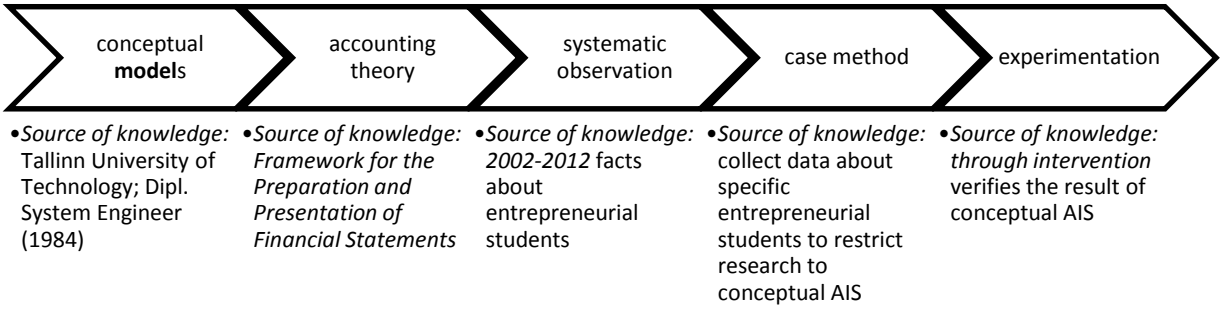

Figure 4. Direction in the action research process

Effectual logic

Solving the problem of the design of the conceptual AIS and providing students of entrepreneurship with an alternative learning tool is based on an *effectual logic*. Effectual and causal logic have been discussed in detail in Sarasvathy's (2001) article. Dew, et al. (2009, p. 293) explained how an *effectual logic* prescribes the beginning with a given set of means and focuses on generating new ends. This may be contrasted with the *causal logic* of selecting a goal first and then choosing between the given means or seeking to acquire the means necessary to achieve the selected end. A simple example of this is the chef who cooks from a recipe (causal) versus one who imagines possible meals from ingredients available at hand (effectual). The study by Eskola (2011, p. 68) reports that since logic is an important part of critical thinking, training in logic has been suggested as one remedy to improve learning outcomes in accounting.

Data collection

Observing students of entrepreneurship and their computerized home assignments, and gathering feedback serve as the sources of data that provide insight into my students' thinking and problem solving.

Daily observations (2002-2012) are conducted among undergraduate students who have passed the financial accounting course FIN104. The purpose of observing students is to get information about obstacles to the perception of the *traditional accounting cycle* and to discover which aspects of the alternative accounting process students find helpful. Observational data were collected through note taking and design ideas were integrated into the alternative accounting process and shared with students to support learning more effectively.

Computer-mediated home assignments for small groups throughout the financial accounting course facilitate group-level cooperative learning. Self-assessment leads students to reflect on their preferences and study habits for different accounting processes, the skills they have learned, and to rate the amount of time and effort they have spent on learning and interaction with each other. This kind of investigation provides insights into students' thoughts on their progress and gives the researcher feedback about the course content, computer-mediated interaction and the application of the alternative accounting process. The analysis of students' interim tests, class attendance and computer-mediated home assignments with their subjective feedback provide objective evidence of students' learning.

Results and discussions

The research findings show the following obstacles to the use of the *traditional accounting cycle* in the learning process by entrepreneurship students.

Firstly, there is an obstacle to adapting to the changes in the IT era in which entrepreneurship students operate. The research results highlight that the terms *data* and *information* are used interchangeably. For example, according to Horngren et al. textbooks:

- Accounting is the information system that measures business activity, processes the *information* into reports, and communicates the results to decision makers (2005, p. 4).
- Accounting is the information system that measures business activity, processes the *data* into reports, and communicates the results to decision makers (2007, p. 4).

In accounting *data* comprise facts about business activities that can be easily stored and communicated using IT. *Information* involves the manipulation of data and represents analysed data. *Knowledge* is information that facilitates knowledge-based decisions and activities. The lack of IT knowledge is an obstacle to understanding the stages of transformations: recording the data, summarizing the data into information and converting the information into knowledge. In Table 3 time efficiency is illustrated with accounting work stages.

Table 3

The accounting process in the industrial era versus in the IT era

accounting activities	in the industrial era	in the IT era
Preparation	1) Collecting documentation 2) Analyzing data from business activities	Filing of documentation to an electronic archive. Spending time on creating a database.
Recording of data	3) Recording business activities in journals 4) Posting to ledgers Data recording 2 times	1) Recording of data into the database to use the data set for data mining.
Summarizing data into information	5) Preparing the unadjusted general ledger trial balance 6) Preparing and posting adjusting entries 7) Preparing the adjusted trial balance Spending significant amounts of time on summarizing.	2) Retrieving data from the database to present relevant information.
Converting information into knowledge	8) Presenting information in annual financial statements.	3) Linking information with financial statements in real time.
	9) Preparing closing entries	No need to prepare closing entries

Secondly, according to the rule of debit and credit (that data of business activities give rise to debit and credit balances: debit=credit) the traditional analysis of data and interpretation is an obstacle to the perception of changes in the AIS. The problem is that students memorize the rule of debit and credit without understanding the changes in the AIS. The focus should be shifted away from memorization debit (Dr) =credit (Cr) to understanding the conceptual AIS that is composed of an interrelated set of elements: assets (A), liabilities (L) and equity (E) and abstract ideas (A=L+O). Systems analysis of data is illustrated in Table 4 with an example of owner withdrawals.

Table 4

A comparison of different approaches to data analysis

traditional analysis of data (Dr=Cr)	systems analysis of data (A=L+O)
Dr E 100€	(A-100€) = L+ (O-100€)
Cr A 100€	Changing one element in the system produces a change in another element. A negative change indicates decrease in the A and E elements.
Owner withdrawals of 100 € give rise to debit and credit balances in the A and E elements.	

Thirdly, the results support the emphasis on information systems (see Figure 5). The lack of understanding how accounting knowledge, data and information relate to information systems, decisions and business activities is an obstacle to build up a simple conceptual accounting data model (flat file database model) to store and process data into information and knowledge. *Declarative knowledge* is relevant at the first stage of accounting knowledge acquisition involving facts such as the classification and relationships between the AIS elements[21] (assets, liabilities, equity) and the sub-classifications of the AIS elements (inflow, outflow, income, expense) to understand the big picture between *declarative knowledge* (AIS elements) and *procedural knowledge* (data -> information-> knowledge).

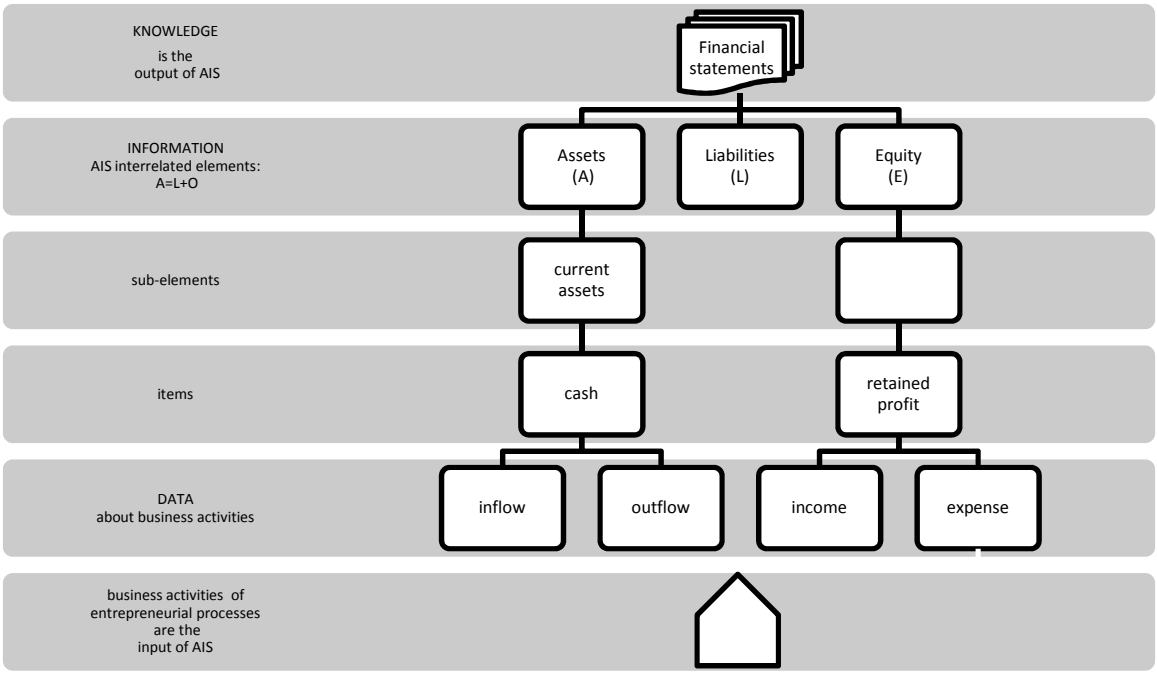

Figure 5 Declarative knowledge of conceptual AIS

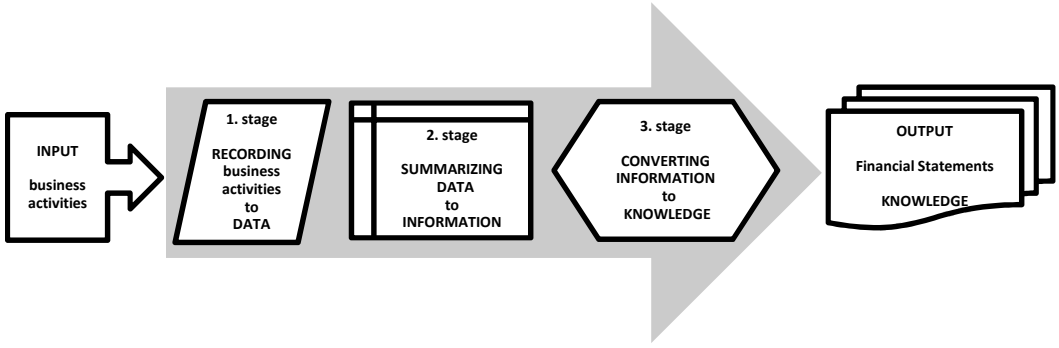

Figure 6 Procedural knowledge of conceptual AIS

Finally, the results support the emphasis on processes (see Figure 6). *Procedural knowledge* is relevant at the second stage of accounting knowledge acquisition that is a sequence of accounting activities resulting in financial statements. According to Deming (1994), quality is improved through the improvement of existing processes. *Procedural knowledge* (data -> information-> knowledge) is not regulated by the

[21] Framework for the Preparation and Presentation of Financial Statements paragraph 47 (F 47)

"*Framework for the Preparation and Presentation of Financial Statements"* and should conform to the changing environment and resources learners have available. A change in the accounting process should enhance the *procedural knowledge* and should have no impact on learners' ethical behaviour. Entrepreneurship students need to distinguish *procedural knowledge* from the technology in which the accounting process is constructed. By whatever means an entrepreneurship student carries out accounting activities, *procedural knowledge* is needed to understand the input, process and output of conceptual AIS so that knowledge-based economic decisions could be made. The conceptual AIS may foster the abstract high level thinking skill of understanding how *accounting activities* transform *data* into *information* and *knowledge.*

4. CONCLUSION

To conclude, it seems that acquiring outdated declarative accounting knowledge (two-column account, the rule of debit and credit) and procedural accounting knowledge (the traditional accounting cycle) to such an extent that students of entrepreneurship waste time on irrelevant accounting steps the gap between accounting practice and good learning has widened. Entrepreneurship students armed with the spreadsheet software can make the data easily collectible, understandable and analysable. To improve understandability[22] between entrepreneurial and accounting processes data of *business activities*[23] have to be classified to operating, investing and financing activities and recorded to multiple-column account to produce high value accounting information and make value-added decisions.

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[22] According to the *Framework for the Preparation and Presentation of Financial Statements* paragraph 24 "An essential quality of the information provided in financial statements is that it is readily understandable by users" (F 24).

[23] **Operating activities** are the principal revenue-producing activities of the entity and other activities that are not investing or financing activities. **Investing activities** are the acquisition and disposal of long-term assets and other investments not included in cash equivalents. **Financing activities** are activities that result in changes in the size and composition of the contributed equity and borrowings of the entity. (IAS 7.6)

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