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DEVELOPMENT AND EFFECT ANALYSIS OF THE ASTERI CONSULTATIVE AUDITING PROCESS - SAFETY AND SECURITY MANAGEMENT IN EDUCATIONAL INSTITUTIONS

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Abstract

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The Finnish legislation requires for a safe and secure learning environment. However, the comprehensive, risk based safety and security management (SSM) and the management commitment in the implementation and development of the SSM are not mentioned in the legislation. Multiple institutions, operators and researchers have studied and developed safety and security in educational institutions over the past decade. Typically the approach has been fragmented and without bringing up the importance of the comprehensive SSM. The development needs of the safety and security operations in universities have been studied. However, in universities of applied sciences (UASs) and in elementary schools (ESs), the performance level, strengths and weaknesses of the comprehensive SSM have not been studied.

The objective of this study was to develop the comprehensive, risk based SSM of educational institutions by developing the new Asteri consultative auditing process and study its effects on auditees. Furthermore, the performance level in the comprehensive SSM in UASs and ESs were studied using Asteri and the TUTOR model developed by the Keski-Uusimaa Department for Rescue Services. In addition, strengths, development needs and differences were identified. In total, 76 educational institutions were audited between the years 2011 and 2014.

The study is based on logical empiricism, and an observational applied research design was used. Auditing, observation and an electronic survey were used for data collection. Statistical analysis was used to analyze the collected information. In addition, thematic analysis was used to analyze the development areas of the organizations mentioned by the respondents in the survey.

As one of the main contributions, this research presents the new Asteri consultative auditing process. Organizations with low performance levels on the audited subject benefit the most from the Asteri consultative auditing process. Asteri may be usable in many different types of audits, not only in SSM audits.

As a new result, this study provides new knowledge on attitudes related to auditing. According to the research findings, auditing may generate negative attitudes and the auditor should take them into account when planning and preparing for audits. Negative attitudes can be compensated by producing added value, objectivity and positivity for the audit and, thus, improve the positive effects of auditing on knowledge and skills. Moreover, as the results of this study shows, auditing safety and security issues do not increase feelings of insecurity, but rather increase feelings of safety and security when using the new Asteri consultative auditing process with the TUTOR model.

The results showed that the SSM in the audited UASs was statistically significantly more advanced than that in the audited ESs. However, there is still room for improvement in the ESs and the UASs as the approach to the SSM was fragmented. It can be assumed that the majority of Finnish UASs and ESs do not likely meet the basic level of the comprehensive, risk based the SSM.

Keywords: Asteri, audit, comprehensive safety and security management, consultation, consultative auditing process, educational institution, risk management, safety, security

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Tiivistelmä

Soili Martikainen
Asterin, konsultoivan auditointiprosessin, kehittäminen ja vaikutuksen arviointi - Turvallisuusjohtaminen koulutusorganisaatioissa
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Suomalainen lainsäädäntö edellyttää turvallista oppimisympäristöä. Kokonaisvaltaista, riskiperusteista turvallisuusjohtamista sekä johdon sitoutumista turvallisuusjohtamisen toteuttamiseen ja kehittämiseen ei ole kuitenkaan mainittu lainsäädännössä. Monet laitokset, toimijat ja tutkijat ovat sekä tutkineet että kehittäneet koulutusorganisaatioiden turvallisuutta viimeisen vuosikymmenen aikana. Lähestymistapa on tyypillisesti ollut sirpaleinen, eikä kokonaisvaltaisen turvallisuusjohtamisen merkitystä ole tuotu esiin. Yliopistojen turvallisuustoiminnan kehitystarpeita on tutkittu, muttei ammattikorkeakoulujen ja peruskoulujen kokonaisvaltaisen turvallisuusjohtamisen suorituskykyä, vahvuuksia eikä kehittämiskohteita.

Tämän tutkimuksen tavoitteena oli kehittää koulutusorganisaatioiden kokonaisvaltaista, riskiperusteista turvallisuusjohtamista kehittämällä uusi konsultoiva auditointiprosessi, Asteri, sekä tutkia sen vaikutuksia auditoitaviin. Tutkimuksessa selvitettiin myös ammattikorkeakoulujen ja peruskoulujen turvallisuusjohtamisen suorituskykyä Asterin ja Keski-Uudenmaan pelastuslaitoksen kehittämän TUTOR-mallin avulla. Lisäksi tunnistettiin vahvuuksia ja kehityskohteita. Tutkimuksessa auditoitiin yhteensä 76 koulutusorganisaatiota vuosien 2011–2014 aikana.

Tutkimus pohjautuu loogiseen empirismiin ja havainnoivaan, soveltavaan tutkimukseen. Tiedonkeruumenetelminä käytettiin auditointia, havainnointia sekä sähköistä kyselyä. Tilastollista analyysiä käytettiin kerätyn tiedon analysoinnissa. Lisäksi käytettiin teemoittelua analysoitaessa vastaajien kyselyssä mainitsemia kehityskohteita organisaatioissa.

Yksi tutkimuksen tärkeimmistä tuloksista on Asterin, uuden konsultoivan auditointiprosessin luominen. Asterista hyötyvät eniten suorituskyvyltään heikoimmat organisaatiot. Asteri voi olla käyttökelpoinen monien eri auditointityyppien kanssa, ei pelkästään turvallisuusjohtamisen auditoinnin kanssa käytettynä.

Tutkimus tuo uutta tietoa auditointiin liittyvistä asenteista. Tutkimustulosten mukaan auditointi voi nostaa esiin negatiivisia asenteita ja auditoijan tulisi ottaa ne huomioon suunnitellessa auditointeja sekä valmistautuessa niihin. Negatiiviset asenteet voidaan kompensoida tuomalla lisäarvoa, objektiivisuutta ja positiivisuutta auditointiin sekä

siten parantaa auditoinnin myönteisiä vaikutuksia tietoihin ja taitoihin. Lisäksi tutkimustulokset osoittavat, että turvallisuuteen liittyvien asioiden auditointi ei lisää turvattomuuden tunnetta, vaan sen sijaan se lisää turvallisuuden tunnetta käytettäessä Asteria, konsultoivan auditoinnin prosessia yhdessä TUTOR-mallin kanssa.

Tutkimustulosten mukaan turvallisuusjohtaminen auditoiduissa ammattikorkeakouluissa oli tilastollisesti merkittävästi kehittyneempää kuin auditoiduissa peruskouluissa. Sekä perus- että ammattikorkeakouluilla on kuitenkin vielä parannettavaa, sillä turvallisuusjohtaminen oli sirpaleista. Voidaan olettaa, että enemmistö suomalaisista ammattikorkeakouluista ja peruskouluista ei todennäköisesti täytä kokonaisvaltaisen, riskiperusteisen turvallisuusjohtamisen perustasoa.

Asiasanat: Asteri, auditointi, kokonaisvaltainen turvallisuusjohtaminen, konsultointi, konsultoiva auditointiprosessin, koulutusorganisaatio, riskienhallinta, turvallisuus.

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This thesis has been carried out between the years 2011 and 2015 as a private academic research on own time, besides teaching the SSM and risk management. My inspiration in studying has been C.S. Lewis by saying: “You are never too old to set another goal or to dream a new dream.” One goal is about to end and I would like to use this opportunity to thank for persons who have helped me achieving this goal.

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Soili Martikainen
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Abbreviations

Arene	Rectors' Conference of Finnish Universities of Applied Sciences
CAF	Common Assessment Framework
COSO	Committee of Sponsoring Organizations of the Treadway Commission
COSO ERM	COSO Enterprise Risk Management
EFQM	Excellence Model of the European Foundation for Quality Management
EN	European Standards (European Norm)
ENETOSH	European Network Education and Training in Occupational Safety and Health
ERM	Enterprise Risk Management
ES	Elementary school
EU-OSHA	European Agency for Safety and Health at Work
FDA	U.S. Food and Drug Administration
IEC	International Electrotechnical Commission
INSAG	International Nuclear Safety Advisory Group
ISO	International Organization for Standardization
OH&S	Occupational Health and Safety
OHSAS	Occupational Health and Safety Assessment Specification
PDCA	Plan-Do-Check-Act model
PESTLE	Political, Economic, Socio cultural, Technological, Legal /Regulatory and Environmental risks
RD&I	Research, Development and Innovation
SECI	Socialization, Externalization, Combination, Internalization model dealing with knowledge creation
SFS	Finnish Standards Association
SPEK	Finnish National Rescue Cooperation

SSM	Safety and security management
TUTOR	Model for inspection or auditing of SSM developed by the Finnish rescue authority, Keski-Uusimaa Department for Rescue Services
TQM	Total Quality Management
UAS	University of Applied Sciences

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Terms and definitions

Attitude is a way of thinking about something/somebody or behaving towards something/somebody. It expresses a feeling or opinion. (Oxford Advanced Learner's Dictionary of Current English 1995, 66.)

An audit is a process created in a planned, systematic, objective, independent and documented way with the intention to find audit evidence. The aim of an audit is to evaluate objectively and to determine whether or not the audit criteria are fulfilled. An audit can be an internal, first-party audit or an external, second- or third-party audit. It can also be a combined audit in which several management systems are audited together. In a joint audit, several auditing organizations cooperate when auditing an auditee. (SFS-EN ISO 9000: 2015, 34; SFS-EN ISO 19011:2011, 13; ISO 22301:2012, 2; Russell 2005, 4, 19–20.) In this study, audit does not refer to an inspection made by an authority.

Audit criteria are a set of policies, procedures or requirements serving as a reference to which the audit evidence is compared (SFS-EN ISO 19011:2011, 13; SFS-EN ISO 9000:2015, 35).

An **Auditee** is an organization that is audited (SFS-EN ISO 9000:2015, 36).

Audit evidence consists of records, statements of fact or other verifiable information relevant to the auditing criteria. It is obtained, for example, by observation and measurement. Auditors are to make sure that the audit evidence is objective and that it supports the verification needs (SFS-EN ISO 19011:2011, 13, 15; Russell, 2005, 6–7).

An **Auditor** is a person who has the competence to carry out an audit (SFS-EN ISO 9000:2015, 45; SFS-EN ISO/IEC 17021:2011, 2).

Coaching is a goal-oriented systematic process whose objective is to encourage self-directed learning (Renton 2009, 3). It is a talent management activity to create a change

through learning. It also helps to transport a person's knowledge and skills to a higher level. (Parsloe & Leedham 2009, 20, 77; Starr 2011, 8.)

Comprehensive safety and security management (Comprehensive SSM) is based on risk assessment (ISO 31000:2009, v; OHSAS 18001:fi 2007, 23; SFS-ISO/IEC 27001:2013, 19; SFS-ISO 28000:2012, 17). It involves 10 sections to address: 1) occupational health and safety, 2) information security, 3) crime prevention, 4) environmental safety, 5) premises security, 6) contingency planning, 7) personal security, 8) rescue operations, 9) safety and security of production and operations and 10) security of operations abroad. The SSM protects assets such as image, personnel, information and the material and environment of the organization. (Confederation of Finnish industries 2011.)

Consultative auditing is a process in which auditing is carried out by an expert who knows the background and the history of the particular audit criterion and also other relevant criteria, and, moreover, who teaches the auditee about the issue (Rajamäki 2014). In consultative auditing, coaching is used as a teaching method (Parsloe & Leedham 2009, 20, 77; Starr 2011, 8).

Continuous improvement is a recurring process of the management system's intention, which is to achieve improvements in performance (OHSAS 18001:fi 2007, 17; SFS-ISO 28000:2012, 13). It is a management philosophy and a system helping to organize processes and employees for achieving quality improvement and also to assure a safe work environment and to increase productivity (Czarnecki, Schroer, Adams & Spann 2000, 74–75).

Educational institution in this study refers to elementary schools (ESs), high schools, vocational schools, universities and universities of applied sciences (UASs). The Finnish educational system is composed of basic education, general upper secondary education and polytechnic education – in other words, education in UAS – as well as university education. (Ministry of Education and Culture, Finnish National Board of Education & CIMO, 2012, 3.)

Harm is physical injury or, alternatively, damage to the health of people, livestock, property or the environment, according to the ISO/IEC Guide 51 (2014, 1) and IEC Guide 116 (2010, 8).

Hazard is an event of a development path, a factor or a source of potential harm, which can be a source of a risk. A danger will be realized very likely or it has already been realized. (ISO Guide 73:2009, 6; Suomen Pelastusalan Keskusjärjestö SPEK & Sanastokeskus. 2014, 67.)

Learning environment consists of physical, psychological, social, technical, pedagogical and didactical areas (Opetushallitus 2014, 29; Manninen & Pesonen 1997, 268).

Management system includes, among other things, policies, organizational structure, planning, risk assessment, setting and achievement of objectives and, furthermore, defining resources, responsibilities, practices, procedures and processes. It may include different kinds of management systems such as quality management system, financial management system, business continuity management system, environmental management system, safety management system and security management system. (SFS-EN ISO 9000:2015, 9; ISO 22301:2012: 4; ISO/TR 31004:2013, 34; OHSAS 18001:fi 2007, 19.) It comprises the Plan-Do-Check-Act model (ISO 22301:2012, vi; OHSAS 18001:fi 2007, 13).

Organizational culture is the learned, tacit pattern of a group's view of the reality of an organization. It is a product of social learning. It determines the way of thinking and solving problems. Moreover, culture includes things which its members hold or share together such as observed behavioral regularities when people interact, group norms, espoused values, formal philosophy, rules, climate and embedded skills. It also includes mental models, linguistic paradigms, shared meanings and root metaphors as well as formal rituals and celebrations. It offers structural stability and integration. One of the most important tasks of the management is to create and manage organizational culture. (Schein 2004, 10–14; Schein 2009, 27, 217, 219–220.)

Risk is expressed by way of consequences of a hazardous event or exposure and its likelihood of occurrence (ISO 31000:2009, 1; OHSAS 18001:fi 2007, 21). In this study only the negative effects of risks are regarded.

Risk management consists of coordinated activities and all processes with the intention to identify, assess and judge risks, assign ownership of risks, take actions to reduce or anticipate risks, to direct and control of an organization and, furthermore, to monitor and review the progress (ISO 31000:2009, 2; ISO Guide 73:2009, 2; HM Treasury 2004, 49). Risk management is part of the management system of an organization (ISO/TR 31004:2013, 34).

Safety is the state of being safe and not being dangerous. It is an ability to keep or to make somebody or something safe. To be safe means being protected from danger or harm and not being harmed, damaged or lost. (Oxford Advanced Learner's Dictionary of Current English 1995, 1035-1036.) Actions that endanger safety are made unintentionally (Reniers, Cremer & Buytaert 2011, 1240).

Safety and security management (SSM) is a coordinated activity to direct and control an organization with regard to safety and security. It consists of organizational structure, resources, responsibilities, processes, procedures and practices. Moreover, it includes the planning of activities such as risk assessment and the setting of objectives. (OHSAS 18001:fi 2007, 19; SFS-EN ISO 9000:2015, 18; SFS-ISO/IEC 27001:2013, 11; SFS-ISO 28000:2012, 17.)

Security is a freedom or protection against attack and danger. It consists of measures which are taken to guarantee the safety of a person or a building or a country. Attack is an act of violence to hurt or kill somebody or to cause a harmful effect on something. Danger is the possibility that injury, harm or damage will occur. (Oxford Advanced Learner's Dictionary of Current English 2000, 65–66, 316, 1155.) Actions that endanger security are made intentionally (Reniers, Cremer & Buytaert 2011, 1240). Security is the resistance to an intentional, unauthorized act that is intended to cause harm or damage (SFS-ISO 28000:2012, 11).

A **Stakeholder** is an individual or group located inside or outside of the workplace who/that can affect and who/that has claims for the performance of the organization. Moreover, a stakeholder can have an effect on or can be affected by decisions, activities or strategic outcomes. Stakeholders are also called interested parties. (Hitt, Ireland & Hoskisson 2005, 22; ISO Guide 73:2009, 3; ISO 22301:2012, 4; OHSAS 18001:fi 2007, 17.)

A **Threat** is a probable, unpleasant event or development path which may result in harm to individuals, an organization or a system. It is a potential cause of an unwanted incident. (ISO/IEC 27000:2012, 10; SFS-EN ISO 22300:2014, 2.)

1 Introduction

In the first chapter, the introduction, the research environment, the research gap, the scope and the objectives of the study are presented. In addition, the research approach and the process are described.

1.1 Research environment

The Finnish educational system is composed of basic education, secondary education and higher education. Basic education is given in ESs. Secondary education is provided in high schools as well as vocational schools. Higher education occurs in universities and UASs, which are also called polytechnics. (Ministry of Education and Culture, Finnish National Board of Education & CIMO, 2012, 3.) In this study, the term educational institution refers to ESs, high schools, vocational schools, universities and UASs.

The local authority has the responsibility to arrange basic education (Basic Educational Act 628/1998, Chapter 2, section 4). General upper secondary educational schools, in other words high schools, are arranged by local authorities, municipal consortiums, registered associations and foundations (General upper secondary schools Act 629/1998, Chapter 2, section 3). Vocational schools are arranged by local authorities, municipal consortiums, registered associations and foundations and state-owned enterprises (Vocational Education and Training Act 630/1998, Chapter 2, section 8). UASs are corporations (Polytechnics Act 932/2014, Chapter 1, section 5). Universities (Universities Act 558/2009, Chapter 1, section 1) are either corporations or foundation universities. The Ministry of Education (Opetusministeriö 2008, 11–12) states that municipalities maintain almost all ESs and high schools. Municipalities or municipal consortiums maintain approximately half of the vocational schools. The above-mentioned ESs and high schools are directed by municipal educational administration departments (Vantaa 2015). The head teacher, typically referred to as the rector, is responsible for the operations in each ES, high school and vocational school (Basic Educational Act 628/1998 Chapter 8, section 37; General Upper Secondary Schools Act

629/1998, Chapter 6, section 30; Vocational Education and Training Act 630/1998, Chapter 6, section 40).

According to the Constitution of Finland (731/1999) everybody has the right to security. The Occupational Safety and Health Act (738/2002) states that employers shall take care of the safety and health of their employees. A safe and secure learning environment is a right for pupils and students according to the Finnish legislation – such as the Basic Educational Act (628/1998), General Upper Secondary Schools Act (629/1998), Vocational Education and Training Act (630/1998), Polytechnics Act (932/2014) and Universities Act (558/2009). The administration of municipalities is to comply with the Local Government Act (365/1995, Chapter 8, section 69), requiring that municipalities report annually on their operations. Risk management in particular is mentioned in the act. However, the requirement concerning the reporting of risk management is new, and it was included in the annual report of fiscal year 2014. The importance of safety and security is emphasized by the Rectors' Conference of Finnish Universities of Applied Sciences (Arene) which influences the development of the Finnish higher education system and promotes closer cooperation between the UASs. One of Arene's (2015a, 2015b) working groups is composed of safety and security network members, which are the UASs. The task of this active network is to develop the safety and security of the UASs. Furthermore, some UASs, such as Laurea UAS and Metropolia UAS (Metropolia UAS 2015), have hired a security manager to take care of safety and security matters. In turn, head teachers and rectors in ESs, secondary schools and vocational schools usually complete a degree in educational administration to show that a person has sufficient knowledge of educational administration. A degree in educational administration concentrates on the principles of public law such as the Administrative Procedure Act (434/2003) as well as the administration of civil service, teaching, personnel and financial matters (Opetushallitus 2015) but comprehensive, risk based SSM is not emphasized.

Multiple institutions and operators have developed the safety and security of educational institutions by way of several different projects over the past decade.

Examples of these projects are improving the construction/technical safety of school buildings (Opetus- ja kulttuuriministeriö 2015), establishing the KiVa anti-bullying program (Oppilaitosten Turvallisuus – Tilanneraportti 2014; University of Turku 2012) and carrying out a project called "Security and Safety in Universities (Kreus et al. 2010) as well as preparing school safety and security handbooks (Sisäasiainministeriö 2009). In Lanne's study (2002), the development needs of safety and security operations in universities were studied. However, in Universities of Applied Sciences (UASs) and Elementary schools (ESs), the performance level, strengths and weaknesses of the safety and security management (SSM) were not known.

A rector is responsible for the operation of the educational institution and, consequently, also for safety and security (Basic Educational Act 628/1998; General Upper Secondary Schools Act 629/1998; Vocational Education and Training Act 630/1998; Polytechnics Act 932/2014; Universities Act 558/2009). There are requirements for the safety and security of the learning environment in the quality criteria for the basic education, too. Education providers and schools are to develop the safety and security by improving the work and methods of operation and, furthermore, safety and security shall be evaluated in practice. (Opetusministeriö 2009, 7–8, 49–50.) The management of an educational institution is to identify, assess and analyze occupational safety and health risks in accordance with the Occupational Health and Safety Act (738/2002). Dunlap (2013, 415) points out that to be able to take care of students and pupils, teachers, administrators and other personnel as well as school associates, visitors and guests cannot be forgotten.

According to the Safer Tomorrow program (Ministry of the Interior 2012a, 31), a safe and secure learning environment makes it possible for pupils and students to enjoy studying, to prepare for growing up and to achieve a good academic performance. At educational institutions, safety and security have been improved over recent years. Still, the Ministry of the Interior (2012a, 31) states that school bullying and threats of violence take place at educational institutions even today. From a preparedness point of

view, each educational institution is to have an updated emergency and evacuation plan. Safety drills shall regularly be held, as it has been proven that they can save lives.

According to the Commission of the European Communities (2002, 3, 6–8, 12; 2007, 2, 4), the changes that have been identified in society include, among other things, an increased feminized society and an aging active population as well as changes in the forms of employment such as part-time work and outsourcing. Moreover, there are changes in the nature of risks such as flexible ways of organizing working time and individually managed human resources as well as an increase in psycho-social problems and illnesses.

According to Maslow's (1943, 371, 374; 1987, 15, 18, 20–22) theory of human motivation, human needs are settled in a hierarchical order of pre-potency. The appearance of one need relies on a more pre-potent need. Safety and security needs are in the top priority for human beings, just after physiological needs. According to Maslow, the most important needs are physiological needs as well as safety and security needs. These are followed by belongingness and love needs, esteem needs and self-actualization needs. However, Maslow's hierarchy of needs has been criticized. For example Trigg (2004, 394, 397) as well as Gambrel and Cianci (2003, 158–159) argue that Maslow's theory focuses on personal growth and does not take into account either the cultural environment or social interactions.

The main objective of this research is the development of comprehensive, risk based SSM in educational institutions by means of the Asteri consultative auditing process and the TUTOR model. The TUTOR model was chosen because the Finnish rescue authority, Keski-Uusimaa Department for Rescue Services, had recently developed a new, rewarded model for inspection or auditing and, moreover offered it for the use of the two researchers. In this study, UASs and ESs were chosen as the target group. UASs were chosen because the author of this study works as a senior lecturer in Laurea UAS the campuses of which were the first audited organizations. Additionally, the researchers desired to include another level of educational institutions in this study. ESs

located mainly in the Central Uusimaa region were chosen because the TUTOR model was created by the authority operating in that region, and the model will be used in the future in these ESs. Moreover, there were many auditable ESs in this region.

1.2 Research gap, scope and objectives

A safe and secure learning environment is a requirement within the Finnish legislation – for example, in the Basic Educational Act (628/1998, Chapter 7, section 29), General Upper Secondary Schools Act (629/1998, Chapter 5, section 21), Vocational Education and Training Act (630/1998, Chapter 5, section 28) and Polytechnics Act (932/2014, Chapter 6, section 31) as well as the Universities Act (558/2009, Chapter 5, section 41a). Learning environment is a wide concept that includes physical, psychological, social, technical, pedagogical and didactical areas (Opetushallitus 2014, 29; Manninen & Pesonen 1997, 268). The Finnish legislation does not, however, mention a requirement of the comprehensive, risk based SSM or the management commitment in the implementation and development the SSM in organizations. As shown in Chapter 2, the safety and security of educational institutions have been developed by multiple institutions, operators and researchers in several projects over the past decade. Typically, the approach has been fragmented, and the need for comprehensive SSM in educational institutions has not been emphasized.

The need for comprehensive SSM was identified when two researchers, the author of this study and Laurea UAS's Head of Safety and Security, Ms. Tiina Ranta, started auditing educational institutions. Head teachers and rectors working in ESs, secondary schools and vocational schools usually complete a degree in educational administration. However, the degree in educational administration focuses on civil service, teaching, personnel and financial matters (Opetushallitus 2015) and does not provide tools for the SSM itself. During the audits, it was recognized that the comprehensive SSM system as well as its main content and sections were not known by all auditees. Thus, the development of a new tool, a consultative auditing process, was started by the author of this study.

The aim of this study is to develop thes comprehensive SSM in educational institutions by developing the new Asteri consultative auditing process and studying its effects. Moreover, the aim is to study the strengths, development needs and differences in the SSM in UASs and ESs with the new Asteri consultative auditing process and the TUTOR model.

The objectives of the research study are:

1. The first objective of the research is to develop a consultative auditing process that can be used while auditing safety and security of an organization.

2. The second objective is to find out what are the effects of the consultative auditing process on the auditee.

3. The third objective is to find out what are the strengths and the development areas of UASs and ESs in comprehensive SSM.

The research hypothesis is: There is no statistical difference in overall SSM between ESs and UASs.

1.3 Research approach and process

The research philosophy of this study was logical empiricism. Eriksson and Kovalainen (2010, 15) state that in empiricism, reality is based on observable material things. Holopainen and Pulkkinen (2003, 17–18) mention that studies can be divided into theoretical and empirical studies. A theoretical study involves basic research, and it produces new scientific knowledge. Empirical research is, in turn, applied research, which relies on basic research, and the main objective is to find answers to practical problems. Järvinen (2012, 181) mentions that logical empiricism is based, as the name says, on two principles: logic and empiricism. The principle of logic requires that

statements must be precise, logically correct and clear. There is to be no contradiction. The principle of empiricism requires that concepts and statements be verifiable and based on perception. A researcher following logical empiricism will consider the scientific work as a neutral and value-free task. A researcher is to register only the objective facts.

An applied research design was used in this study. Bickman and Rog (1998, x–xiii) emphasize that applied research uses scientific methodology to produce information. Its aim is to improve the understanding of the problem and to solve an immediate societal problem. In applied research, practical and statistical significances are important. Additionally, theory is utilized to provide practical results. Research teams are typically used for applied research.

In the applied research design, there are two phases: planning and execution. During the first phase, planning, the problem or the issue is to be understood by reviewing the relevant literature and having discussions with the research clients to understand their concerns. Moreover, the objectives of the study are set. Information can be collected from experts and major stakeholders on the issue by carrying out information-gathering visits, observing and discussing with persons working on the issue. Every study is based on a conceptual framework, which can be an academic theory specifying the variables of interest and their relationships. Next, the questions are identified and refined. Data collection approaches are chosen and the resources, such as information sources, time, researchers and money, are planned. Then, the feasibility as well as strengths and weaknesses of the approach are evaluated. During the second stage of the applied research design, execution, the research is conducted by collecting information and describing the material. Moreover, data are analyzed and interpretations and conclusions are made. The reliability and validity of the research findings are evaluated. Finally, the research report is compiled. (Bickman, Rog & Hedrick 1998, 5–8, 10, 17–18, 23, 33; Holopainen & Pulkkinen 2003, 15–16.) This research is a cross-sectional study. It was made once at one point only, and it concentrated on a particular phenomenon at a

particular time (Holopainen & Pulkkinen 2003, 18; Saunders, Lewis & Thornhill 2007, 148; Nardi 2006, 121).

In this study, a literature review was used to search for the relevant literature on the SSM that can be applied in educational institutions. The purpose of the literature review is to explore, compare, critically analyze and summarize studies and theories produced by other researchers about the subject to be studied (Eriksson & Kovalainen 2010, 44). A structured interview by means of an audit, structured observation and electronic survey were used as data collection methods. A consultative auditing process was used in combination with the TUTOR model to develop comprehensive SSM of educational institutions.

According to van der Velde, Jansen and Anderson (2004, 102–104), an audit is a combination of observation and oral, unstructured interviews. Oral interviews are a suitable data collecting approach for a research concerning the individual's knowledge, facts, opinions or attitudes. An interview makes it possible to gain access to information sources that are not available otherwise. During an interview, there is a direct interaction between the researcher and the respondents. A key element is active listening, during which attention is paid both to the content of the interview and to the intention behind the words used by respondents. An interview offers a relatively large amount of information in a short period. Furthermore, there is the possibility to obtain more detailed background information based on follow-up questions. There is a smaller risk of skipped questions, too. The disadvantages of an interview are the human resources needed, a lack of anonymity and, accordingly, the level of reliability of the data as well as the difficulty of processing and analyzing the results.

Qualitative, thematic analysis was used when analyzing the written comments given in the electronic survey. According to Aronson (1994), thematic analysis can be used to identify essential topics or themes in the data by searching, combining or dividing issues. Data themes and sub-themes are identified, combined and categorized to be able to carry out a closer and more detailed exploration.

A deductive approach was used in this study. Eriksson and Kovalainen (2010, 22) as well as Holopainen and Pulkkinen (2003, 12) mention that in the deductive approach conclusions are made using deductive reasoning. It proceeds from the more general situation to the more specific. The process of deduction is linear, and it proceeds from theory to the empirical study. Theory is the first source of knowledge, and, therefore, at first the theory about the topic is applied to the object to be studied. Then, the data are collected. Finally, verification, interpretations and conclusions are made.

In Figure 1, the research process is illustrated. The TUTOR model was used for auditing comprehensive SSM. The TUTOR was chosen because of its wide-ranging way of viewing the SSM. Moreover, the use of the TUTOR model began in Laurea UAS, and it was considered a suitable model for this purpose. The TUTOR model was created by the Keski-Uusimaa Department for Rescue Services, and the model will be used by the authorities in the future in this region. The Asteri consultative auditing process was developed step by step based on auditing experience and a feedback survey.

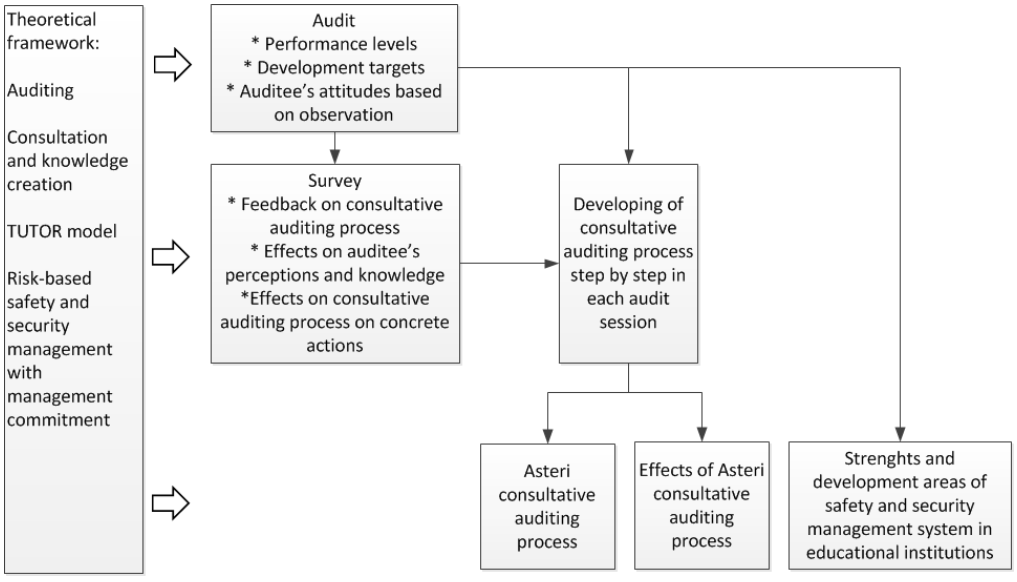

Figure 1. Research process

The research process started with the theoretical framework. Next, the author of this study designed the feedback questionnaire in the form of an electronic survey. Then, the two researchers conducted the audits together and, additionally, the author of this study started to develop and test the new consultative auditing process. The development and the testing phases continued in this study throughout the audit period, and it was influenced by the theoretical framework, the audits and their results as well as the results from the survey. The development ended when the author of this study evaluated the effects of the new consultative auditing process. Finally, the author of this study analyzed the results of the audit and made conclusions.

2 Risk based SSM and auditing

Risk based SSM is an important issue in this study. In the second chapter, the importance of the management of an organization in general, risk management and the SSM are presented. Next, safety and security culture as well as measurement and metrics are given. Moreover, earlier studies and developing programs concerning safety and security and improvement needs concerning SSM systems are given. Finally, auditing and in detail consultative auditing, obviously an important part of this study, are presented.

2.1 Management of organizations

In this study, the existence and operation of comprehensive SSM is evaluated in educational institutions. This section presents the content of a management system. Moreover, an organization's mission, policy and strategy are presented as they are important starting points for the SSM system. Additionally, the importance of risk management is shown. Finally, safety and security culture, measurement and metrics are presented.

2.1.1 Management system, mission, policy and objectives

The need of the management system is raised by numerous national and international standards and standardization organizations, such as Occupational Health and Safety Assessment Specification Standards (OHSAS), European standards (EN), the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC) and the Finnish Standards Association (SFS). A SSM system can be integrated into other management systems, such as quality, information security, financial, business continuity and environmental management systems (Hitt, Ireland & Hoskisson 2005, 21–22; Mol 2003, 329–330; SFS-EN ISO 9000:2015, 21; ISO 31000:2009, 9–10; SFS-ISO/IEC 27001:2013, 11; OHSAS 18002:fi 2008, 17, 23; ISO 22301:2012, 10; Dunlap (2013, 409, 411).

According to Hitt, Ireland and Hoskisson (2005, 31–32), strategic intent identifies the ideal state of the organization and considers its strengths, weaknesses, opportunities and threats. However, strengths have the most important influence on strategic intent, as they describe the organization's desired character and commitment. The mission statement needs to be based on strategic intent, according to Hitt, Ireland and Hoskisson (2005, 31–32) as well as Mol (2003, 329–330). The mission is the reason for the existence of an organization, its unique purpose and the scope of its operations. In a versatile mission statement, customers, products, services, markets, technologies, employees, philosophy and public image are taken into account. The mission statement should be individual and inspiring to all stakeholders. Standard SFS-EN ISO 9000 (2015, 7) adds that the needs and the expectations of customers and other stakeholders are to be defined.

Thereafter, the policy of the organization is set by the top management (SFS-EN ISO 9000:2015, 22; ISO 22313:2012, 5). It shall be appropriate for the nature and scale of the organization and it may vary among different organizations, but it includes certain common features. First of all, it gives guidance to the personnel. It describes the responsibilities of the personnel to ensure that the responsibilities are known and understood. It also gives the framework for objective setting as well as declares the commitment to the implementation and fulfilment of the legislation. Additionally, the policy expresses the overall intentions and direction of the organization as far as quality and continuous improvement are concerned. The policy must be documented, communicated to the personnel, implemented, maintained and regularly reviewed. Moreover, it must be available to the personnel and stakeholders. (International Atomic Energy Agency 1991, 7–8; SFS-EN ISO 14001:2015, 14; ISO 22301:2012, 11; ISO 22313:2012, 5; OHSAS 18001:fi 2007, 21; SFS-EN ISO 8402:1995, 23.)

The next step is to define processes and responsibilities to attain objectives. Thereafter, the resources to attain the objectives are to be determined and provided. It is important to firmly decide, who is responsible and what resource will be needed, what and when shall be done. The objectives need to be consistent with the policy and be measurable,

too. Just like the policy, the objectives must be documented and communicated to the organization as well as monitored and reviewed at regular intervals. Objectives also need to be available to the personnel and, if appropriate, the stakeholders. (SFS-EN ISO 9000:2015, 7-8; ISO 22301:2012, 12-13.)

2.1.2 **Risk management**

Risk management is an important issue in this study. The terms hazard, and occasionally threat, vulnerability, event, harm and risk are connected to the risk management. A hazard is an event of a development path, a factor or a source of potential harm, that will be realized very likely or, alternatively, it has already been realized. It can be a source of risk. A hazard can be treated with risk management. Additionally, a threat is a probable and unpleasant event or a development path which may result in harm to individuals, an organization or a system. A threat may cause an unwanted incident. (ISO Guide 73:2009, 6; ISO/IEC 27000:2012, 10; SFS-EN ISO 22300:2014, 2.)

Moreover, vulnerability is an intrinsic property or properties, or a weakness of an asset or control that exposes an entity to the source of risk (ISO Guide 73:2009, 6, 8; ISO/IEC 27000:20012, 11). An organization should create, implement and maintain documented procedures for continuous and systematic hazard identification and risk assessment (ISO 22301:2012, 16; OHSAS18001:fi 2007, 21, 23). Standards OHSAS 18001:fi (2007, 21, 23) and OHSAS 18002:fi (2008, 35) point out that hazards should be identified before the risk assessment can be made. When identifying a hazard, usual and unusual activities such as human factors, human behavior and human capabilities are taken into account. It is important to consider the activities of all persons who have access to the workplace, including, among others, contractors, and visitors. Furthermore, hazards arising near the workplace and hazards arising outside the workplace that may have a negative affect are regarded, too. Working areas, processes, installations, equipment, operation procedures, infrastructure and materials are also taken into consideration.

According to ISO/IEC Guide 51 (2014, 1) and IEC Guide 116 (2010, 8), harm is a physical injury or, alternatively, damage to the health of people, livestock, property or the environment. There are various definitions of what constitutes a risk. It is the positive or negative effect of uncertainty on objectives, such as financial, health, safety and environmental goals. The objectives are set to different levels of the organization. They may be strategic or organization-wide objectives or project, product and process objectives. Risk level is often expressed by way of consequences of potential events and their likelihood of occurrence (ISO 31000:2009, 1–2, 6; ISO Guide 73:2009, 1–2). Risk can also be defined as a combination of the likelihood of an occurrence of a hazardous event or exposure to and severity of an injury or illness based on an exposure (OHSAS 18001:fi 2007, 21). In this study, only negative risks are regarded.

A foundation to the Enterprise Risk Management (ERM) is formed by the risk management framework which offers arrangements, such as plans, processes, practices, resources, communication and culture. Furthermore, the management commitment is an essential requirement for the risk management. (ISO/TR 31004:2013, 8; ISO 31000:2009, 8-12.) ERM is a process affected by the board of directors, management and other personnel. Its task is to plan and control activities for minimizing risk impact. ERM must be implemented into the decision making process regardless of the level and function of the organization in which the decision is made. Thus, ERM is applied in strategy setting and throughout the organization. Risks are to be reviewed comprehensively instead of treating individual risks. (Committee of Sponsoring Organizations of the Treadway Commission 2004, 2; Hopkin 2010, 226, ISO/TR 31004: 2013, 35.) According to standards ISO Guide 73 (2009, 2) and IEC/ISO 31010 (2009, 6), risk management is a coordinated action through which an organization's risks are managed and controlled. It is also a process that helps in making decisions. Moreover, it takes into account uncertainty as well as the possibility of intended and unintended future events or circumstances.

The risk management process comprises establishing the context, risk assessment and, additionally, risk treatment. Moreover, risk assessment is not a single item but it

includes risk identification, risk analysis and risk evaluation. Risk identification is a process in which risks are found, recognized and described. It includes the identification of risk sources, events, their causes and their potential consequences. Risk analysis follows risk identification. It is a process, in which the nature of the risk is understood, the risk is estimated and the level of the risk is determined. It precedes risk evaluation and risk treatment. Again, risk evaluation is a process in which the results of the risk analysis are compared with the risk criteria. The intention is to define whether the risk and its magnitude can be accepted or tolerated. Risk treatment means that risks are modified with one or more options, and, thereafter, the chosen options are applied. Risk treatment is a cyclical process during which the risk treatment is assessed, and, subsequently, it is decided whether the residual risk level can be accepted. If not, a new risk treatment is generated, and it is assessed. Risk can be avoided, taken or increased, removed, shared or retained. The likelihood or consequences of the risk can be changed. The costs and efforts of the implementation of the risk treatment are balanced. Several risk treatment options can be applied individually or using several options together (ISO 31000:2009, 4–6; 18–19; ISO Guide 73:2009, 5–8). The HM Treasury (2004, 37) emphasizes that inter-dependencies with other organizations influence risk management and, consequently, other organizations should also be taken into account. Mol (2003, 286) adds that employees need to understand the nature of the risks in the workplace as well as how the risks may change, what the repercussions may be and how human behavior influences the risks. Therefore, employees need training.

ERM offers numerous advantages. It helps to achieve objectives, make decisions and identify and treat risks around the organization. The fulfilment of the regulatory requirements is important and ERM helps to ensure that they are met, too. ERM improves governance, controls, reporting, stakeholder confidence, organizational learning and loss prevention as well as operational effectiveness and efficiency. In addition, it encourages moving toward proactive management. It helps to achieve cost reduction of capital and finance, profitability and growth. It also helps to achieve good governance and uninterruptible operation. Moreover, it enables an improved reputation,

more positive publicity and an improved level of consciousness in an organization. (ISO 31000:2009 v–vi; Hopkin 2010, 4–5, 228–229.)

There may be weaknesses in ERM processes, too. ERM may be useful, but it is primitive, states Merchant (2012, 32–36). Standard risk management processes focus on identifying and prioritizing negative risks but are less effective concerning positive risks. Standard ERM process makes it difficult to manage all risks and also to determine and quantify the risk appetite of the organization. Additionally, highly improbable events may be difficult to evaluate. The likelihood of negative matters may be underestimated, and the likelihood of positive matters may be evaluated over-optimistically. The organization may use lists of known risks based on its history, and hence the future will remain unknown. Future scenario planning may help managers to better envision of the future.

As far as classifying risks are concerned, there is no right or wrong way to do it. However, it is important that an organization divides risks into categories that best suit its circumstances. Standard ISO 31000:2009 does not recommend using any specific risk classification. The Institute of Risk Management (2002, 39) classifies risks into strategic, financial, operational and hazard risks. Strategic risks are caused by competition, customer and industry changes, research and development, intellectual capital and the integration of mergers and acquisitions. Financial risks are caused by interest rates, foreign exchange, credits, liquidity and cash flow. Next, operational risks are based on recruitment, supply chain, regulations, culture, board composition, accounting controls and information systems. Lastly, hazard risks are results of contracts, natural events, suppliers, environment, products, services, properties, employees and public access. Helsloot and Jong (2006, 144) classify risks into social, organizational and knowledge risks. According to COSO Enterprise Risk Management (COSO ERM), risk management is classified into four categories to support an organization's objectives: strategic, operations, reporting and compliance (Committee of Sponsoring Organizations of the Treadway Commission 2004, 3). The Orange Book of the HM Treasury (2004, 17) uses the political (P), economic (E), Socio cultural (S),

Technological (T), Legal /Regulatory (L) and Environmental (E) risks, called PESTLE model, for categorizing risks.

Additionally, Hopkin (2010, 205) and Moeller (2011, 35) emphasize that operational risks can mean different things to different organizations. Operational risks interfere with the daily operations of the organization. Usually they are risks for which insurance is taken out. In some organizations, such risks are process risks, compliance risks and risks caused by persons. Process risks can be divided into supply chain risks, customer satisfaction risks, cycle time risks and process execution risks. Compliance risks include, for example, environmental risks, regulatory and government compliance risks, policy and procedures risks and litigation risks. Risks caused by persons include, for example, human resources risks, employee turnover risks, performance incentive risks and training failure risks.

In this study, while auditing the SSM in educational institutions, the focus was on operational risks interfering with the daily operations of the organization. For ESs, strategical and financial risks were not discussed because these risks are treated at the municipal level. For UASs, different categories of risks were highlighted. However, the focus of the consultative auditing process was on operational risks interfering with daily operations.

2.1.3 **SSM system**

Pesonen (1993, 280–282) and standard OHSAS (OHSAS 18001:fi 2007, 11) argue that the task of an organization's management system is to support the success of the organization. A SSM system is based on strategic intent and mission statement, policy and objectives. In this study, the importance of the management's commitment in the SSM is strongly evident. Pesonen (1993, 280–282) emphasizes that the top management must be involved in security management. The director in charge of security activities should work directly under the chief executive officer. Simola (2005, 193–194) and Mäkinen (2005, 226) argue that the development of the SSM needs to be a part of the long-term development strategy, and, furthermore, it should be embedded as a part of

everyday activities and used as a decision making tool. Pesonen (1993, 280–282) mentions that the growth of the organization is to be taken into account when investing in security management.

The Confederation of Finnish Industries (2011) divides comprehensive SSM to 10 sections to address. They include 1) occupational health and safety, 2) information security, 3) crime prevention, 4) environmental safety, 5) premises security, 6) contingency planning, 7) personal security, 8) rescue operations, 9) safety and security of production and operations and 10) security of operations abroad. The assets, such as image, persons, information, material and environment, including learning environment, are protected by means of organizational SSM. Risk management has a vitally important role in comprehensive SSM.

The safety and security of the learning environment is a vital issue for educational institutions. In the national core curriculum for basic education, the learning environment comprises four areas which are physical, psychological, social and pedagogical areas (Opetushallitus 2014, 29). Manninen and Pesonen (1997, 268) divide the learning environment into four other areas: physical, social, technical and didactical areas. Buildings, facilities, furniture layout, lighting, instructional tools and learning materials are examples of the physical environment. Furthermore, it comprises the wider constructed environment and surrounding natural environment. The psychological learning environment entails the behavioral models associated with the learning environment. The social learning environment includes, among other things, cooperation, interaction situations, human relationships, mutual respect as well as a good atmosphere. Next, the pedagogical environment consists of planning, teaching and guidance as well as educational materials and equipment. The didactical learning environment focuses on the environment that supports learning such as different learning materials, the use of various learning theories and individual learning styles. Lastly, the technical environment includes tools and their reliability and ease of use. (Opetushallitus 2014, 29; Manninen & Pesonen 1997, 268.)

In this study both safety and security management are discussed. Safety management protects against human and technical failures and also prevents harm to persons, non-intentional events, human errors, errors in systems or processes as well as natural disasters causing failures and harms (ISO Guide 116:2010, 10; Reniers, Cremer & Buytaert 2011, 1240; Rasmussen & Svedung 2000, 48; SFS-EN ISO 8402:1995, 19). Security management protects against deliberate, intentional acts of persons, losses caused by intentional acts, as well as errors caused by intentional human actions motives of which are vandalism, fraud, and espionage (SFS-ISO 28000:2012, 11; Sisäasiainministeriö 2008, 5; Virtanen 2002, 41; Mäkinen 2005, 149, 169; Cole 2003, 9-11; Reniers, Cremer & Buytaert 2011, 1240). Mäkinen (2005, 169) states that organizational security can be outlined through four dimensions: operational, information, physical, and personnel security. Risks endangering operation are minimized by way of operational security. Information security protects information, systems, services, electronics, and hardware. Physical security helps to protect buildings and premises. Physical property protection may include access control, electronic intrusion, and fire detection systems, guarding and patrol services. Personnel security includes, as its name suggests, personnel-related risks, such as rights and duties and pressure.

The quality of operations is displayed when auditing educational institutions. According to Rasmussen and Svedung (2000, 48, 72), a safety management system has a clear connection with a quality management system. The requirements for an organization following proactive risk management are compatible with the requirements for an organization following a quality management system according to standard ISO 9001:2015 or Total Quality Management (TQM). Standard SFS-EN ISO 8402 (1995, 25) points out that TQM is a quality-centered management approach to achieving long-term success, customer satisfaction and benefits to the organization and the society. The concept is based on the participation of the members of the organization and the strong leadership of the top management. Leflar and Siegel (2013, 40) add that TQM is closely linked to a culture of continuous improvement. Virtanen (2002, 36) argues that quality

takes an internal point of view while security takes an external point of view. Juran and Godfrey (1999, 2.16–2.17) emphasize that successful companies invest in a quality management system by carrying out strategic quality planning. They concentrate on employee empowerment, motivation, customer focus, partnering, benchmarking and measurement. Additionally, these companies invest in leadership, management training and continuous improvement. In these companies, upper managers take charge of quality management, as they have realized that that certain responsibility is to be carried out by themselves.

Krause (1997, 58) states that the development of quality and safety management systems supports and strengthens both systems. Employees may perceive a contradictory message if the organization develops only one of the systems. Safety is typically developed by means of short projects or programs, and, thereby, the trust of employees can be lost. Stability is required for improving safety. Pheng and Shiua (2000, 41, 43–44) add that the combination of safety and quality management systems may not be simple, although there are similarities. Combination may cause resistance, not least because of reducing flexibility. It may prevent the effective use of resources, too. It may also be difficult for various parties to understand the nature of quality and safety work, responsibilities and duties. Loebbaka and Lewis (2009, 197) point out that the manager of the future should be a value-added leader and establish his/her actions for continuous improvement.

One of the tasks of the SSM is to prevent accidents. According to Reason (1997, 1, 224–226), there are two types of accidents: accidents against individuals and accidents that happen to organizations. Most accidents happen to individuals and the victims are persons. Organizational accidents, however, are uncommon. They are caused by technological innovations and have severe influences on uninvolved populations, the environment and assets. The SSM can be viewed from the perspective of an individual model, a technological model or an organizational model. In the individual model, accidents can be prevented through, among other things, poster campaigns, rewards and punishment, audits of hazardous activities, guidelines, training and staff selection. In the

technological model, the prevention of accidents can be done by way of risk analysis, human reliability assessment, databases and applications that support decisions. The organizational model has a connection to crisis management, and human error is seen as a consequence, rather than a cause. Errors are the symptoms that usually reveal the existence of latent conditions.

As far as UASs and universities are concerned, contingency planning is required according to the Polytechnics Act (932/2014, Chapter 10, section 66) and Universities Act (558/2009, Chapter 11, section 90). According to the National Emergency Supply Agency (2009, 3–5, 9), business continuity management and continuity planning have a strong connection to the SSM. Continuity management covers both strategic and tactical activities, and the role of the top management is vitally important. Continuity management and continuity planning help an organization to achieve long-term and short-term objectives. Firstly, the aim is to prevent disruptions, and secondly, to reduce the effects of disruptions to the operation by securing the recovery of critical operations as soon as possible after the disruption. Continuity management requires strategic and operational decisions. The task of the management is to organize continuity planning and, moreover, to determine objectives and priorities. Critical operations and processes are to be identified. Continuity management must also be implemented, monitored, assessed and improved.

2.1.4 Safety and security culture

Safety and security culture is a part of organizational culture and it is reflected in the SSM. Schein (2009, 27, 217, 219–220; 2004, 10–14) argues that organizational culture is a learned, tacit pattern of a group's view of reality. It is a product of social learning and it determines the way of thinking and solving problems. Moreover, culture includes those things that its members hold or share together such as observed behavioral regularities when people interact, group norms, espoused values, formal philosophy, rules, climate and embedded skills. It also includes mental models, linguistic paradigms, shared meanings and root metaphors as well as formal rituals and celebrations. It offers

structural stability and integration. One of the most important tasks of the management is to create and manage organizational culture. Organizational culture and leadership are "two sides of the same coin." According to Schein (2009, 21–25; 2004, 25–32), there are three levels in the organizational culture: uppermost artifacts, then espoused values and, at the bottom, underlying assumptions. Artifacts are easy to observe but hard to interpret. They comprise all that one can see, hear and feel when entering a new organization such as closed doors, informal dress and a feeling of a fast-paced work. Artifacts include visible organizational structures and processes, too. Espoused values include strategies, goals and philosophies. They are values that are supposed to create a certain image of the organization. Espoused values may conflict with the visible behavior. Underlying assumptions are shared, tacit and unconscious. They comprise taken-for-granted beliefs, assumptions, thoughts and feelings. They are tacit assumptions about the nature of the work and what to do to succeed. They are the ultimate sources of values and action in the organization.

Schein (2004, 225, 245–246) reminds that the organizational culture grows with the impact of the founders and leaders. There are six primary embedding mechanisms for founders and leaders to teach their conscious and unconscious beliefs, values and assumptions to their group or organization. Firstly, they teach by paying attention to, by measuring and by controlling certain things regularly. Secondly, they teach by reacting to crises and critical incidents. Thirdly, they teach by allocating resources. Fourthly, founders and leaders teach by acting as role models, by teaching and by coaching. Fifthly, they teach by rewards and status. Sixthly, founders and leaders teach by recruiting, selecting, promoting, retiring and excommunicating. Moreover, there are six secondary embedding mechanisms for founders and leaders. They teach through organizational design and structure. Furthermore, they teach through systems and procedures. They teach through organization's rites and rituals. Additionally, founders and leaders teach when designing physical space, facades and buildings. They also teach through stories, legends and myths about important persons and events. Finally,

founders and leaders teach through formal statements about organizational philosophy, creeds and charters.

Organizational culture is a group phenomenon, and it cannot be assessed with a survey; rather, it can be assessed through structured group discussion in which the groups will identify the tacit assumptions on their own (Schein 2009, 220). Reiman and Oedewald (2002, 24, 30) argue that organizational culture is hard to measure. Document analysis, group work and interviews with representatives at different levels of the organization, surveys and activity development seminars can be used for data collection methods. Top (1997, 83) states that the measurement of behavior should be directed at two groups: persons in leadership positions and persons in operating positions. The measurement of the behavior of persons in operating positions may be done by general observation or task observation. General observation gives information about the way employees behave while working. Secondly, task observation can be done while persons execute their task to obtain information critical to the task. Moreover, Top emphasizes that the measurement of behavior is critical because behavior reflects the attitude of the person and the organization. Attitudes and beliefs influence the actions of individuals. By observing and measuring behavior, a window into the attitudes can also be revealed. Lastly, according to van der Velde, Jansen and Anderson (2004, 102–104), attitudes can be studied by oral interviews.

Safety culture is formed by individual awareness, knowledge and competence, commitment, motivation, supervision and responsibility toward safety. It comprises two components: the framework of the organization and the attitude of the personnel toward safety at all levels of the organization (International Atomic Energy Agency 1991, 5–6). According to Blair (2013, 59–64), the level of safety performance can be determined based on the organization's culture. A strategy for building a safety culture is simple, but not easy. There are three simple strategies to be followed. The first strategy encourages working toward a 100% reporting culture without fearing subsequent punishment and blame and without worrying about extra work. A reporting culture is

created by means of confidentiality, ease of reporting and fast feedback. The second strategy is developing safety awareness with meaningful, practical and relevant safety rules that are effectively communicated, monitored and continually updated and improved. The third strategy encourages leaders to understand how to act consistently in developing a safety culture. Leadership by walking around, monitoring, listening, coaching and resolving safety matters – in other words practicing walk-the-talk – is the best way to find out what is happening in the workplace.

Arezes and Miguel (2003, 23–24) emphasize that terms safety culture and safety climate are used to indicate the assumptions of the value of safety matters for individuals or groups of individuals. Safety culture is a part of organizational culture. It is a product of interactions among persons, functions and organizations. A culture is a generally stable state, and it describes the commitment to safety by everybody at every level of the organization. In turn, a climate indicates a temporary or a seasonal characteristic. Harrison (1997, 90–91) adds that an organization maintaining a positive safety culture will encourage individuals and teams at all levels of the organization to act actively and proactively. Therefore, they will be able to act, for example, by anticipating and managing risks, developing working practices and procedures and, furthermore, continuously improving the operations and efficiency of the organization. Safety culture parameters are, therefore, management and organizational factors, enabling activities such as training and communication as well as individual factors.

The term safety culture was brought into use by the International Nuclear Safety Advisory Group (INSAG) in 1986 in the report of the Chernobyl accident. The original definition of safety culture is the following: “Safety culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance” (International Atomic Energy Agency 1991, 3–4). In the Government Degree on the Safety of Nuclear Power Plants (717/2013, Chapter 7, section 28), a good safety culture is also mentioned. “When designing, building, operating and

decommissioning a nuclear power plant, a good safety culture shall be maintained. Nuclear safety is a priority in all activities. The decisions and activities of the management of all organizations participating in the above-mentioned activities shall reflect its commitment to safety-promoting operating methods and solutions. Personnel shall be motivated to perform responsible work and shall be encouraged to the identification, reporting and elimination of factors endangering safety. Personnel shall be given an opportunity to contribute to the continuous enhancement of safety." According to the International Atomic Energy Agency (1991, 5-6), safety culture comprises two components: framework of the organization and the attitude of the personnel at all levels of the organization. It includes individual awareness, knowledge and competence, commitment, motivation, supervision and responsibility.

The management has an important role to play in the development of an organization's safety culture. Even making a single change can be a slow process; however, a strong management can create a wanted change based on its own example. On the other hand, due to a weak management, a variety of organizational subcultures may arise. The management must commit to the desired development area for a sufficiently long period. The safety rules of the organization need to be strictly complied with through leadership and discussion. (Simola 2005, 221.) There is a causal loop between the management commitment, personnel participation, resource requirements, effective safety policy, safety implementation and cost of accidents. When the management commitment increases toward safety and focuses especially on leadership, the development work will get a boost. Personnel will increase participation in safety matters because of the management's commitment. It follows that more resources will be needed. When resource requirements increase, the need of effective safety policy arises. Next, the formulation of the safety policy enhances, and, in turn, it improves safety implementation and reduces cost of accidents. (Mohamed & Chinda 2011, 272-273, 278.) A new manager has four paths to take when arriving in a new organization. He/she can destroy the existing culture by getting rid of the persons who are the key culture carriers and then implement new beliefs, values and assumptions. Another

option is to fight against the existing culture and bring his/her own beliefs, values and assumptions to the organization. The third option is to keep the existing culture. The fourth option is to create a new culture gradually. (Schein 2009, 4–5.)

2.1.5 Measurement and metrics

Educational institutions need both safety and security indicators to evaluate their performance in the SSM. Van Steen (1997, 3–4) emphasizes that performance measurement comprises input and output indicators. When safety is at a good level, and moreover, for example, injuries and loss rates are low, the output indicators do not provide sufficient information for the SSM system. Proactive indicators are a necessity. Furthermore, performance indicators are needed to obtain positive inputs. Performance indicators cover four areas, three of which are positive: systems and procedures, people as well as facility and equipment. Only the fourth area, failure, is negative. In continuous improvement, the positive inputs expand and negative outputs reduce.

Laitinen, Vuorinen, Simola and Yrjänheikki (2013, 69–70) mention that reactive indicators are widely used. However, to obtain a broader view of the SSM, effective proactive indicators are also needed. Even today, proactive activity indicators, such as number of safety audits made and number of risk assessments carried out, are used. Additionally, in particular learning organizations, proactive outcome indicators are needed. These indicators include, for example, know-how, motivation and work practices of the personnel. Moreover, the physical work environment and ergonomics as well psychosocial work environment, such as work climate and commitment, can be measured.

Educational institutions need safety and security metrics to monitor their performance in the SSM. As mentioned by van Steen (1997, 3–4), a balance between negative indicators (failures) and positive indicators (systems and procedures, people, and facilities and equipment) are needed. Furthermore, to obtain a broader view of the SSM, effective proactive indicators are also needed (Laitinen et al. 2013, 69-70).

2.2 Earlier studies concerning safety and security

In international studies and in the literature, school security, and particularly physical security, is strongly underscored. Typically risk based, comprehensive safety and security is not, however, emphasized in developing programs. The following topics are raised: the physical school environment (for example, Everett Jones, Axelrad & Wattigney 2007), the influence of school environment on school violence (for example, Lindstrom Johnson, Burke & Gielen 2011; Lindstrom Johnson 2009), school bullying and harassment (for example, Casebeer 2012; Sourander, Helstelä, Helenius & Piha 2000; Chapell et al. 2006), fear of crime on campus (for example, Woolnough 2009) as well as children's and adolescents' aggression, and school shootings (for example, Ferguson 2015; Ferguson 2008; Muschert 2007). Additionally, the status of risk management in higher education in the Netherlands (Helsloot & Jong 2006, 143, 157–158) as well as safety and risks of school travel (National Research Council, 2002; Wiegand, Bergoffen, Daecher, Hanowski & Bowman 2010) have been studied.

In Finland, safety is highlighted in different studies. Kallio (2014) has studied pupils' risk-responsibility in sloyd education in his doctoral thesis. He argues that pupils' responsibility controls the sense of safety, which, in turn, defines the acceptable risk limit of the pupil. Anttila, Hyytinen and Kivistö-Rahnasto (2014 5, 21–22, 28) have studied the systematic promotion of the total safety and well-being of personnel in enterprises by taking into account leisure safety, too. They state there is a connection between occupational safety and leisure safety. Nenonen (2013, 2, 63–67) studied occupational accidents and diseases in her doctoral thesis. According to her study, there is an improvement in working conditions in Europe and a decreasing trend in occupational accidents. She concludes that safety risk in different professions and different work tasks should be taken into account. Waitinen (2011), in his doctoral thesis, studied the safety culture of the ESs located in Helsinki city as well as the factors affecting it. Niemelä, Latva-Rantala, Ollanketo and Väyrynen (2010, 24–25, 27–28) investigated the suitability and effectiveness of the health, safety, environment and quality (HSEQ) system in modern process industry companies and their suppliers in

Northern Finland. They argue that the auditees felt that they benefitted from the HSEQ assessment and the view of the second-party auditors. Moreover, they mention that clarifying the audit questions as well as offering tips for potentially confusing questions decreased misunderstanding. In Puhakainen's (2006, 139) doctoral thesis, information security awareness is stressed. He emphasizes that to be able to comply with an organization's policies and instructions, the personnel need knowledge, skills, motivation and management. Simola (2005, 221–222) investigated safety leadership as a line supervisor's task in his doctoral thesis. He emphasizes the role of the management in developing the organizational safety culture. Levä (2003, 119), in her doctoral thesis, studied the functionality of safety management systems in installations. She points out that the key tasks of the management are setting safety goals and objectives, developing a comprehensive safety management system, systematically identifying hazards and ensuring employee involvement.

Additionally, Lanne (2007, 77–78) studied in her doctoral thesis, cooperation in terms of its role and importance among responsible persons in different sectors of the SSM in Finland. She emphasizes that internal and external cooperation helps to improve the safety and security process. She developed a model of cooperation's role in comprehensive corporate security management. Lanne (2002, 301-304) also studied the safety development needs of the SSM as well as good practices in Finnish universities. According to Lanne, some of the most important improvement needs in safety performance were co-operation, teamwork and resources. Furthermore, the responsibilities, safety culture as well as commitment to safety management need to be improved. Tuomi (2012, 35) focused on quality management in the public sector in his doctoral thesis. He stresses that a total quality management system is applicable to the public sector. Virtanen (2002, 40-41) studied security from different perspectives in his doctoral thesis. He formed a 4-sector model showing assets and protection methods. Additionally, Kuusisto (2000, 159) evaluated the reliability of the auditing tools for safety management systems in his doctoral thesis. He states that the reliability of the audit results increases when an experienced auditor uses a constructed audit tool.

Pesonen (1993) studied security arrangements and their economic impacts in Finnish companies in his doctoral thesis. He emphasizes that the task of the organization's security system is to support the objectives and success of the organization.

2.3 Developing programs for the safety and security of educational institutions and the society

This section presents the developing programs for the safety and security of educational institutions and the society taking place in Finland, elsewhere in Europe and in the United States. The developing programs concerning educational institutions are targeted for different levels of education. In Finnish language there is only one, common word "turvallisuus" for describing both safety and security. The concept of comprehensive management has been used in the Finnish literature and studies. However, the safety and security matters are typically discussed in fragmented way or in different contexts without emphasizing the development of comprehensive SSM.

2.3.1 Finnish developing programs

The development of the safety and security of the Finnish society is strongly connected to the objective of the Finnish governmental policy. According to the Ministry of the Interior (2012b), the Finnish government has implemented three Internal Security Programs since 2004. The government programs set an objective according to which Finland will be the safest country in Europe: "A country in which people will feel that they live in a fair and equal society regardless of how they identify themselves." According to the Ministry of the Interior (2012a, 4, 15–16), the government adopted a resolution on the Third Internal Security Program in June 2012, the title of which is A Safer Tomorrow. In the program, the most important safety and security problems from the perspective of everyday life were identified. It is noteworthy that one objective of the program was to improve safety and security in educational institutions. It has been identified that members of the educational community feel insecure because of the threat of bullying, sexual harassment and violence.

The Ministry of Education and Culture (Opetus- ja kulttuuriministeriö 2015, 5) set up a working group to improve the construction/technical safety of school buildings. In total, 17 recommendations were given, including ones related to the responsible stakeholders and implementation schedules. Some of these recommendations include the following topics: the shape, size, location and site arrangements of school buildings; safety as a part of the design and construction process; improvement in fire and rescue safety; locking systems and access control as a part of facility management technology and technical safety as well as safety related to school buildings' time of use.

The Ministry of Education and Culture (2010) emphasizes that legislation concerning disciplinary actions to improve safety and security has been developed. Moreover, the KiVa anti-bullying program has been established and implemented in approximately 2,500 schools, covering 90% of Finnish ESs (Oppilaitosten Turvallisuus – Tilanneraportti 2014, 9; University of Turku 2012). Additionally, school safety handbooks have been prepared (Sisäasiainministeriö 2009, 22–23).

The bombing of the shopping center Myyrmanni in Vantaa city in 2002 and the school shootings in Jokela, Tuusula municipality, in 2007 and in Kauhajoki in 2008 have had a strong influence on Finnish thinking about security. The Ministry of Justice (Oikeusministeriö 2009) published the report by the Investigation Commission on the school shooting in Jokela. In the report, the Ministry gave recommendations for improving the SSM in educational institutions. These recommendations included the welfare development of pupils and students, the preparation of treatment guidelines for youth mental health services and the prevention of bullying. Furthermore, the recommendations included the reduction of firearms, the tightening of firearm permits, carrying out risk assessments and coordinating the different safety and security plans of educational institutions. The recommendations also included the establishment of common rules for Internet service providers concerning inappropriate communication as well as an online police "tip" service. Lastly, the recommendations included the possible development of legislation to criminalize the planning and preparation of homicides.

In 2009–2010, Laurea UAS (Kreus et al. 2010, 5, 77–81) carried out a project called "Security and Safety in Universities" which was funded by the Ministry of Education and Culture. A key output of the project was a manual called the Handbook of Security and Safety in Universities – Managing Serious Threats against Personnel and Students, which is intended for all Finnish universities and UASs and their personnel responsible for safety and security. In the manual, the ways universities and UASs can develop safety and security by themselves, are presented. Many development areas are also presented, including students' well-being, students' rights and responsibilities, the confidentiality of personal data and a code of conduct for processing personal data. It is recommended that students' well-being be developed by establishing student welfare groups and safety/security teams for identifying the need for personal risk assessment in all universities and UASs.

In 2011, Laurea UAS (Koskenranta, Paasonen & Ranta 2012, 45, 67, 69–70) conducted an international survey of universities and UASs about the SSM. According to the research findings, the SSM was seen as a part of strategic, high-quality risk management. Moreover, it was found that powerful SSM takes into account safety and security communication and supports organizations' other forms of communication. Additionally, it was found that standards supporting the SSM are beneficial to universities and UASs. According to the recommendations of the study, universities and UASs will benefit from a safety and security risk management model that is based on international standard ISO 31000:2009. It was noted that risk based safety and security training is needed for all levels of the organization after carrying out the current state analysis. Cooperation between safety, security and communication experts as well as open, two-way safety and security communication as a part of organizations' other forms of communication are needed, too.

The government has divided Finland into 22 rescue service regions. Municipalities are jointly responsible for the rescue services in their regions (Government Degree on the Rescue Regions 174/2002). According to the Rescue Act (379/2011), each rescue region must shift from mere fire inspections into supervision based on risks. Individual

supervision intervals may be shortened or extended based on assessment visits. Thus, emergency rescue resources can be used more effectively. According to the Rescue Act (379/2011, Chapter 3, section 15), the occupant of the building must make an emergency plan that includes the conclusions of the risk assessment. The Keski-Uusimaa Department for Rescue Services developed the TUTOR model to be able to meet the requirements caused by the new Rescue Act. In addition, the Keski-Uusimaa Department for Rescue Services (Keski-Uudenmaan pelastuslaitos 2015) established the Tulikukko (Fire Rooster) safety training program for personnel working in ESs and kindergartens with the intention of providing capabilities for accidental circumstances and special situations. The main contents of the training are risk identification, preparation for incidents and preparedness for emergency situations. Additionally, there is an annual No Worries! Campaign (Nou Hätä! 2015) promoting rescue skills for eighth grade pupils in ESs. It involves a few hours of safety training, after which the class or the group of pupils may choose to participate in the competition. The campaign helps to identify accident and fire hazards, to prevent accidents, to identify the most common causes of the ignition of fires and, moreover, how to improve fire safety at home. It also provides training on the first actions to be taken in the case of fire, traffic accidents, and sudden illnesses as well as emphasizes the importance of making an emergency call to 112. In addition, it teaches basic emergency first aid skills. No Worries! Campaign is organized by various departments for rescue services, Finnish National Rescue Cooperation (SPEK), the Ministry of the Interior, National Board of Education, Emergency Services College, rescue unions and the Finnish Association of Fire Chiefs.

The Ministry of Education and Culture (Opetus- ja kulttuuriministeriö 2013, 10, 38–39) created in November 2010 a follow-up group with the purpose of monitoring the safety and security status in educational institutions. The task of the follow-up group was to report and make suggestions to the relevant authorities and to the ministers of Internal Security. Moreover, the task was to improve the safety and security in educational institutions. The follow-up group concentrated its work on the development activities of

safety and security, particularly for basic education and upper secondary education as well as for vocational education and training. It also had the task of providing recommendations by disseminating good practices. As a result of the work of the follow-up group, it was stated that safety and security are closely related to the safety and security culture and the quality assurance system of educational institutions. Safety and security training and the development of related skills are important factors. In educational institutions, the rector has the sole responsibility for safety and security. The follow-up group mentions that rectors, teachers and lecturers have pedagogical training, whilst comprehensive SSM requires a wide range of other forms of expertise. Additionally, a rector may find other school duties more important than the SSM.

Lounamaa et al. (2005, 50–51, 58–59) have studied school accidents in a project in which schools developed various processes for accident prevention and, additionally, developed their safety protocol. According to the study, hospital care was sometimes needed because of school accidents. The identified development areas were prevention of winter slipperiness, accident reduction in gym classes and a reduction in fighting between pupils.

2.3.2 Developing programs elsewhere in Europe and in the United States

The European Network Education and Training in Occupational Safety and Health (ENETOSH) was established in 2005 with the financial support of the European Commission. In ENETOSH, there are more than 40 partners from 16 European countries and South Korea. It offers a database on a web platform containing 700 examples of good health and safety practices for educational institutions. Examples of these topics are stress and psychosocial risks, accident prevention, teacher training, mental health, violence prevention, first aid, risk assessment and road safety. (The European Network Education and Training in Occupational Safety and Health 2015a, 2015b.)

The Council of Europe has recommended using the Whole-School Approach, in which young children, teenagers and young adults gain knowledge and skills that cover health,

safety, well-being and risk awareness starting at an early stage in their studies at educational institutions. They will learn an approach that covers facilities, equipment, procedures, management and preventive culture. Teachers, students and pupils will receive education concerning risks as well as training concerning occupational health and safety. They will learn to work as active players in their educational institution. Hence, young persons will learn a safe, risk preventive culture and, accordingly, be more prepared for their work lives. (European Agency for Safety and Health at Work 2013, 8–11, 90; 2004, 6, 12, 22.) The methods according to which safety and health can be implemented in educational institutions are divided into three groups: holistic, curriculum and workplace approach. In the holistic approach, the culture of the educational institution is influenced. Numerous projects have been implemented in various European countries, such as the National Healthy School Standard and the Safer Primary Schools Project in the United Kingdom, the Safe School and Towards an Accident-free School in the Netherlands, and the School Environment Round in Sweden. In the curriculum approach, safety and health are implemented through all levels of education and all studied subjects. Examples of these projects are At the Safety School in Italy, Personal Protective Equipment in the United Kingdom as well as Ar and Mi at School / New Kids on the Job in Denmark. Lastly, the workplace approach incudes the final step through which the students are prepared for professional life. Examples of these projects are OSH Passport in France, Students Make Machines Safe in Belgium and Young People Want to Live Safely in Germany. (European Agency for Safety and Health at Work 2004, 14, 144-146.)

As far as universities and UASs are concerned, the aim of the European Agency for Safety and Health at Work (EU-OSHA) is to create a safety culture by including occupational health and safety into university education through the curriculum. The idea is to develop a whole-university approach in which a safe and healthy learning environment is combined with risk prevention, knowledge development, skills and safety attitudes as well as raising the awareness of students and personnel. It is recognized that universities and UASs are not very hazardous environments, although

some laboratories and research activities may be potentially hazardous. According to the EU-OSHA expert group, various faculties of universities view occupational safety in different ways. Most likely, occupational health and safety have an important role in the faculties of engineering and law. Technical universities may also have a safety faculty that offers occupational teaching in health and safety matters. EU-OSHA reminds that all future experts graduating from universities and UASs will have roles and responsibilities related to occupational health and safety in their workplaces. (European Agency for Safety and Health at Work 2010, 13, 148–151). Additionally, the U.S. Department of Education (2007, 2009) has been active in preparing various guides for different levels of educational institutions. Examples of these are the Guide for Emergency Management at Institutions of Higher Education as well Practical Information on Crisis Planning: A Guide for Schools and Communities.

2.4 Improvement needs in SSM system

This section presents the defects in the SSM systems identified by number of researchers as well as defects raised by the literature.

2.4.1 Policy and objectives in safety and security activities

Helsloot and Jong (2006, 143, 152, 157–158) state that in the Netherlands, in higher education an integrated policy on safety, security and crisis management was typically missing. Additionally, most of the higher institutions hired specialists to design and implement safety and security policies. According to Lanne's (2002, 300–301) research findings, only two universities in Finland had safety and security policies or overall safety and security principles. The need for such policies was not internalized in Finnish universities. Kerko (2001) identified the most common deficiencies in safety and security systems in Finnish organizations over his long career. Lanne (2002, 300) notes that typically in Finnish universities there was no concrete, up-to-date safety and security policy. Kerko (2001, 32) has identified the same deficiencies in the Finnish organizations. In addition, Lanne (2002, 300–301) concludes that missing safety and security policies may have had an effect on the safety and security culture, management

commitment and the concept of continuous improvement. Management's commitment to safety and security was found to exist in Finnish universities at least at some level. The commitment was found in a positive attitude and an interest in the safety and security field. Personnel were found to be indifferent to safety and security issues. Furthermore, Lanne (2002, 300–301) states that the weakness of the safety and security culture may have been caused by several factors, such as lack of management commitment and cooperation, lack of information and lack of employee orientation and training as well as lack of employee participation.

Kerko (2001, 32) mentions that Finnish organizations had generally not identified their essential safety and security objectives. Neither had they been able to concretize safety and security objectives in the workplace nor had they been able to divide them into smaller objectives. Lanne (2002, 300) emphasizes that, according to her research findings, only three universities had set objectives for safety and security activities.

2.4.2 Responsibilities, cooperation and communication

Waitinen (2011), Kerko (2001), Lanne (2002) and Kuusisto (2000) raise the importance of clear responsibility in safety management. Waitinen (2011, 217–218) states that a rector and a safety/security officer need to familiarize themselves with the SSM. Lanne (2002, 301) states that, based on her research findings, more than half of the respondents in the Finnish universities pointed out the fact that the managers and the personnel were not fully aware of their own obligations and responsibilities. Additionally, personnel were found to have a lack of concern about safety and security matters. Safety and security activities as well as responsibilities were not centralized in Finnish universities.

Kuusisto (2000, 155) argues that the lack of safety leadership decreases motivation and job satisfaction. Lanne (2002, 300–301) states that only some universities had established safety/security teams. Communication between units and safety/security teams were also seen as a challenge in the Finnish universities. Most of the respondents in Lanne's study were satisfied with the health care activities but felt that cooperation

with occupational health experts could be broader. Moreover, facility maintenance companies made corrective actions and some decisions concerning the maintenance without consulting the holder of the facility. In addition, cooperation with facility management companies was seen an important future task. About half the respondents stated that safety and security matters were taken into account in some way when choosing contractors.

Waitinen (2011, 217–218) points out that if personnel are safety- and risk-oriented, they can detect deficiencies and take corrective actions. According to Waitinen, rectors as well as safety officers felt that they had received an insufficient amount of training. Furthermore, according to Lanne (2002, 301), the respondents from the Finnish universities stated that resources concerning safety and security activities were inadequate. The biggest challenge was limited time for taking care of safety and security matters. Personnel were not properly trained in safety plans, either. The majority of respondents felt that training and orientation were inadequate, although guides for general orientation did exist in many universities. Kerko (2001, 32) emphasizes that responsibilities, obligations and authorization of safety and security organization had either been defined ambiguously or not in sufficient detail in Finnish organizations. In addition, it had not been clearly conveyed that safety and security issues are under the responsibility of the management.

2.4.3 **Comprehensive SSM**

The Ministry of Justice (Oikeusministeriö 2009, 123) recommends that the Ministry of Interior and the Ministry of Education and Culture should provide instruction on the planning of comprehensive safety and security activities, the coordination of different plans and their implementation in educational institutions. Additionally, the plans need to include the identification of risks and their prevention. Waitinen (2011, 217–218) emphasizes that rectors and safety offices need knowledge in safety management. Moreover, personnel can detect deficiencies and take corrective actions if said personnel are safety- and risk-oriented. According to Lanne (2002, 301), risk identification was

found to be inadequate in the Finnish universities. Most of the universities had identified risks, but not in a comprehensive way. Helsloot and Jong (2006, 147, 151) emphasize that in the Netherlands, higher education institutions, personnel and students were found to have limited risk awareness. In general, higher education institutions failed to identify many social safety and security risks, and, additionally, they did not have concrete plans to reduce these risks. Most of the educational institutions identified only fire and burglary as safety and security risks. Kerko (2001, 33) states that risk assessment was not considered part of organizations' everyday activities, but rather it was considered to belong to the experts outside the organization. In this way, risk assessment was seen as a one-time event and not as an ongoing operation of the organization.

Kerko (2001, 32–33) mentions that, almost without exception, there was a lack of routines for self-motivated maintenance of quality in the workplace in Finnish organizations. Additionally, the indirect reasons behind the occurrence of injuries, accidents, damages and disruptions were not detected in spite of the well-known fact that improving quality means that said indirect reasons will be detected and removed. Half of the respondents in Lanne's (2002, 300–302) study noted that safety drills were organized at the universities, but they covered only part of the buildings. Additionally, methods for the identification and monitoring of legislation were missing. Uniform procedures for monitoring the achievement of objectives were also missing. Safety and security monitoring was found to be based on inspections and work environment surveys as well as accident and absence statistics. There were no indicators for the management, and the procedures for monitoring were also missing. Lastly, near-miss situations were often studied superficially.

Finally, Kerko (2001, 33) emphasizes that the importance of preventive actions were known in Finnish organizations but that the forms of preventive actions were not developed systematically. Different areas of organizations' safety and security matters were treated as separate entities without the realization that all of them could be developed in the same basic ways. Employees did not commit to safety and security

work because training, information sharing and participation in planning and decision making failed due to the inefficiency and short-sightedness of the management. The safety and security legislation was fragmented. Furthermore, safety and security were seen a task for experts. In addition, the practical safety and security work in organizations was directed by the requirements of insurance companies, which did not necessarily improve safety and security activities as a whole.

2.5 Consultative auditing

Auditing and knowledge creation through consultation play important roles in this study. In this section, the auditing process, audit evidence as well as different audit types and audit criteria are presented. Moreover, safety and security consultation combined with auditing, knowledge creation and continuous improvement are presented.

2.5.1 Auditing process and audit evidence

An audit is a systematic, independent and documented process in which audit evidence is sought. During an audit, a case or subject is evaluated objectively to determine whether or not the auditing criteria are fulfilled. Objectivity is a key element of the audit process. (SFS-EN ISO 9000:2015, 27; SFS-EN ISO 19011:2011, 13; SFS-ISO-IEC 27001:2013, 21.) Russell (2005, 7) mentions that an audit is not a tool to search for errors but to obtain evidence of conformance or non-conformance against the audit criteria. According to van Steen (1997, 16), an audit helps to reduce the number of incidents and also to move efficiently to better overall performance. An audit follows the Deming cycle, which consists of four steps: plan, do, check and act, according to standard SFS-EN ISO 19011 (2011, 23), as shown in Figure 2 and outlined by the author of this study.

Figure 2. Auditing process

As standard SFS-EN ISO 19011 (2011, 23–37) mentions, the auditing process starts with the phase Plan: Establishing the audit program objectives and the audit program. An audit program includes such things as roles, responsibilities and competence. It also includes making the audit program and identifying and evaluating the risks of the audit program as well as establishing the extent of the procedures involved in the audit. In the Do phase, the audit program is implemented, and in the Check phase, the audit program is monitored. In the final phase, Act, the audit program is reviewed and improved. The Deming cycle is repeated to achieve continuous improvement.

An auditor is a person conducting an audit and who possesses related personal attributes and competence. An audit team consists of one or more auditors conducting an audit. (SFS-EN ISO 9000:2015, 36.) There are several features required of auditors. They must be competent, honest, responsible, law-abiding, impartial and objective. Moreover, they need to be fair, truthful, precise, professional and confidential. Eventually, auditors

are to be independent and ethical and have a fact-based approach. (SFS-EN ISO 19011:2011, 19; Karapetrovic & Willborn 2000, 287; Russell 2005, 33–34.) According to Russell (2005, 37–38), an auditor needs to understand the principles of auditing and the items that are to be observed. Effective communication skills, both orally and in writing, are also needed. The questions asked by an auditor should be proper and intelligent. An auditor interviews auditees, and thus, the ability to listen attentively is vitally important. Russell (2005, 6–7) and van Steen (1997, 16) state that an auditor needs to know which questions to ask and, moreover, in which order the questions are to be asked, collected and analyzed.

Auditing criteria are policies, procedures or requirements acting as a reference to which the audit evidence is compared (SFS-EN ISO 19011:2011, 13; SFS-EN ISO 9000:2015, 35). Kuusisto (2000, 152) states that a structured auditing method with competent auditing questions increases consistency. Safety audit tools differ from audit tools intended for quality management systems, in most cases, by including a scoring system. Typically, the structured audit method offers good consistency. The auditee's responses to safety audit questions are translated into scores according to which the practices and performance are measured.

According to standard SFS EN-ISO 19011 (2011, 13, 15), audit evidence comprises records, statements of fact or other verifiable information relevant to the auditing criteria. Russell (2005, 7) adds that audit evidence is received, for example, by observation, measurement and test devices. Auditors must make sure that the audit evidence is objective and that it supports the verification needs. As mentioned in standard SFS EN-ISO 19011 (2011, 13, 15), audit findings are obtained by the evaluation of the collected audit evidence. They may prove either conformity or nonconformity against the audit criteria or opportunities for improvement. Moreover, the audit conclusion is the outcome of the audit announced by the audit team. Russell (2005, 6, 42) mentions that after finishing the audit, the report is sent to the customer. OHSAS points out that the audit report should be clear, precise and complete (OHSAS 18002:fi 2008, 125). Russell (2005, 10) adds that an audit report acts as a valuable

management tool as it can give input for management decisions and inform about actual and potential risks. The management can see from the audit reports which areas are working well and which require further improvement. Finally, Russell (2005, 9) and Dunlap 2013 (347–348, 383) argue that it is important to make sure that the corrective actions will be taken and that a defined follow-up system exists.

2.5.2 Audit types

Safety and security audits can be perceived in various ways. According to Dunlap (2013, 383–384), Russell (2005, 11, 19–20) and standards SFS EN-ISO 19011 (2011, 9, 13), SFS-EN ISO/IEC 17021 (2011, 2) and ISO 22301 (2012, 2) these include the following:

- internal audits, external audits, first-party audits, second-party audits and third-party audits
- annual audits, follow-up audits, re-audits and special purpose audits
- combined audits, joint audits and integrated audits.
- performance audits, housekeeping audits, fire audits, process audits and system audits

Safety and security audits can be first-, second- or third-party audits. First-party audits are internal audits intended to evaluate the strengths and weaknesses of an organization against its procedures, own methods or standards. They are carried out by auditors employed by an organization to be audited. Auditors must not, however, have a vested interest in the audit results. External audits are second- or third-party audits. (SFS-EN ISO 19011:2011, 9, 13; ISO 22301:2012, 2; Russell 2005, 11, 19.) Second-party audits are carried out by suppliers, customers or contracted organizations on behalf of a customer. They may evaluate facilities, resources, economic stability, technical capacity, personnel, production capability and management systems. (Russell 2005, 11, 19.) Third-party audits are external audits and free of conflict of interest. They are

intended for legal, regulatory and similar purposes for verifying compliance with or conformity to regulations or standards. They can be used for improving competitive position and also for recognition, registration, certification, award, license approval, fines or penalties. They are carried out by independent auditing organizations such as regulators and certification bodies. The independence of the auditing organization is the key element of third-party audits. (Russell 2005, 11, 20; SFS-EN ISO 19011:2011, 13.)

Additionally, safety and security audits can be annual audits, follow-up audits, re-audits and special purpose audits. According to Dunlap (2013, 383–384) annual audits are typically comprehensive audits covering all components of the management system. Russell (2005, 21–22) mentions that follow-up audits are conducted to verify the corrective actions of the audit findings. Quite often, a single purpose follow-up audit is combined with a next scheduled audit because of high costs. Document review audits are examples of special purpose audits. Document review means, as the name says, auditing the documents of the organization and it can be done simply from a desk; neither observations nor interviews are to be made. Document review is also called a desk audit.

Safety and security audits can be conducted to identify the performance of an organization. The use of words audit and inspection is unsettled, and sometimes a word audit is used rather than a word inspection. Russell (2005, 21–22) mentions that performance audits are also called compliance audits or conformance audits. Dunlap (2013, 383–384) states that housekeeping audits or housekeeping inspections are focused on how well the facility is maintained as far as safety and security are concerned. In fire audits or fire inspections safety issues related to fire are assessed. Housekeeping and fire audits/inspections may take place weekly or monthly. Moreover, Russell (2005, 16–18) and Karapetrovic and Willborn (2000, 286) emphasize that process audits are used for verifying that inputs, outputs, resources, procedures, instructions, training, environment and process controls meet their requirements. System audits are intended to verify management systems such as the SSM system,

quality management systems or environmental systems. The targets of a system audit are company policies, contract commitments, regulatory requirements and activities such as customer service, training and waste management.

Finally, safety and security audits can be combined audits in which two or more practices, such as safety and security, quality and environmental management are audited (SFS-EN ISO 19011:2011, 9; ISO 22301:2012, 2). Karapetrovic and Willborn (2000, 281) emphasize that joint audits are audits in which, for example, safety and quality audits are made simultaneously by different auditors. They follow the same audit program, have the same lead auditor and they share opening and closing meetings. In these audits, several contents are audited at the same time. In this study, the SSM of educational institutions is audited using consultative auditing method combined with the TUTOR model. It is an external, third-party audit, a system audit and a special purpose audit as well as a performance audit.

2.5.3 Safety and security audit criteria

Cole (2003, 136), Dunlap (2013, 383–384) and Karapetrovic and Willborn (2000, 280) mention that audits according to objective auditing criteria, such as a standard or a regulation, are a useful method for the evaluation of safety and security practices, quality assurance, accounting and performance. Russell (2005, 9–10) states that many companies are still auditing only for safety issues. Forward-thinking companies are, however, auditing for safety management systems and looking for continuous improvement. In these cases, the focus on audits is on management commitment and responsibility.

In this study, the TUTOR model was used when evaluating the SSM system. The audit covers assets to be protected and all 10 sections of the SSM circle of the Confederation of Finnish industries (2011). These sections are occupational health and safety, information security, crime prevention, environmental safety, premises security, contingency planning, personal security, rescue operations and safety and security of

production and operations as well as security of operations abroad. It is remarkable that safety and security can be assessed using a number of other criteria with a narrower and deeper scope.

There are several perspectives on safety audits. They can be carried out, for example, according to the criteria of standards OHSAS 18001:fi (2007), SFS-EN ISO 14001:2015 and HSEQ. In international standard OHSAS 18001:fi (2007, 11, 21–33) the focus is on the requirements for occupational health and safety (OH&S) management system. It includes, among other things, requirements for the existence of OH&S policy, objectives, risk assessment, resources, competence and training, communication, documentation and emergency preparedness as well as evaluation of compliance. Another international standard, SFS-EN ISO 14001:2015, includes the same topics as standard OHSAS 18001:fi (2007), but its perspective is on the external environment. Thus, the standard can be used for auditing environmental management systems. HSEQ criteria are used for auditing occupational health and safety, environmental safety and quality, and for increasing the productivity of a networked business. The HESEQ criteria can also be used to improve the business skills in HSEQ matters, to develop systematic approaches, to raise the level of management and to help organizations in selecting their suppliers. (HSEQ Assessment Procedure 2015.)

Examples of security audits are auditing according to standard SFS-ISO/IEC 27001:2013 and auditing with the national security audit tool, Katakri. International standard SFS-ISO/IEC 27001:2013 can be used for auditing information security management systems including confidentiality, integrity and availability of information. A facility security clearance based on a Katakri audit can be conducted in domestic and international projects. The Katakri audit tool includes three main areas: security management system, physical security and information assurance. During Katakri auditing, an organization's ability to protect the authorities' classified information are evaluated. (Ministry of Foreign Affairs of Finland, 2015.) As an example, universities and UASs may face these requirements in Research, Development and Innovation (RD&I) projects that are carried out in cooperation with the authorities.

Moreover, there are quality management system audits that support SSM audits. They can be made, for example, according to the Common Assessment Framework, in other words, the CAF Model (European Institute of Public Administration 2013) and standard ISO 9001:2015. The CAF Model is a European self-assessment model for total quality management, which helps to improve performance in all parts of the public sector at the national, federal, regional and local levels. In the CAF Model, there are nine criteria. Criteria 1–5 are enablers: 1) leadership, 2) strategy and planning, 3) people, 4) partnership and resources, and 5) processes. The enablers determine how the organization operates. Moreover, criteria 6–9 are called results: 6) citizen/customer-oriented results, 7) people results, 8) social responsibility results and 9) key performance results. The CAF Model has been influenced in particular by the Excellence Model of the European Foundation for Quality Management (EFQM) (European Institute of Public Administration 2013, 9–10). Moreover, the quality management system can be audited according to international standard ISO 9001:2015. It provides a systematic process approach to achieving customer requirements as well as requirements for quality management system.

2.5.4 Consultation combined with auditing and knowledge creation

The concept of a consultative audit has been used on rare occasions in the literature. In addition, it has been stated that there is a contradiction in the combination of consultation and auditing and, moreover, a loss of auditing independence when combined with consultation. The U.S. Food and Drug Administration (FDA) mentions consultative auditing that is carried out to determine whether an organization meets the specified requirements, the results of which are intended for the internal use of the organization only. The FDA requires independence, objectivity, impartiality and freedom from conflict of interests in the third-party auditor and certification body tasks. Furthermore, the FDA allows a third-party auditor to carry out both consultative auditing and regulatory auditing for the same organization within 13 months if there are no sufficient accredited auditors in the region or in the country. (Draft Guidance for Industry and Food and Drug Administration Staff 2015, 6, 12–13.) Moreover, standard

SFS-EN ISO/IEC 17021 (2011, 5–6) takes a position on impartiality, and it mentions that a certification body and a part of the same legal entity may not provide management system consultation. As far as a certification body is concerned, impartiality may be threatened because of ownership, governance, management, personnel, shared resources, finances, contracts, marketing or payment of sales commission. Additionally, a certification body must not certify a management system of an organization to which internal audits have been made or to which management system consultation has been given by the certification body within less than two years. Furthermore, technical report ISO/TR 31004 (2013, 26) emphasizes that impartiality, objectivity and independence are important features of the auditor. Independence arises from the fact that the auditor has no relationship to the organization under consideration. Jeppesen (1998, 517, 532–533) argues that the auditor is independent if he/she does not make any direct managerial decisions. On the contrary, consultative auditing offers information for decision making in an organization, and it is no longer considered to weaken the auditor's independence. In this context, consultation is seen as a service to improve the decision making of the organization.

An audit that is carried out according to objective auditing criteria is a useful method for the evaluation of safety and security practices. An audit evaluates the effectiveness and inefficiencies of a system and its processes. In addition, the audit verifies compliance and conformity to regulations and standards. Forward-thinking organizations audit for the SSM systems and look for continuous improvement as well as management commitment and responsibility. (Cole 2003, 136; Dunlap 2013, 383–384; Karapetrovic & Willborn 2000, 280; Russell 2005, 9–10.) Lastly, an audit helps to reduce the number of incidents and also efficiently to move to a better overall performance (van Steen 1997, 16).

According to Parsloe and Leedham (2009, 20, 77), Renton (2009, 3–4) and Starr (2011, 8), coaching, mentoring and consultancy are similar in content. Coaching is a goal-oriented systematic process to encourage self-directed learning, the intention of which is to transport a person's knowledge and skills to a higher level and to generate change.

Parsloe and Leedham (2009, 20, 77) as well as Starr (2011, 8) mention that coaching can be used as a teaching method. Furthermore, knowledge creation is an important part of consultation. Davenport and Prusak (1998, 17, 24, 48, 158, 174) argue that knowledge offers a sustainable advantage. Shared information will remain and enrich the organization. New ideas will also generate new ideas. Creation, sharing and use of knowledge require confidence, rewards and incentives as well as management support and resources. Wilson (2007, 10–13) emphasizes that there are seven principles for coaching. The first principle is to deliver awareness to the coachee. The second and third principles are to build self-responsibility and self-belief within the coachee. The fourth principle is that the coach offers a blame-free coaching culture. The fifth principle is to focus on solutions while coaching. The sixth principle is to challenge the coachee. The final, seventh principle is for the coachee to take actions and change. Renton (2009, 26, 35) mentions that a coach needs empathy to achieve influence. First, the coach needs to understand the coachee, and after that the coachee can understand the coach. Parsloe and Leedham (2009, 7, 15–16, 18, 22–23, 75–76) and Starr (2011, 53, 80, 228) state that the coachee needs the desire to change his/her approach and the desire to improve the performance on his/her own. The coach joins the learning journey of the coachee by listening, giving supportive feedback, building rapport and using intuition. Most persons have the potential to change their behavior and attitude, but the process takes time. There is a connection between learning and emotional maturity. The difficult task of the coachee is to control his/her own feelings. Personal feelings about the issue to be learned and weak emotional maturity may obstruct learning.

Starr (2011, 155) reminds that the usual way to begin coaching is to establish a conversation during which the session is introduced, the rapport is established and the coaching atmosphere is created. Thereafter, it is time to identify the topic of the coaching. Next, the coachee and the coach build mutual understanding and identify the goals. Thereafter, ideas and options are raised and the necessary actions are identified. Conclusions are made and a path for continuation into the future is created. Finally, the coach closes the coaching section by giving a summary, and the next steps are agreed

upon. Cultural differences affect coaching, states Renton (2009, 46–47). The power distance is divided into low and high distance countries. In Finland and elsewhere in northern Europe, the power distance is low, which means that power relations are more equal, consultative and democratic. The formal positions in an organization do not seem to affect equality very much. Moreover, questioning the authority is allowed.

According to Renton (2009, 26, 35), Parsloe and Leedham (2009, 7, 15–16, 18, 22–23, 75-76) and Starr (2011, 53, 80, 228), coaching offers concrete benefits for individuals and organizations by offering learning experiences. A skillful coach asks, not tells, what to do. A powerful formula is 75 percent asking questions, 20 percent giving answers and only five percent sharing suggestions. Additionally, standard SFS-EN 16114 (2012, 22) mentions that respect, honesty, transparency, responsibility, flexibility, common understanding and commitment to continuous improvement are values that are typically linked to the management consultancy service provider.

Davenport and Prusak (1998, 5, 12) argue that knowledge is a combination of experience, expert insight, values and contextual information. It is located in the minds of individuals, and it appears in documents, organizational routines, practices, processes and norms. Knowledge may produce information, and information may lead to knowledge. A person's individuality appears through different values and, thus, we see different things in the same situations. Kakabadse, Kakabadse and Kouzmin (2003, 76–77) state that there is a chain in the knowledge flow that describes the data refinement: Data turn into information, information turns into realization, realization turns into actions and reflection and, finally, reflection turns into wisdom. Wisdom is needed to know how to use information.

Lönnqvist (2012, 99–100), Nuñez and Villanueva (2011, 61) argue that the part of knowledge located in the mind of an individual will be lost when an employee leaves an organization. In turn, intellectual capital, such as organizational practices and culture, work practices and routines, control mechanisms and emergency procedures, will remain. Moreover, intellectual capital enriches the organization and helps it to succeed.

Nonaka and Takeuchi (1995, 8–9, 12–13, 70–73) remind that there are both explicit and tacit knowledge. Explicit knowledge is easily transferable, because it can be expressed in words and numbers. Tacit knowledge includes the know-how, mental models, schema, beliefs and perceptions which we take for granted. Tacit knowledge is difficult to handle. It is highly personal and neither easily visible nor expressible. It is of little use to an organization, unless an individual is capable of converting it into another form to share it with others. Nonaka and Takeuchi (1995, 70–73) describe the model of Socialization, Externalization, Combination and Internalization (SECI model) associated with knowledge creation. It is a dynamic spiral of interaction between tacit and explicit knowledge and includes shifts among different modes. The spiral of knowledge creation starts at the individual level and expands to the group, to the organization and to the stakeholders. During knowledge creation, the content of knowledge in different modes interacts with each other. When tacit knowledge is communicated and shared in the organization, it needs to be converted into words or numbers. In this way, tacit knowledge becomes explicit knowledge which, again, turns into tacit knowledge and creates new organizational knowledge. At a team level, information is strengthened and compressed with dialogue, discussion, observation and sharing of experiences. The creation of organizational knowledge takes place in a dynamic interaction and the transfer of personal knowledge. Nonaka and Toyama (2003, 6–8) mention that the knowledge-creating place, "Ba", is needed. "Ba" creates new knowledge in interactions, for example, in working groups, meetings, e-mail groups and at the front line contact with customers. Wang and Lu (2007, 122, 128–130) have noticed that the knowledge transfer process depends on the knowledge gap and the knowledge stickiness. Knowledge transfer may be disturbed because of the stickiness in the four stages of knowledge management: initiation, implementation, ramp-up and integration. In mutually dependent low-sticky interactions, the generation of new knowledge occurs more easily.

In summary, it can be concluded that consultation should deliver added value. Knowledge creation is an essential part of the consultative auditing process in which

auditors give information and share their explicit and tacit knowledge with auditees. During the consultative auditing process, the objectives are that the intellectual capital of the audited organization will increase; both explicit and tacit knowledge will be shared. In this way auditees individually and as a team will be able to improve work practices and routines in their organization. However, the knowledge transfer may face obstacles. The knowledge gap and knowledge stickiness have an influence on the success of the knowledge transfer.

2.5.5 **Continuous improvement**

According to standards OHSAS 18001:fi (2007, 13, 17) and SFS-ISO 28000 (2012, 13), continuous improvement is a recurring process of the management system through which the improvements in performance are achieved. Continuous improvement is a vitally important part of the Plan-Do-Check-Act (PDCA) model used in management systems. Czarnecki, Schroer, Adams and Spann (2000, 74–75) state that continuous improvement is a management philosophy and a system that helps to organize processes and employees. It also adds customer value and satisfaction. Moreover, continuous improvement is one of the most frequently used methods for improving quality, assuring a safe work environment and increasing productivity. Oliver (2009, 559) points out that continuous improvement must be embodied within the strategy and the culture of the organization. The improvement process needs to begin in the organization but must also be included in the normal work and sustained. Performance measures and performance goals direct the organization in becoming a learning community.

Jabnoun (2001, 382, 385–386) emphasizes that there are driving and enabling values supporting continuous improvement. The driving values are respect, responsibility and empathy. The enabling values are humbleness, trust, openness and cooperation. Persons sharing these values are more likely to identify the need to continuously improve, and, therefore, they are more likely to be committed to continuous improvement. Typically a behavioral change program is needed to generate these values within the members of the organization. The commitment of the top management is essential, and, moreover,

the leaders need to act as role models and coachers. Organizational structure influences the cultivation of values, too. A team-based organization enables the change more easily. Furthermore, Tervonen and Haapasalo (2012, 6) argue that the biggest challenges for continuous improvement are the resources and the commitment of the management. Although employees make proposals for improvement, there is a lack of time and resources to plan the implementation of improvements. The empowerment of personnel to make decisions themselves is a part of the solution.

2.6 Theoretical synthesis

The theoretical basis of this study consists of comprehensive, risk-based SSM and its key elements. Moreover, it comprises auditing, consultation, knowledge creation and continuous improvement, which are key elements of the Asteri consultative auditing process developed in this study, as shown in Figure 3.

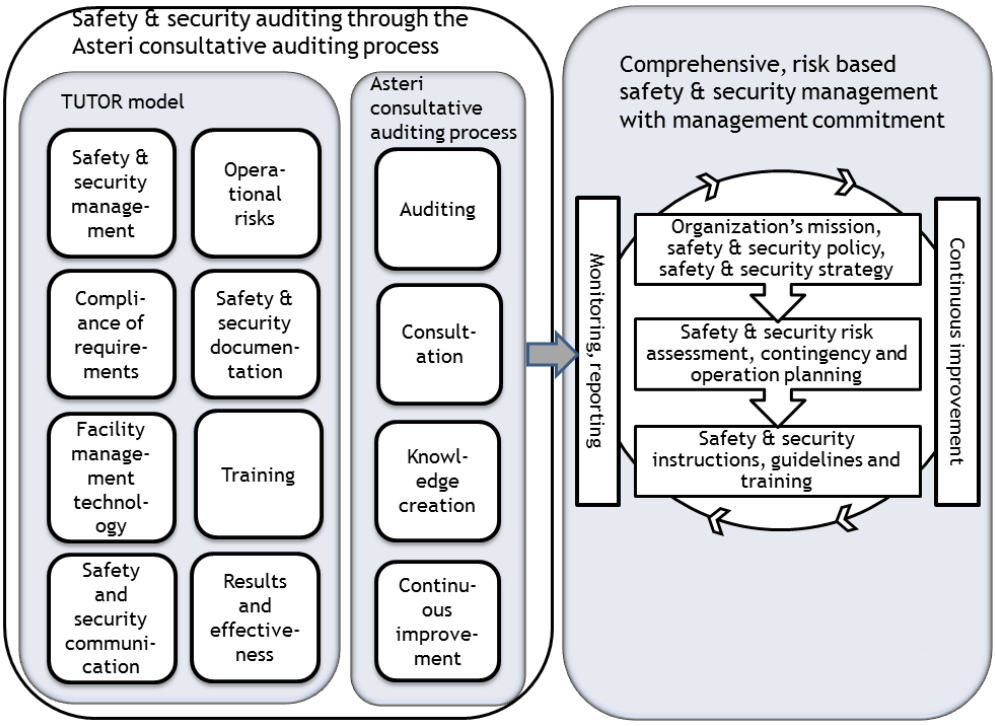

Figure 3. Theoretical basis of the study

The comprehensive SSM of an educational institution is based on risk assessment. When carrying out the SSM audits according to the Asteri consultative auditing process combined with the TUTOR model, all ten sectors of the Confederation of Finnish Industries (2011) are discussed in various TUTOR sections. The SSM protects assets such as image, personnel, information, materials and the environment of the organization. (Confederation of Finnish Industries 2011.) In educational institutions, the learning environment is one of the main assets to be protected. It consists of the physical, psychological, social, technical, pedagogical and didactical environment (Opetushallitus 2014, 29; Manninen and Pesonen 1997, 268).

Both safety management and security management are needed in educational institutions. The task of safety management is to protect against human and technical failures and to prevent harm to persons, non-intentional events, human errors and errors in systems or processes as well as failures and harms caused by natural disasters (ISO Guide 116:2010, 10; Reniers, Cremer & Buytaert 2011, 1240; Rasmussen & Svedung 2000, 48; SFS-EN ISO 8402:1995, 19). The task of security management is to protect against deliberate, intentional acts of persons and losses caused by intentional acts as well as errors caused by intentional human actions such as vandalism, fraud and espionage (SFS-ISO 28000:2012, 11; Sisäasiainministeriö 2008, 5; Virtanen 2002, 41; Mäkinen 2005, 149, 169; Cole 2003, 9–11; Reniers, Cremer & Buytaert 2011, 1240).

Risk management provides a basis for the successful SSM. Creating, implementing and maintaining documented procedures for continuous, systematic hazard identification and risk assessment are important matters (ISO 22301:2012, 16; OHSAS18001:fi 2007, 21, 23). If the personnel are safety- and risk-oriented, they are able identify deficiencies and, moreover, to take corrective actions (Waitinen 2011, 217–218.) A safe and secure learning environment is a requirement within the Finnish legislation – for example, required by the Basic Educational Act (628/1998), General Upper Secondary Schools Act (629/1998); Vocational Education and Training Act (630/1998), Polytechnics Act (932/2014) and Universities Act (558/2009). The safety and security legislation is

fragmented (Kerko 2001, 33). Moreover, safety and security legislation concerning educational institutions is wide (Lanne 2002, 300–302). The Finnish legislation neither mentions a requirement of comprehensive, risk based SSM nor the management commitment in the implementation and development of the SSM in educational institutions.

Safety and security documentation is an important part of the SSM systems. Davenport and Prusak (1998, 5, 12) argue that knowledge is a combination of the experience, expert insight, values and contextual information that is located in the minds of individuals, and it appears, inter alia, in documents. The Ministry of the Interior has emphasized the need for school handbooks to combine all safety and security documents, instructions and plans together (Sisäasiainministeriö 2009, 14–15, 22–23). Moreover, employees need training to understand the nature of risks of the workplace as well as how the risks may change, what the repercussions may be and how human behavior influences risks (Mol 2003, 286). Risk based safety and security training is needed by rectors and safety & security officers as well all other members of the organization (Waitinen 2011, 217–218; Lanne 2002, 301; Koskenranta, Paasonen & Ranta 2012, 70).

A positive safety and security culture includes training and open, two-way safety and security communication (Harrison 1997, 90–91; Koskenranta, Paasonen & Ranta 2012, 45, 67, 69–70). In Finnish organizations, employees do not commit to safety and security work due to a lack of training, information sharing and participation in planning (Kerko 2001, 33). In Finnish universities, communication between units and safety/security teams, facility maintenance companies and occupational health experts is needed (Lanne 2002, 300–301). In the SSM, measurement of performance is needed with effective, proactive indicators to obtain a broader view of the SSM (Laitinen et al. 2013, 69–70).

In consultative auditing, consultation is used as a teaching method. It is a goal-oriented, systematic process to encourage self-directed learning – the task of which is to transport

person's knowledge and skills to a higher level and to generate change (Parsloe and Leedham 2009, 20, 77; Renton 2009, 3–4; Starr 2011, 8). An audit is a systematic, independent and documented process, during which it is evaluated objectively whether or not the audit criteria are fulfilled. The reliability of the audit results increases when an experienced auditor uses a constructed audit tool. (Kuusisto 2000, 159; SFS-EN-ISO 19011: 2011, 13.) Consultative auditing has a connection to knowledge creation. It requires dynamic interaction and the transfer of personal knowledge (Nonaka & Takeuchi 1995, 70–73). There is a chain in the knowledge flow that describes the data refinement: Data turn into information, information turns into realization, realization into actions and reflection and, finally, reflection turns into wisdom. Through wisdom it can be known how to use information. (Kakabadse, Kakabadse & Kouzmin 2003, 76–77.) In addition to the personnel of the educational institutions, young persons need to learn a safe, risk preventive culture and to be more prepared for their working lives. They need to learn a comprehensive approach that covers facilities, equipment, procedures, management and preventive culture (European Agency for Safety and Health at Work 2013, 8–11, 90; 2004, 6, 12, 22).

Additionally, continuous improvement is an important element of the SSM systems. The SSM needs to be embodied within the strategy and the culture of an organization as well as within the normal work (Oliver 2009, 559). The commitment of the management and lack of resources are the biggest challenges for continuous improvement. The empowerment of personnel to make decisions themselves is one of the solutions to these challenges. (Tervonen & Haapasalo 2012, 6.)

In conclusion, multiple institutions and operators have developed the safety and security of educational institutions through several projects over the past decade. Many studies have highlighted safety and security deficiencies in educational institutions. Typically the need for comprehensive, risk based SSM in educational institutions has not yet been emphasized. In general, organizations' safety and security matters are treated as separate entities – partly due to the fact that the safety and security legislation is fragmented, and the supervision is carried out by various authorities. Moreover, rectors,

teachers and lecturers have pedagogical training, whilst comprehensive, risk based SSM require a wide range of other forms of expertise. The need for safety and security knowledge has been identified by the author of this study, who works as a lecturer teaching the SSM and risk management. Therefore, in addition to the objectives of the research, there is a desire to share information and produce added value for the auditee. For these reasons, in this study, the consultative auditing process is combined with the TUTOR model, through which the knowledge and skills of comprehensive, risk based SSM are created.

3 Materials and methods

In this third chapter, the materials and methods of the study, the participants, the TUTOR model and the development phases of the new Asteri consultative auditing process are given. Moreover, the observation, survey methodology as well as statistical and thematic analysis are presented.

The audit of the educational institutions and the observation of the auditees were conducted by the two researchers, the author of this study and Ms. Tiina Ranta, Laurea UAS's Head of Safety and Security. Audit results according to the TUTOR model constituted the data for both researchers, who constructed separate studies and separate analyses based on the data. The author of this study developed the new Asteri consultative auditing process while auditing, and the researchers applied the consultative auditing process with the TUTOR model. The author of this study designed an electronic survey, through which the auditees gave feedback about the new consultative auditing process used with the TUTOR model. Additionally, the author of this study prepared the observation criteria used during auditing.

3.1 Participants

In this study, the SSM of 76 Finnish educational institutions were audited between 2011 and 2014 according to the TUTOR model and using the new Asteri consultative auditing process. In Finland there are 2,597 ESs with 527,900 pupils, 366 high schools with 113,800 students and 144 vocational schools with 206,200 young students (Tilastokeskus 2015b). Primary and secondary education operates under the Finnish National Board of Education, which also acts as a national development agency of primary and secondary education (Finnish National Board of Education 2015).

Furthermore, there and 14 universities in which there are 162,900 students and totally 26 UASs with 143,200 students; 24 of them operating under the Ministry of Education and Culture (Tilastokeskus 2015b). The Ministry of Education and Culture is

responsible for higher education (Finnish National Board of Education 2015). In Vantaa city (2014), there are 45 Finnish ESs, and in Hyvinkää town (2015) there are 18 Finnish ESs. The target was to audit as many ESs as possible in Vantaa city and Hyvinkää town. However, the minimum targeted quantity was to audit at least half of these ESs. In Table 1, the number of participants is presented.

Table 1. Participants related to the total number of Finnish educational institutions

Location	**Number of elementary schools (teaching in Finnish)**	**Number of universities of applied sciences (operating under the Ministry of Education and Culture)**
Finland	2,597 elementary schools; audited 48 of them (1.9%)	24 universities of applied sciences; audited 19 of them, of which 13 different universities (54.2%) and all seven campuses of Laurea UAS were included
Vantaa city	45 elementary schools; audited 32 of them (71.1%)	
Hyvinkää town	18 Finnish elementary schools; audited 12 of them (66.7%)	
Summary of audited educational institutions	In total, 76 educational institutions. This number includes nine other educational institutions that were partners of Laurea UAS. Six of them were vocational schools, one was a university, one was a high school and one was a community college.	

The development of the new Asteri consultative auditing process was made step by step while auditing the different levels of the educational institutions. To develop and test the suitability of the Asteri process in different educational institutions, a minimum of five UASs, five ESs and five vocational schools was the targeted quantity. To draw conclusions about the performance level, strength and weaknesses of the SSM in the educational institutions, all 24 UASs operating under the Ministry of Education and Culture were invited to be audited. Additionally, ESs in two municipalities of different sizes, Vantaa city and Hyvinkää town, located in the Central Uusimaa region, were chosen for this study. According to the Statistics of Finland, Vantaa city has approximately 208,000 inhabitants while Hyvinkää has approximately 46,000 inhabitants (Tilastokeskus 2015a).

The study is a cross-sectional study, and the unit of the observation is an educational institution. In this study, the educational institutions were divided into three different categories: UASs, ESs and other educational institutions. The population was made up of 19 UASs (25.0%), 48 ESs (63.2%) and nine other types of educational institutions (11.8%). Among the audited UASs, there were seven campuses of Laurea UAS and 12 other UASs. Additionally, among the audited ESs, there were 12 ESs located in Hyvinkää town and 32 ESs in Vantaa city, both operating under the operational area of the Keski-Uusimaa Department for Rescue Services. Moreover, four ESs located in other cities and towns were audited. Furthermore, nine other educational institutions audited were partners of Laurea UAS. The names and municipalities of the audited educational institutions are mentioned in Appendix 1. In Table 2, the location of the audited educational institutions is presented.

Table 2. Location of the audited educational institutions

Municipality	Number of educational institutions	Percent	Cumulative percent
Espoo	4	5.3	5.3
Hämeenlinna	1	1.3	6.6
Heinola	1	1.3	7.9
Helsinki	4	5.3	13.2
Hyvinkää	16	21.2	34.4
Järvenpää	1	1.3	35.7
Kemi	1	1.3	37.0
Kerava	2	2.6	39.6
Kokkola	1	1.3	40.9
Kuopio	1	1.3	42.2
Lahti	1	1.3	43.5
Lohja	1	1.3	44.8
Porvoo	1	1.3	46.1
Riihimäki	1	1.3	47.4
Rovaniemi	1	1.3	48.7
Seinäjoki	2	2.6	51.3

Municipality	**Number of educational institutions**	**Percent**	**Cumulative percent**
Sipoo	1	1.3	52.6
Tampere	1	1.3	53.9
Turku	1	1.3	55.2
Vaasa	1	1.3	56.5
Vantaa	33	43.5	100.0
Total	**76**	**100.0**	

Most of the audited educational institutions were located in Vantaa city (33 out of 76; 43%) and in Hyvinkää town (16 out of 76; 21%). The provinces of the audited educational institutions are given in Table 3.

Table 3. Province of the audited educational institutions

Province of audited educational institution	**Number of educational institutions**	**Percent**	**Cumulative percent**
Uusimaa	63	82.5	82.5
Kanta-Häme	2	2.7	85.2
Päijät-Häme	2	2.7	87.9
Lapland	2	2.7	90.6

Province of audited educational institution	Number of educational institutions	Percent	Cumulative percent
Southern Ostrobothnia	2	2.7	93.3
Central Ostrobothnia	1	1.35	94.7
Ostrobothnia	1	1.35	96.0
Pirkanmaa	1	1.35	97.4
Northern Savo	1	1.35	98.7
Southwest Finland	1	1.35	100.0
Total	**76**	**100.0**	

The audited educational institutions were located in 10 different provinces. Most of the educational institutions (63 out of 76; 82%) were located in Uusimaa province in Southern Finland. The number of teachers working in the audited educational institutions is presented in Figure 4.

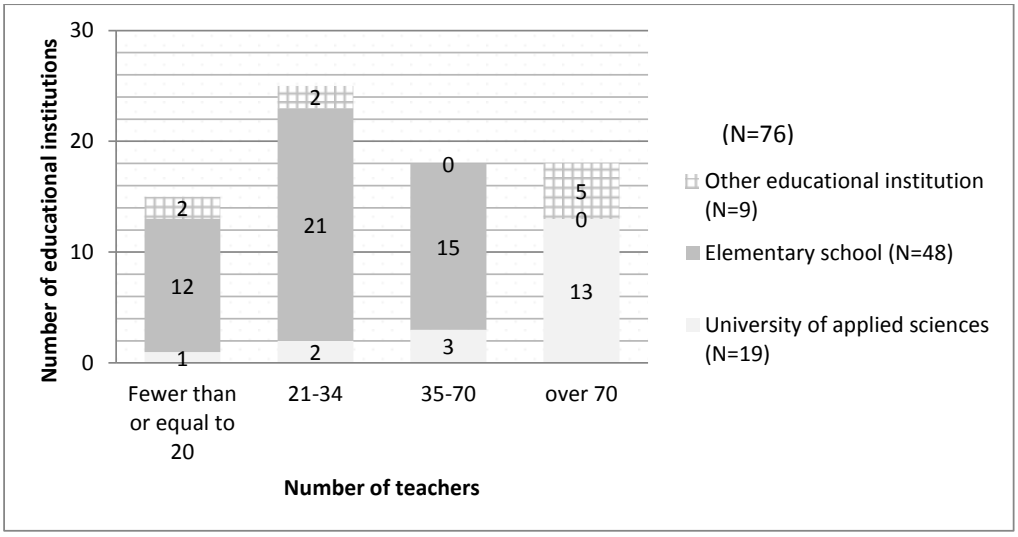

Figure 4. Number of teachers in the audited educational institutions

In the audited ESs, there were fewer than or equal to 70 teachers. The numbers of teachers varied widely in the audited UASs and other educational institutions. The variation in the number of teachers in UASs occurred because both individual campuses and entire UASs were audited. The number of teachers was used as a background variable instead of the number of personnel for reasons of comparability. For example, in the UASs, there are RD&I personnel that do not exist in ESs. The number of pupils and students in the audited educational institutions are presented in Figure 5.

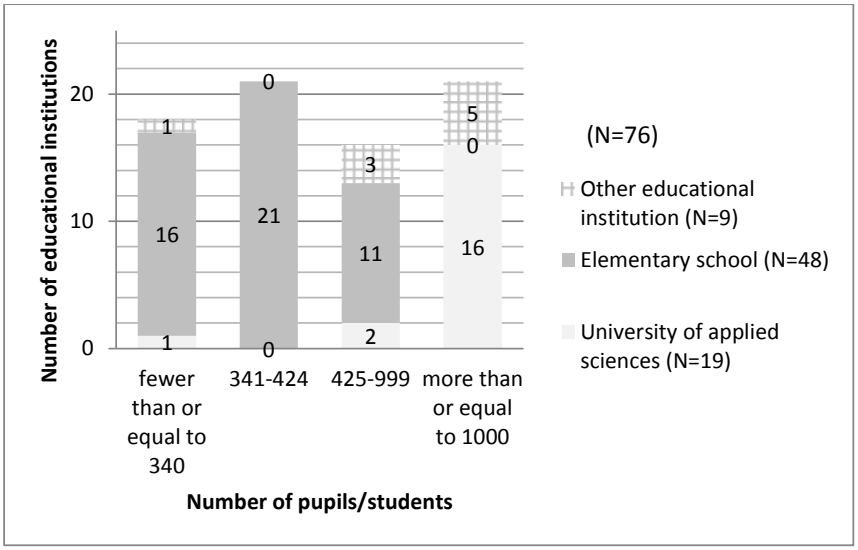

Figure 5. Number of pupils and students in the audited educational institutions

The number of pupils and students in the audited ESs was fewer than or equal to 999. In ESs, there were typically fewer pupils than in UASs. The variation concerning number of students in UASs occurred because both individual campuses and entire UASs were audited. The number of pupils/students in other educational institutions varied widely.

3.2 TUTOR model

The Finnish rescue authority, the Keski-Uusimaa Department for Rescue Services, offered its rewarded inspection model for the use of the two researchers. The TUTOR model was used in this study because it made it possible to audit comprehensive SSM system. The Keski-Uusimaa Department for Rescue Services has been developing the TUTOR model since 2010. TUTOR is a model through which either the safety management system or the SSM system can be inspected by an authority or audited, for example, by an independent third-party expert. In addition, the compliance according to the requirements of the laws covering safety and security matters in an organization can

be assessed. The audit helps to determine the intent of the SSM as well as to identify the current state of safety and security activities. The auditee makes a self-assessment and sets future targets, too. The objective is to transition away from a long tradition of mere fire inspections, in which an auditee is passive and just waits for the authority to tell what to do. By way of the TUTOR model, it is demonstrated that the organization itself has the responsibility for safety, security and risk management and, furthermore, that preparedness is a key element of the overall safety and security. (Keski-Uudenmaan pelastuslaitos 2011, 2; Helsingin kaupungin pelastuslaitos 2013, 105–108.)

According to the Keski-Uusimaa Department for Rescue Services (Keski-Uudenmaan pelastuslaitos 2011, 5), a self-assessment is an important part of the TUTOR model. The authorities may ask organizations to make a self-assessment prior to their visits. In this study, however, the management of the organization conducted a self-assessment with the auditors during the consultative auditing process. The management of the organization also set objectives for the next few years regarding their safety and security activities. Finally, an inspection was made by the authority or, as in the case of this study, the audit was carried out by the researchers.

The TUTOR model is based on EFQM and ERM. The aim is to increase the effectiveness of the audit and to offer value added service (Keski-Uudenmaan pelastuslaitos 2011, 3; Helsingin kaupungin pelastuslaitos 2013, 115, 117). Validation of the TUTOR model has been achieved in many contexts. The Keski-Uusimaa Department for Rescue Services has tested the development versions of the TUTOR model with 15 development partners in 2010 and with 30 development partners in 2011. The development partners have included, among others, the airline company Finnair, the brewery Sinebrychoff, the trading company Kesko, the National Emergency Supply Agency, the insurance broker MARSH and the insurance companies Pohjola and LähiTapiola. In 2012, the Keski-Uusimaa Department for Rescue Services applied the TUTOR model in 150 organizations. Furthermore, self-assessments have been conducted by 300 occupants of residential buildings and 50 holders of apartment

buildings according to the TUTOR model. Validation has also been achieved as part of the national TUKEVA II project, which was tasked to develop a safety culture with supervision. During the TUKEVA II project, the TUTOR model was compared with the inspection model of the Helsinki Department for Rescue Services. In addition, the TUTOR model was also tested by the Oulu-Koillismaa Department for Rescue Services and the Department for Rescue Services of the South Carelia region (Helsingin kaupungin pelastuslaitos 2013, 108, 120). In 2011, TUTOR received the OHTO (very good safety/security insight) award, which is awarded by the Finnsecurity association and Turvallisuus Journal for Finnish innovations (STT Viestintäpalvelut 2011). The TUTOR quality manual provides guidance regarding how to carry out the inspection. Moreover, the TUTOR model was taught to the researchers by the experts of the Keski-Uusimaa Department for Rescue Services during meetings and the three first audits.

3.2.1 TUTOR sections and themes

The TUTOR model (Keski-Uudenmaan pelastuslaitos 2012) consists of eight different sections, as follows:

1) SSM
2) Operational risks
3) Compliance with requirements
4) Safety and security documentation
5) Facility management technology and safety & security technology
6) Training
7) Safety and security communication
8) Results and effectiveness

In the TUTOR model, each section comprises a variable number of topics that are called cards, as they are presented on their own pages. The organization to be assessed obtains scores from 1 to 5 from each card, and a half-point interval is used. Score 1 represents the lowest performance level (Weak) and score 5 represents the highest level

(Forerunner). The arithmetical mean of each section is calculated. Eventually, a total arithmetical mean covering all sections is calculated, and thus the overall performance level of the SSM of the organization is determined. (Keski-Uudenmaan pelastuslaitos 2011, 2012.)

There are five repeating themes in the TUTOR model: risks, stakeholders, reporting, indicators and continuous improvement (Keski-Uudenmaan pelastuslaitos 2012). In Figure 6, the eight different sections and the five themes of the TUTOR model are illustrated.

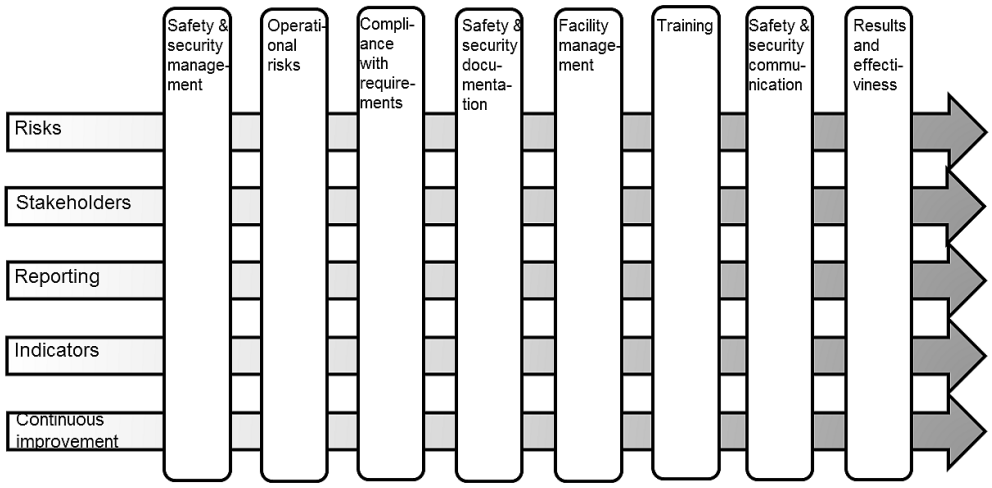

Figure 6. Sections and themes of the TUTOR model

It is important to note that the TUTOR model can be used when auditing, for example, all SSM sectors of the Confederation of Finnish Industries (2011), or it can be used in a limited context – for example, to inspect fire safety and emergency preparedness only. There are four different versions according to which the TUTOR inspection or audit can be made: TUTOR Home, TUTOR Light, TUTOR Basic and TUTOR Max. The version is chosen based on the size of the organization and its specific features as well as the nature of the risks. In each section, there are one or more relating topics. As mentioned,

the topic is called a card, as it is presented on its own page. The number of cards varies in different versions of the TUTOR model. The simplest level is the TUTOR Home model, which can be used as its name implies: for homes. It consists of one card only. The TUTOR Light model comprises eight cards, and it can be used for small-scale industry, offices and shops. There are 11 cards in the TUTOR Basic model, and it is intended for large stores and offices, hotels and therapy clinics, for example. There are 23 cards in the TUTOR Max model and it can be used, for example, for enterprise groups and the educational departments of towns and cities. (Keski-Uudenmaan pelastuslaitos 2011.) According to Eklund (2013), who is one of the developers of the TUTOR model, the results do not depend on the TUTOR version used. Thus, the results obtained with, for example, the TUTOR Basic model are comparable with the results obtained with the TUTOR Max model.

3.2.2 TUTOR Max model

In the TUTOR Max model (Keski-Uudenmaan pelastuslaitos 2012), there are a total of 23 cards – in other words, 23 pages divided into eight different sections. There are five cards in section 1, SSM: Planning and control (1.1), management awareness (1.2), monitoring and control of the organization (1.3), resources as well as safety and security organization (1.4) and, finally, cooperation with stakeholders (1.5). Card 1.1 includes the requirements of the guiding principles for safety and security operations as well as for risk based safety and security planning. Moreover, it consists of the requirements for the role of management control and continuous improvement. Card 1.2 comprises the safety and security reporting procedure and its interval. Card 1.3 includes the requirements for regulatory controls and corrective actions caused by the controls. It also includes requirements for the routine internal controls made by the organization itself and internal and external audits as well as the management's awareness of the current state of safety and security. Card 1.4 covers the adequacy of resources and the designation of responsibilities for safety and security tasks. Card 1.5 includes the requirements to determine whether the organization has identified its safety and security stakeholders and their needs, expectations and responsibilities.

Examples of the safety- and security-related stakeholders of educational institutions identified in this study are shown in Figure 7. In the inner periphery of Figure 7, internal stakeholders are presented and, respectively, in the outer periphery external stakeholders are given.

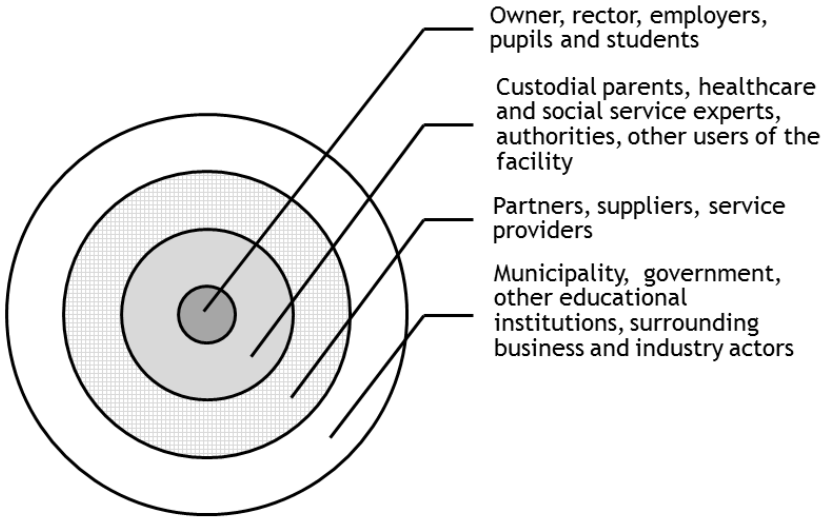

Figure 7. Safety- and security-related stakeholders of educational institutions

Additionally, in TUTOR Max model (Keski-Uudenmaan pelastuslaitos 2012) in section 2, Operational risks, there are four cards: objectives and guidelines (2.1), risk management system and comprehensiveness (2.2), risk identification (2.3) and, finally, implementation and effectiveness (2.4). Card 2.1 brings up the objectives of the risk management based on the risk management policy, vision and strategy. Furthermore, the guidelines and instructions based on risk assessment are assessed. Card 2.2 assesses whether the overall risk assessment is made both at the corporate and the unit levels. Card 2.3 investigates the identification of operational risks. The participation of stakeholders is evaluated, too. Moreover, card 2.3 includes the requirements for risk identification, forming a part of enterprise risk management. Card 2.4 comprises the

prioritization and categorization of risks, appointing persons in charge, defining schedules and taking the necessary steps to manage risks. Moreover, in the TUTOR Max model, in section 3, Compliance with requirements, there is one card: safety- and security-related regulatory requirements and other relevant guidelines (3.1). It consists of regulatory requirements and their recognition and the monitoring of changes in legislation. (Keski-Uudenmaan pelastuslaitos 2012.)

In section 4 of TUTOR Max model (Keski-Uudenmaan pelastuslaitos 2012), Safety and security documentation, there are two cards: operating models (4.1) and legal documents and plans (4.2). Card 4.1 comprises the requirements for the documentation of the management system, and it identifies the person responsible for the documentation. It also investigates the coverage of safety and security documentation as well as the confidentiality, integrity and availability of safety and security documentation. Card 4.2 includes the requirements for the legal documents that must be available for the members of the organization and its stakeholders. It investigates whether these documents have been put into practice, too. Additionally, it comprises the requirements for the documentation that must form a part of the quality management system and the processes of the management.

In section 5 of TUTOR Max model (Keski-Uudenmaan pelastuslaitos 2012), Facility management technology and safety and security technology, there are four cards: technical systems (5.1), premises for rescue operation (5.2), preparedness (5.3) and outsourced operations (5.4). Card 5.1 covers the appropriateness and operation of the technical systems. It includes the requirements for management's awareness of the need for maintenance and also the implementation of the maintenance. Card 5.2 covers periodic inspections and the requirement of the premises for the rescue operation that must fulfill the requirement of the building permit. Furthermore, it covers the operational ability of the personnel and safety-critical stakeholders. Card 5.3 concerns the organization's ability to protect its personnel in danger. Civil defense shelters, their supplies and the management of shelters are also assessed. In addition, it covers the identification of critical infrastructure. Card 5.4 brings up the need for the management

of outsourced services, the responsibilities caused by outsourcing activities and the need for contracts covering safety and security issues.

Furthermore, in TUTOR Max model (Keski-Uudenmaan pelastuslaitos 2012) section 6, Training, there are three cards: planning and organizing of training (6.1), adequacy of the training (6.2) and, lastly, training register and training plan (6.3). Card 6.1 investigates the planning of the safety training, and it assesses whether the training is appropriate compared to the risks involved and, additionally, whether training is planned adequately and comprehensively. Card 6.2 consists of the amount, adequacy and quality of the training. Card 6.3 assesses whether quantitative and qualitative goals have been set for safety and security training and whether they are recorded in the training register.

In section 7 of the TUTOR Max model, Safety and security communication, there are two cards: implementation of safety and security communication (7.1) and safety communication in special situations (7.2). Card 7.1 covers the implementation of safety and security communication as well as its adequacy and comprehensiveness as far as the risks and activities of the organization are concerned. Card 7.2 investigates crisis communication, its adequacy and its implementation. (Keski-Uudenmaan pelastuslaitos 2012.)

Finally, in TUTOR Max model (Keski-Uudenmaan pelastuslaitos 2012) section 8, Results and effectiveness, there are two cards: monitoring and measurement (8.1) and analysis and improvement (8.2). Card 8.1 addresses the monitoring and measurement of the activities of the organization. It assesses the existence of a monitoring and measuring system and also agreed responsibilities. Card 8.2 comprises analysis and improvement. It includes the requirement of indicators that are to be analyzed and used effectively as well as the requirement of continuous improvement.

3.2.3 Performance levels

As mentioned, the organizations to be assessed obtain scores from all cards. The scores vary from 1 to 5, and a half-point interval is used. The arithmetical mean of each section is calculated. Eventually, a total arithmetical mean covering all sections is calculated, and thus the overall performance level of the organization is determined. There are five different performance levels: Weak (level 1), Incomplete (level 2), Basic (level 3), Committed (level 4), and Forerunner (level 5) in the TUTOR model (Keski-Uudenmaan pelastuslaitos 2012), as shown in Figure 8, outlined by the author of this study.

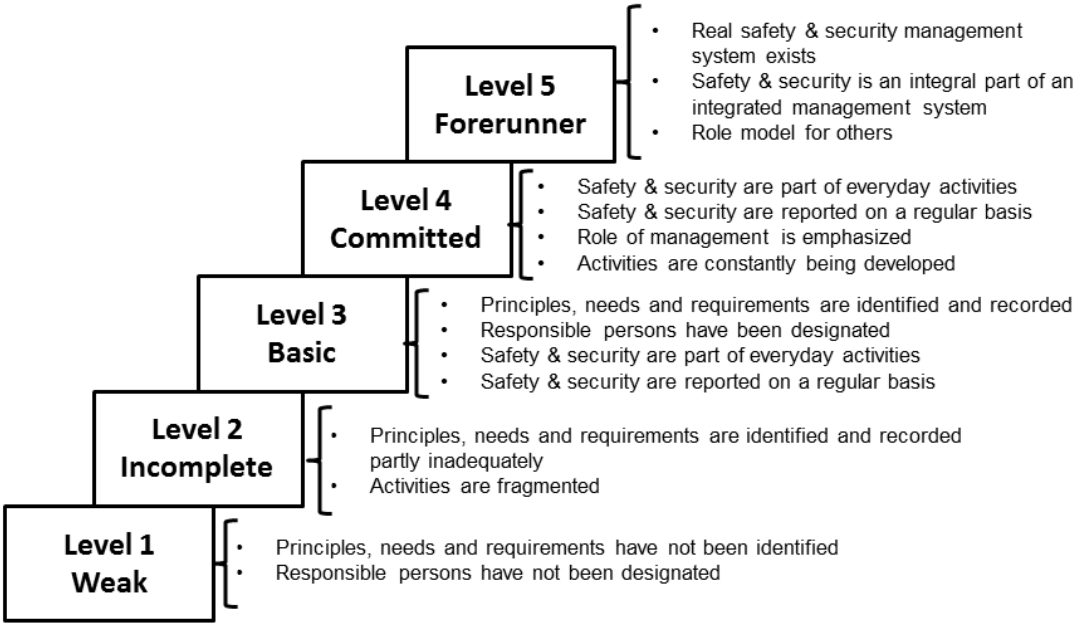

Figure 8. Performance levels according to the TUTOR model

In the first level, Weak, the SSM is at an early stage. The identification of principles, needs and requirements are missing. Furthermore, the responsibilities are not designated as far as safety and security activities are concerned. In the second level, Incomplete, the development of the SSM has been started. Principles, needs and requirements are

identified, but they are recorded partly inadequately. Moreover, there is fragmentation in the safety and security activities. In the third level, Basic, principles, needs and requirements are identified and recorded. Additionally, the responsible persons have been designated. In the third level, safety and security form a part of everyday activities, and a reporting system operates on a regular basis. Level three is considered to be the minimum acceptable level based on the TUTOR model. In the fourth level, Committed, safety and security can be seen in everyday activities. Furthermore, safety and security matters are regularly reported and the role of the management is emphasized. Safety and security activities are also constantly developed. At the top, in the fifth level, Forerunner, a true SSM system exists. Safety and security form a part of the organization's integrated management system. Moreover, the organization is a role model for other organizations (Keski-Uudenmaan pelastuslaitos 2011, 2012). The summary page of the TUTOR Max report is shown in Appendix 2.

3.2.4 Carrying out audits with the TUTOR model

The researchers carried out audits of the educational institutions by visiting the auditees' premises. In this study, the consultative auditing process Asteri was combined with the TUTOR model. The auditees conducted self-assessments and set target states for each different card according to the TUTOR model. In addition, the auditors gave the mutual score for each card. A scale of 1 to 5 with a half-point interval was used. This procedure was repeated for all cards, comprising the eight different sections of the SSM. Six campuses of Laurea UAS and one vocational school were audited according to the TUTOR Basic model, and the rest, 69 educational institutions, were audited according to the TUTOR Max model.

In this study, all SSM sectors of the Confederation of Finnish Industries (2011) were covered. The arithmetical means for the eight sections were calculated for the self-assessment, the target state of the future and also for the evaluation made by the auditors. Eventually, a total score per educational institution, in other words an overall performance level for the SSM covering all eight sections, was calculated.

3.3 Audits as a process toward Asteri

In this section, the development of the Asteri consultative auditing process is described. Asteri is intended to be used with many different types of audits, not only in SSM audits, when there is a need for the teaching and learning of the subject to be audited.

3.3.1 Phases of the development

The new consultative auditing process, Asteri, was developed in the study between December 2011 and April 2014, step by step, and while carrying out the audits according to the TUTOR model, as shown in Table 4. There were five partially overlapping phases in the development of the consultative auditing process.

Table 4. Phases of the development of consultative auditing process

Phase of development of consultative auditing process	**Audited educational institutions**	**Content of the development**
First phase December 2011– June 2012	Seven campuses of Laurea University of Applied Sciences	In December 2011, the learning of the TUTOR model was started by the two researchers. In March 2012, the need for the consultative approach was identified. In March 2012, it was identified that the self-assessment is a significant part of the consultative auditing process. It was decided that self-assessment by the organization would be made during the audit with the help of the auditors, not independently before the audit.

Phase of development of consultative auditing process	**Audited educational institutions**	**Content of the development**
		In March 2012, the observation regarding attitudes on auditing was taken into use. The initial and closing attitudes of the auditees on auditing were recorded. In March 2012, it was decided that two auditors, where possible, would be used and that an audit duration of 3-3.5 hours would be optimal. Moreover, in March 2012 the need for auditees' self-preparation was decided to be kept to a minimum. In March 2012, it was decided to use the TUTOR Max model instead of TUTOR Basic model whenever possible.
Second phase May 2012 – February 2014	Other universities of applied sciences than Laurea UAS as well as Laurea UAS's partners (vocational schools, university, high school, and	Development of the consultative auditing process continued. In May 2012, the need to introduce the content of the SSM system arose. In August 2012, the strengths and development areas of the audited organization were started to be reported in the summary of the audit. In October 2012, the need for introducing performance levels of the SSM to the auditee in more detail at the beginning of the audit was identified.

Phase of development of consultative auditing process	Audited educational institutions	Content of the development
	community college)	In October 2012, it was noticed that it is beneficial to encourage the auditee's members to discuss with each other and think out loud and not immediately answer the questions raised by the auditors. In May 2013, the perception was confirmed that the presence of a rector or the managing director is needed to achieve management commitment.
Third phase October 2012 – August 2013	Elementary schools in Hyvinkää town	The developed consultative auditing process was re-evaluated and no changes were made to the process during the third phase.
Fourth phase September 2013 – March 2014	Elementary schools in Vantaa city	Development of the consultative auditing process continued. In September 2013, it was decided to always check the documentation constituting the audit evidence whenever during the self-assessment the auditee considered that performance level 3 or higher has been achieved. In October 2013, the need to introduce additional documents for the auditee showing compliance of performance level 3 in the SSM was identified. In November 2013, it was identified that the auditor must take into account possible negative attitudes

Phase of development of consultative auditing process	**Audited educational institutions**	**Content of the development**
		generated by the audit when planning and preparing for the audit. It was decided that the audit may be interrupted if it appears that the auditee had strong emotional feelings toward the audit. It was also decided to start the audit by informing the auditee that the audit may generate negative attitudes and that the audit may be interrupted, if desired. In November 2013, the order of items to be audited was changed. In November 2013, it was decided that if a separate fire inspection is made by the authority relating to the audit, it should be made before the audit. It was also identified that the setting of future targets is a vitally important part of the consultative auditing process.
Fifth phase March 2014 – June 2014	Analyzing results	Analyzing the results of the audits and the consultative auditing process. The consultative auditing process was finalized. Finally, the consultative auditing process was given the name of Asteri.

First of all, the TUTOR model was taught to the researchers by the experts of the Keski-Uusimaa Department for Rescue Services during meetings and three first audits. In the first phase of the development of Asteri, the new consultative auditing process, six campuses of Laurea UAS were audited according to the TUTOR Basic model and the

seventh campus was audited according to TUTOR Max model. During the three first audits, an expert from the Keski-Uusimaa Department for Rescue Services acted as lead auditor. After that, the audits were carried out by the researchers.

The need for the consultative approach was identified while auditing, and, therefore, the development of the new consultative auditing process was started by the author of this study. As of March 2012 it was decided that the TUTOR Max model was to be used instead of the TUTOR Basic model whenever possible due to the fact that more cards were needed to bring to light the comprehensive SSM. The consultative auditing process began with scheduling the date for the audit. Typically, in the case of educational institutions, the date and time of the audit were agreed upon with the rector or the safety/security manager. A time period of three to three and a half hours was requested for the audit. The auditor asked the contact person of the organization to be audited to invite other participants to the audit, such as the members of the safety team or the crisis team, the quality manager and either the maintenance manager or the janitor. The contact person of the educational institution was asked to bring documents relating to safety and security with him/her to the audit session. The auditor sent a brochure describing the auditing procedure to the contact person by e-mail, and he/she was asked to distribute the brochure to all participants. This way all participants were able to become familiar with the auditing procedure in advance.

It was known by the author of this study that the Keski-Uusimaa Department for Rescue Services sends the form of the TUTOR model in advance to the organization to be inspected and asks them to make a self-assessment before the audit. Nevertheless, it was also decided that the self-assessment in this study would be made during the audit with the help of the auditors and not independently before the audit. The observation regarding attitudes on the consultative auditing process was started. Additionally, the optimal combination of the audit duration and the number of auditors were determined. It was decided that two auditors, where possible, and audit duration of 3–3.5 hours were optimal. Moreover, the need for auditees' self-preparation was decided to be kept to a

minimum; the auditees were asked only to bring their safety and security documentation with them to the audit session.

In the second phase, the UASs other than Laurea UAS as well as Laurea UAS's partners were audited. As mentioned, Laurea UAS's partners that were audited were vocational schools, a university, a high school, and a community college. The development of the consultative auditing process was continued. In May 2012, it was noticed that the theoretical framework of the comprehensive SSM system was needed by the auditees to be able to understand the audit questions. The model of the organizational SSM developed by the Confederation of Finnish Industries (2011) was presented to the auditees at the beginning of the audit session. Furthermore, In August 2012, it was started to report the strengths and development areas of the audited organization as a part of the summary of the audit. Moreover, the need for introducing the performance levels of the SSM in more detail was identified in October 2012, and the figure describing these levels was outlined, as shown in Figure 8. Moreover, in October 2012, it was noticed that the auditors needed to encourage the auditee to discuss with each other and think out loud and not immediately answer the questions raised by auditors. In May 2013, the perception was confirmed that the presence of a rector or the managing director was needed to achieve management commitment. In the third phase, while auditing ESs in Hyvinkää town, the developed consultative auditing process was re-evaluated and no changes were made.

In the fourth phase, the ESs of Vantaa city were audited. The development of the consultative auditing process continued. In September 2013, it was decided to always check the documentation constituting the audit evidence if, during the self-assessment, the auditee considered that a performance level 3 or higher had been achieved. With lower performance levels, it was decided to rely mostly on the verbal information received from the auditees.

In October 2013, it was noticed that there was a need to introduce additional safety and security documents that show in detail the compliance with performance level 3. Some

theoretical and some concrete, real life documents were chosen. The definition of risk (ISO 31000:2009, 2; OHSAS 18002:fi 2008, 43), the security policy of Kesko Corporation (2010) and the risk management policy of Kemi town (2010) were presented to the auditees, when needed. Furthermore, Laurea UAS's training register and the risk assessment results of one of Laurea UAS's campuses were shown, if necessary. Van Steen's (1997, 4) indicators were presented as an example of balanced indicators concerning safety and security. Additionally, safety- and security-related stakeholder groups, as presented in Figure 7, were shown to the auditees, when needed. These documents were used to demonstrate what kind of documentation was required to be able to fulfil the requirement of performance level 3 in the SSM.

At the beginning of developing the Asteri consultative auditing process, it was thought by the author of this study that sending the form of the TUTOR model in advance may create stress for the auditee. The printed versions of the audit form were given to the auditee at the beginning of the audit. In autumn 2013, it was decided to send the audit form to the contact person by e-mail some days before the audit, because the number of participants of the audit varied greatly. Sometimes there was only the rector present, and some other time there were 10 persons present; an average of four persons of the organization were involved in the audit. In a few cases, there were representatives of adjacent educational institution in the audit, too. It was also emphasized to the contact person of the organization that the self-evaluation would be conducted during the audit session. It was identified that the self- assessment and setting of the future targets by the auditee itself are vitally important parts of the consultative auditing process.

During the fourth phase in November 2013, the possible negative attitudes generated by the audit were identified. It was decided that the auditor must take into account the attitudes of the auditees when planning and preparing for the audit. This is reflected, inter alia, in the facts that the audit is to be based on objectivity and positivity as well as it must produce added value to the auditees. The auditor also highlighted the strengths of the organization, as well as emphasized the purpose of the audit to develop its SSM. It was decided that the audit may be interrupted if it appeared that the auditee had strong

emotional feelings toward the audit. It was also decided to start the audit by informing the auditee that the audit may generate negative attitudes and that the audit may be interrupted, if desired. The researchers observed auditees while auditing, and if signs of strong negative attitudes were identified, the auditees asked whether the audit should be interrupted. The auditee makes a decision for interrupting the audit. It was also decided that the researchers could interrupt the audit for a while if the atmosphere was becoming very tense – for example, by taking a break or taking an observation tour of the indoor or outdoor premises.

The order of the items to be audited was changed, too. In the early stages of the consultative auditing process, the TUTOR Max sections and cards were gone through in numerical order starting at card 1.1 and ending at card 8.2. While auditing the educational institutions, it was identified which requirements were easier and which were more difficult to meet and, moreover, which requirements were more difficult to internalize. After that finding, the most familiar sections were discussed first. The order of the TUTOR Max cards was as follows: Documents (cards 4.1, 4.2), Compliance with requirements (card 3.1), Safety & security communication (cards 7.1, 7.2), Facility management technology and safety & security technology (cards 5.1, 5.2, 5.3, 5.4), Training (cards 6.1, 6.2, 6.3) and, finally, Results and effectiveness (cards 8.1, 8.2). Next, Operational risks were audited. The order of cards in the Operational risks section was changed, and the new order of the cards was as follows: 2.3, 2.4, 2.1 and 2.2. Finally, SSM was audited. The order of cards in the SSM section was changed, and the new order of the cards was as follows: 1.5, 1.4, 1.3, 1.2 and 1.1.

Next, it was decided that if a separate fire inspection is to be made by the authority relating to the audit session; it should be made before the consultative audit. This way, the authority would have already raised deficiencies related to fire safety, if any, before the consultative audit starts. This helps the auditee to accept any deficiency, and the discussion about future targets can begin well.

After the audit, the auditor sent an e-mail to the auditee in which the audit report, and strengths and development areas as well as the link to the electronic survey in connection with this research were enclosed. Therefore, no separate cover letter was created for the electronic survey. The survey is shown in Appendix 3. During the audit, the auditee was informed about the upcoming electronic survey and also the purpose for which the survey results will be used. The contact person of the audited organization was asked to distribute the audit report, strengths and weaknesses and the link to the electronic survey to all participants of the audit. On request, the researchers joined the management team of the organization and presented the audit results. In the fifth phase, feedback concerning the use of the consultative auditing process and its effects on auditees were analyzed. Lastly, the consultative auditing process was finalized and the name Asteri was given to the consultative auditing process.

3.3.2 Observation of the auditees

In this study, a participatory-type of observation was conducted by the two researchers while auditing. The researchers observed auditees' attitudes on the consultative auditing process first at the beginning of the audit session (initial attitude) and eventually at the end of the session (closing attitude). Attitude is a way of thinking about something/ somebody or behaving towards something/somebody. It expresses a feeling or opinion. (Oxford Advanced Learner's Dictionary of Current English 1995, 66.) The observation was made on a three point scale, 1 to 3, in which 1 is reserved, 2 is neutral and 3 is positive. The scoring was based on the way the participants talked and their body language. The signs of a neutral attitude during the auditing were shown as calm speech while answering the auditors and talking with other participants. The participants were also sitting peacefully in their seats. Additionally, they were ready to hear about the good practices presented by the researchers. The signs of a reserved attitude were restless movement in the chair, worried facial expressions and a strong desire to defend his/ her organization. A positive attitude was indicated by open conversation with the auditors and other participants. Moreover, the participants raised questions and

commented actively, and they themselves found ways to improve the SSM of their organization.

The audited organization received one general score on their initial attitude and one general score on their closing attitude. Often there were many participants in the audit, and the overall attitude of the group was assessed. Both auditors made observations by themselves. Just after the auditing was over, the auditors compared the given scores. Only twice were the scores of the researchers unequal. The auditors found a common understanding through discussion and thus adopted joint scores.

Top (1997, 83) mentions that behavior reflects the attitude of the person and, moreover, attitudes and beliefs influence the actions of individuals. A window into the attitudes is revealed by observing behavior. Saunders, Lewis and Thornhill (2007, 287–288), van der Velde, Jansen and Anderson (2004, 99) and Järvinen (2012, 146) state that an observation is used to investigate the concrete behavior of the individual or the group of individuals and the complex interactions among them. The research may be a participatory type or a non-participatory type of observation. Yin (1998, 231, 247) argues that the strengths of a participatory type of observation are a sense of reality and a contextual nature. An observation of an event takes place in real time, and it covers the context of the event. Additionally, it offers information about human relationships, behavior and motives. There are weaknesses in participatory observation, too. According to van der Velde, Jansen and Anderson (2004, 101) as well as Yin (1998, 231), such an observation takes time and requires human resources, preparation and training. An event may occur differently because of the absence of observers. It may also be selective. Moreover, it is difficult to control the research variables, as the researcher just waits until the behavior takes place, and the behavior may be too subtle to be recognized. Individual differences among researchers may affect the observation results. Finally, an observation may also be biased because of manipulation of the event by the observer.

3.3.3 Survey after the audits

An electronic survey was used to obtain feedback after the audit on the Asteri consultative auditing process and the development targets of the workplace. The audit results and a link to the survey were sent to the contact person of 76 audited educational institutions, approximately two weeks after the audit. The contact person was most commonly a rector. He or she was asked to distribute the audit report and a link to the electronic survey to all participants of the audit. In total, 63 respondents from 40 different audited educational institutions (52.6 %) answered the survey by the end of April 2014. The number of respondents varied for different questions, as shown in section 4.3.

In the electronic survey there were four different sets of questions: attitudes on the consultative auditing process, effects on the respondent's perceptions and knowledge, effects on concrete actions and development targets of the workplace. Moreover, in the electronic survey there were nine statements concerning the attitudes on the consultative auditing process, 11 statements concerning the effects of the consultative auditing on the auditee's perceptions and knowledge and six statements concerning the effects of consultative auditing on the concrete actions taken by the audited educational institution after the audit. The respondents were asked to take a stand on a six-point Likert scale from 1 to 5, while 6 corresponded to "I do not know / I cannot take a stand." Statements such as "I do not want to answer" or "I cannot take a stand" were deleted from the answers. An arithmetical mean was calculated per each statement given by the respondents. The closer the arithmetical mean was to the score of 1, the more pleased the respondents were. Finally, in the electronic survey, there were 14 statements concerning the development targets of the auditee's workplace. Analyzing methods used for the development targets are given in section 3.4 and, moreover, the development targets are presented in section 4.5.

According to Järvinen (2012, 55), Nardi (2006, 17–18) and Fowler Jr (1998, 365–366), questionnaires can be used to collect opinions, attitudes, motives, values, norms and

actions of respondents. Questionnaires are economical to implement because they require few human resources. Anonymity is also an advantage. In addition, results can be statistically analyzed. However, wrong terminology or language may cause misunderstanding among respondents. All respondents should be able to understand the question in a survey in the same way, and if definitions are needed, they should be given before the question is asked.

However, a questionnaire has also disadvantages. There is a large amount of work in preparing a questionnaire (Saunders, Lewis & Thornhill 2007, 61–62; van der Velde, Jansen, & Anderson 2004, 106–107). There may be a gap between what people think or do and what they answer. The questions can be misunderstood and overlooked. In addition, the return rate may also be low. (Nardi 2006, 17–18.)

Nardi (2006, 75) mentions that the Likert scaling technique can be used in a questionnaire, and it is useful when studying a person's attitudes and opinions. Even-numbered scales prevent respondents' tendency to choose a neutral, middle opinion when they do not have any opinion. By keeping the direction of the scale consistent throughout the questionnaire, confusion and errors can be minimized.

3.4 Statistical methods, indexing and thematic analysis

In this section, the statistical methods, indexing and thematic analysis used in this study are presented. Tabulation and diagrams were used in this study for basic data analysis. Statistical analysis was used for analyzing the collected data about auditee's attitudes on consultative auditing process, the effects of the consultative auditing process on the auditee's perceptions and knowledge and the effects of the consultative auditing process on concrete actions. Moreover, statistical analysis was used for analyzing connections between the different variables collected via the survey after the audit and by observation during the consultative auditing process. Non-parametric statistical methods were used for analyzing results because the collected data were not normally distributed and were skewed. According to Boslaugh (2012, 307, 548) and Nummenmaa (2011,

259), non-parametric statistical methods are distribution-free statistics, and they are used when the collected data are not normally distributed and when the data may be skewed. The data were analyzed by using IBM SPSS Statistics 22 program. To detect possible errors in the data recording stage, average, deviation, minimum and maximum values were calculated. Missing data were not replaced, and therefore the sampling sizes varied slightly. Since the scale of TUTOR Max model as well as that of the initial and closing attitudes on auditing were different from those in the survey results, their scales were reversed before carrying out factor and reliability analyses.

A Mann-Whitney U-test was used to test the significance of differences between different variables. Nummenmaa (2011, 259–269) as well as Plichta Kellar and Kelvin (2013, 111, 177) state that the Mann-Whitney U-test compares independent samples by determining whether there is a relationship between two groups. It identifies whether the samples originate from the same distribution. According to the null hypothesis, two or more medians of the distribution of the ranked data are equal. Additionally, Spearman's rank-order correlation coefficient, also called Spearman's Rho, was used to determine relationships between different variables. According to Plichta Kellar and Kelvin (2013, 276), Spearman's Rho tests the relationship of two groups by ranking each of the variables. The correlation coefficient is computed on the differences in the rank scores. According to the null hypothesis, the ranks of one sample do not correlate with the ranks of the other sample.

Furthermore, Fisher's exact test was used to test the relationship between two variables to measure the internal reliability and consistency of the electronic survey. Boslaugh (2012, 127, 132) mentions that Fisher's exact test is a nonparametric test similar to Pearson's chi-square test but can be used for few or sparsely distributed data for which Pearson's chi-square test cannot be used. According to the null hypothesis of the Fisher's test, there is no relationship between the two categorical variables. The alternative hypothesis is that the variables are dependent. In addition, Cronbach's alpha was used to analyze the internal reliability and consistency of the electronic survey. Nummenmaa (2011, 356) as well as Plichta Kellar and Kelvin (2013, 374) mention that

Cronbach's alpha is a measure of internal consistency reliability and can be used to test an electronic survey with a number of statements. It is used to identify whether the individual questions, in other words items, correlate with each other and, thus, measure the same matter.

In this study, factor analysis was used for analyzing the statements of the survey. Furthermore, graphical examination of the sum variables was conducted to clarify relationships between variables. According to Boslaugh (2012, 291–292), factor analysis is used to compress a data set into a smaller and more manageable data set. Secondly, it is also used to identify latent variables in large data sets representing highly correlated input variables. Thirdly, factor analysis is used for hypothesis testing.

In the electronic survey, there were 14 different development targets for the auditees to choose from among after the auditing was finished. The statements were based on the theory of the SSM and previous studies such as Lanne (2002), Waitinen (2011), Kuusisto (2000), Helsloot and Jong (2006), Koskenranta, Paasonen and Ranta (2012), European Agency for Safety and Health at Work (2010) and Opetus- ja kulttuuriministeriö (2013). The aim was to find out whether the chosen development targets were in line with the results of the audit. Furthermore, the scenario work outside the TUTOR model was added as a development target to determine whether the need to plan for the future had arisen in the audited organizations. As mentioned, the respondents were asked to choose the six most important development targets of the workplace for the next three years in order of importance. In the survey, 1 equals the most important and 6 equals the least important. It was also instructed that it was not necessary to choose a maximum of six development targets but just to select as many targets as needed. However, at least one target was asked to be chosen. Some respondents chose more than one development item with the same priority. An index summarizes the responses. The index was calculated separately for each individual development target based on ranking as follows:

- The first important choice was multiplied by 10;
- The second important choice was multiplied by 7;
- The third important choice was multiplied by 5;
- The fourth important choice was multiplied by 3;
- The fifth important choice was multiplied by 2 and
- The sixth important choice was not multiplied.

Additionally, auditees were also asked to state the reasons why these particular development targets were chosen. A thematic analysis was conducted for analyzing the reasons mentioned by the respondents. Aronson (1994) and Eriksson and Kovalainen (2010, 219) mention that in thematic analysis, a researcher examines narratives from respondents' speech or written text. The researcher looks for patterns of themes to identify essential topics or themes and examines them by combining or dividing issues. A theme may be a concept, trend, idea or, alternatively, a distinction arising from the empirical data. Themes and sub-themes are identified, combined and categorized to be able to carry out a closer and more detailed exploration.

4 Results of the study

In this fourth chapter, the results of the empirical study are presented. The results concerning the development of the Asteri consultative auditing process are given, and furthermore, the results on attitudes on the Asteri process as well as effects of the Asteri process are shown. Additionally, audit results including the strengths, development needs and differences between the educational institutions in comprehensive SSM are presented. The development targets of the auditees' workplaces are also given. Finally, the connections between different variables of the study are shown.

4.1 The Asteri consultative auditing process

The new consultative auditing process, Asteri, is illustrated in Figure 9. The traditional auditing process is given on the left side, and the additional elements associated with Asteri are shown on the right side of the figure.

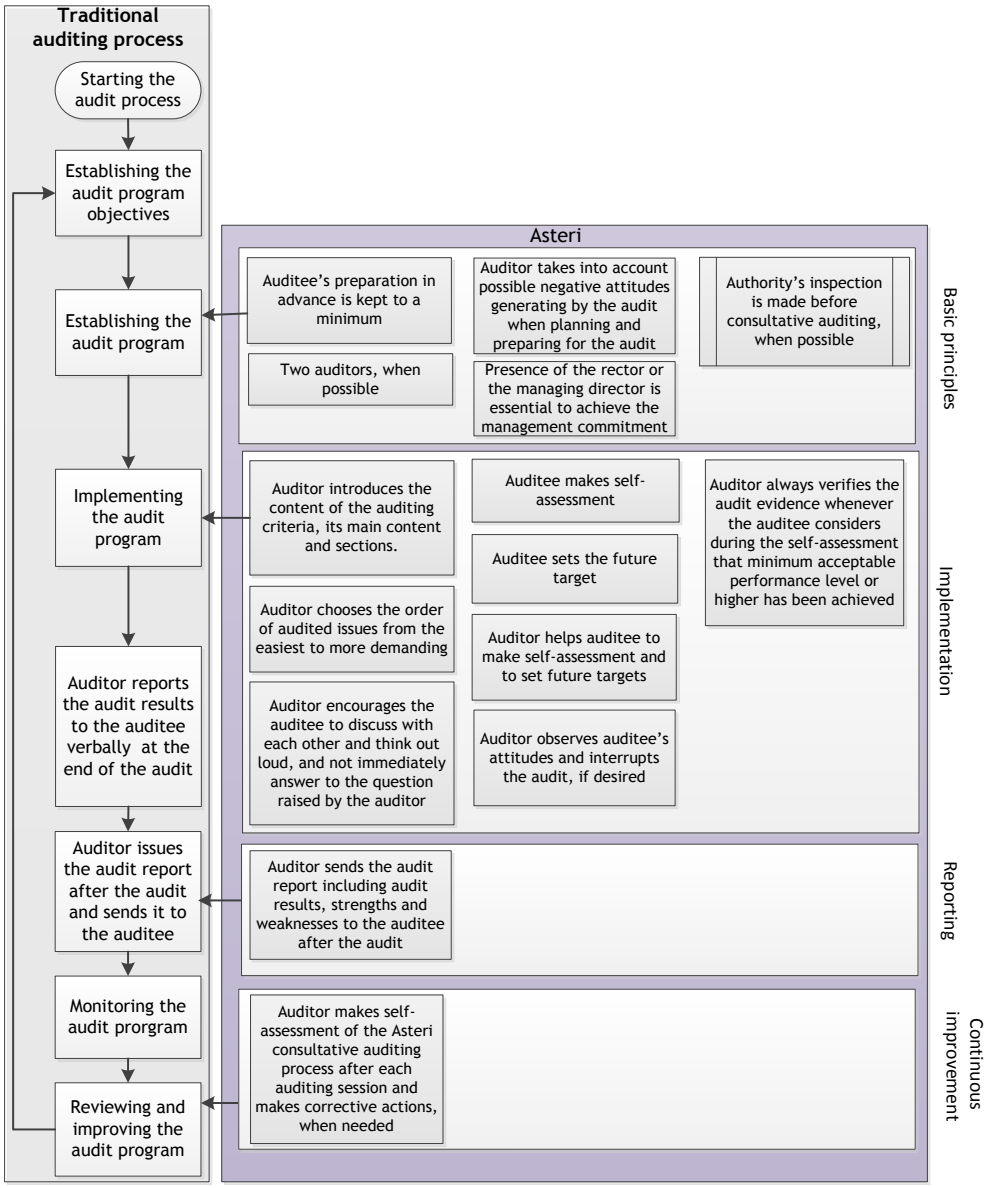

Figure 9. Connection between a traditional auditing process and the Asteri consultative auditing process

The auditing session starts with introducing the purpose of the audit and describing the auditing criteria. Next, the auditors present the model of organizational SSM and its assets developed by the Confederation of Finnish Industries. In addition, the sections and performance levels of the TUTOR model are introduced and the auditing process is presented.

The auditors choose the order of audited issues from easiest to more demanding based on their experience. At the beginning of the audit, when using the TUTOR model, the auditor reads the description of performance level 3 of the first card to be discussed and, furthermore, asks the auditee to describe how the item has been addressed in their organization. The auditors give consultation by asking questions and presenting documentation meeting a minimum acceptable performance level of 3 and, if needed, present the lower or higher performance levels. The intention of the consultation is to help the auditee to conduct self-assessment and to set future targets, too Thus, the auditors help the members of the organization to identify the key issues of the cards. It is beneficial that the auditor encourages the auditee to discuss with each other and think out loud and not immediately answer the question raised by the auditor. Suitable participants for the audit include the rector or the managing director, the safety/security manager, the members of the safety team or the members of the crisis team, the quality manager, the maintenance manager and the janitor. The presence of the rector or the managing director is essential to achieve the management commitment.

After the discussion, the auditee is asked to perform a self-assessment one item at a time during the audit. Typically, the future target is to be achieved within the next three years. Thereafter, the auditee sets the future target – in other words, the future performance level one item at a time. The auditors observe auditee's attitudes and interrupt the audit, if desired. Finally, the auditors ask for the audit evidence. The auditor always verifies the audit evidence whenever the auditee considers during the self-assessment that the minimum acceptable performance level of 3 or higher has been achieved. Next, the auditors assess the audit evidence and make judgments one item at a

time. The auditors give their mutual score based on a brief conversation between auditors and, where appropriate, after posing focused questions to the auditee.

Each card is discussed through one at a time in a certain order set by the auditors. The arithmetical mean of the self-evaluation, future target and the auditors' evaluation are calculated for each section, and, finally, the overall score for the SSM system of the organization is calculated. The auditors report the audit results to the auditee verbally at the end of the consultative auditing. Lastly, the auditors prepare the audit report and send it to the auditee after the audit. The report includes the audit results as well as the strengths and the development areas of the SSM system. Finally, the auditors conduct a self-assessment of the consultative auditing process and make corrective actions, when needed.

In summary, the most significant differences between an ordinary audit process and the consultative auditing process are that in the latter, the auditee performs self-assessment and sets the future targets during the audit with the help of the consultative approach of the auditors. The aim of the Asteri consultative auditing process is to keep the auditee's preparation in advance to a minimum. Two auditors should carry out the consultative auditing together, when possible, as it helps the consultation and reporting which are made at the same time. Investigator triangulation is achieved through the use of two auditors, too. Lastly, any inspection carried out by an authority is made before the consultative auditing, when possible.

4.2 Observed attitudes on the consultative auditing process

The results of the auditees' observed attitudes on the Asteri consultative auditing are presented in Table 5. The scale was reversed, whereby the lowest value corresponds to the best, positive attitude.

Table 5. Assessment of the auditees' attitudes on auditing; 1= positive, 2= neutral, 3=reserved

Auditees' attitudes on auditing	Educational institution					
	Number of universities of applied sciences		Number of elementary schools		Number of other institutions	
	Initial	Closing	Initial	Closing	Initial	Closing
Positive	0	2	1	8	0	3
Neutral	15	15	44	36	9	6
Reserved	4	2	3	4	0	0
Total	19		48		9	

During the auditing, the change in neutral attitude to positive attitude occurred quickly in some cases and in other cases more slowly. At the beginning of the audit, there was only one educational institution with a positive initial attitude, and at the end there were 13 of them. Furthermore, at the beginning of the audit there were seven educational institutions with a reserved attitude, and at the end there were six of them.

As mentioned, during the study, it was recognized that auditing may generate negative attitudes. Typically, the change in neutral attitude to reserved attitude occurred within the first hour of the audit. According to the Asteri consultative auditing process, the audit may be interrupted, if desired. The decision regarding the interruption is made by the auditee. It was also decided that the researchers may pause the audit for a while if the atmosphere becomes very tense. According to the research findings, in six educational institutions the closing attitude was very reserved, possibly negative. In four of them the researchers considered interrupting the audit but, nevertheless, brought the audits to the end as the auditees either did not ask to stop or did not want to stop.

Auditees' initial attitudes (M=2.08, SD=0.32, N=76) and auditees' closing attitudes on auditing (M = 1.91, SD = 0.49, N = 76) were mostly neutral. Next, the statistical difference between auditees' initial and closing attitudes was studied. The closing attitude was significantly more positive than the initial attitude (Fisher's exact test, X^2=10.23, df=4, p=0.037). However, there was no statistically significant difference between the respondents working in UASs and the respondents working in ESs – neither in initial attitudes (Fisher's exact test, X^2=3.50, df=2, p=0.236) nor in closing attitudes (Fisher's exact test, X^2=0.455, df=2, p=0.904) on auditing. Finally, there was no correlation between the overall performance level of the SSM and auditees' initial attitude (Spearman's Rho, rs=-0.094, p=0.420, N=76) nor between the overall performance level of the SSM and auditees' closing attitude (Spearman's Rho, rs=-0.087, p=0.453, N=76).

4.3 Results on the effects of the consultative auditing process

The purpose of this section is to describe effects of Asteri, the new consultative auditing process, on the auditee. The effects were tested three different ways by studying the following:

- feedback on the consultative auditing process (section 4.3.1);
- effects of the audit on the auditee's perceptions and knowledge (section 4.3.2);
- effects on concrete actions (section 4.3.3).

As mentioned, the link of the electronic survey was sent approximately two weeks after the audit to the contact person of the audited organization with the audit report as well as the identified strengths and the development areas of the organization. The contact person was asked to distribute the link of the electronic survey to all persons who took part in the consultative auditing process.

4.3.1 Feedback on the Asteri consultative auditing process

The feedback on the Asteri consultative auditing process is presented in Table 6.

Table 6. Feedback given by the respondents on the Asteri consultative auditing process; 1= strongly agree, 2= agree, 3= neither agree nor disagree / neutral, 4= disagree, 5= strongly disagree

Respondents' feedback on the Asteri consultative auditing process	**N**	**Mini-mum score**	**Maxi-mum score**	**Mean score (M)**	**Std. Deviation (SD)**
Auditing was useful for my workplace	61	1	5	1.52	0.77
The audit questions covered the scope of the audit	58	1	3	1.62	0.64
Auditing was a positive experience	61	1	5	1.70	0.96
The purpose of the audit questions became clear to me during the discussion of the audit	60	1	5	1.73	0.80
Auditing process was objective	61	1	5	1.95	0.97
I have reviewed the results of the audit of my workplace	60	1	5	2.05	1.27
The number of the questions was appropriate	61	1	5	2.28	1.19
The TUTOR material, which I received in advance, gave me a fair view of the forthcoming audit	55	1	5	2.38	1.10
I was prepared for the audit	60	1	5	2.78	1.25

Feedback on the Asteri consultative auditing process was received from respondents on the survey. In total, minimum 55 respondents from 40 educational institutions out of 76 (52.6 %) answered these questions. The closer the arithmetical mean was to the score of 1, the more positive the respondent's feedback on the consultative auditing process was. The arithmetical mean varied between 1.52 and 2.78. According to the research findings, 62.3% of all answers varied between 1.00 (strongly agree) and 2.00 (agree) and moreover, 93.4% of all answers varied between 1.00 (strongly agree) and 3.00 (neutral). The best scores were given to the statements "Auditing was useful for my workplace," "The audit questions covered the scope of the audit" and "Auditing was a positive experience." The weakest scores were given to the following statements: "I was prepared for the audit" and "The TUTOR material, which I received in advance, gave me a fair view of the forthcoming audit". There is no statistically significant difference in the feedback on the Asteri consultative auditing process between the respondents working in UASs and the respondents working in ESs (Mann-Whitney U-test, U=393.5, p=0.268).

4.3.2 Effects on auditees' perception and knowledge

Arithmetical means were calculated for each statement concerning the effects of the Asteri consultative auditing process on the respondents' perception and knowledge from the answers given by the respondents on the survey. The scores are presented in Table 7.

Table 7. Effects of the Asteri consultative auditing on auditees' perceptions and knowledge; 1= strongly agree, 2= agree, 3= neither agree nor disagree / neutral, 4= disagree, 5= strongly disagree

Effects of the Asteri consultative auditing process on auditees' perceptions and knowledge	**N**	**Mini-mum score**	**Maxi-mum score**	**Mean score (M)**	**Std. Deviation (SD)**
Auditing highlighted the responsibility of the management in safety & security operations	61	1	3	1.51	0.65
Auditing helped to identify the current state of safety & security of my workplace	62	1	5	1.63	0.73
Auditing helped to define the safety & security target state of my workplace	63	1	5	1.71	0.85
I can identify better the need for safety & security development due to auditing	63	1	5	1.73	0.90
My safety & security awareness grew while auditing	62	1	5	1.74	0.92
I know what I'm responsible for and what are my safety & security tasks in my workplace	63	1	5	1.78	0.91
Auditing helped to outline actions needed to reach the safety & security targets of my workplace	63	1	5	1.79	0.81
I know what the management is responsible for and what his/her safety/security tasks are in my workplace	63	1	5	1.79	0.97
I got new ideas for the development of safety & security operations based on auditing	63	1	5	1.90	0.88
I know what the students & pupils are responsible for and what are their safety & security tasks in my workplace	60	1	4	2.57	1.02

Effects of the Asteri consultative auditing process on auditees' perceptions and knowledge	N	Mini-mum score	Maxi-mum score	Mean score (M)	Std. Deviation (SD)
I feel that my workplace is safer and more secure due to the result of the audit	62	1	5	2.61	0.89

Feedback on effects of the Asteri consultative auditing on auditees' perceptions and knowledge was received from the respondents on the survey. In total, minimum 60 respondents from 40 educational institutions out of 76 (52.6 %) answered these questions. The closer the arithmetical mean was to the score of 1, the more positive effect the audit had on the respondents' perceptions and knowledge. The arithmetical mean varied between 1.51 and 2.61. The best scores were given to the statements "Auditing highlighted the responsibility of the management in safety & security operations", "Auditing helped to identify the current state of safety & security of my workplace" and "Auditing helped to define the safety/security target state of my workplace." The weakest scores were given to the statements "I feel that my workplace is safer and more secure due to the result of the audit" and "I know what the students & pupils are responsible for and what their safety & security tasks in my workplace." The total arithmetical means varied most, between 1.00 and 4.11, in ESs. According to the research findings, 62.3% of all answers varied between 1.00 (strongly agree) and 2.00 (agree), and, moreover, 93.4% of all answers varied between 1.00 (strongly agree) and 3.00 (neutral). There was no statistically significant difference in the effects on perceptions and knowledge between the respondents working in UASs and respondents working in ESs (Mann-Whitney U-test, U=306.5, p=0.435).

4.3.3 Effects of the Asteri consultative auditing process on concrete actions

Arithmetical means were calculated for statements concerning the effects of the Asteri consultative auditing process on concrete actions after the audit (Table 8).

Table 8. Effects on concrete actions; 1= strongly agree, 2= agree, 3= neither agree nor disagree / neutral, 4= disagree, 5= strongly disagree

Auditees' statement on effects on concrete actions	**N**	**Mini-mum score**	**Maxi-mum score**	**Mean score (M)**	**Std. Deviation (SD)**
Auditing confirmed the need for previously planned safety & security activities	62	1	5	1.81	0.97
The most important safety & security measures that arose during the audit will be implemented in the next six months	60	1	5	1.92	0.81
Auditing raised discussion on safety & security in my workplace	60	1	5	2.18	0.77
Auditing started the continuous safety & security development work	60	1	5	2.38	0.92
Auditing has already had visible effects on safety & security in my workplace	62	1	5	2.71	1.05
Safety & security actions have been taken due to auditing	60	1	5	2.77	1.25

Feedback on effects of the Asteri consultative auditing process on concrete actions was received from the respondents. In total, minimum 60 respondents from 40 educational institutions out of 76 (52.6 %) answered these questions. The closer the arithmetical mean was to the score of 1, the more positive the effects on concrete actions were. The mean varied between 1.81 and 2.77. According to the research findings, the following statements received the best scores: "Auditing confirmed the need for previously planned safety & security activities" and "The most important safety & security measures that arose during the audit will be implemented in the next six months."

The weakest total score was given to the statement "Safety & security actions have been taken due to auditing."

The total arithmetical mean varied the most, between 1.80 and 4.00, in other educational institutions. Moreover, 33.9% of all answers varied between 1.00 (strongly agree) and 2.00 (agree) and 87.1% between 1.00 (strongly agree) and 3.00 (neutral). There was no statistically significant difference in the effects on concrete actions after the Asteri consultative auditing process between the respondents working in UASs and respondents working in ESs (Mann-Whitney U-test, U=257.0, p=0.130).

4.4 Auditing results

The strengths and development areas of comprehensive SSM in the UASs and in the ESs were identified by means of the consultative auditing process, Asteri, combined with the TUTOR model. Additionally, differences in the performance level in comprehensive SSM between UASs and ESs were investigated. The number of other audited education institutions was low (N=9), and, therefore, their safety and security performance level was not analyzed in detail.

4.4.1 Overall performance level of comprehensive SSM in UASs

The overall performance level of the SSM in the UASs assessed by the auditors, as well as auditees' self-assessment and future targets are shown in Figure 10. Sorting was made based on the auditors' total scores. Abbreviations UAS1…UAS19 were used to identify different UASs.

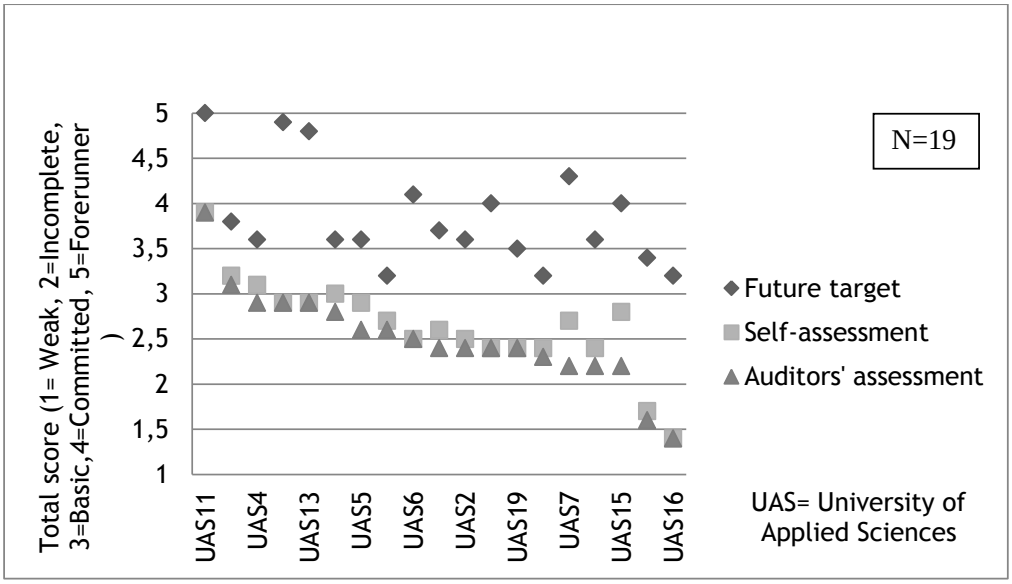

Figure 10. Overall performance levels of SSM in UASs based on auditors' assessment; 1≤x<2=Weak, 2≤x<3=Incomplete, 3≤x<4=Basic, 4≤x<5=Committed, 5=Forerunner

In total, 19 UASs were audited. According to the research findings, 89.5% (N=17) of these educational institutions had a total score less than 3.0, which is the minimum acceptable overall performance level. Moreover, the total scores of the future targets were clearly higher than the scores of self-assessment. Of the UASs, 78.9% (N=15) set a future target of 3.5 or more. Arithmetical means were calculated for the eight different sections of the TUTOR model (Table 9). Scores given by the auditors are shown.

Table 9. Performance levels of UASs for different sections of SSM based on auditors' assessment; 1≤x<2=Weak, 2≤x<3=Incomplete, 3≤x<4=Basic, 4≤x<5=Committed, 5=Forerunner

Sections of SSM according to the TUTOR model	N	Mini-mum score	Maxi-mum score	Mean score (M)	Std. Deviation (SD)
Training	19	1.0	3.7	2.12	0.74
Results and effectiveness	19	1.0	3.5	2.22	0.73
Operational risks	19	1.5	3.9	2.27	0.62
Safety & security documentation	19	1.0	4.0	2.57	0.66
Safety & security communication	19	1.0	4.0	2.63	0.73
Safety & security management	19	1.8	4.0	2.66	0.50
Facility management technology and safety & security technology	19	2.0	3.9	2.80	0.47
Compliance with requirements	19	2.0	4.5	2.94	0.67

In the UASs, the Compliance with requirements section received the best score while the Training section received the weakest score.

4.4.2 Overall performance level of comprehensive SSM in ESs

The overall performance level of the SSM in ESs assessed by the auditors, as well as auditees' self-assessment and future targets are is shown in Figure 11. Sorting is based on the auditors' assessment.

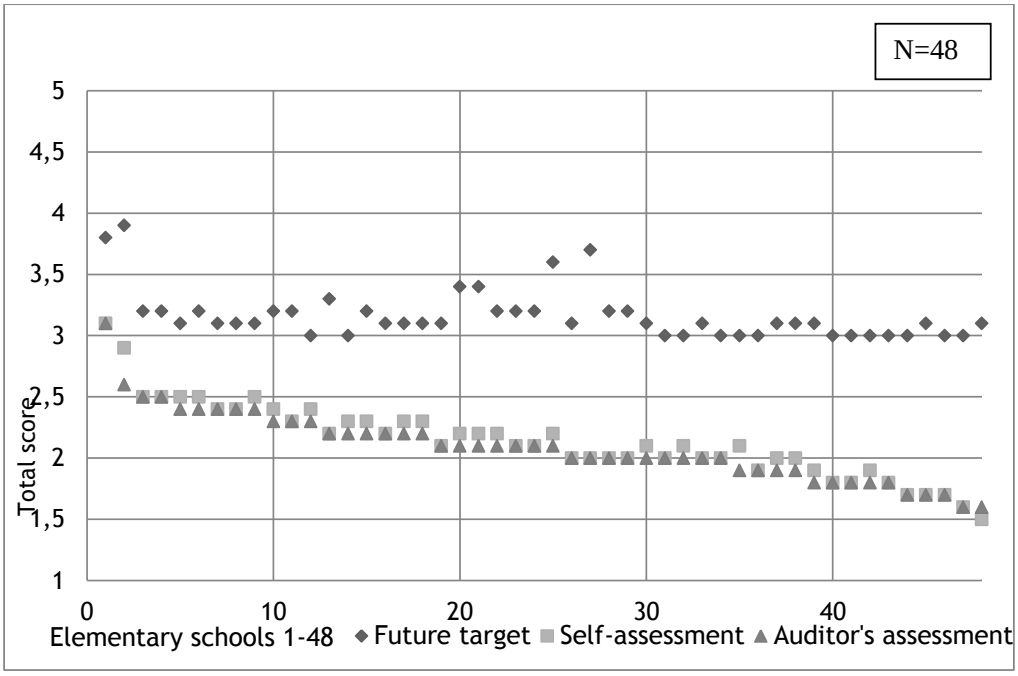

Figure 11. Overall performance levels of SSM in ESs based on auditors' assessment; 1≤x<2=Weak, 2≤x<3=Incomplete, 3≤x<4=Basic, 4≤x<5=Committed, 5=Forerunner

In total, 48 ESs were audited. According to the research findings, 97.9% (N=47) of these educational institutions had a total score less than 3.0, which is the minimum acceptable overall performance level. Moreover, the total scores of the future targets were clearly higher than the scores of self-assessment. Of the ESs, 29.2% (N=14) set a future target of 3.0, which is the minimum acceptable overall performance level, and 56.3% (N=27) set a future target between 3.1 and 3.2. For the ESs, arithmetical means were calculated for eight different sections of the TUTOR model, as shown in Table 10. Scores given by the auditors are shown.

Table 10. Performance levels of ESs for different sections of SSM based on auditors' assessment; 1≤x<2=Weak, 2≤x<3= Incomplete, 3≤x<4=Basic, 4≤x<5= Committed, 5=Forerunner

Sections of SSM according to the TUTOR model	**N**	**Mini-mum score**	**Maxi-mum score**	**Mean score (M)**	**Std. Deviation (SD)**
Results and effectiveness	48	1.0	3.0	1.59	0.52
Training	48	1.0	3.2	1.65	0.46
Operational risks	48	1.0	3.0	1.74	0.38
Compliance with requirements	48	1.0	3.5	2.10	0.52
Safety & security management	48	2.0	4.0	2.26	0.33
Facility management technology and safety & security technology	48	1.6	3.0	2.38	0.30
Safety & security communication	48	1.3	4.0	2.44	0.51
Safety & security documentation	48	1.5	3.5	2.64	0.43

In the ESs, the Safety & security documentation section received the best score. Additionally, the Results and effectiveness section received the weakest score.

4.4.3 Comparison of overall performance level of comprehensive SSM in educational institutions

The overall performance level of comprehensive SSM in the educational institutions assessed by the auditors are shown in Table 11.

Table 11. Overall performance level of SSM in the educational institutions based on auditors' assessment

Educational institution	N	Minimum score	Maximum score	Mean score (M)	Standard deviation (SD)
Universities of applied sciences	19	1.4	3.9	2.51	0.54
Elementary schools	48	1.6	3.1	2.09	0.29
Other educational institutions	9	1.5	2.6	2.16	0.34

The overall performance level of the SSM in the audited educational institutions varied between 1.4 and 3.9, while the minimum acceptable score is 3.0 according to the TUTOR model. All except one audited educational institution reached an overall performance level between 1.4 and 3.1. Three audited educational institutions out of 76 (3.9%) met the minimum acceptable performance level of 3.0. Only one of these educational institutions, one UAS, reached the overall performance level of 3.9 of the SSM. One UAS received a total score of 3.1, and yet it had one section score of which was less than 3.0. Additionally, one ES received a total score of 3.1, and yet it had three sections scores of which were less than 3.0.

In Appendix 4, the audit results according to the different cards of the TUTOR model are given. The results are based on auditors' assessment. According to the research findings, there are uniting and separating factors in terms of the SSM between UASs and ESs. For both levels of educational institutions, the most significant developing areas were Training, Results & effectiveness and Operational risks sections. Both levels of educational institutions received moderate scores for the Facility management technology and safety & security technology, Safety & security management and Safety & security communication sections. UASs received the best score in the Compliance

with requirements section, while ESs received the best score in the Safety & security documentation section.

The audited educational institutions have many development areas in the SSM, and all sections according to the TUTOR model required development efforts. As far as the Safety & security management section is concerned, safety and security policy was mostly missing. The SSM was fragmented. Moreover, planning, reporting and control of safety and security activities were minor. There was a lack of internal safety and security checks and inspections. More cooperation with stakeholders was also needed. In addition, the safety and security needs of stakeholders should have been examined. Mainly in the ESs, there was also lack of resources. As far as the Operational risks section is concerned, a risk management system should have been developed. Risk identification was fragmented and mainly based on occupational health and safety as well as fire safety. In the Compliance with requirements section, contact persons for monitoring changes in legislation were not nominated. Moreover, in addition to e-mail, other means for sharing information on changes in legislation were needed. In the Safety and security documentation section, there was a need for the establishment of a documentation management system through which one could recognize a need for valid safety and security documentation. Moreover, documentation was missing on safety and security checks and inspections made by the personnel. There were only a few quick safety and security instructions for substitute teachers. In the Facility management technology and safety & security technology section, challenges arose when the facility was not owned by the educational institution and neither the facility management nor the janitor were employees of the educational institution. In these cases, the members of the educational institution were not well aware of the status of the maintenance system of the facility. In the Training section, the biggest challenges were the planning and adequacy of the training compared to risks. Moreover, there was a need to establish a training register. Additionally, the task-specific safety and security competence requirements were not identified. In the Safety and security communication section, it was noted that the identification of needs, other than crisis communication needs, were

minor. Active, two-way safety and security communication with stakeholders was also one of the development areas. Furthermore, implementation of positive, informative communication was needed, through which a positive safety and security culture could be created. Finally, in the Results and effectiveness section, the most important development areas were the monitoring, measurement and analysis of the comprehensive SSM.

In the audited educational institutions, there were strengths, too. Educational institutions were aware of the importance of the SSM, and the rectors knew that the safety and security of the educational institution were part of their responsibility. Self-evaluation and the setting of future targets in the SSM were realistic. Safety and security handbooks were prepared, and safety and security documentation was plentiful. Risk identification was made with regard to occupational safety and health. Safety drills were held regularly. Additionally, property maintenance system existed. Safety training was held, and fire inspections by the authorities were made regularly.

According to the hypothesis, there is no statistical difference in overall SSM between ESs and UASs. However, there was a statistically significant difference (Mann-Whitney U-test, $U=187$, $p<0.001$) in the overall performance level of the SSM between UASs and ESs. Scores given by the auditors were used. The SSM of the UASs was significantly more advanced than the SSM of the ESs. Additionally, there were statistically significant differences between the UASs and the ESs according to Mann-Whitney U-test in the following sections according to the TUTOR model:

- Safety & security management ($U=208$, $p=0.001$)
- Operational risks ($U=194$, $p<0.001$)
- Compliance with requirements ($U=146.5$, $p<0.001$)
- Facility management technology and safety & security technology ($U=204$, $p<0.001$)
- Training ($U=277$, $p=0.012$)
- Results and effectiveness ($U=224.5$, $p=0.001$).

Performances in the above-mentioned sections of the SSM were better in the UASs than in the ESs. There were no statistically significant differences between performance in the Safety and security documentation (Mann-Whitney U-test, U=477, p=0.766) section or in the Safety and security communication (Mann-Whitney U-test, U=341, p=0.106) section in the UASs and the ESs. The overall performance level of the SSM of the educational institutions (Figure 10 and Figure 11) had a significant correlation with the number of the teachers (Spearman's Rho, r_s=0.323, p=0.004, N=76) and with the number of pupils/students (Spearman's Rho, r_s=0.262, p=0.022, N=76). Large institutions reached better scores than small ones. Finally, there were no statistically significant differences between performance levels of ESs in Vantaa city and Hyvinkää town (Mann-Whitney U-test, U=117.5, p=0.049).

4.5 Development targets of auditees' workplace

As mentioned, the respondents of the survey were asked to choose the six most important development targets for their workplace over the next three years in order of importance. At least one target was asked to be chosen. Some respondents chose more than one development target with the same priority. It was also instructed that it was not necessary to choose a maximum of six development targets but just to select as many targets as needed. In total, 63 respondents from 40 educational institutions out of 76 (52.6 %) answered these questions. An index was calculated separately for each individual development target based on ranking, as shown in Figure 12.

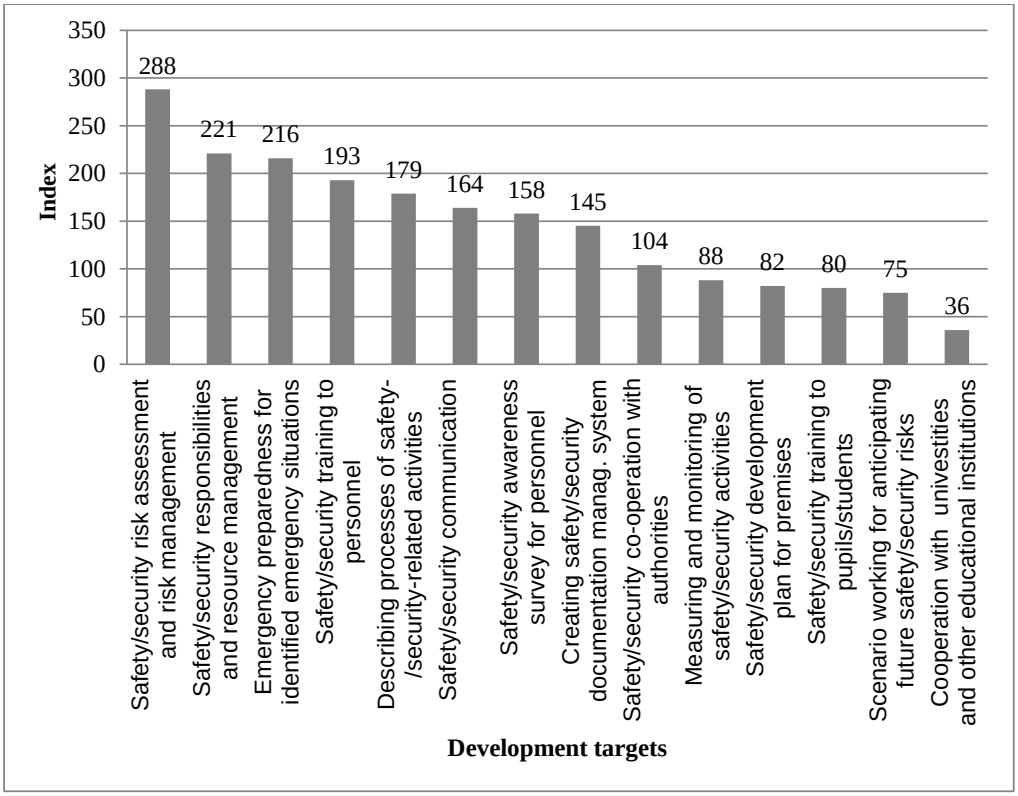

Figure 12. Index of development targets based on auditees' responses

According to the results of the survey, the most important development targets were Safety and security risk assessment and risk management, Safety and security responsibilities and resource management of safety- and security-related activities and Emergency preparedness concerning identified emergency situations. Moreover, the next most important developing targets were Safety and security training targeted to different groups of personnel and Describing processes concerning safety- and security-related activities. The least important development targets identified by the auditees were Cooperation with various universities and other educational institutions as well as Scenario work for anticipating future safety and security risks.

On the survey the respondents had the chance to write a development target not mentioned in the survey. Two respondents mentioned additional targets, which were information and alarm systems, security services and welfare safety. The respondents were asked to justify the reasons for the development targets chosen. A thematic analysis was made to study the reasons mentioned by the respondents. The following three main themes were identified: The current situation of the educational institutions (30 respondents), own judgement (25 respondents) and results of the consultative auditing process (eight respondents).

4.6 Connection between different variables of the study

Answers to the survey given by the members of the audited educational institutions were converted into school-specific variables by calculating the mean value for each statement from the same educational institution. Next, a factor analysis (Appendix 5) was performed from the statements of the survey. In the factor analysis, there were eight factors whose Eigenvalue was more than 1. Eigenvalues varied between 6.270 and 1.286. Furthermore, variables having low correlation on the factor, less than 0.3, were filtered out. When a variable was loaded to several factors, it was used in the factor in which the correlation was the strongest. Next, sum variables were created to improve reliability and to create a smaller set of variables while maintaining the information. Not all variables of the factors were included in the sum variables. If the variable did not fit with the designated topic, it was used as a separate variable. Finally, six factors were used in this study. From factor 1, the sum variable of "Positive effects of auditing on knowledge and skills" was made. From factor 2, the sum variable of "Positive effects of auditing on SSM" was formed. The sum variable of "Actions initiated by the audit" was created from factor 3, except that the factor "I was prepared for an audit" was excluded. From factor 4, the sum variable of "Added value and objectivity of the audit" was formed. From factor 5, the sum variable of "Positive experience in the Asteri consultative auditing process" was formed. From factor 6, the sum variable of "Identified responsibilities" was made, except that the factor "I feel that my workplace

is safer and more secure due to the result of the audit" was excluded. From factors 7 and 8, only two variables were left: "TUTOR material, which I received in advance, gave me a fair view of the forthcoming audit" and "I have studied the results of the audit of my workplace." The reliability analysis of the sum variables of the survey is presented in Appendix 6. In Table 12, the content of the sum variables of the survey and their reliability are shown.

Table 12. Sum variables of the survey and their reliability

Factor	Sum variable	Statement of the survey	Loading	Cronbach's alpha
1	Positive effects of auditing on knowledge and skills	I got new ideas for the development of safety & security operations based on auditing	0.923	0.930
		My safety & security awareness grew during the assessment	0.639	
		Auditing helped to define the safety & security target state of my workplace	0.618	
		Auditing helped to outline actions needed to reach the safety & security targets of my workplace	0.536	
		I can identify better the need for safety & security development due to auditing	0.515	
		Auditing was useful in my workplace	0.391	

Factor	Sum variable	Statement of the survey	Loading	Cronbach's alpha
2	Positive effects of auditing on SSM	Auditing started the continuous safety & security development work	0.871	0.766
		Auditing raised discussion on safety & security in my workplace	0.667	
		I know what the management is responsible for and what his/her safety & security tasks are in my workplace	0.475	
		The most important safety & security measures that arose during the audit will be implemented in the next six months	0.468	
3	Actions initiated by the audit	Safety & security actions have been taken due to auditing	0.964	0.719
		Auditing already made visible effects on the safety & security in the workplace	0.775	
4	Added value and objectivity of the audit	The number of questions was appropriate	0.748	0.604
		Auditing highlighted the responsibility of the management in safety & security operations	0.624	
		Auditing helped to identify the current state of safety & security in my workplace	0.607	

Factor	Sum variable	Statement of the survey	Loading	Cronbach's alpha
		The auditing process was objective	0.362	
		The audit questions covered the scope of the audit	0.333	
5	Positive experience in the Asteri consultative auditing process	The purpose of the audit questions became clear to me during the discussion of the audit	0.950	0.778
		Auditing was a positive experience	0.345	
6	Identified responsibili-ties	I know what I'm responsible for and what are my safety & security tasks in my workplace	0.520	0.620
		I know what the students & pupils are responsible for and what are their safety & security tasks in my workplace	0.411	

All sum variables are linked to the achievement of the second objective of the study, according to which the effects of the consultative auditing process on the auditee are studied. The internal consistency of the factors was between acceptable and excellent (Cronbach's alpha, $0.930 \leq \alpha \leq 0.620$), and the items correlated well with the total scale (lower r = 0.248).

4.6.1 Comparison of survey results between better and weaker groups of educational institutions

Educational institutions were divided into "better" and "weaker" groups based on their performance level in the SSM. The better educational institutions were those in which

the overall performance level in the SSM was more than or equal to 2.4. Accordingly, the weaker educational institutions were those in which the overall performance level in the SSM was less than 2.4. In the weaker group of the educational institutions, the sum variables of the survey results were clearly and systematically better than sum variables of the better group of educational institutions except in Identified responsibilities in which no difference existed. However, there was no statistically significant difference between the sum variables of the survey results in educational institutions of the better and weaker groups (Mann-Whitney U-test, U=101-178, p=0.083-0.942). In Figure 13, the survey results between the better and weaker groups of the educational institutions are illustrated. . The smaller the score is, the better the result of the survey is.

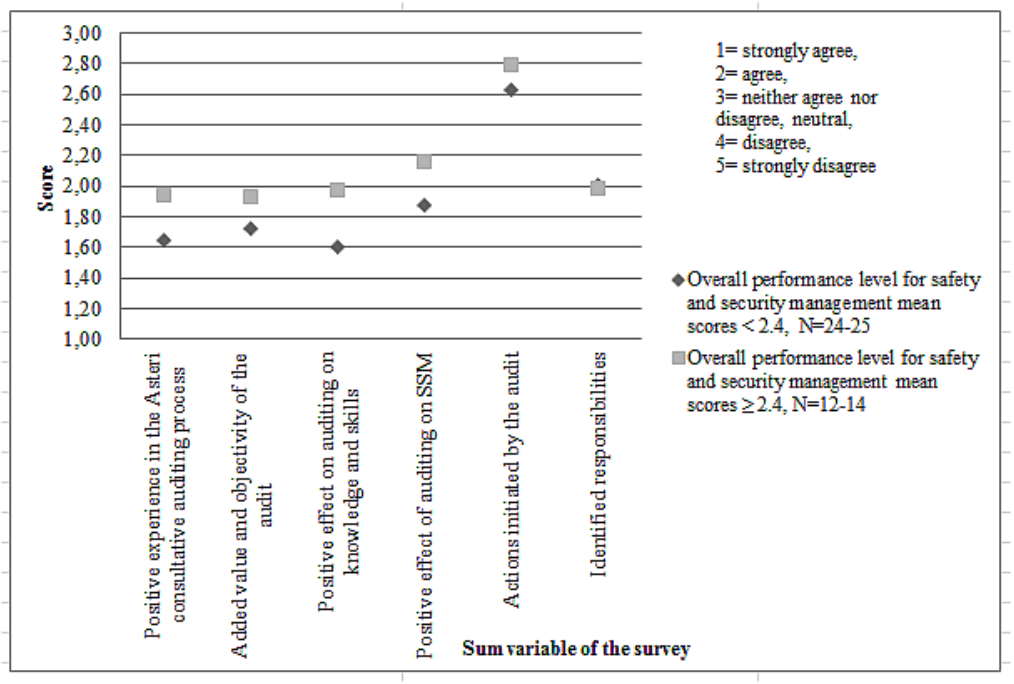

Figure 13. Difference in survey results between the better and weaker groups of the educational institutions

The weaker group of educational institutions (total score of the overall performance level in the SSM less than 2.4) benefited more from the Asteri consultative auditing process than did the better group (figure 13).

4.6.2 Connection to the effects on knowledge and skills

Correlations between the sum variables of the survey, the single variables left outside the sum variables and three other variables (initial attitude on auditing, closing attitude on auditing as well as total SSM) were analyzed. A graphical examination of the data was also made to evaluate the relationships between variables. By removing the variables at the edges, it was tested whether the correlation was based on only a few variables or whether the correlation was real. In Appendix 7, the correlation table is given.

There was a significant positive correlation between the added value and objectivity of the audit and the positive effects of auditing on knowledge and skills (Spearman's Rho, rs=0.452, p=0.006, N=36). The more useful and more objective the audit was experienced, the better the effects of auditing on knowledge and skills were. In addition, there was a significant positive correlation between the positive experience in the Asteri consultative auditing process and the positive effects of auditing on knowledge and skills (Spearman's Rho, rs=0.529, p=0.001, N=38). The more positive the Asteri consultative auditing process was experienced, the better the effects of auditing on knowledge and skills were. Finally, there was a significant positive correlation between the positive effects of auditing on knowledge and skills and the positive effects of auditing on the SSM (Spearman's Rho, rs=0.509, p=0.002, N=36). The better the effects of auditing on knowledge and skills were, the better the effects of auditing on the SSM were.

4.6.3 Connection to initiated actions

There was a significant positive correlation between the actions initiated by the audit and the feeling that the workplace is safer and more secure due to the result of the audit (Spearman's Rho, rs=0.339, p=0.038, N=38). The more certain the safety and security actions were initiated, the safer and more secure the workplace was experienced. Moreover, there was a significant positive correlation between the actions initiated by the audit and the preparation of the auditee for the audit (Spearman's Rho, rs=0.450, p=0.004, N=39). The better the auditee was prepared for the audit, the more certain the audit initiated actions.

4.6.4 Connection to the effect of SSM and feeling safe and secure

There was a significant positive correlation between identified responsibilities and the positive effects of auditing on the SSM (Spearman's Rho, rs=0.475, p=0.003, N=37). The better the responsibilities were identified, the better were the effects of auditing on the SSM. Additionally, there was a significant positive correlation between identified responsibilities and the feeling that the workplace is safer and more secure due to the result of the audit (Spearman's Rho, rs=0.555, p<0.001, N=38). The better the responsibilities were identified, the safer and more secure the workplace was experienced.

5 Discussion

In this fifth chapter, the major findings of the study are presented. Moreover, the results of the study are connected to the theoretical framework and earlier studies. Finally, the validity, reliability and generalizability of the results of the study are evaluated.

Over the past decade, multiple researchers and organizations have studied and developed the safety and security of educational institutions. The development has been fragmented. Moreover, a safe and secure learning environment is a requirement within the Finnish legislation, but typically the comprehensive, risk based SSM and the management commitment in the implementation and development the SSM have not been mentioned. The need for comprehensive, risk based SSM was identified when the audits of the present study began.

5.1 Review of the key results

The first objective of the research is to develop a consultative auditing process that can be used while auditing an organization. Therefore, as one of the main contributions, this research presents the new Asteri consultative auditing process. It follows the key concepts of auditing, coaching, knowledge creation and continuous improvement. It is intended to be used with any kind of auditing criteria when there is a need for teaching and learning of the subject to be audited. Asteri includes 15 elements, as presented in table 13, divided into basic principles, implementation, reporting and continuous improvement.

Table 13. Key concepts of the Asteri consultative auditing process

Basic principles:
• Auditee's preparation in advance is kept to a minimum • Two auditors carry out the consultative auditing, when possible • Presence of the rector or the managing director is essential to achieve the management commitment

• When planning and preparing for the audit, auditor takes into account possible negative attitudes generated by the audit • Inspection or audit carried out by an authority is made before the consultative auditing, when possible
Implementation: • Auditor introduces the content of the auditing criteria, its main content and sections to the auditee • Auditor chooses the order of audited issues from the easiest to more demanding • Auditor encourages the auditee to discuss with each other and think out loud, and not immediately answer to the question raised by the auditor • Auditee makes self-assessment one issue at a time during the audit • Auditee sets the future target one issue at a time during the audit • Auditor helps auditee to make self-assessment and to set future targets by asking questions and presenting documentation that supports the issue • Auditor observes auditee's attitudes and interrupts the audit, if desired • Auditor always verifies the audit evidence whenever the auditee considers during the self-assessment that minimum acceptable performance level or higher has been achieved
Reporting: • Auditor sends the audit report including audit results, strengths and weaknesses to the auditee after the audit
Continuous improvement: • Auditor makes self-assessment of the Asteri consultative auditing process after each auditing session and makes corrective actions, when needed

In summary, according to the basic principles the intention is to keep the auditee's preparation in advance to a minimum. Suitable participants in the audit include the rector or the managing director, the safety/security manager, the members of the safety team or the members of the crisis team, the quality manager, the maintenance manager

and the janitor. The presence of the rector or the managing director is essential to achieve the management commitment, inter alia, when making the self-assessment and setting the future targets during the audit as well as later when implementing and developing the SSM of the organization. Two auditors should carry out the consultative auditing together, when possible, as it helps the consultation and reporting which are made at the same time.

The second objective of the research is to find out what are the effects of the consultative auditing process on the auditee. The results of this study confirm that the Asteri consultative auditing process provides added value for the auditee. According to the research findings of the survey, Asteri combined with the TUTOR model increases organizations' knowledge and skills. The more useful, the more objective and the more positive the audit was experienced, the better the effects on knowledge and skills were. Finally, the better were the effects of auditing on knowledge and skills; the better the effects of auditing on the SSM were.

Additionally, according to the results of this study, organizations with a low performance level on the audited subject benefit the most from the Asteri consultative auditing process. In the weaker group of the educational institutions, the sum variables of the survey results were clearly and systematically better than the sum variables of the better group of educational institutions except in identified responsibilities in which no difference existed. However, there was no statistically significant difference between the sum variables of the survey results in educational institutions of the better and weaker groups. It is likely that the weaker group of educational institutions needed more consultation, new knowledge and new skills in the SSM. Therefore, the weaker group welcomed the help of the Asteri consultative auditing process combined with the TUTOR model. In Figure 14, the connection between the Asteri consultative auditing process and the effects on comprehensive SSM are illustrated.

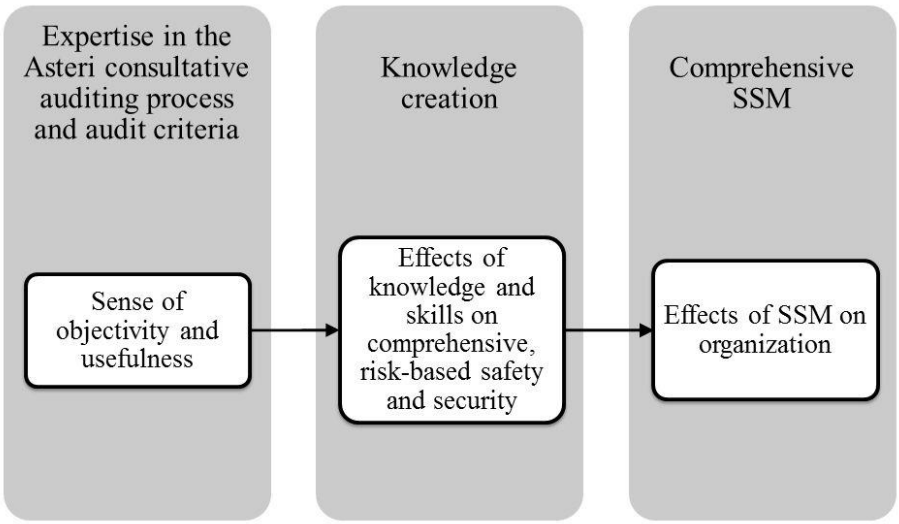

Figure 14. Chain between the Asteri consultative auditing process and the effects on comprehensive, risk based SSM

Knowledge creation is an important part of this study, as the aim was to increase the knowledge and skills of the auditees in comprehensive, risk based safety and security. The findings of the research are supported by Parsloe and Leedham (2009, 7, 15–16, 18) as well as Starr (2011, 53, 80) when arguing that the task of coaching is to offer concrete benefits for individuals and organizations by providing learning experiences. Moreover, an important issue is that a coach asks questions instead of simply telling what to do. Persons sharing values such as respect, responsibility, empathy, humbleness, trust, openness and cooperation are more likely to identify the need to improve continuously, and, hence, they are more likely to be committed to continuous improvement. The research findings are also supported by the theory of knowledge creation and knowledge management, according to which knowledge is a combination of experience, expert insight, values and contextual information that can be used to generate new experiences and new information. Shared information remains and enriches the organization. (Davenport & Prusak 1998, 17, 24, 48, 158, 174.) Moreover,

in the consultative auditing knowledge creation process starts at the individual level and expands to the team, to the organization and to the stakeholders (Nonaka & Takeuchi 1995, 70–73). In the knowledge flow of the consultative auditing, the data are refined: Data turn into information, information turns into realization, realization into actions and reflection and, finally, reflection turns into wisdom (Kakabadse, Kakabadse & Kouzmin 2003, 76–77).

As another main contribution, this study adds new knowledge on attitudes related to auditing. At the beginning of the audit, there was only one educational institution with a positive initial attitude, and at the end there were 13 of them. In most of the educational institutions, the initial and closing attitudes of the auditees were either neutral or positive, and these auditees were not noticeably upset by the scores given by the auditors. As the results of this study show, there was a statistically significant difference between the initial and closing attitudes where the closing attitude was slightly better. However, there was no statistically significant difference between the auditees working in UASs and auditees working in ESs, neither in initial nor in closing attitudes. According to the research findings, auditing may generate negative attitudes and auditors must take them into account when planning and preparing for audits. Negative attitudes could arise from guilt or disappointment when the prior expectations of high scores are not met. Negative attitudes can be compensated by producing added value, objectivity and positivity for the audit and, thus, improve the positive effects of auditing on knowledge and skills. The more useful, the more objective and the more positive the audit was experienced, the better the effects of auditing on knowledge and skills were. In addition, it is good to be aware that there was no correlation between auditees' initial/closing attitudes and the overall performance level of the SSM.

Typically, attitudes are not observed during safety and security audits. However, an audit is a suitable data collecting approach for a study concerning individuals' knowledge, facts, opinions or attitudes. Moreover, interviews during an audit offer relatively large amount of information in a short period, and they gain access to information sources that are not available otherwise. Attitudes relate to safety and

security culture, too. (Van der Velde, Jansen & Anderson 2004, 102–104.) Safety culture is an assembly of characteristics and attitudes in an organization and individuals that overrides attention and priority in safety issues (International Atomic Energy Agency 1991, 3–4). As the organizational culture is difficult to measure, behavior can be observed. Behavior reflects the attitude of the person and the organization, and, moreover, attitudes and beliefs influence the actions of individuals. By observing and measuring behavior, a window opens onto the attitudes behind. (Reiman & Oedewald 2002, 24, 30; Top 1997, 83.)

Moreover, as a result of this study shows, feeling safe and secure can be affected by the consultative auditing. The better the members of the organization identify safety and security responsibilities and the more certain they are that safety and security actions are initiated in the organization based on the audit, the safer and more secure the personnel felt in the workplace. It can be concluded that auditing safety and security matters does not increase feelings of insecurity but rather increase feelings of safety and security when using the new Asteri consultative auditing process with the TUTOR model. Feeling of insecurity arose in the Third Internal Security Program of June 2012, according to which the safety and security in educational institutions were to be improved. Members of the educational community felt insecure because of the threat of bullying, sexual harassment and violence. (Ministry of the Interior 2012a, 4, 15–16.)

The third objective is to find out what are the strengths and the development areas of UASs and ESs in comprehensive the SSM. As a new result, it was found that the SSM in UASs was significantly more advanced than the SSM in the ESs. The educational institutions had many development areas in the SSM, and, in addition, all sections according to the TUTOR model needed development efforts. The areas of the TUTOR model are the following: 1) SSM, 2) Operational risks, 3) Compliance with requirements, 4) Safety and security documentation, 5) Facility management technology and safety & security technology, 6) Training, 7) Safety and security communication and 8) Results and effectiveness. The findings of the study suggest that the majority of the Finnish UASs and the ESs do not likely meet the basic level of comprehensive

SSM. In the UASs, it is evident that own activity is required in the SSM. This can be justified by the fact that UASs are corporations, and therefore, some of them had already hired safety/security experts of their own. On the contrary, ESs operate under municipal educational administration departments, and, for them, comprehensive SSM has not yet been highlighted. A rector has the sole responsibility for the SSM, and that responsibility was identified by all rectors. A degree in educational administration, intended for the training of rectors, concentrates mainly on administrative matters, and not on the SSM. Moreover, rectors, teachers and lecturers have pedagogical training, whilst comprehensive SSM requires a wide range of other forms of expertise. ESs did not have safety and security experts of their own, and, in addition, a rector and a safety team have relatively limited resources for the development of safety and security activities. ESs may, for justified reasons, expect an active role from the educational administration department of the municipality. As the results of this study show, the overall performance level of the educational institution predicts the ability of the organization to take care of safety and security matters and to ensure for pupils, students and personnel a safe and secure learning environment including the commitment of the management in implementation and development of the comprehensive, risk based SSM in the organization.

In educational institutions, safety and security policy was mostly missing. In addition, the planning, reporting and control of safety and security activities were minor. There was also lack of internal safety and security checks and inspections. Broader cooperation with stakeholders was needed, and, additionally, the safety and security needs of stakeholders should have been examined. Mainly in the ESs, there was also lack of resources. Risk management systems were not established, and broader risk identification was needed. Risk identification was fragmented and mainly based on occupational health and safety as well as fire safety. Risk evaluation made was either limited or completely lacking in the following areas: information security, crime prevention, environmental safety, premises security, contingency planning, personal security, safety and security of educational operations and security of operations abroad.

In addition, contact persons for monitoring changes in legislation to identify new requirements were not nominated. Changes in legislation should have been shared with relevant members of the organization by using methods other than just e-mail. Moreover, a documentation management system was needed through which one could have recognized the need for valid safety and security documentation. Furthermore, documentation was missing regarding safety and security checks and inspections made by the personnel. There were only a few quick safety and security instructions for substitute teachers. In Facility management technology and safety & security technology, challenges arose because the facility was not owned by the educational institution and because the facility management and the janitor were not employees of the educational institution. Therefore, the status of the maintenance system of the facility was not well known by the members of the educational institution.

Planning and adequacy of training compared to risks needed improvement. Moreover, there was a need to establish a training register. Additionally, the task-specific safety and security competence requirements were not identified. In Safety & security communication, it was noted that the identification of communication needs other than those for crises was minor. Active, two-way safety and security communication with stakeholders was one of the development areas. Furthermore, the implementation of positive, informative communication was needed through which a positive safety and security atmosphere can be created. Finally, monitoring, measurement and analysis of the comprehensive safety and security management was needed.

As mentioned, the findings of the study support the theory and the previous studies relating to the role and tasks of the SSM which includes coordinated activities to direct and control an organization. The SSM supports the success of the organization and establishes strategic intent, a mission statement, policies and objectives. In addition, it consists of organizational structure, resources, responsibilities, training, measurement and monitoring. It also includes the planning of activities such as risk assessment. (OHSAS 18001:fi 2007, 19, 21, 23; Dunlap 2013, 409, 411; Pesonen 1993, 280–282; SFS-EN ISO 9000:2015, 7.) The development areas of educational institutions were

similar to the challenges in other Finnish organizations in which different areas of organizations' safety and security matters were treated as separate entities. In Finnish organizations, the importance of preventive actions was known, but the forms of preventive actions were not developed systematically. Safety and security were also seen as a task for experts. Employees did not commit to safety and security work because training and information sharing, participation in planning as well as decision making failed due to the inefficiency and short-sightedness of the management. (Kerko 2001, 32–33.) In EASs and UASs, the challenges were similar to the challenges in Finnish universities, in which there was limited time for taking care of safety and security matters (Lanne 2002, 301). Moreover, there was lack of time and resources to plan the implementation of improvements (Tervonen & Haapasalo 2012, 6).

Additionally, comprehensive risk management was a new issue for educational institutions. This conclusion is supported by the study conducted by Lanne (2002, 301), according to which risk identification was inadequate in the Finnish universities. Most of the universities had identified risks, but not in a comprehensive way. The conclusion is also supported by the finding of Kerko (2001, 33), according to which the importance of preventive actions was known in Finnish organizations, but the forms of preventive actions were not developed systematically. The Occupational Health and Safety Act (738/2002) as well as the Rescue Act (379/2011) have led to the identification of hazards and risks in educational institutions. However, these laws do not cover all sections of the SSM according to the Confederation of Finnish Industries (2011). Municipalities drive ESs, and the Local Government Act (365/1995) has only recently started to require an annual report of risk management. In the annual report of fiscal year 2014, risk management was reported for the first time.

As mentioned, the importance of knowledge and skills in the SSM has been emphasized in this study. This subject is supported by Lanne (2002, 300–301), Mol (2003, 286) and Waitinen (2011) in stating that training of safety and security was needed. Most of the rectors in ESs have completed a degree in educational administration, but it concentrates mainly on administrative matters (Opetushallitus 2015).

Also as mentioned, the audited educational institutions had strengths, too. Educational institutions were aware of the importance of the SSM, and the rectors knew that the safety and security of the educational institution were part of their responsibility. Self-evaluation and the setting of future targets in the SSM were realistic during the auditing. Safety and security handbooks were prepared, and safety and security documentation was plentiful. Risk identification was made with regard to occupational safety and health. Safety drills were held regularly. Additionally, property maintenance system existed. Safety training was held, and fire inspections by the authorities were made regularly.

5.2 Contribution of the results

As one of the main contributions, this research presents the new Asteri consultative auditing process. In this study, Asteri was used with the TUTOR model. However, Asteri's principles may be usable in many different types of audits, not only in SSM audits. Aster can be used when one wants to teach the audited subject matter to the organization to be audited.

As another main contribution to the previous research and literature, this study provides information about the performance of the SSM in ESs and UASs. Lanne (2002) has studied the development needs of the SSM as well as good practices in the Finnish universities. According to the hypothesis of this study, there is no statistical difference in the overall SSM between ESs and UASs. As the results of this study show, the SSM in UASs was significantly more advanced than the SSM in the ESs. Despite the many different safety and security development projects of educational institutions over the past decade, there is still room for improvement. It can be assumed that the majority of Finnish UASs and ESs do not likely meet the basic level of the SSM performance. Based on the results of this study, there are the same development needs in ESs and UASs today as the universities had at the beginning of the year 2000.

The results of this study add new knowledge on attitudes relate to auditing. According to the research findings, auditing may generate negative attitudes and auditor must take them into account when planning and preparing for audits. However, by producing added value and objectivity for the audit, the negative attitudes can be compensated. In this way the positive effects of the auditing on knowledge and skills are also improved. The more useful and more objective the audit is experienced, the better the effects of auditing on knowledge and skills are. Finally, auditees' initial and closing attitudes on safety and security auditing do not correlate with the overall performance level of the SSM.

5.3 Validity and reliability

Reliability is about consistency, according to Nardi (2006, 60) and Nummenmaa (2011, 354). Furthermore, reliability refers to the repeatability of the study, and the ability of the researcher to produce results based on the real, investigated phenomenon, state Boslaugh (2012, 10–11) as well as Tähtinen, Laakkonen and Broberg (2011, 52). Additionally, Boslaugh (2012, 11–12) mentions that there are different approaches to reliability: multiple-occasions reliability, multiple-forms reliability and internal consistency reliability. Multiple-occasions reliability, also called test-retest reliability, is linked to the stability of the results when the test is repeated. Multiple-forms reliability refers to how different versions of tests or surveys perform. Internal consistency reliability refers to how the items in the same instrument, such as a test or survey, measure the same matter.

Validity of the research refers to its ability to measure what it is intended to measure. Methods do not always correspond to the reality, argue Hirsjärvi, Remes and Sajavaara (2009, 231) as well as Tähtinen, Laakkonen and Broberg (2011, 52). Nardi (2006, 58) and Nummenmaa (2011, 361) state that validity is about accuracy. Boslaugh (2012, 12–13) mentions that there are several types of validity, such as content, face and construct validity. Content validity describes how well the measurement covers the important content of the domain of interest. Face validity is attained by means of fair assessment.

Heron (1996, 159) mentions that construct validity relates to the generalizability of the findings of the result.

5.3.1 Effect of different forms of data collection on reliability of the results

In order to achieve good usability, reliability and external validity in the Asteri consultative auditing process, Asteri was developed through several phases while auditing different types of educational institutions. New elements were included in the process one at a time due to experience obtained while carrying out the audits. It was recognized by the author of this study that a comprehensive SSM system as well as its content and sections were not known by all auditees. The interest in safety and security matters as well as coverage of the SSM varied among the different educational organizations. Moreover, the way in which the SSM was organized varied among the educational institutions. The safety and security culture was different among the educational institutions, too. There were variations in personal responsibilities, tasks, job descriptions, knowledge and personalities. In addition, the motivation levels to be audited and to be consulted in the SSM were different.

The survey had a role in the development of the Asteri consultative auditing process, too. The key terms used in the survey were defined in the survey before the statements were given to ensure that the respondents understood the statements equally. Fowler Jr. (1998, 344) states that there are five basic characteristics for questions and answers as far as validity is concerned. The questions should be consistently understood by the respondents, and they should be clearly communicated to the respondents. The respondent should know what an adequate answer is. Equally, unless knowledge is being measured, the respondent should have access to the information needed to be able to answer the question. Finally, the question should be such that the respondent is willing to answer.

There were several statements in the survey concerning the same phenomenal area to increase reliability of the measurement. Statistical analysis was used for analyzing the results of the survey. Factor analysis was performed to form the sum variables of the

statements of the survey (Appendix 5). Cronbach's alpha was used to identify the internal reliability and consistency of the statements of the survey and, thus, to find out whether the statements measured the same matter.

As mentioned, observation was used for studying auditees' attitudes on auditing at the starting point of the audit (initial attitude) and at the end of the audit (closing attitude) by using a scale of reserved, neutral and positive. Observation was based on monitoring auditees' speech and body language. In some ESs, the auditors got the feeling that the organization was not participating voluntarily in the audit, and it was reflected in the reserved attitude. In a few other cases, the attitude of the auditees of the educational institutions changed from neutral to reserved most likely because of guilt or disappointment when the prior expectations of high scores were not met. Investigator triangulation was used as two auditors observed the attitudes together. The audited organization received one general score on initial attitude and one general score on closing attitude. Often there were many participants in the audit, and the overall attitude of the group was recorded. Both auditors made observations by themselves, and only twice were the scores of the researchers unequal. This happened in the early stages of the development of the consultative auditing process. The auditors found a common understanding through discussion and thus adopted joint scores for initial and closing attitudes. There is reason to believe that the results concerning the attitudes toward the auditing are reliable and valid.

The TUTOR model was chosen because of its wide-ranging way of viewing the SSM. Thus, the content validity was improved. The reason for choosing the Central Uusimaa region was that the TUTOR model was created by the Keski-Uusimaa Department for Rescue Services, and the model will be used in the future for auditing educational institutions of this region.

Statistical analysis was used for analyzing the results of the survey, observation and auditing. A graphical examination of the figures was also conducted. According to Nummenmaa (2011, 14–15, 148, 158–159) and Tähtinen, Laakkonen and Broberg

(2011, 12, 15) in an empirical study, common features and regularities are sought in the investigated sample. In statistical reasoning, the way the phenomenon occurs in a larger population is predicted. The selected sample should have as united characteristics as possible among the general population. It is not evident that the phenomenon occurring in the sample will also occur in the population. Therefore, statistical analysis is used to clarify how likely the phenomenon in the sample is to occur in the population, too. The suitability of statistical methods affects the reliability of the study. Additionally, reliable statistical reasoning requires sampling criteria which, in turn, have an effect on how the results can be generalized. If non-participation bias exists, it reduces the sample size and affects the representativeness of the sample. According to Nummenmaa (2011, 154), the form of the research data distribution affects the suitability of the statistical analysis method. Before making a statistical analysis of the material, the normal distribution of variables was examined. In this study, non-parametric tests were used because the variables deviated from the normal distribution.

Maxwell (1998, 93) argues that triangulation reduces the risk of systematic distortion. Hirsjärvi, Remes and Sajavaara (2009, 233) mention that different kinds of triangulation exist, such as investigator triangulation, methodological triangulation, data triangulation, theory triangulation and, moreover, mixing methods. In this study, triangulation was used to enhance the confidence in the research findings. Theoretical triangulation was applied using multiple perspectives in the SSM while preparing for the audits, creating the survey, auditing and consulting. Methodological triangulation was used when studying the effects of the consultative auditing process by means of the survey and observation. Feedback about the Asteri consultative auditing process was collected via the survey. The feedback was gathered from all participants of the audited educational institutions through their contact person, and it was received from 61 respondents representing 40 different educational institutions out of 76 (52.6%). There is a reason to believe that the results can be generalized to all Finnish EAs and UASs.

The study could have been performed in another way. The presentation of the TUTOR model, the link to the survey and the audit results could have been sent directly to all

participants of the audit instead of sending them to the contact person of the organization. In addition, on the survey the respondents were asked to choose the six most important development targets of the workplace for the next three years in order of importance after the audit. It would have been easier for the respondents to choose the three most important development targets without putting them in priority. Finally, in the survey, the statements concerning the effects on concrete actions could have been asked later – for example, six months after the audit. This would have provided time for audited organizations to take corrective actions.

5.3.2 Effect of the target group on generalization of the results

To develop and to test the usability of the Asteri consultative auditing process in different educational institutions, a minimum five UASs, five ESs and five vocational schools was formed the targeted quantity in this study. Eventually, Asteri was tested in 76 educational institutions, of which there were 19 UASs, 48 ESs and six vocational schools. Two auditors were used because of reliability, face validity and stability.

The TUTOR model combined with the Asteri consultative auditing process were used to draw conclusions about the performance level, strengths and weaknesses in the SSM in the educational institutions. All UASs operating under the Ministry of Education and Culture were invited to be audited. Additionally, ESs in two municipalities of different sizes, Vantaa city and Hyvinkää town, located in the Central Uusimaa region, were invited to be audited, and the educational administration departments of Vantaa city and Hyvinkää town recommended that they accept the audit invitation. There are 24 UASs operating under the Ministry of Education and Culture (Opetus- ja kulttuuriministeriö 2014), of which 13 (54.2%) were audited, and, in addition, all seven campuses of Laurea UASs were audited. In 2014 in Vantaa (2014), there were 45 Finnish ESs, of which 32 (71.1%) were audited. In Hyvinkää (2015), there were 18 Finnish ESs, of which 12 (66.7%) were audited. The number of audited ESs was low (1.9%) compared to the total number of ESs in Finland. However, the coverage of the audited ESs of Vantaa city and Hyvinkää town were high enough in order to draw general conclusions

based on the results. Some ESs of Vantaa city informed that the Keski-Uusimaa Department for Rescue Services had already audited them using the TUTOR Basic model. Some ESs in Hyvinkää town and Vantaa city and, in addition, some UASs did not want to be audited. A few UASs explained that they did not want to be audited because the development of the SSM system was in progress. It can be assumed that an educational institution that has not yet been audited would not refuse auditing if its SSM system is already advanced. In this study, the number of audited UASs was high enough (54.2 % of all UASs) to allow general conclusions based on the results. The number of other educational institutions was small, and, therefore, a comparison of the performance levels of the SSM was not made between other educational institutions and UASs, or between other educational institutions and ESs.

UASs are similar in the sense that they are corporations, and, moreover, the Ministry of Education and Culture provides guidance, including safety and security guidance, to them. In addition, ESs are similar in the sense that they receive guidance, including safety and security guidance, from the municipality and the Finnish National Board of Education. There were no statistically significant differences between performance levels of ESs in Vantaa city and Hyvinkää town. Additionally, educational institutions are familiar with safety matters through fire inspections made by the department for rescue services and inspections made by the occupational health and safety authority. However, these inspections do not cover all sections of organizational SSM as described by the Confederation of Finnish Industries. Rectors, teachers and lecturers have pedagogical training, whilst comprehensive SSM requires a wide range of other forms of expertise. Typically, the need of comprehensive, risk based SSM in educational has not yet been emphasized. All this gives reason to believe that the SSM is similar between the audited and other UASs and, moreover, among the audited and other ESs in Finland. Hence, there is reason to believe that the results of the study concerning auditing, the consultative auditing process and its effects are valid for all ESs and UASs in Finland.

The study could have been carried out in another way. More cities or towns outside Uusimaa province could have been included in the research in order to determine whether there are differences between ESs in the different municipalities of Finland. In addition, from a validity point of view, it would have been useful to audit all UASs due to their relatively small number.

5.4 Development proposals and further research

Based on the results of the study, development proposals have been made. The educational administration departments of municipalities could take an active role in the facilitation of the SSM of ESs, although currently the rector in each ES has the sole responsibility for the SSM. The educational administration departments of municipalities could offer guidance on comprehensive, risk based SSM, share good practices and arrange training and cooperation between safety and security teams of ESs in the same municipality. Moreover, an educational institution could bring together main stakeholders affecting its safety and security, such as facility services, contractors, security company, evening and weekend users and authorities as well as the safety and security experts of the municipality. In addition, educational administration departments in different municipalities could cooperate and learn from each other – for example, by means of benchmarking.

This study opens opportunities for further research. A follow-up audit for the educational institutions evaluated in this study would be useful. During the follow-up audit, the performance level in comprehensive SSM of the educational institutions could be evaluated again in order to determine how the SSM has improved and, moreover, whether the future targets have been achieved. In this way, a possible need for training would also arise. In addition, the Asteri consultative auditing process could be applied in an internal audit of corporates, municipalities, federation of municipalities or educational administration departments. Differences in the performance levels in comprehensive SSM could be compared, for example, over three years and between the organizations, departments or units to which the Asteri consultative auditing process has

been applied and the organizations, department or units to which a traditional auditing process has been applied.

The Asteri consultative auditing process may be usable in many different types of audits, not only in SSM audits – for example, in conjunction with the audit criteria for an information security management system. Moreover, in future research, the Asteri consultative auditing process could be used in a second-party or a third-party audit to teach the audited subject matter to the organization to be audited. The effects of the consultative auditing process on auditees' knowledge and skills as well as actions initiated by the audit could be compared to the results achieved in this study.

6 Conclusions

The safety and security of educational institutions have been studied and developed over the past decade and yet in a fragmented way. A safe and secure learning environment is a requirement within the Finnish legislation without mentioning the need of comprehensive, risk based SSM as well as the management commitment in the implementation and development of the SSM. As one of the main contributions, this research presents the new Asteri consultative auditing process. Asteri may be usable in many different types of audits, not only in SSM audits while auditing an organization where there is a need for teaching and learning of the subject to be audited. The Asteri consultative auditing consists of auditing, coaching, knowledge creation and continuous improvement.

The results of this study confirm that the Asteri consultative auditing process provides added value for the auditee. When used with the TUTOR model, organizations' knowledge and skills increase. The more useful, the more objective and the more positive the audit is experienced, the better the effects on knowledge and skills are. Finally, the better the effects of the auditing are on knowledge and skills, the better are the effects of auditing on the SSM. Organizations with low performance levels on the audited subject benefit the most from the Asteri consultative auditing process.

As a new result, this study provides new knowledge on attitudes related to auditing. According to the research findings, auditing may generate negative attitudes and auditors must take attitudes into account when planning and preparing for audits. The negative attitudes can be compensated by producing added value, objectivity and positivity for the audit and, thus, improve the positive effects of auditing on knowledge and skills. According to the results, there was no correlation between auditees' initial and closing attitudes and the overall performance level of the SSM. Moreover, as the results of this study show, auditing safety and security matters do not increase feelings of insecurity, but rather increase feelings of safety and security when using the new Asteri consultative auditing process with the TUTOR model.

As a new result, it was found that the SSM in the UASs was significantly more advanced than that in the ESs, and yet there is still room for improvement in the ESs and the UASs. The SSM was fragmented, and there is a need for comprehensive, risk based SSM in educational institutions. The findings of the study suggest that the majority of Finnish UASs and ESs do not likely meet the basic level of comprehensive SSM.

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Appendicies
Appendix 1: Audited educational institutions

Universities of applied sciences	Centria University of Applied Sciences, Kokkola
	Diak University of Applied Sciences, Helsinki campus
	HAMK University of Applied Sciences, Hämeenlinna campus
	Kemi-Tornio University of Applied Sciences, Kemi
	Lahti University of Applied Sciences, Lahti
	Laurea University of Applied Sciences, Espoo Leppävaara campus
	Laurea University of Applied Sciences, Espoo Otaniemi campus
	Laurea University of Applied Sciences, Hyvinkää campus
	Laurea University of Applied Sciences, Kerava campus
	Laurea University of Applied Sciences, Lohja campus
	Laurea University of Applied Sciences, Porvoo campus
	Laurea University of Applied Sciences, Vantaa Tikkurila campus
	Metropolia University of Applied Sciences, Helsinki
	Novia University of Applied Sciences, Vaasa
	Rovaniemi University of Applied Sciences, Rovaniemi
	Savonia University of Applied Sciences, Kuopio
	Seinäjoki University of Applied Sciences, Seinäjoki campus
	Tampere University of Applied Sciences, Tampere
	Turku University of Applied Sciences, Turku

Other educational institutions	Helsinki University, teacher education, Helsinki
	Hyria koulutus, vocational school, Hyvinkää
	Hyvinkään Opisto, community college, Hyvinkää
	Hyvinkään Sveitsin lukio, high school, Hyvinkää
	Invalidiliiton Järvenpään koulutuskeskus, vocational school, Järvenpää campus
	Keuda, vocational school, Kerava Keskikatu campus
	Keuda, vocational school, Sipoo campus
	Omnia, vocational school, Espoo
	Sedu, vocational school, Seinäjoki
Elementary schools	Aseman koulu, Hyvinkää
	Askiston koulu, Vantaa
	Hakalan koulu, Hyvinkää
	Hakalanpolun koulu, Hyvinkää
	Hakunilan koulu, Vantaa
	Hevoshaan koulu, Vantaa
	Hyvinkäänkylän koulu, Hyvinkää
	Hämeenkadun koulu, Hyvinkää
	Ilolan koulu, Vantaa
	Itä-Hakkilan koulu, Vantaa
	Jokivarren koulu, Vantaa
	Kaivokselan koulu, Vantaa

Elementary schools (cont.)	Kanniston koulu, Vantaa
	Kartanonkosken koulu, Vantaa
	Kaukasten koulu, Hyvinkää
	Kilterin koulu, Vantaa
	Kivimäen koulu, Vantaa
	Kivistön koulu, Vantaa
	Koivukylän koulu, Vantaa
	Kulomäen koulu, Vantaa
	Kytäjän koulu, Hyvinkää
	Kytöpuiston koulu, Vantaa
	Leppäkorven koulu, Vantaa
	Leppävaaran koulu, Espoo
	Martin koulu, Hyvinkää
	Martinkulman koulu, Hyvinkää
	Martinlaakson koulu, Vantaa
	Mikkolan koulu, Vantaa
	Patastenmäen koulu, Riihimäki
	Peltolan koulu, Vantaa
	Pohjoispuiston koulu, Hyvinkää
	Puolimatkan koulu, Hyvinkää
	Pähkinärinteen koulu, Vantaa
	Rajakylän koulu, Vantaa

Elementary schools (cont.)	Rajatorpan koulu, Vantaa
	Rekolan koulu, Vantaa
	Rekolanmäen koulu, Vantaa
	Ruusuvuoren koulu, Vantaa
	Simonkallion koulu, Vantaa
	Tapainlinnan koulu, Hyvinkää
	Tommola-talo, Heinola (also day care and family support center)
	Töyrynummen ala-asteen koulu, Helsinki
	Uomanrinteen koulu, Vantaa
	Vantaankosken koulu, Vantaa
	Viertolan koulu, Vantaa, Jokiranta
	Viertolan koulu, Vantaa, Viertola
	Vierumäen koulu, Vantaa
	Ylästön koulu, Vantaa

Appendix 2: Summary page of the TUTOR Max Model

(Translation from Finnish)

Safety and security management	Management	Self-evaluati	3rd party	**Operational risks**	Management	Self-evaluati	3rd party eval	**Compliance with requirements**	Management	Self-evaluati	3rd party
1.1 Planning and control	0,0	0,0	0,0	2.1 Objectives and guidelines	0,0	0,0	0,0	3.1 Safety- and security-related regulatory requirements and other relevant guidelines	0,0	0,0	0,0
1.2 Management awareness	0,0	0,0	0,0	2.2 Risk management system and comprehensiveness	0,0	0,0	0,0				
1.3 Monitoring and controlling	0,0	0,0	0,0								
1.4 Resources and safey & security organization	0,0	0,0	0,0	2.3 Risk identification	0,0	0,0	0,0				
1.5 Cooperation with stakeholders	0,0	0,0	0,0	2.4 Implementation and effectiveness	0,0	0,0	0,0				
Average	**0,0**	**0,0**	**0,0**	**Average**	**0,0**	**0,0**	**0,0**	**Average**	**0,0**	**0,0**	**0,0**
Safety and security documentation	Management	Self-evaluati	3rd party		Management	Self-evaluati	3rd party eval	**Facility management technology and**	Management	Self-evaluati	3rd party
4.1 Operating models	0,0	0,0	0,0					5.1 Technical systems	0,0	0,0	0,0
4.2 Legal documents and plans	0,0	0,0	0,0	**LEVEL OF SAFETY & SECURITY**				5.2 Rescue operation prerequisites	0,0	0,0	0,0
					0,0	**0,0**	**0,0**	5.3 Preparedness	0,0	0,0	0,0
								5.4 Outsourced operations	0,0	0,0	0,0
				MAX version							
Average	**0,0**	**0,0**	**0,0**					**Average**	**0,0**	**0,0**	**0,0**
Training	Management	Self-evaluati	3rd party	**Safety and security communication**	Management	Self-evaluati	3rd party eval	**Results and effectiveness**	Management	Self-evaluati	3rd party
6.1 Planning and organizing of training	0,0	0,0	0,0	7.1 Implementation of safety and security communication	0,0	0,0	0,0	8.1 Monitoring and measurement	0,0	0,0	0,0
6.2 Adequacy of training	0,0	0,0	0,0	7.2 Safety & security communication in special situations	0,0	0,0	0,0	8.2 Analysis and improvement	0,0	0,0	0,0
6.3 Training register and training plan	0,0	0,0	0,0								
Average	**0,0**	**0,0**	**0,0**	**Average**	**0,0**	**0,0**	**0,0**	**Average**	**0,0**	**0,0**	**0,0**

Appendix 3: Electronic survey for auditees

(Translation from Finnish)

I Background information

My workplace
○ University /University of applied sciences
○ Vocational school
○ High school
○ Elementary school
○ Other

Name of my workplace and unit:
_____

During the audit using the TUTOR model, I represented
○ management
○ personnel

II **Development targets of my workplace**

Please choose the six (6) most important development targets of your workplace (university or educational institution) in the order of importance for the next three years.

1 = Most important, 2 = Second most important, 3 = Third most important, 4 = Fourth most important, 5 = Fifth most important, 6 = Sixth most important.

If your workplace does not need six development targets, please just select as many targets as needed. However, please select at least one target.

Finally, please mention the reasons why you chose these development targets.

Please consider your choice carefully before filling in the table. The chosen development target cannot be completely removed if a priority has already been given to it.

Key concepts

Processes related to safety activities are, for example, orientation and training of new employees, key management and crisis communication.

Individual safety and security awareness is based on values and attitudes. They become visible on knowledge, understanding and action.

Safety and security risks are, for example, personnel risk, fire risk, criminal risk and information risk.

Authorities in this context refer to, for example, police, fire and rescue authorities as well as health care and social welfare personnel.

The safety and security management of the premises aims to protect the organization, its assets and personnel with various means of protection. These include, among other things, access and loss control as well as security surveillance to prevent damages caused by fire, water, electricity, air-conditioning and burglary. Furthermore, maintenance and service agreements are also included.

	1	2	3	4	5	6
Safety & security responsibilities and resource management of safety & security-related activities	○	○	○	○	○	○
Describing processes concerning safety/security-related activities	○	○	○	○	○	○
Safety & security awareness survey for personnel	○	○	○	○	○	○
Safety & security risk assessment and risk management	○	○	○	○	○	○
Emergency preparedness concerning identified emergency situations	○	○	○	○	○	○
Creating safety & security documentation management system	○	○	○	○	○	○
Safety & security training targeted to different groups of personnel	○	○	○	○	○	○
Safety & security training targeted to pupils/students	○	○	○	○	○	○
Responsibilities of safety & security communication (Internal, external), planning and implementation of safety & security communication	○	○	○	○	○	○
Measuring and monitoring safety & security activities (Reactive, proactive)	○	○	○	○	○	○
Safety & security cooperation with authorities (e.g., police, fire and rescue authorities and health care and social services personnel)	○	○	○	○	○	○
Safety & security cooperation with various universities and other educational institutions	○	○	○	○	○	○
Safety & security development plan for the premises	○	○	○	○	○	○
Scenario work for anticipating future safety/security risks	○	○	○	○	○	○
Some other development area. Which one?						
----------	○	○	○	○	○	○

Why did you choose these development areas?

III Experiences concerning auditing using the TUTOR model

Auditing process:

The rating scale is as follows:

1 = Strongly agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly disagree, 6 = No response.

	1 2 3 4 5 6
The TUTOR material, which I received in advance, gave me a fair view of the forthcoming audit	○ ○ ○ ○ ○ ○
I was prepared for the audit	○ ○ ○ ○ ○ ○
The purpose of the audit questions became clear to me during the discussion of the audit	○ ○ ○ ○ ○ ○
The audit questions covered the scope of the audit	○ ○ ○ ○ ○ ○
The number of questions was appropriate	○ ○ ○ ○ ○ ○
Auditing process was objective	○ ○ ○ ○ ○ ○
Auditing was a positive experience	○ ○ ○ ○ ○ ○
Auditing was useful for my workplace	○ ○ ○ ○ ○ ○
I have reviewed the results of the audit of my workplace	○ ○ ○ ○ ○ ○

Effects on respondent's perceptions and knowledge:

The rating scale is as follows:

1 = Strongly agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly disagree, 6 = No response.

	1	2	3	4	5	6
Auditing helped to define the safety & security target state of my workplace	○	○	○	○	○	○
Auditing helped to identify the current state of the safety & security of my workplace	○	○	○	○	○	○
Auditing helped to outline actions needed to reach the safety & security targets of my workplace	○	○	○	○	○	○
Auditing highlighted the responsibility of the management in safety & security operations	○	○	○	○	○	○
My safety & security awareness grew while auditing	○	○	○	○	○	○
I got new ideas for the development of safety & security operations based on auditing	○	○	○	○	○	○
I can identify better the need for safety & security development due to auditing	○	○	○	○	○	○
I feel that my workplace is safer and more secure due to the result of the audit	○	○	○	○	○	○
I know what I'm responsible for and what are my safety & security tasks in my workplace	○	○	○	○	○	○
I know what the management is responsible for and what are his/her safety & security tasks in my workplace	○	○	○	○	○	○
I know what the students & pupils are responsible for and what are their safety &security tasks in my workplace	○	○	○	○	○	○

Effects on concrete actions:

The rating scale is as follows:
1 = Strongly agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly disagree, 6 = No response.

	1	2	3	4	5	6
Auditing confirmed the need for previously planned safety & security activities	○	○	○	○	○	○
Auditing started the continuous safety & security development work	○	○	○	○	○	○
Auditing raised discussion on safety & security in my workplace	○	○	○	○	○	○
Auditing has already had visible effects on safety & security in my workplace	○	○	○	○	○	○
Safety & security actions have been taken due to auditing	○	○	○	○	○	○
The most important safety & security measures that arose during the audit will be implemented in the next six months	○	○	○	○	○	○

Appendix 4: Audit results

Six campuses of Laurea UAS and one vocational school were audited according to the TUTOR Basic model (11 different cards), and the rest, 69 educational institutions, were audited according to the TUTOR Max model (23 different cards). The results given in the table below are based on the auditors' assessment and presented according to the different cards.

The rating scale is as follows:
1≤x<2=Weak, 2≤x<3=Incomplete, 3≤x<4=Basic, 4≤x<5=Committed, 5=Forerunner

Assessment of auditor	**University of applied sciences**			**Elementary school**			**Other educational institution**		
	N	**Mean**	**Standard deviation**	**N**	**Mean**	**Standard deviation**	**N**	**Mean**	**Standard deviation**
1 Safety & security management	19	2.66	0.50	48	2.26	0.33	9	2.29	0.37
1.1 Planning and control	13	2.58	0.53	48	2.19	0.49	8	2.38	0.52
1.2 Management awareness	13	2.69	0.63	48	2.40	0.33	8	2.19	0.53
1.3 Monitoring and control of organization	13	2.85	0.43	48	2.49	0.24	8	2.50	0.27
1.4 Resources of safety & security organization	13	2.96	0.59	48	2.23	0.61	8	2.31	0.65
1.5 Cooperation with stakeholders	13	2.31	0.63	48	2.02	0.56	8	2.00	0.46
2 Operational risks	19	2.27	0.62	48	1.74	0.38	9	1.92	0.31

Assessment of auditor	University of applied sciences			Elementary school			Other educational institution		
	N	Mean	Standard deviation	N	Mean	Standard deviation	N	Mean	Standard deviation
2.1 Objectives and guidelines	13	2.46	0.90	48	1.45	0.52	8	1.81	0.46
2.2 Risk management system and comprehensiveness	13	2.46	0.97	48	1.45	0.50	8	1.88	0.64
2.3 Risk identification	13	2.31	0.56	48	1.99	0.39	8	1.94	0.18
2.4 Implementation and effectiveness	13	2.35	0.63	48	1.99	0.39	8	1.94	0.32
3 Compliance with requirements	19	2.94	0.67	48	2.10	0.52	9	2.33	0.56
3.1 Safety- and security-related regulatory requirements and other relevant guidelines	13	3.00	0.68	48	2.10	0.52	8	2.25	0.53
4 Safety and security documentation	19	2.57	0.66	48	2.64	0.43	9	2.50	0.42
4.1 Operating models	13	2.81	0.60	48	2.70	0.45	8	2.50	0.53
4.2 Legal documents and plans	13	2.73	0.67	48	2.53	0.49	8	2.38	0.35

Assessment of auditor	**University of applied sciences**			**Elementary school**			**Other educational institution**		
	N	**Mean**	**Standard deviation**	**N**	**Mean**	**Standard deviation**	**N**	**Mean**	**Standard deviation**
5 Facility management technology and safety & security technology	19	2.80	0.47	48	2.38	0.30	9	2.59	0.36
5.1 Technical systems	13	2.81	0.60	48	2.62	0.52	8	2.81	0.59
5.2 Premises for rescue operations	13	2.81	0.56	48	2.60	0.33	8	2.69	0.37
5.3 Preparedness	13	2.81	0.72	48	2.27	0.73	8	2.63	0.52
5.4 Outsourced operations	13	2.73	0.60	48	1.98	0.52	8	2.25	0.53
6 Training	19	2.12	0.74	48	1.65	0.46	9	1.82	0.57
6.1 Planning and organizing of training	13	2.42	0.73	48	1.69	0.58	8	2.13	0.58
6.2 Adequacy of training	13	1.50	0.68	48	1.50	0.58	8	1.75	0.71
6.3 Training register and training plan	13	1.81	0.60	48	1.73	0.49	8	1.75	0.65
7 Safety and security communication	19	2.63	0.73	48	2.44	0.51	9	2.22	0.60
7.1 Implementation of safety & security communication	13	2.27	0.75	48	2.04	0.53	8	1.88	0.69

Assessment of auditor	University of applied sciences			Elementary school			Other educational institution		
	N	Mean	Standard deviation	N	Mean	Standard deviation	N	Mean	Standard deviation
7.2 Safety communication in special situations	13	3.15	0.85	48	2.79	0.63	8	2.44	0.73
8 Results and effectiveness	19	2.22	0.73	48	1.59	0.52	9	1.69	0.63
8.1 Monitoring and measurement	13	2.19	0.72	48	1.69	0.57	8	1.81	0.65
8.2 Analysis and improvement	13	2.12	0.79	48	1.48	0.54	8	1.63	0.69

Appendix 5: Factor analysis of the survey variables

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.270	24.114	24.114	2.223	8.551	8.551	3.311	12.734	12.734
2	3.349	12.882	36.996	4.794	18.438	26.989	2.500	9.617	22.351
3	2.345	9.018	46.014	2.308	8.875	35.864	2.429	9.342	31.694
4	2.048	7.876	53.891	2.473	9.510	45.374	1.987	7.643	39.336
5	1.801	6.926	60.817	1.783	6.857	52.231	1.918	7.379	46.715
6	1.584	6.094	66.911	1.533	5.896	58.128	1.879	7.228	53.943
7	1.530	5.885	72.796	.926	3.560	61.688	1.749	6.728	60.670
8	1.286	4.946	77.742	1.470	5.655	67.342	1.735	6.672	67.342
9	.939	3.612	81.355						
10	.898	3.453	84.808						
11	.748	2.877	87.685						
12	.678	2.608	90.293						
13	.524	2.016	92.309						
14	.410	1.575	93.884						
15	.354	1.361	95.245						
16	.268	1.032	96.276						
17	.247	.951	97.227						
18	.196	.756	97.982						
19	.169	.648	98.631						
20	.111	.427	99.058						
21	.076	.291	99.349						
22	.062	.238	99.587						
23	.047	.182	99.769						
24	.035	.134	99.903						
25	.018	.068	99.971						
26	.008	.029	100.000						
Extraction Method: Generalized Least Squares.									

Rotated Factor Matrix[a]								
	Factor							
	1	2	3	4	5	6	7	8
I got new ideas for the development of safety & security operations based on auditing	.923							
My safety & security awareness grew during the assessment	.639							
Auditing helped to define safety & security target state of my workplace	.618	.405						
Auditing helped to outline actions needed to reach safety & security targets of my workplace	.536				.517			
I can identify better the need for safety & security development due to auditing	.515				.362			
Auditing was useful in my workplace	.391							.390
Auditing started the continuous safety & security development work		.871						
Auditing raised discussion on safety & security in the workplace		.667						
I know what the management is responsible for and what are his/her safety & security tasks in my workplace	.330	.475				.310	.326	

Rotated Factor Matrix[a]								
	Factor							
	1	2	3	4	5	6	7	8
Most important safety & security measures that rose during the audit will be implemented in the next six months		.468			.360			
Safety & security actions have been taken due to auditing			.964					
Auditing already made visible effects on safety & security in the workplace		.320	.775					
I was prepared for an audit			.434					
Number of questions was appropriate				.748			.506	
Auditing highlighted the responsibility of the management in safety & security operations		.316		.624				
Auditing helped to identify the current state of safety & security of my workplace			.332	.607				
The auditing process was objective				.362				
The audit questions covered the scope of the audit				.333				
Purpose of the audit questions became clear to me during the discussion of the audit					.950			

Rotated Factor Matrix[a]								
	Factor							
	1	2	3	4	5	6	7	8
Auditing was a positive experience	.302		-.344		.345		.314	
I feel that my workplace is safer and more secure due to the result of the audit						.927		
I know what I'm responsible for, and what are my safety & security tasks in my workplace	.421					.520		
I know what the students/pupils are responsible for and what are their safety &security tasks in my workplace	.314					.411		.382
The TUTOR material, which I received in advance, gave me a fair view of the forthcoming audit							.926	
I have studied the results of the audit of my workplace								.965
Extraction Method: Generalized Least Squares. Rotation Method: Varimax with Kaiser Normalization.								
a. Rotation converged in 15 iterations.								

Appendix 6: Reliability analysis of the sum variables of the survey

1st factor: Positive effects of auditing on knowledge and skills

Reliability Statistics	
Cronbach's Alpha	N of Items
.930	6

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I got new ideas for the development of safety & security operations based on auditing	8.3982	11.623	.827	.913
My safety & security awareness grew during the assessment	8.5818	11.757	.803	.916
Auditing helped to define safety & security target state of my workplace	8.4895	12.115	.763	.921
Auditing helped to outline actions needed to reach safety & security targets of my workplace	8.4446	12.209	.818	.915
I can identify better the need for safety & security development due to auditing	8.5397	11.787	.841	.911
Auditing was useful in my workplace	8.7346	12.496	.722	.926

2nd factor: Positive effects of auditing on SSM

Reliability Statistics	
Cronbach's Alpha	N of Items
.766	4

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Auditing started the continuous safety & security development work	5.6132	2.061	.707	.625
Auditing raised discussion on safety & security in my workplace	5.7735	2.840	.509	.740
I know what the management is responsible for and what are his/her safety & security tasks in my workplace	6.2776	2.703	.464	.762
Most important safety & security measures that rose during the audit will be implemented in the next six months	6.0632	2.459	.602	.690

3rd factor: Actions initiated by the audit

Reliability Statistics	
Cronbach's Alpha	N of Items
.719	2

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Safety & security actions have been taken due to auditing	2.6336	.864	.588	.
Auditing already made visible effects on safety & security in the workplace	2.7454	1.599	.588	.

4th factor: Added value and objectivity of the audit

Reliability Statistics	
Cronbach's Alpha	N of Items
.604	5

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Number of questions was appropriate	6.6143	2.755	.458	.494
Auditing highlighted the responsibility of the management in safety & security operations	7.4165	3.533	.447	.507
Auditing helped to identify the current state of safety & security of my workplace	7.3795	4.205	.248	.599
The auditing process was objective	7.0451	3.630	.291	.588
The audit questions covered the scope of the audit	7.3327	3.828	.394	.539

5th factor: Positive experience in the Asteri consultative auditing process

Reliability Statistics	
Cronbach's Alpha	N of Items
.778	2

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Purpose of the audit questions became clear to me during the discussion of the audit	1.7705	.698	.645	.
Auditing was a positive experience	1.7354	.509	.645	.

6th factor: Identified responsibilities

Reliability Statistics	
Cronbach's Alpha	N of Items
.620	2

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I know what I'm responsible for, and what are the safety & security tasks in my workplace	2.3577	.779	.467	.
I know what the students & pupils are responsible for and what are their safety & security tasks in my workplace	1.6523	.446	.467	.

Appendix 7: Correlations between different variables

		Total SSM, auditor	Auditor's closing view on auditee's willingness to be audited	Auditor's initial view on auditee's willingness to be audited	Positive effects of auditing on knowledge and skills	Positive effects of auditing on SSM	Actions initiated by the audit	Added value and objectivity of the audit	Positive experience in Asteri consultative auditing process	Identified responsibilities	TUTOR material, which I reveiced in advance, gave me a fair view of the forthcoming audit	I have studied the results of the audit of my workplace	I was prepared for an audit	I feel that my workplace is safer and more secure due to the result of the audit
Total SSM, auditor	Correlation Coeficcient	1,000												
	Sig. (2-tailed)													
	N	76												
Auditor's closing view on auditee'swillingness to be audited	Correlation Coeficcient	-0,870	1,000											
	Sig. (2-tailed)	0,453												
	N	76	76											
Auditor's initial view on auditee'swillingness to be audited	Correlation Coeficcient	-0,094	0,297**	1,000										
	Sig. (2-tailed)	0,420	0,009											
	N	76	76	76										

		Total SSM, auditor	Auditor's closing view on auditee's willingness to be audited	Auditor's initial view on auditee's willingness to be audited	Positive effects of auditing on knowledge and skills	Positive effects of auditing on SSM	Actions initiated by the audit	Added value and objectivity of the audit	Positive experience in Asteri consultative auditing process	Identified responsibilities	TUTOR material, which I reveiced in advance, gave me a fair view of the forthcoming audit	I have studied the results of the audit of my workplace	I was prepared for an audit	I feel that my workplace is safer and more secure due to the result of the audit
Positive effects of auditing on knowledge and skills	Correlation Coeficcient	0,233	-0,377*	-0,234	1,000									
	Sig. (2-tailed)	0,159	0,020	0,157										
	N	38	38	38	38									
Positive effects of auditing on SSM	Correlation Coeficcient	0,122	-0,225	-0,277	0,509**	1,000								
	Sig. (2-tailed)	0,471	0,182	0,097	0,002									
	N	37	37	37	36	37								
Actions initiated by the audit	Correlation Coeficcient	0,005	0,039	-0,144	0,028	0,352*	1,000							
	Sig. (2-tailed)	0,975	0,816	0,381	0,866	0,032								
	N	39	39	39	38	37	39							

		Total SSM, auditor	Auditor's closing view on auditee's willingness to be audited	Auditor's initial view on auditee's willingness to be audited	Positive effects of auditing on knowledge and skills	Positive effects of auditing on SSM	Actions initiated by the audit	Added value and objectivity of the audit	Positive experience in Asteri consultative auditing process	Identified responsibilities	TUTOR material, which I reveiced in advance, gave me a fair view of the forthcoming audit	I have studied the results of the audit of my workplace	I was prepared for an audit	I feel that my workplace is safer and more secure due to the result of the audit
Added value and objectivity of the audit	Correlation Coeficcient	0,159	-0,186	-0,167	0,452	0,308	-0,005	1,000						
	Sig. (2-tailed)	0,349	0,271	0,322	0,006	0,068	0,979							
	N	37	37	37	36	36	37	37						
Positive experience in Asteri consultative auditing process	Correlation Coeficcient	0,122	-0,313	-0,222	0,529**	0,311	-0,206	0,337*	1,000					
	Sig. (2-tailed)	0,460	0,052	0,174	0,001	0,061	0,208	0,041						
	N	39	39	39	38	37	39	37	39					
Identified responsibilities	Correlation Coeficcient	-0,078	-0,034	0,197	0,430**	0,475**	0,251	0,097	0,061	1,000				
	Sig. (2-tailed)	0,636	0,838	0,230	0,008	0,003	0,129	0,569	0,717					
	N	39	39	39	37	37	38	37	38	39				

		Total SSM, auditor	Auditor's closing view on auditee's willingness to be audited	Auditor's initial view on auditee's willingness to be audited	Positive effects of auditing on knowledge and skills	Positive effects of auditing on SSM	Actions initiated by the audit	Added value and objectivity of the audit	Positive experience in Asteri consultative auditing process	Identified responsibilities	TUTOR material, which I reveiced in advance, gave me a fair view of the forthcoming audit	I have studied the results of the audit of my workplace	I was prepared for an audit	I feel that my workplace is safer and more secure due to the result of the audit
TUTOR material, which I reveiced in advance, gave me a fair view of the forthcoming audit	Correlation Coeficcient	-0,126	-0,089	-0,020	0,286	0,160	0,057	0,412*	0,386*	0,348*	1,000			
	Sig. (2-tailed)	0,456	0,599	0,907	0,096	0,359	0,741	0,016	0,020	0,038				
	N	37	37	37	35	35	36	34	36	36	37			
I have studied the results of the audit of my workplace	Correlation Coeficcient	0,145	-0,242	-0,304	0,210	0,475**	0,241	0,245	0,075	0,351*	-0,056	1,000		
	Sig. (2-tailed)	0,370	0,132	0,057	0,207	0,003	0,140	0,144	0,650	0,028	0,744			
	N	40	40	40	38	37	39	37	39	39	37	40		

		Total SSM, auditor	Auditor's closing view on auditee's willingness to be audited	Auditor's initial view on auditee's willingness to be audited	Positive effects of auditing on knowledge and skills	Positive effects of auditing on SSM	Actions initiated by the audit	Added value and objectivity of the audit	Positive experience in Asteri consultative auditing process	Identified responsibilities	TUTOR material, which I reveiced in advance, gave me a fair view of the forthcoming audit	I have studied the results of the audit of my workplace	I was prepared for an audit	I feel that my workplace is safer and more secure due to the result of the audit
I was prepared for an audit	Correlation Coeficcient	-0,270	-0,079	-0,322*	0,218	0,340*	0,450**	-0,158	-0,148	0,423**	0,021	0,274	1,000	
	Sig. (2-tailed)	0,096	0,633	0,045	0,189	0,039	0,004	0,349	0,369	0,008	0,905	0,091		
	N	39	39	39	38	37	39	37	39	38	36	39	39	
I feel that my workplace is safer and more secure due to the result of the audit	Correlation Coeficcient	-0,154	0,008	0,015	0,362*	0,244	0,339*	0,157	0,092	0,555**	0,547**	-0,063	0,230	1,000
	Sig. (2-tailed)	0,350	0,959	0,926	0,027	0,152	0,038	0,354	0,584	0,000	0,001	0,705	0,164	
	N	39	39	39	37	36	38	37	38	38	36	39	38	39

*. Correlation is significant at the 0,05 level (2-tailed).

**. Correlation is significant at the 0,01 level (2-tailed).

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