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Osmo Kauppila

INTEGRATED QUALITY EVALUATION IN HIGHER EDUCATION

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OSMO KAUPPILA

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Abstract

The role of higher education as an essential component of the productive economy has been emphasized in the 21st century, resulting in a constant need to demonstrate compliance and excellence to various stakeholders. To achieve this, a large variety of internal and external evaluation processes have been developed. However, to connect these evaluations with continuous improvement has often proved challenging due to factors arising from organizational complexity.

This compilation dissertation examines how various quality evaluations in higher education could be integrated in a meaningful and synergistic manner. Integration is analyzed both horizontally across the three missions of the university, as well as vertically ranging from external evaluations to self-assessment. The four research articles each support this whole from a different viewpoint. The results of the articles are complemented by a literature review of chosen relevant topics on quality management and evaluation in higher education.

The results of this work suggest that a planned process of evaluations starting from the institution level could help evaluations build upon each other and to drive continuous improvement. A holistic view on evaluation and evaluation criteria could be of use in avoiding sub-optimization and ensuring that issues such as stakeholder engagement and societal impact are included in evaluations. The integration of evaluations would constitute a part of integrating an institution's management system and advance unity of effort. The ubiquitous concept of excellence can be seen as linking factor in integration, and an excellence award model was used as an example of a holistic evaluation framework.

The theoretical contribution of this study contributes in the discussion regarding quality evaluation, excellence and the integration of management activities in higher education. For practitioners this dissertation work provides both practical tools arising from the results of the research articles, as well as a synthesis of theoretical and practical issues that should be accounted for when developing quality evaluation approaches in institutions of higher education.

Keywords: evaluation, excellence, higher education, integration, quality, quality assurance, quality management

Kauppila, Osmo, Integroitu laadunarviointi korkeakoulutuksessa.
Oulun yliopiston tutkijakoulu; Oulun yliopisto, Teknillinen tiedekunta
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Tiivistelmä

Korkeakoulujen rooli tuottavan talouden olennaisena osana on korostunut uudella vuosituhannella. Tästä on seurannut jatkuva tarve osoittaa vaatimustenmukaisuutta ja erinomaisuutta eri sidosryhmille. Tämän seurauksena on kehitetty suuri määrä erilaisia sisäisiä ja ulkoisia arviointiprosesseja. Kuitenkin näiden prosessien yhdistäminen toiminnan jatkuvan kehittämiseen on usein osoittautunut haastavaksi johtuen organisatorisesta monimutkaisuudesta.

Tässä kokoomaväitöskirjassa tarkastellaan, kuinka erityyppisiä laadunarviointeja korkeakoulutuksessa voitaisiin integroida mielekkäällä ja synergistisellä tavalla. Integraatiota tarkastellaan niin horisontaalisesti yliopiston kolmen tehtävän läpi, kuin myös vertikaalisesti ulkoisista arvioinneista itsearviointiin. Väitöskirjaan liittyvät tutkimusartikkelit tukevat tätä tutkimusongelmaa eri näkökulmista. Kirjallisuuskatsaus tukee artikkelien tuloksia valittujen laatujohtamisen ja arvioinnin aiheiden tarkastelun kautta.

Tämän työn tuloksien mukaan suunnitelmallinen arviointikokonaisuus lähtien korkeakoulutasolta voisi tukea arviointien tulosten kumuloitumista ja edistää jatkuvaa kehittämistä. Holistinen näkökulma arviointiin ja arviointikriteereihin voisi ehkäistä osaoptimointia ja varmistaa, että seikkoihin kuten sidosryhmien osallistuminen ja yhteiskunnallinen vaikuttavuus huomioidaan arvioinneissa. Arviointien integrointi tukisi osaltaan korkeakoulun johtamisjärjestelmän integrointia ja edistäisi yhteisiin tavoitteisiin pyrkimistä. Erinomaisuuden yleistynyttä käsitettä voidaan pitää yhdistävänä tekijänä integraation toteutumisessa, ja siihen perustuvaa laatupalkintomallia käytettiin työssä esimerkkinä holistisesta arviointimallista.

Väitöskirjatyön teoreettinen kontribuutio liittyy korkeakoulujen laadunarvioinnin, erinomaisuuden ja johtamistoimien integroinnin tieteelliseen keskusteluun. Käytännön työn kannalta tutkimustulokset tarjoavat käytännön työkaluja artikkelien tulosten kautta, sekä yhdistelmän teoreettisista ja käytännön seikoista jotka tulisi huomioida korkeakoulun laadunarviointia kehitettäessä.

Asiasanat: arviointi, erinomaisuus, integraatio, korkeakoulutus, laadunvarmistus, laatu, laatujohtaminen

Acknowledgements

I have to admit: the phrase ”The journey is more important than the destination” feels very trite to me. Nevertheless, it holds true for this book in front of you, dear reader. Sure, it feels great to reach the finish line, but I believe my own learning during the process is of more value than the Ph.D. title. Not only my researcher competence, but my teaching and professional skills in industrial engineering and management have reached an entirely new level. I even feel like I have grown overall as a person (Not sure if this is a result of the thesis work. Maybe it means I have finally reached an adult age).

There are too many people to whom I owe gratitude for supporting me during this project, but I’ll try to name a few. First and foremost, my heartfelt thanks to my supervisor, Professor Jaakko Kujala. You are a kind and thoughtful superior and without you this work would not have finished. Secondly I would like to thank Doctor Janne Härkönen. Without your help the road to completion would have been much more difficult. For getting me in this mess in the first place I would like to thank my first superior and supervisor, Doctor Tauno Jokinen. Discussions with you are always interesting and I have learned a lot from them, even though it may have not always seemed that way.

I want to show my gratitude towards my co-authors M.Sc. Tuomo Kinnunen, Doctor Anu Mursula and Professor Seppo Väyrynen. Your work and co-operation presented in the articles has been indispensable. Thank you, my pre-examiners Professor Paul Lillrank and Director Juha Kettunen for your valuable comments. This book is a better one because of you. I would also like to acknowledge the Tauno Tönning Foundation for supporting this research.

A big thank you to all my current and former Industrial Engineering and Management colleagues. We share a great work environment, and discussions with you have helped me find my way to finalizing this thesis. Thanks to all my friends for extracurricular activities. One needs places for his mind outside work and you have often provided me with that. And last but not least, thank you my dear family and relatives. You have always been there for me.

Oulu, March 2016 Osmo Kauppila

Abbreviations

AP	Assessment Procedure
EC	The European Commission
EFQM	The European Foundation for Quality Management
EHEA	European Higher Education Area
ENQA	The European Association for Quality Assurance in Higher Education
ESG	The Standards and Guidelines for Quality Assurance in the European Higher Education Area
EU	The European Union
FINEEC	The Finnish Education Evaluation Centre
HE	Higher Education
HEI	Higher Education Institution
HSEQ	Health, Safety, Environment and Quality
IMS	Integrated Management System
ISO	International Organization for Standardization
MS	Management System
OHSAS	Occupational Health and Safety Assessment Series
QA	Quality Assurance
QM	Quality Management
QMS	Quality Management System
RQ	Research Question
TQM	Total Quality Management
U-I	University-industry

Definitions of key concepts

Evaluation	The process of judging and passing a statement of goodness based on predetermined criteria or a standard.
Excellence	Achievement of outstanding results amongst peers as perceived by stakeholders.
External audit	An evaluation of compliance against threshold criteria. Performed by a third party
External evaluation	An evaluation of a level of quality performed by a third party.
Integrated management system	The merge of some activities in the management processes of the organization aimed to achieve synergistic advantages.
Integration	The degree of the level on which two or more organizational activities are fused to strive for a common goal.
Internal audit	An evaluation of compliance against threshold criteria. Performed by organizational peers.
Internal evaluation	An evaluation of a level of quality performed by peers.
Quality assurance	The processes within an organization's management system that aim to ensure quality objectives are fulfilled.
Self-assessment	A systematic assessment of performance within an organizational unit. Aims to identify improvement areas and to drive continuous improvement.

Original publications

This thesis is based on the following publications, which are referred throughout the text by their Roman numerals:

I Kauppila O, Kinnunen T, Harkonen J, Kujala J (2015) Integrated internal evaluation in a higher education institution. International Journal of Management in Education 9(1): 92–110.

II Kauppila O, Mursula A, Harkonen J & Kujala J (2015) Evaluating university–industry collaboration: the European Foundation of Quality Management excellence model-based evaluation of university–industry collaboration. Tertiary Education and Management 21(3): 229–244.

III Kauppila O (2016) Excellence in teaching: Centres of Excellence in Finnish university education 2010–2012. The Online Journal of Quality in Higher Education 3(1): 14-33.

IV Kauppila O, Härkönen J, Väyrynen S (2015) Integrated HSEQ management: developments and trends. International Journal for Quality Research 9(2): 231–242.

Contents

1 Introduction

1.1 Background and research environment

The 21st century has witnessed a change in higher education (HE) from a social expenditure into an essential component of the productive economy (Hazelkorn 2011). This change has been caused by external factors such as the growth of the knowledge economy, the rapidly changing academic work environment, diverse student cohorts with changing demands and expectations, and government performativity agendas that determine funding allocations and institutional reputations (Krause 2012).

This paradigm shift has resulted in new demands on the management and assurance of quality in higher education institutions. In the European context, three key developments have affected how these demands have shaped: the Bologna Process, the European Union (EU)'s growth and innovation strategies alias the Lisbon strategy, and the European Community (EC)'s 'Modernization Agenda' (Enders & Westerheijden 2014).

The Bologna Declaration was issued in 1999, and resulted in the birth of "Standards and guidelines for quality assurance in the European Higher Education Area (ESG)" in 2005 (Huisman & Westerheijden 2010). A distinct characteristic of the Bologna process was that it emphasised both transnational and local dimensions of quality assurance (Saarinen 2005). On transnational level it increased harmonization and cooperation. The implementation and technical instrumentation of quality assurance (QA) was left to the national and institutional levels (Enders & Westerheijden 2014).

The QA agenda arising from the Bologna process was joined by excellence (Gosling & Hannan 2007, Rostan & Vaira 2011), which was underlined in the Lisbon strategy, regarding both excellence in European universities and the excellence of research in the EU (EC 2003a, 2003b). The excellence movement has also been supported by national policy changes towards increasing the competitiveness of the higher education system (Ramirez & Tiplic 2014), the 'enterprization' of higher education institutions (Skelton, 2009) and the global rankings movement (Brusoni, Damian, Sauri, Jackson, Kömürcügil *et al.* 2013).

The Modernization agenda (EC 2006) brings together Bologna and Lisbon, joining them up with a New Public Management-inspired agenda for the modernization of higher education institutions (HEIs) (Enders & Westerheijden

2014). A 2011 policy communication highlights both quality assurance and excellence, and in addition calls for strengthening the knowledge triangle between education, research and business (EC 2011a). A related working document also emphasises excellence, noting that internal and external QA systems often have a focus on accreditation of programmes against minimum standards rather than pushing for excellence (EC 2011b)

The developments described above have resulted in a constant need to demonstrate compliance and excellence to various stakeholders (Brink 2010) and regarding all three missions of the university (Brdulak 2014). Various external and internal evaluation systems have subsequently been developed to meet the demands (Stensaker *et al.* 2008). However, gaining value of quality assurance processes has proven difficult. The linkage of external and internal QA processes with improvement is often tenuous and patchy (Harvey & Williams 2010). In order to gain value from internal QA processes, HEIs should manage them in a proper way and aim to find synergy benefits between them and external QA (Loukkola 2012).

This proper management and search for synergy is synonymous to integration, which has been defined by Lawrence & Lorsch (1967) as "the process of achieving unity of effort among the various subsystems in the accomplishment of the organization's task". Integration is more valuable in conditions of high organizational and task complexity (Lawrence & Lorsch 1967, Turkulainen & Ketokivi 2013). It has been defined as the means to achieve integration, and currently more commonly as a state variable referring to the degree to which activities are coordinated towards a common objective while functional sub-units are able to transfer, process and exploit information between each other (Barki & Pinsonneault 2005, Turkulainen & Ketokivi 2012).

Integration differs from co-ordination in that it is a fusion of components, not merely an arrangement of roles and tasks (Lillrank 2012). Neither does integration mean merging into a single entity as the specializations of the sub-units remain. The aim of integration should be to enhance the gains from functional differentiation and specialization (Barki & Pinsonneault 2005). In order to achieve this, each part of the integrated system needs to contribute and submit to the demands of the whole, something that makes integration efforts often difficult (Lillrank 2012).

Manatos *et al.* (2015) observe that the concept of integration of quality management (QM) in HEIs is a little studied and a developing topic and further discussion of the concept of integration is potentially important. The key to success in quality improvement in HEIs is to understand its complex nature with various

missions and variety of solutions in required processes and structures (Loukkola 2012). This study aims to enhance this understanding through an examination of various quality evaluations, while keeping the integration and excellence contexts in mind.

1.2 Objectives and scope

In order to be efficient and effective, higher education QA processes should function as a coherent whole, both across the institution's three missions and across unit, institutional and societal levels. The success in this integration task is vital in linking QA to continuous improvement and the realization of the institution's strategy. This current issue has been studied from various viewpoints in previous studies, but the ways to achieve this are still debated.

The purpose of this research is to contribute to this discussion through a study of integrating the various forms of audits, evaluations and assessment that take place in institutions of higher education (HE). This purpose is addressed through the following research problem:

How could internal and external evaluations and self-assessment be designed in a synergetic and meaningful manner in a higher education institution, and how could they be integrated across the three core missions of the institution?

There could have been several different paths to study this research problem in more detail. In this dissertation the problem was studied from four complementary perspectives on different forms of evaluation and all three missions of a university. These four perspectives were formulated into four research questions (RQ) as presented in Table 1.

Table 1. Research questions.

RQ#	Research question
RQ1	How can internal and external evaluation be integrated in a higher education institution?
RQ2	Can university-industry collaboration be evaluated using criteria based on the EFQM excellence model?
RQ3	Which practices can be identified in the applications of Centres of Excellence in Finnish university education 2010–2012?
RQ4	What are the current state and trends in integrated management systems in the private sector?

Each of these research questions approaches the aim of this study from a different viewpoint related to the three missions of the university and the organizational level on which the evaluation takes place. These relationships are illustrated in Figure 1. RQ3 is linked to both the operating environment regarding the excellence award scheme, and to the unit level as the units of analysis were the applications written in individual units.

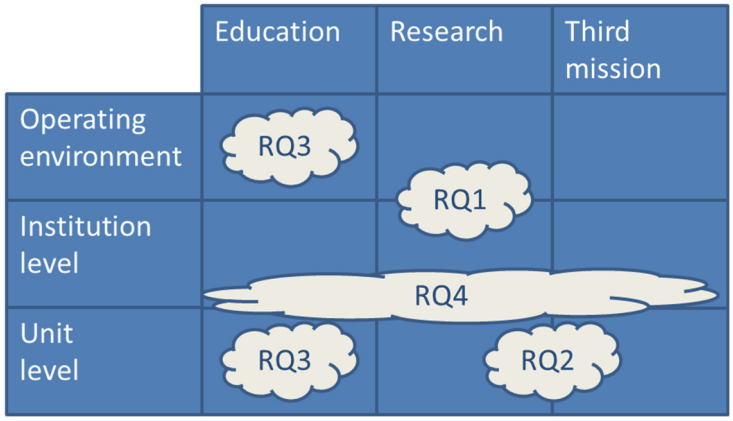

Fig. 1. The positioning of the articles related to the three missions and organizational level.

The relationship between the research questions and the research articles included in this dissertation is presented in Table 2. Article I contributes to RQ1 by presenting a study of internal evaluation that followed an external evaluation of research activities at the University of Oulu. Article II demonstrates a case example related to RQ2, in which a framework for assessing university-industry co-operation was created based on a review of success factors and the European Foundation for Quality Management (EFQM) Excellence Model. The framework was piloted at Biocenter Oulu. Article III presents an analysis and a comparison of practices applied by Centres of Excellence in Finnish university education. Article IV supports RQ4 by providing views outside higher education on current practices related to integrated management systems. The article also provides a case example of an IMS assessment procedure from a cluster of industrial companies in Northern Finland.

Table 2. Overview of the research articles.

Article	RQ#	Article title	Name of the journal
I	1	Integrated internal evaluation in a higher education institution	International Journal of Management in Education
II	2	Evaluating university–industry collaboration: the European Foundation of Quality Management excellence model-based evaluation of university–industry collaboration	Tertiary Education and Management
III	3	Excellence in teaching: Centres of Excellence in Finnish university education 2010–2012	The Online Journal of Quality in Higher Education
IV	4	Integrated HSEQ management: developments and trends	International Journal for Quality Research

The presented research questions are related to each other, even though their focus is slightly different. Each of the four articles that these questions are based on attempts to address a separate relevant aspect identified during the research. These articles complement each other and provide partial solutions to the research problem.

1.3 Research approach

Cunliffe (2011) presents a revision of Morgan and Smircich's (1980) typology of qualitative research related to organization and management theory. Looking at the refined intersubjectivist-subjectivist-objectivist framework presented by Cunliffe (2011), the research presented in this dissertation and its underlying assumptions position this work on the hazy border between subjectivism and objectivism, with a slight bias towards objectivism. Figure 2 illustrates the ontological and epistemological typologies from this framework.

	Intersubjectivism		Subjectivism		Objectivism	
Form of knowledge – epistemology	Pragmatic knowing. In-situ knowledge, micro-level focus. Research as embedded and embodied.		Pragmatic or syntagmatic. Common sense knowledge, mundane activities. Non-replicable, situational validity. Macro and micro level focus.		Syntagmatic knowing:.Relationships between structural and linguistic elements. Replicable or shareable knowledge → accumulation of knowledge. Mainly macro level focus.	
The nature of social reality – core ontological assumptions	Reality: Relative to interactions between people at a specific time an place. Social community.	Human actions and their inter-pretations form socially constructed realities.	Symbolic and linguistic meanings and interpretations. Social site context.	Discursive, con-textual. Formed by discursive & non-discursive practices & systems.	Process – acti-ons, elements, structures & systems, interrelations. Generalizable to some extent.	Concrete structures & behavioral patterns. Guided by rules and laws.

Fig. 2. Intersubjectivism, subjectivism and objectivism. Adapted from Cunliffe (2011).

All of the articles and this compilation start from theoretical frameworks which are applied to practice, so in this light a deductive approach is used. However, as Bryman & Bell (2007) point out, deduction includes an element of induction. To classify whether a research approach is quantitative or qualitative, Ketokivi & Choi (2014) recommend using definitions based on the terms themselves:

- Qualitative: concepts examined in terms of their meaning and interpretation in specific research contexts
- Quantitative: concepts examined in terms of amount, intensity or frequency

Based on this, it can be said that three out of the four dissertation articles are mainly qualitative, and the fourth includes a quantitative element through coding qualitative material using qualitative data analysis software.

Combining all of this, one could suggest the researcher is inclined towards pragmatism, a philosophy based on the premise that the research question directs one's choice of epistemology, ontology and axiology (Saunders *et al.* 2007). Or as Morgan (2007) expresses this, methodology and its study should connect issues in epistemology and research design, rather than separating efforts of producing knowledge from thoughts on the nature of knowledge. Pragmatism emphasises abduction, intersubjectivity and transferability (Morgan 2007). A pragmatic researcher is more likely to be aware of various research techniques available and judge their value regarding answering underlying research questions (Onwuegbuzie & Leech 2005). In a way this feels like a natural direction, parallel with the researcher's view on quality management and quality management research: combining hard and soft values, adapting to context, having a diverse arsenal of "tools" to apply according to the environment.

1.4 Research realisation and dissertation structure

Various research approaches were utilized in the four scientific studies that form the research contribution of this dissertation. Article I, "Integrated internal evaluation in a higher education institution", was a qualitative study of an internal evaluation carried out at the University of Oulu. The research process of the article is demonstrated in Fig. 3.

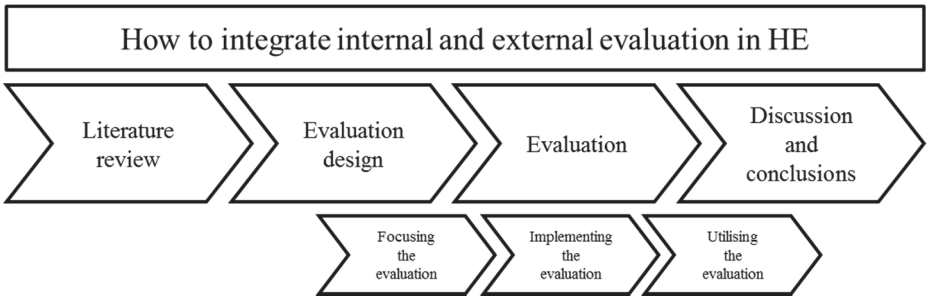

Fig. 3. The research process of article I. (Published by permission of Inderscience.)

The data used in article I was collected throughout the internal evaluation project, and the authors also facilitated, recorded and reported the actual evaluation events. The author of this dissertation was a part of the steering group, supervised the planning and implementation of the project, participated in peer evaluation and was the lead writer in the research article. The evaluation project itself consisted of eight evaluation events and a total of 80 people participated in the process.

A constructive research approach was used Article II, "Evaluating university–industry collaboration: the European Foundation of Quality Management excellence model-based evaluation of university–industry collaboration", in order to create and test the validity of evaluation criteria for university-industry collaboration. The criteria were created based on a literature review and the EFQM Excellence Model, and were piloted at Biocenter Oulu. The evaluation was based on a co-author's extensive knowledge of the organisation, two expert interviews and previous available material. The author of this dissertation was responsible for the supervision of the evaluation, making conclusions based on the evaluation report and writing the article itself including an extensive literature review.

Article III studied excellence in teaching using the award applications of the winners of the "Centre of Excellence in Finnish university education 2012" competition as the source material. A total of 410 practices used by the ten award

winning units were coded using the qualitative data analysis software NVivo and the EFQM Excellence Criteria as the coding framework. The practices were further analysed for each unit and each criterion, and compared with previous research on the topic. This was a single-author study by the author of this dissertation.

Article IV combined three viewpoints on integrated health and safety, environmental and quality management (HSEQ) systems. The current status in the area of international standards, scientific literature on the topic and the research on HSEQ assessment by the Industrial Engineering and Management research group were combined as illustrated in Fig. 4.

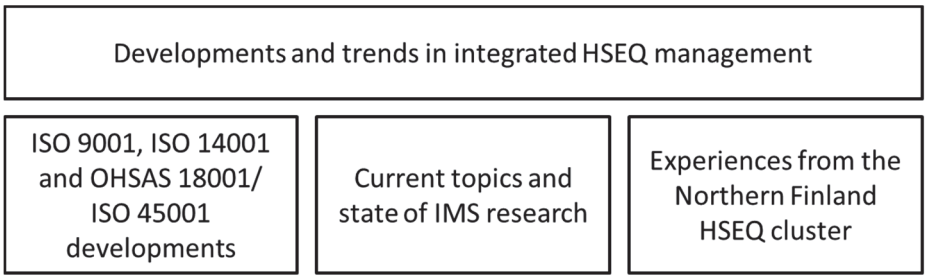

Fig. 4. Outline of article IV. (Published by permission of International Journal for Quality Research.)

The author of this dissertation was mainly responsible for the manuscript and its results, conducting the parts on standards and IMS research based on literature reviews and compiled the part on the HSEQ cluster along with a co-author's long-standing knowledge, experience and previous publications of the topic.

This dissertation consists of the four scientific articles presented above and this compilation part. Chapter 2 presents a literature review on selected topics on quality management and evaluation in higher education, while Chapter 3 summarizes the research contributions of the four articles. These two chapters are combined in Chapter 4 to discuss the scientific and practical implications of the results, as well as the reliability and validity of the research, and potential directions for future studies.

2 Literature review

The 21st century has seen quite dramatic changes in the quality assurance and quality management of higher education institutions. The first phase was the shift towards quality assurance, led by the Bologna process (Enders & Westerheijden 2014, Huisman & Westerheijden 2010, Saarinen 2005). The second phase has been excellence, which has become a dominant theme in both private and public sectors. In the private sector the main driver of excellence have been quality award models (Conti 2007), while in higher education the return of excellence has been driven by policy changes (Ramirez & Tiplic 2014), in Europe EU policy in particular (EC 2003a, 2003b, 2011a, 2011b).

This, combined with New Public Management and the rise of knowledge society (Brink 2010, Krause 2012), has resulted in a situation in which higher education institutions are required to constantly demonstrate excellence to stakeholders and conformance to requirements. In order to achieve this and enable continuous evaluation in an effective way, QA procedures and striving for excellence should all support each other and be aligned (Loukkola 2012).

The literature review of this work supports the aim of this thesis and the discussion based on the individual articles by presenting a few themes that are central for understanding how the integration of QA procedures, excellence and compliance requirements could take place. Audits, evaluations, self-assessment, their HE interpretation and hierarchy are presented. The concept and foundations of excellence in a higher education context is analyzed from the perspective of the three university core functions to provide a view of what evaluation should aim for regarding excellence. As the research articles are based in the Finnish context, the guiding QA documents by the European Association for Quality Assurance in Higher Education (ENQA) and by the Finnish Education Evaluation Centre (FINEEC) are summarized to give insight on what evaluation should aim for regarding compliance. As integration is an emerging theme in the higher education context, a compilation of integrated management systems (IMS) research is presented to support this direction of analysis.

2.1 Audits, evaluations and self-assessment

An audit is by ISO 9000:2015's definition a "systematic, independent and documented process for obtaining objective evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled" (ISO 2015). An

audit can be viewed as an extension of evaluation with a compliance requirement. They can be divided into financial and non-financial audits (Power & Terziovski 2007). The scope of this dissertation is on non-financial audits and particularly the most common form, the quality audit. They can be further divided into internal and external audits.

Internal audits, also referred to as first-party audits (ISO 2015) are "conducted by, or on behalf of, the organization itself for management review and other internal purposes, and can form the basis for an organization's declaration of conformity. Independence can be demonstrated by the freedom from responsibility for the activity being audited" (ISO 2015). A typical example of an internal audit in a HE context is presented by Blackmore (2004) in which an institution undertakes an internal audit for three reasons: 1. Verify compliance with QA system issues 2. To measure compliance with national guidelines and standards and 3. To "get the house in order" for an upcoming external audit. Similarly to auditing, confusion can ensue with financial auditing, where internal audit refers to such an audit performed within an organization. This type of a financial internal audit has been even linked to total quality management (TQM) by Hawkes & Adams (1995), and to HE institutions (Zakaria *et al.* 2006).

According to the International Organization for Standardization (ISO)'s (2015) definition external audits "include those generally called second and third-party audits. Second party audits are conducted by parties having an interest in the organization, such as customers, or by other persons on their behalf. Third-party audits are conducted by external, independent auditing organizations such as those providing certification/registration of conformity or governmental agencies". In a higher education context external audits are usually quality audits, or management system (MS) audits if an institution is aiming for a certification for a MS such as ISO 9001 or ISO 14001.

Accreditation can be seen as an important subset of an external audit, "the establishment of the status, legitimacy or appropriateness of an institution, programme (i.e. composite of modules), or module of study" (Harvey 2014). Distinction has been made to other external evaluations by a formal summative statement acknowledging that the applicant has satisfied the threshold criteria (Schwarz & Westerheijden 2004). According to Harvey (2004) accreditation has three characteristics: it is a process applied to applicant organizations, the label resulting from passing the process, while legitimization comes through formal authorization related to the process. The identification and focusing of development activities through self-assessment as a part of the process can potentially be the

greatest source of benefits for the applicant, not the formal label nor the accompanying gain of reputation (Niemelä *et al.* 2014).

Accreditation was introduced in European HE policy through the Bologna process and the need of degree transferability and labor policies (Saarinen & Ala-Vähälä 2007). This combined with the generation of QA agencies has resulted in a multitude of qualifications frameworks and in "the growing pressure to accredit everything, even though accreditation is a poor means of assuring quality and encouraging improvement" (Harvey & Williams 2010).

In 2003, the Berlin Communiqué called for "accreditation, certification or comparable procedures". This has been interpreted in different ways, while both accreditations and enhancement-led audits are widely used in the European Higher Education Area (EHEA) (Haapakorpi 2011). Kastelliz *et al.* (2014) recognize three common characteristics of audit procedures between the countries of the Quality Audit Network, an informal group of European HE quality assurance agencies. These characteristics are an explicit focus on institutional quality assurance, enhancement orientation and evidence through samples. The Finnish audit system in enhancement-led, even though it involves a control element in the form of an acceptance system.

Evaluation can be defined in a multitude of ways, but any prescriptive theory of it must consider three aspects (Carden & Alkin 2012): methodology-related issues, the manner in which data will be judged or valued and the user focusedness of the evaluation process. Campbell & Rozsnyai (2002) define evaluation in a higher education context as a "general term denoting any process leading to judgments and/or recommendations regarding the quality of a unit. A unit is an institution, programme, discipline. Evaluation can be an internal process – self-evaluation – or an external one conducted by external experts, peers, or inspector". A particular subset of evaluation is program evaluation, in which social action programs are evaluated (Posavac & Carey 1997). It can be defined as "careful retrospective assessment of the merit, worth, and value of administration, output, and outcome of government [and other sector] interventions, which is intended to play a role in future, practical action situations" (Vedung 1997). Although it is a somewhat separate field from "management literature" evaluation, the same issues such as the choice between external and internal evaluation are pertinent (Conley-Tyler 2005).

Internal evaluation can be seen as (Harvey 2014) "a process of quality review undertaken within an institution for its own ends (with or without the involvement

of external peers)". An example of an internal evaluation is the follow-up evaluation of a research assessment exercise presented in (I).

External evaluation can either be a generic reference for most quality reviews, or more particularly a process that uses external resources to evaluate the quality of a program or an institution (Harvey 2014). A more precise definition of the latter is given by Vlasceanu *et al.* (2007): "The process whereby a specialized agency collects data, information, and evidence about an institution, a particular unit of a given institution, or a core activity of an institution, in order to make a statement about its quality. External evaluation is carried out by a team of external experts, peers, or inspectors, and usually requires three distinct operations: i). an analysis of a self-study report; ii) a site visit iii) the drafting of an evaluation report." Examples of external evaluations in education include the Research Assessment Exercise (Jaako & Ruskoaho 2008), the external examination practice in which for degree examinations there must be an examiner from outside the institution (Stensaker *et al.* 2008). In a school context, particularly in the US, external evaluation refers to a nationally appointed evaluator(s) examining the performance of a school (Nevo 2001). The motifs of external evaluations are often criticized, as Nevo (2001) quips: it is sometimes difficult to avoid the notion that the main function of external evaluation is to motivate people and organizations to perform internal evaluation.

Self-assessment refers to a methodology for continuous improvement (Tari 2008). Hillman (1994) defines it as "Self-assessment = Model + Measurement + Management". Its purpose is to identify strengths and improvement areas, and activate organizational performance improvement (Karapetrovic & Willborn 2001). Self-assessment can be pursued in a TQM context or as an independent strategy (Tari 2008). Svensson & Klefsjö (2006) describe it as a four-phase process of planning the assessment, describing the assessed area in the context of the chosen methodology, analysing the results and acting based on the identified strengths and improvement possibilities.

These various forms of assessment are summarized in Table 3 below.

Table 3. Typology of assessment types in higher education.

Assessment type	Characteristics
Internal audit	Cross-evaluation by peers, often precedes external audit and external audit criteria is used, second-party audit within an institution.
External audit	Third party assessor, peer review in case of national audit, pre-determined criteria, reported afterwards, includes accreditation-like procedures. In case of some institutions may also be a management system audit such as ISO 9001.

Assessment type	Characteristics
Accreditation	An external audit carried out by a formally authorized third party, resulting in the legitimization of the status of a HEI or a study programme or a study module
Internal evaluation	Enhancement-led and no compliance requirement, peer review by "critical friends, should be linked to external and departmental level QA procedures.
External evaluation	No compliance requirement. Evaluators are either external peers or professional evaluators. Can be voluntary or compulsory. Can be high-impact.
Self-assessment	Enhancement-led first-party assessment against a model, should support continuous improvement. Can be done on an institutional level or within a part of the institution. Results can later support other types of evaluation.

For most effective improvement, external processes should mesh with internal improvement activities (Harvey & Newton 2004); still the integration of these two has been the subject of relatively little attention (Stensaker *et al.* 2008). ENQA (2009) state that one of the major lessons of ESG implementation has been that a "sound balance has to be maintained between internal and external quality assurance processes", and that they should mutually support each other, contribute to development of a quality culture within a HEI and to promote coherent and integrated national QA systems.

Internal evaluation can broaden the scope of an external evaluation, promote the interpretation of the external evaluation results or drive implementation of improvement needs recognized during external evaluation. They can be integrated through using the same reference models, same methodologies and through cross-use (Karapetrovic & Willborn 2001). Kettunen (2012) presents a HEI case in which process management functioned as the link between external and internal audits.

The challenge of creating a functional feedback loop from an internal evaluation back to the departmental level was also noted in the Iranian context by Bazargan (2007). From the case of developing HE QA in Iran, Mehralizadeh *et al.* (2007) conclude that to realize the value of internal evaluation on a continuous basis it has to be an integral part of quality assurance and management on departmental, institutional and national levels.

Peer review is the academia's "gold standard" (Hazelkorn 2011), and HE audit schemes, external and internal evaluation nearly always depend on it. The concept of a "critical friend" (Andreu *et al.* 2003, Blackmore 2004, Costa & Kallick 1993, Dixon 2009) is central in peer review regarding internal evaluation.

Tari (2008) studied EFQM based self-assessment in HEIs and private sector organizations and identified three success factors: 1. Management commitment, 2.

Communicating the purpose of the evaluation and 3. Supporting the evaluation team with appropriate training, data and management of the assessment project.

2.2 Excellence in higher education

Excellence has become a nearly ubiquitious subject in discussions on research and HE within the European Union during the 2000s (Sørensen *et al.* 2015). The return of excellence started in the late 1990s (Rip 2011) is linked to rise of the knowledge society (Brink 2010) and the emergence of the new regime of strategic science (Rip 2011), and to the new stage of New Public Management (Bleiklie 1988, Froumin & Lisyutkin 2015). From a knowledge society viewpoint, the idea behind the return of excellent research is a prerequisite for creating a wide knowledge base for problem solving in the society (Rip 2011).

The traditional academic interpretation for excellence has been "showing outstanding results among higher education institutions" (Westerheijden 2008). Altbach & Salmi (2011) equate excellence with world class and present a model of three dimensions based on Salmi (2009): concentration of talent, abundant resources and favorable governance. These result in graduates, research output and technology transfer, and when combined, a world class university.

The notion of quality in HE has two facets: 1. it is in the eye of the beholder or stakeholder relative or 2. it is measurable in absolute or relative terms (Harvey & Green 1993, Jungblut *et al.* 2015). The first facet implies that HEIs should pay attention to identifying its stakeholders, the management of stakeholder relations and involving stakeholders in improvement activities, as in the case example presented by Kettunen (2015b). Related to research, Tijssen (2003) presents two general and somewhat intertwined meanings for excellence: 1. Superior quality; an inherent aspect of high quality research capacities, activities and outputs and 2. Going beyond a standard; comparison of superiority between entities, also related to benchmarking. The focus on excellence on the policy-maker level has resulted in efforts to construct quantitative measures of excellence (Sørensen *et al.* 2015) to support the second facet, as by the original definition excellence is exactly stakeholder relative. The Finnish university funding model can be seen as one example of a policy-driven instrument for defining excellence. It was proposed in 2011 by the Ministry of Education and Culture with an aim to support the Ministry of Education's desired state of the university reform by year 2020 (Aarrevaara 2012). This reform aims for "a better, more efficient international university system with stronger impact and a better defined profile" (Ministry of Education and

Culture 2011), which could be interpreted as a Finnish HE policy view of university excellence. The model proposed in 2011 allocates 41% of university core funding based on educational factors, 34% on research factors and the remaining 25% based on education and science policy objectives (Ministry of Education and Culture 2011). The funding model was adjusted for the year 2015 (Ministry of Education and Culture 2014) and another adjustment is due for the year 2017 (Ministry of Education and Culture 2015).

In the discussion of rankings and world-class excellence, Hazelkorn (2012) concludes that all commentators agree on three points: 1. Rankings map changes in the knowledge world order, 2. Being able to participate in global science is a basis for national sovereignty and 3. Rankings should not dictate social values, policy objectives or institutional strategy.

Besides academia, in industry excellence and business excellence have become mainstream terms in the 21st century. The EFQM Excellence Model is used by over 30,000 European organizations (EFQM 2012), making it the main reference model for excellence in Europe. In the model, excellence is defined through a set of eight fundamental concepts and the model states that "Excellent organizations achieve and sustain outstanding levels of performance that meet and exceed the expectations of all their stakeholders" (EFQM 2012). An excellence model enables an organization to assess itself in relation to pre-determined criteria (Heras-Saizarbitoria *et al.* 2011). The EFQM criteria consists of five enabler categories and four results categories, which are further divided into sub-criteria (EFQM 2012) and based on the assumption that the enablers lead to the results in an excellent organization. Self-assessment against the model aims to drive systematic continuous improvement in organizations (Hides *et al.* 2004).

The EFQM model has also been applied in higher education on numerous instances (e.g. Davies, 2008; Hides et al., 2004; Tari & Madeleine, 2011). However, its applicability to HE has been criticized in some studies; Osseo-Asare & Longbottom (2002) found that the criteria and sub-criteria structure can be argued to be too prescriptive. In contrast, Asif *et al.* (2013) found that the EFQM's US equivalent Malcolm Baldrige's Education Criteria for Performance Excellence (Baldrige Performance Excellence Program 2015) has been criticized as too generic and not providing specific guidelines for its users. It should also be noted that the EFQM Excellence model originates from the TQM era of 1990s, meaning that the criticism pointed towards TQM's applicability in HE may also extend to the EFQM model. Higher education institutions can adopt business practices, but they must relate them within their own context as Tarí (2008) has observed among others.

2.2.1 Excellence in teaching

In the excellence context rewards systems have greatly favoured research and research output (Turner & Gosling, 2012), up to where an 'overwhelming dominance of the research agenda' lowers the status of teaching (Young, 2006). This is not just an issue of the new millennium, as Winston (1994) already noted that the hunt for research prestige and excellence has resulted in decline in undergraduate teaching both on institutional and individual levels. In recent years the discourse around teaching excellence in Europe has revitalized, with the aim to bring back the prestige for excellent teaching within a dominant rhetoric of excellence in research (Gunn & Fisk, 2013).

Excellence in teaching can be identified through student satisfaction, or alternatively through the assessment of student performance (Brusoni et al., 2013). The Finnish university funding model can be viewed as an instrument to implement the national HE policy view of excellence. It awards Master's degrees (14% of the 41% share of core funding allocated to education factors), bachelor's degrees (6%), study credits in Open University and in non-degree programmes (2%), number of students completing more than 55 study credits (12%), student feedback (3%), graduate employment (2%) and international student exchange (2%) (Ministry of Education and Culture 2015).

The very notion of excellence has caused confusion (e.g. Gosling & Hannan, 2007), particularly whether it is exclusive, referring to prestige, or whether the concept is 'bleached' and refers to conformance to given standard (Allan, 2007). The concept of excellence has helped in driving enhancement, but careless use of the term in a political context can result in unrealistic expectations for institutions of higher education (Brusoni et al., 2013). Gunn & Fisk (2013) differentiate three clashing discourses of teaching excellence:

1. Cynicism: teaching excellence is a facet of neoliberalism and part of an agenda aimed towards a consumerist view of higher education.
2. Pragmatism: it is focused on policy: how can teaching excellence be implemented and demonstrated to satisfy all stakeholders.
3. Aspirationalism: it is a genuine drive towards enhancement of teaching, based on practice, and supported by appropriate internal reward mechanisms.

One conceptualization of teaching excellence from an aspirationalist viewpoint is given by Skelton (2009). In his view on an individual level teaching excellence involves the development of a personal philosophy of teaching and a constant strive

to realize one's values and ideals in practice. To realize this, excellence should be viewed as a moral category resulting in fundamental questions of what one strives for. His view also involves the existence of a vibrant deliberative institutional culture, material conditions that enable high quality teaching and the integration of the different aspects of academic practice.

Similarly Elton (1998) has put forth a five stage argument for teaching excellence:

1. It is a multidimensional concept and requires different forms of recognition and reward.
2. Teaching excellence must be recognized and rewarded in order to maintain and improve teaching quality.
3. The criteria for teaching excellence are not harder to elaborate and evaluate than criteria for research excellence. However they are sophisticated and the evaluation requires proper expertise and training.
4. Professional teaching training is a prerequisite for excellence, and teaching excellence should be linked to staff development.
5. Excellence on an individual level must be supported by departmental and institutional level excellence in order to provide excellent student learning experience.

Kane *et al.* (2004) investigated a group of excellent science teachers, and conclude that purposeful reflective practice combines several of their common characteristics, including a strong link between research and teaching, as well as interpersonal relationships and the teacher's personality. The seminal seven principles by Chickering and Gamson (1987) can also be viewed as a guideline for excellent higher education to strive for:

1. Encourage contacts between students and faculty
2. Develop reciprocity and cooperation among students
3. Use active learning techniques
4. Give prompt feedback
5. Emphasize time on task
6. Communicate high expectations
7. Respect diverse talents and ways of learning.

In order to enhance excellence in teaching, several European countries have developed recognition and reward systems (Raaheim & Karjalainen, 2012). In Great Britain, the Centres for Excellence in Teaching and Learning initiative was

established in 2004. 74 centers were recognized and awarded significant recurring funding for a five-year period (Turner & Gosling, 2012). In Norway, a bidding and assessment process took place in 2013. Three out of 24 applicants were nominated Centres of Excellence in Education (NOKUT, 2013) and each of the units will receives 3 million Norwegian Crowns (300–350 k€) annually for a five-year period. In Finland, a selection processes took place between 1998 and 2012, and during the period 88 units were awarded the status of a Centre of Excellence in University Education (Hiltunen, 2009). The evaluation results can be utilized as a trigger for long-term development of educational processes, as they provide peer evaluation on the pedagogical decisions, teaching processes and outcomes of an institution (Kettunen 2011), and should be used in the enhancement of teaching on a wider scale than just locally (Raaheim & Karjalainen 2012).

2.2.2 Excellence in research

Research excellence is often seen synonymous with good quality science, and as such its pursuit is uncontroversial amongst scientific communities (Tijssen 2003). Another view of excellence in "a new utilitarian and economic guise" (Tijssen 2003) relates to the changes discussed in 2.1. This change has resulted in an explosion of the concept of research excellence, and it has become a huge political and everyday factor in higher education. Sørensen *et al.* (2015) report a growth of 32 to around 55,600 Google Scholar hits for "research excellence" between the years 2002 and 2014. An example of this policy-based view is the EU's Composite Indicator for Scientific and Technological Excellence. It defines excellence through four metrics: highly cited publications, amount of top scientific universities and public research organizations, top patent applications and European Research Council grants (Sørensen *et al.* 2015). Westerheijden (2008) points out that scientific rankings may provide some incentive for striving towards excellent research; however Sørensen *et al.* (2015) remind of the risk that using a narrowly focused set of excellence indicators may result in decreased priority for non-measured important tasks such as teaching.

In the United Kingdom, roughly two billion pounds are allocated based on assessment results of the Research Excellence Framework. It is an external evaluation process, and the criteria consists of Outputs (65% weight), Impact (20% weight) and Environment (referring to the vitality and sustainability of the research environment, 15% weight) (Hubble 2015). In the Finnish university funding model from year 2017 (Ministry of Education and Culture 2015) the factors for research

are doctoral degrees (9% of the 33% core funding share allocated to research), scientific publications weighed according to the Finnish Publication forum classification (13%), foreign teaching and research personnel (2%) and competitive research funding (9%).

Besides institutional and unit level excellence, Rons & Amez (2009) propose a definition on an individual level: "An excellent researcher is prominently present in the field, continuously publishing new knowledge and ideas over a long period of time. As an established reference in the field, his/her contributions are eagerly followed by colleagues and his/her ideas are picked up fast in their further research. As such, he or she is a central figure in a strong research dynamic, at the level of the researcher's own research team as well as for the research area as a whole, increasing both volume and impact of research in the field." They present an indicator based on this definition and international research databases.

Excellence in doctoral supervision has been discussed by McCulloch (2010) from different viewpoints, and analyzing whether the supervisors role is addressed, contribution of an individual supervisor is distinguished, what competence is required, and how excellence is defined. His finding was that the lack of definition of excellence, and particularly identification of excellence when the supervisor is part of a team or the university support structure made it impossible to, for instance, award individuals based on a well-established basis.

2.2.3 Excellence and societal impact

Whether a university is a good one will be more and more judged by its interaction with civil society, and how it meets societal demands and delivers social benefits (Brink 2010). Recent studies suggest the third mission has indeed been moving from periphery towards the academic core of HEIs, resulting in both policy and institutional efforts to institutionalize it comprehensively (Pinheiro *et al.* 2015, Benneworth *et al.* 2015).

It has been observed that excellence in the third mission does not naturally follow from excellence in teaching and research (Montesinos *et al.* 2008), and it lacks a quality assurance context and a coherent quality judgment (Brink 2010). Pinheiro *et al.* (2015) present a number of proposed assessment models, all of which can be criticized and none of which have been extensively used in practice.

The third mission is partially fulfilled through producing graduates and technology transfer (Salmi 2009). However, besides these growth-driven third mission tasks there is a plethora of other modes of civic engagement, such as

community-centred research, organization of public events, internationalization and exchanges with developing countries etc. (Krčmářová 2011). Core value-added engagement activities add value to teaching and research (Benneworth *et al.* 2015). They are characterized by:

- Knowledge exchange is linked to teaching or research
- 'Users' experiencing benefits are involved through products, services or content
- Collaboration is regarded as an important means to make resources available to support core activities
- Core activities' scope and quality is enchanced through engagement

Montesinos *et al.* (2008) suggest that assessment and ranking of societal impact excellence could be performed on an EFQM Excellence Model based evaluation tool, in which the third mission dimensions of social and civic, enterprising and innovative are evaluated based on financing and leadership, processes and services and magnitudes and possible indicators. Krčmářová (2011) has also proposed a framework with indicators based on the same dimensions.

On EU level, there have also been attempts to create instruments for measuring excellence. The set of processes and indicators proposed as a result of the E3M project (European Indicators and Ranking Methodology for University Third Mission) divides the third mission into continuing education, technology transfer & innovation and social engagement (E3M 2012). Another EU level initiative related to the third mission is the U-Multirank profiling and ranking system (Jongbloed *et al.* 2013). It offers a multidimensional set of indicators on teaching & learning, research, knowledge transfer, international orientation and regional engagement. It seems to be better received by academia, as participating universities can influence the choice of indicators and analysis methods (Schmoch 2015) and it is seen that a composite indicator such as the U-Multirank better captures the complexity of excellence and university performance (Schmoch 2015) and can thus better aid management (Sorz *et al.* 2015). Criticism has also been posed that it will suffer from the same issue as current rankings: favorable parts can be cherry-picked to highlight an institution in a positive manner (O'Neill 2015). In November 2015, the ranking tool at http://www.u-multirank.eu had the data of over 1200 HEIs located in 83 countries.

Co-operation with industry is seen as a key task in fulfilling the third mission. The benefits HEIs seek include access to funding and technology, improved status in competing for public funding and feedback on practical validity of research,

while companies seek access to scientific competencies, sourcing of innovation, and ultimately increased competitiveness as the result of collaboration (Bonaccorsi & Piccaluga 1994, Dooley & Kirk 2007, Perkmann & Salter 2012, Philbin 2008). It can occur in the forms of meetings and conferences, consultancy and contract research, creation of physical facilities, training and joint research (D'Este & Patel 2007). Success in co-operation can be difficult due to issues arising from cultural mismatch and regarding intellectual property and technology (Dooley & Kirk 2007, Perkmann & Salter 2012). In order for co-operation to be productive it needs structuring and management (Perkmann *et al.* 2011), and the required level of institutionalization depends on the form (Thune 2011).

U-I co-operation is not the only means for HEIs to achieve regional impact, for instance in Finland the mission of universities of applied science is to support regional development. A strategic view of regional impact would involve taking a comprehensive view of all partners including developing and implementing a strategy complete with targets, milestones and required processes (Benneworth 2010). However, Benneworth *et al.* (2015) point out that in reality this requires the regional impact activities to add value to the other HE core processes of teaching and research. A way of linking external and regional impact with the strategy and QA of HEI's through the use of a balanced scorecard and a process management approach has been presented by Kettunen (2015b).

2.3 European and Finnish standards and guidelines for QA in HE

The Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) form the overarching framework of quality assurance in the EHEA, as stated by the ENQA (2009) following the 2009 Leuven ministerial meeting. The ESG are rooted in the action line of the 1999 Bologna Declaration to promote "European cooperation in quality assurance with a view to develop comparable criteria and definitions" (Huisman & Westerheijden 2010). In the 2003 Berlin communiqué a demand was made to the ENQA to develop common standards and guidelines by 2005 (Westerheijden 2008). As a result, the first version of the ESG was indeed published in 2005. In the 2012 Bucharest communiqué the ENQA was requested to revise the ESG for adoption by 2015.

This revised ESG was approved by the ministerial conference in Yerevan in May 2015 and thus stands as the current backbone for European HE quality assurance. It is divided into three parts: internal and external quality assurance, and QA agencies. Together, these interlinked parts form the basis for a European quality

assurance framework (ENQA 2015). Each part consist of a set of standards, "agreed and accepted practice for quality assurance in the higher education in the EHEA and should, therefore, be taken account of and adhered to by those concerned, in all types of higher education provision", and guidelines which explain why a standard is important and how they could be implemented. The guidelines also list good practice to be considered in implementation (ENQA 2015).

The ESG is not a set of legally binding regulations, but can rather be seen as a typical EU governance way of neo-voluntarism and "soft law" (Stensaker *et al.* 2010, Bovens 2006).

2.3.1 FINEEC university audit scheme

Audits of the Finnish higher education institutions have taken place since 2005. Their objective has been to support quality system enhancements in Finnish HEIs according to the European QA principles, and to demonstrate functionality and consistency of QA procedures in Finland on institutional and national levels (FINEEC 2015). The official HE quality assurance agency and the audit model was externally evaluated in 2010 and found to be in line with the ESG standard (Talvinen 2012), while an evaluation against the revised ESG is due in 2016 (Kekäläinen 2015). In 2014, the activities related to the national audit system was transferred from the Finnish Higher Education Evaluation Council (FINHEEC) to the Finnish Education Evaluation Centre (FINEEC). The task of FINEEC is to produce information for decision-making in educational policy and development of education for all educational sectors. (FINEEC 2015).

The audit manual and criteria were originally established in 2005, updated for the second audit round in 2010, and in 2015 the 2010 version was updated to reflect the change from FINHEEC to FINEEC, and improved based on feedback and experiences from the 2010 model audits (FINEEC 2015). From an institutional viewpoint the audit process is a typical one and consists of:

- registering for the audit
- preparing material and a self-evaluation report for the auditors
- a site visit
- reception of the audit report and a pass/re-audit decision
- organizing a joint concluding seminar with FINEEC
- feedback to FINEEC
- preparing a short report on post-audit development work

- possible re-audit
- case-to-case decision if re-audit fails
- appealing according to a set procedure if the HEI is unsatisfied with the audit decision

The audit targets for the period 2015-2018 are

1. The quality policy of the higher education institution
2. Quality system's link with strategic management
3. Development of the quality system
4. Quality management of the higher education institution's basic duties:
   4.1. Degree education (including first-, second- and third-cycle education)
   4.2. Research, development and innovation activities, as well as artistic activities
   4.3. The societal impact and regional development work (incl. social responsibility, continuing education, open university and open university of applied sciences education, as well as paid-services education)
   4.4. Optional audit target
5. Samples of degree education: degree programmes
6. The quality system as a whole.

In audit target 4, each core duty and the optional audit target are reviewed separately, and in audit target 5, each degree programme is review separately. All targets are evaluated according to a four-level maturity model (absent, emerging, developing and advanced), for which descriptions are provided in the audit manual. The audit team can propose passing the audit if none of the targets is on the "absent" level and the quality system as a whole is at least on the "developing" level. (FINEEC 2015)

Like all evaluations conducted by FINEEC, the audit model applies an enhancement-led viewpoint (Talvinen 2012). However, the model does have elements of an accreditation model as there is a minimum threshold required for passing, however the process does not involve immediate and clearly defined sanctions (Haapakorpi 2011), meaning it can be viewed as a "soft law" similarly to the ESG.

2.4 Integrated management systems

Karapetrovic (2003) defines an IMS conceptually as "a single set of interconnected processes that share a unique pool of human, information, material, infrastructure and financial resources in order to achieve a composite of goals related to the satisfaction of a variety of stakeholders". The main reason for the emergence of integrated management systems, is the expansion of scope of "quality" in organizations, with the scope widening both from conformance to excellence and from the customer to all stakeholders (Karapetrovic 2003). Wilkinson & Dale (1999) refer to organizational theory, in which integration and co-ordination are used synonymously, and use the definition by Dessler (1992) according to which coordination is the process of achieving unity of action among interdependent activities.

As Manatos *et al.* (2015) point out, integration is particularly interesting in HEIs due their traditionally loosely coupled and fragmented organizational structures. They also note that this is currently fairly little studied but emerging area of research. A recent study by Kettunen (2015a) demonstrates a concept in which strategic management and HEI QA were integrated through a balanced scorecard approach, and operationalized through pedagogical and process management. In industry, it is most common to integrate health and safety, environmental and quality management (HSEQ), usually based on standards. Often IMS and HSEQ are even considered synonymous even though this is not the case. Besides HSEQ aspects, sustainability and corporate social responsibility have also been discussed in the IMS context (Abrahamsson *et al.* 2010, Mezinska *et al.* 2015).

Tervonen (2010) states that IMS can be seen as a question of a harmonized and unified way of working and the quality of management. A similar view can be seen in an airline IMS case study by López-Fresno (2010) in which the IMS was seen as a system for the quality of management.

Manzanera *et al.* (2014) suggest that an organization characterized by a high degree of complexity, government by different bodies and regulations with mandatory or recommended control systems often experiences difficulties due to issues such as lack of integration, excessive staff workload, communication problems and difference of perceived strategic value between areas of the organization could benefit from the synergies gained from IMS implementation. These characteristics are typical for an higher education organization.

Taxonomies of integration levels have been presented by several authors. Jørgensen *et al.* (2006) suggest a three level model of corresponding integration in

which cross-references increase compatibility between management systems, coordinating and coherent integration in which the management cycles are integrated with a focus on tasks, and strategic and inherent integration which involves a learning culture, continuous improvement and stakeholder involvement in the IMS. Abad *et al.* (2014) suggest a division between documental harmonization, partial integration and full integration and that higher levels of integration provide more benefits. In a closely related topic, Asif *et al.* (2010) divide integration strategies into a systems approach and a technocentric approach, the main difference between the two being a focus on stakeholder requirements versus a focus on the technical structure combining the MSs.

The benefits of IMS implementation can include a reduction of administrative burden, competitive advantage and progress towards sustainable development (Jørgensen *et al.* 2006). Zeng *et al.* (2011) list IMS benefits as decrease in management cost, paperwork, complexity of internal management, simplified certification and facilitation of continuous improvement. In addition, Khanna *et al.* (2010) mention increased transparency, while the results of Simon *et al.* (2012b) indicate better use of internal and external audit results and firm image improvement as IMS benefits.

In the implementation case presented by López-Fresno (2010) the IMS was structured as a global framework, modules for processes with specific requirements and follow-up and evaluation tools. Using an abandonment case, Gianni & Gotzamani (2014) found out that the lack of performance-oriented management and integrated auditing resulted in not sustaining the IMS change, and the root cause leading to lack of strategic perspective in the original implementation.

Zeng *et al.* (2007) and later Bernardo *et al.* (2012) present a division of implementation difficulties into internal and external ones based on an extensive literature review. Internal barriers to implementation can be based on systems issues such as not understanding who the stakeholders are and strategic misalignment of the importance of the different IMS areas, resources including both under-resourcing the change and IMS upkeep and change resistance, and organization-related issues such as change management caused by loss of power, organizational culture and communication issues and increased bureaucracy (contrary to perceived benefits). External difficulties can arise from standards being conflicting or incompatible, or from lack of experience, leading to using consultants who either do not qualify or cannot be sufficiently resourced to implement and train staff regarding the integrated management systems. To alleviate these difficulties, Simon *et al.* (2012a) recommend that managers and

practitioners pay attention to efficient management of documentation resources and strategic and operative actions by establishing IMS plans and policy, including achievable objectives for IMS activities.

The use of the EFQM Excellence Model as a conceptual basis for an IMS was suggested by Wilkinson & Dale (1999), and Karapetrovic (2003) stated that comprehensive business excellence should be the next target for integrated management systems. This view has been supported by e.g. Tarí & Molina-Azorín (2010) who studied the integration of QM and environmental management systems, concluding that in particular the enabler area of the model could be used both as the IMS framework, as well as a basis for evaluation. They also point out the results area could be used in the evaluation of an IMS.

Tervonen *et al.* (2010) suggest that the combination of IMS and EFQM is a beneficial way to organize a management system and present an EFQM-based Toddlergrade method for assessing the maturity of various areas incorporated into an IMS. In the IMS case example presented by Garengo & Biazzo (2012) the adoption of the EFQM model supported TQM implementation and the improvement of the case company's management system. Interestingly, in López-Fresno's (2010) airline case study it was seen that IMS implementation serves to facilitate a later EFQM adoption. This process was tested in a government-run medical evaluation IMS project reported by Manzanera *et al.* (2014), in which the first phase of IMS implementation was evaluated using the EFQM criteria and further refined.

Besides EFQM, another unifying framework for standards-based IMS has arisen from ISO, as all the new management standards and revisions are based on ISO's Annex SL structure, which sets a high-level format for all ISO's management standards (e.g. Hotti 2014, Pojasek 2013). The Annex SL is expected to ease integration of ISO standard based management systems (Tangen & Warris 2012).

In their discussion of auditing an IMS based on several management standards, Kraus & Grosskopf (2008) point out that a particular important auditor skill is to understand where the management systems intersect, why they do and what issues should be examined in the audit of an IMS. They emphasise that this requires auditor skill or audit team skill (preferably the former), and also that the auditors remain up-to-date regarding industry best practice. Domingues *et al.* (2014) recommend that integrated audits should take place process by process rather than requirement by requirement.

2.5 Literature summary

The management and assurance of quality in universities in the 21st century is a complex whole. Institutions need to be able to demonstrate compliance and excellence and work actively with a multitude of stakeholders and the surrounding society. Table 4 summarizes some of the key context that need to be accounted for in this work.

Table 4. Main aspects in the literature.

Topic	Key concepts
Audit, evaluation and self-assessment	Definition of typology of internal and external audits and evaluations and self-assessment, different forms should form a coherent whole, in academia peer review and the concept of critical friend are central
Excellence in higher education	Rise of excellence in the 21st century, dual nature of the excellence concept – inherent high quality vs. quality amongst peers, private sector excellence models also used in the higher education sector
Excellence in teaching	Lagging compared to research excellence, dual nature, characteristics of excellence on institutional level, programme level, individual level, teaching excellence awards
Excellence in research	Very strongly driven by policy and output/impact metrics in the 21st century, rankings, research excellence assessments
Excellence and societal impact	Strongly emerging in the knowledge society, making its way into policy, strongly but not fully interlinked with excellence in the other two core functions, metrics being developed, success in university-industry collaboration one of the key factors
ESG guidelines	Set of standards and guidelines on internal QA, external QA and QA agencies, backbone of EHEA quality assurance framework
FINEEC audit scheme	ESG-compliant, enhancement-led but with an accreditation elements, based on internal QA procedures and peer review, examines all three core function with some emphasis on education and teaching

Topic	Key concepts
Integrated management systems	Harmonization and unification, system for the quality of management, different levels of integration, benefits and barriers, IMS assessment frameworks, Annex SL, auditor skill requirement

This compilation of themes related to audits, evaluations, self-assessment, excellence and integration forms the basis upon which the results of the research articles can be reflected.

3 Research contribution

3.1 Integrated internal evaluation

The first article answers the research question 1. Due to requirements of accountability and conformity higher education institutions are required to or voluntarily take part in external evaluations. These evaluations can be linked to quality improvement with the help of internal evaluations. However, in practice this has proven difficult and often does not happen. In the article, this issue was addressed by investigating a follow-up evaluation of the Research Assessment Exercise that took place in the University of Oulu in 2007 (Jaako and Ruskoaho 2008, Jaako 2008).

For integration of internal and external evaluation to be successful, attention should be paid to the roles of the stakeholders. The goal is to guide the stakeholders to work towards the common goal of the evaluation besides their own goals. Table 5 illustrates the roles of the stakeholders as they were observed during the case evaluation.

Table 5. Internal evaluation stakeholders. (Reproduced by permission of Inderscience.)

Stakeholder	Definition
Client	A board, a vice rector or an appropriate council that has the authority to set a purpose, scope and resources for internal evaluation and to nominate competent facilitator/operator(s).
Facilitator / Operator	A vital resource of the process in practice, framing the basis and logic of the evaluation. The role of the facilitator/operator is based on the idea that internal evaluations should be conducted by staff who are engaged in the activities that are under evaluation. A full-time facilitator/operator ensures that operations are as smooth as possible, decreasing the effort required from the other stakeholders.
Peer evaluator	The essence of internal evaluation. Peer evaluators do not need to be expert evaluators as long as they are familiar with the environment, understand the evaluation purpose, the basics of evaluation and the evaluated phenomena, and are willing to contribute.
Target unit of evaluation	Should be able to contribute to and benefit from the evaluation with regards to its purpose, scope and the desired extent of evaluation.
Decision-maker	Deans and vice-deans at universities are the key to the internal environment and are thus the primary partners for the facilitator at the focus stage of evaluation

Stakeholder	Definition
Other members of community	Not directly involved in the internal evaluation, but are familiar with target unit or other similar units can benefit from the results, are also stakeholders.

Furthermore, the roles and activities of the stakeholders change during different stages of the evaluation. These roles and activities are demonstrated in Table 6.

Table 6. The roles and activities of stakeholders during evaluation. (Reproduced by permission of Inderscience.)

Stakeholder	Focusing the evaluation	Implementing the evaluation	Utilising the evaluation
Client	Acts as an activator, sets the purpose, scope, resources and time frame	Sets guidelines, follows progression	Assesses the success of the evaluation. Communicates results to the decision-makers
Facilitator / Operator	Creates basis for the entire evaluation process in collaboration with stakeholders	Arranges framework. Creates positive atmosphere for evaluation	Reports results. Disseminates results and promotes their use in a wider context
Peer evaluator	Selected and trained personnel. Committed to subject	Carries out the evaluation transparently and critically in a development-oriented manner	Learns during the process. Utilises the results in their own work
Target unit of evaluation	Selected. Commitment starts through collaboration	Active participation of responsible people. Liberty to speak and ask questions	Develops own processes and takes actions based on feedback and learning
Decision-maker	Involved in the process and collaboration	Informed about progression	Communicates results ate the organisational level. Coordinates development at the organisational level
Other members of community	Informed	Informed	Informed about results and learnings

The integration starts from a client's need for an internal evaluation based on an earlier external evaluation. The facilitator's role was to plan the evaluation in detail, and to interact with the evaluation users to gain commitment. The peer evaluators and the target units are the primary users, so their active participation throughout is

critical for success. Decision-makers and other members of the community are the secondary users and the results should be communicated to them in way that encourages their application on both organisational and individual levels.

Key requirements for integrated internal evaluation

The observations about critical issues regarding integration of internal and external evaluation were compared with findings from previous research. These results and comparisons are presented in in Table 7.

Table 7. Key requirements for integrated internal evaluation. (Reproduced by permission of Inderscience.)

Phase	Key requirement	Authors' findings
Focusing the evaluation	The purpose and the scope are set and described by an authority (c.f. Svensson and Klefsjö, 2006)	Internal evaluation should be subordinate to the university management to function as top-down quality assurance
	Basis and logic for internal evaluation is created in collaboration with the intended users (Patton, 1997)	Transparency and adaption to local settings forms the basis for trust and later utility. Involving people who can influence the utilisation of the results was found important.
	Primary stakeholders are recognised, selected and involved in process by the facilitator (e.g. Preskill and Torres, 1999; Patton, 1997; Ehlers, 2009)	Internal evaluation should be designed to be a collective process with shared ownership
Implementing the evaluation	The facilitator arranges a framework and creates a positive atmosphere for the evaluation (Morabito, 2002)	Evaluation should be seen as a chance to develop and learn. All involved parties need to make an effort for this to happen.
	Peer evaluators act transparently and critically in a development-oriented manner (Costa and Kallick, 1993; Andreu et al., 2003; Dixon, 2009)	Internal evaluation should be based on peer evaluation, as it is experienced to be a fair method by the participants.
	Target unit participants are people responsible for the evaluation area and have liberty to discuss it (c.f. Svensson and Klefsjö, 2006)	People responsible for an area being evaluated should participate to exploit the evaluation findings at a local level

Phase	Key requirement	Authors' findings
Utilising the evaluation	Target units develop their own processes and actions based on feedback and learning (Patton, 1997)	The primary effect of the internal evaluation is experienced locally. Each unit should be considered as unique
	Decision-makers disseminate the evaluation findings and coordinate development at organisational level (Preskill and Boyle, 2008)	Internal evaluation should be integrated with quality assurance and management systems to function as bottom-up quality assurance

The facilitator, client and decision-makers should clarify and plan the evaluation based on the need, the purpose and the scope of the evaluation. The implementation of the evaluation should be guided by these situational and contextual factors. In the training of peer evaluators critical factors include the purpose of the evaluation, the peer evaluators' role as a critical friend, the actual implementation plan and how they should prepare.

To enhance the creation of positive evaluation experiences and utilisation of the results, communication with peer evaluators and target units should be started early in the process. Relevant information about the target units should also be gathered with the contextual factors in mind and provided to the peer evaluators beforehand. During the implementation phase the facilitator should treat each evaluation event as unique and collect and report the evaluation results accordingly in order to maximize local effect.

The factors presented above form the basis of successful utilisation. The primary effects are local and best achieved when a target unit perceives ownership of the process and sees the evaluation as fair and useful. The secondary effects include actions by decision makers and peer evaluators in their own organisational contexts, and by facilitators to improve the evaluation process.

3.2 Evaluation of university-industry cooperation

Article II provides an answer to the second research question by presenting a case, in which the industry collaboration of a university research unit was assessed with a framework based on the EFQM excellence model. Success factors of university-industry (U-I) collaboration were identified and classified based on a literature review. These factors were reflected against the EFQM excellence criteria and a tailored self-assessment framework was created based upon this.

Twelve categorical factors influencing the success of U-I collaboration were recognized in the literature review. These factors are presented in Table 8.

Table 8. Factors influencing university-industry collaboration success. (Reproduced by permission of Taylor & Francis Group.)

Factor	Authors
Breadth of interaction: Partners interact using multiple channels.	Aapaoja *et al.* (2012), Bruneel *et al.* (2010), Butcher & Jeffrey (2007), D'Este & Patel (2007), Plewa & Quester (2007), Plewa *et al.* (2013), Rohrbeck & Arnold (2006)
Choice of partners: Attention is paid to issues such as cultural fit, strategic fit and geographical proximity when planning partnerships.	Barnes *et al.* (2002), Barry & Fenton (2013), D'Este *et al.* (2012), Mead *et al.* (1999), Mora-Valentin *et al.* (2004), Plewa & Quester (2007), Thune (2011)
Clearly defined roles: Roles and responsibilities are clearly defined and communicated.	Barbolla & Corredera (2009), Barnes *et al.* (2002), Nielsen *et al.* (2013), Rohrbeck & Arnold (2006)
Clear policy on publication and intellectual property rights: Policies and processes are transparent and agreed upon.	Barbolla & Corredera (2009), Bruneel *et al.* (2010), Bstieler *et al.* (2015), Rohrbeck & Arnold (2006)
Commitment to collaboration: Senior management allocates appropriate resources for collaboration and acts in a champion role. Commitment in collaboration is accounted for in people management.	Barnes *et al.* (2002), Barry & Fenton (2013), Butcher & Jeffrey (2007), Mora-Valentin *et al.* (2004), Plewa & Quester (2007), Plewa *et al.* (2013), Rohrbeck & Arnold (2006), Schubert & Bjorn-Andersen (2012), Thune (2011)
Communication: Channels for effective sharing of information exist and are actively used both within and between organizations.	Barnes *et al.* (2002), Barry & Fenton (2013), Butcher & Jeffrey (2007), Karlsson *et al.* (2007), Mead *et al.* (1999), Mora-Valentin *et al.* (2004), Plewa *et al.* (2013)
Working methods support value creation for both parties.	Barbolla & Corredera (2009), Barnes *et al.* (2002), Rohrbeck & Arnold (2006), Schubert & Bjorn-Andersen (2012)
Inter-organizational trust: Mutual trust is a key requirement for success. The prerequisites for creating trust are at place.	Barbolla & Corredera (2009), Barnes *et al.* (2002), Bruneel *et al.* (2010), Bstieler *et al.* (2015), Nielsen *et al.* (2013), Plewa & Quester (2007), Plewa *et al.* (2013), Rohrbeck & Arnold (2006), Schubert & Bjorn-Andersen (2012)
Mutually shared mission, goals and benefits: Both parties understand and agree on the aims of collaboration.	Barnes *et al.* (2002), Butcher & Jeffrey (2007), Mead *et al.* (1999), Nielsen *et al.* (2013), Plewa *et al.* (2013), Rohrbeck & Arnold (2006)
Previous collaboration experience: Accumulating both mutual and overall collaborative experience increases the chance of success.	Barnes *et al.* (2002), Bruneel *et al.* (2010), Butcher & Jeffrey (2007), Mora-Valentin *et al.* (2004)

Factor	Authors
Project management: Collaboration projects are managed actively throughout their lifecycle	Rohrbeck & Arnold 2006), Barnes *et al.* (2002), Butcher & Jeffrey (2007), Bstieler *et al.* (2015), Nielsen *et al.* (2013)
Use of key performance indicators: Collaboration is evaluated and monitored in a balanced way.	Barnes *et al.* (2002), Perkmann *et al.* (2011), Plewa *et al.* (2013), Rohrbeck & Arnold 2006), Thune (2011)

To recognize whether the success factors presented in the previous table can be presented within the EFQM excellence criteria, an analysis of the linkages between the factors and the criteria was performed. The resulting linkages are presented in Table 9.

Table 9. Linkages between factors affecting collaboration success and the EFQM criteria. (Reproduced by permission of Taylor & Francis Group.)

Leadership	Strategy	People	Partnerships and resources	Processes, products and services	Measures and indicators
Leaders recognize collaboration in the mission and vision of the organization	Collaboration is included in the organization's strategy	Collaboration roles and responsibilities are clearly defined	Partnerships are strategically planned	The needs of partners are identified and considered	Collaboration performance is measured, evaluated and the results are utilized
Leaders act as champions of university-industry collaboration	Creating value for partners is accounted for in strategy and policy	Capabilities required to achieve mutual value are recognized and developed	Aims of collaboration are clearly agreed upon with partners	Collaboration processes facilitate broad interaction between partners	Different dimensions of collaboration success are accounted for in the indicators
Leaders interact with collaboration stakeholders	Collaboration strategy and policies are communicated and deployed	People communicate actively and transparently	Clear processes and policies for intellectual property issues are at place	Collaboration projects are actively managed to create an environment for success	

Leadership	Strategy	People	Partnerships and resources	Processes, products and services	Measures and indicators
		Success in collaboration is recognized and rewarded	Technology and knowledge is kept up-to-date	Capabilities, products and services are communicated and marketed	

Based on this comparison, the EFQM evaluation criteria and sub-criteria were then modified to address the results of the literature review and the comparison. This tailored evaluation framework is demonstrated in Table 10.

Table 10. EFQM excellence criteria adapted for evaluating university-industry collaboration (Reproduced by permission of Taylor & Francis Group.)

1. Leadership of university-industry collaboration
   a. Leaders recognize the importance of collaboration in the development of the mission and vision of the organization
   b. Leaders engage with customers, partners and representatives of society
   c. Leaders act as champions of university-industry collaboration
2. Strategy of university-industry collaboration
   a. Collaboration is accounted for in the organization's strategy, accounting for the needs and expectations of the stakeholders
   b. Collaboration goals and strategy are based on understanding internal performance and capabilities
   c. Collaboration strategy and supporting policies are developed, reviewed and updated
   d. Collaboration strategy and supporting policies are communicated and deployed through plans, processes and objectives
3. People involved in university-industry collaboration
   a. Roles and responsibilities are clearly defined to support the aims of collaboration
   b. People's knowledge and capabilities required to succeed in collaboration are recognized and developed
   c. People communicate effectively within their organization and throughout the collaborative partnership
   d. People are rewarded and recognized for success in collaboration
4. Partnerships & resources of university-industry collaboration
   a. University-industry partnerships are managed, work on a mutually agreed basis and broad interaction in partnerships is supported
   b. Funding and financial resourcing for collaboration are managed to secure sustained success
   c. Technology is managed to support collaboration

d. Information and knowledge, including intellectual property, are managed to support effective collaboration

5. Processes, products & services of university-industry collaboration
   a. Processes, products and services are designed and managed to create value for both university and industry
   b. Collaboration projects are actively managed
   c. Products and services are effectively promoted and marketed
6. Results of university-industry collaboration
   a. Performance indicators and goals for collaboration have been defined
   b. Different dimensions of success are accounted for in the indicators and goals
   c. Performance indicators and goals are actively managed and utilized

The pilot evaluation of Biocenter Oulu was seen as useful and supporting the case organization's goal to assess and continuously develop its collaboration with industry. The key improvement areas were related to processes, products and services and regarded productization and processes related to collaboration. These areas are linked to other parts of the criteria as, for instance, collaboration strategy, its implementation and its communication is related to the leadership area.

The results of article II combine and categorize success factors of U-I collaboration identified from previous studies. These factors address a multitude of themes, which combined try to lessen the cultural gap between academia and industry, to support the creation of trust and commitment, and an environment in which collaboration occurs in an organized and co-productive way. The suggested evaluation criteria address these success factors within the EFQM framework. The results of the pilot evaluation suggest that the presented way of evaluation is a valid option for assessing and improving the collaboration processes of an organization. Resulting from the non-prescriptive nature, the evaluation framework could potentially be used in various sectors and on both academia and industry sides of collaboration.

The identified success factors were mapped against the EFQM model, and the comparison in Table 2 shows the links between the recognized success factors and the EFQM evaluation criteria. An evaluation criteria for collaboration presented in Table 3 was proposed as the outcome of the comparison. The validity of the criteria was tested by evaluating the industry collaboration of Biocenter Oulu, an umbrella organizations for life sciences research within the University of Oulu. The pilot evaluation was successful and proved to be of help in pinpointing to the relevant improvement areas of the organization's cooperation with industry. The rigor of the

assessment can be adjusted to meet the maturity level of the target organization's U-I activities.

3.3 Excellence in teaching

Article III sheds light on RQ3 by presenting an analysis of practices of the Centres of Excellence in Finnish university education 2010–2012. The qualitative data analysis NVivo was used to code all practices presented by the award winners in their applications. The enabler areas of the EFQM Excellence criteria were used to classify these practices. The amount of coded practices for each individual unit between ranged between 33 and 60, and the total amount of coded practices was 410. These practices were summarized for each individual unit as well as for each enabler criterion. The results were compared to highlight common areas and differences between the units and were compared with earlier research findings on the topic.

Analysis results by criterion

References to leadership were quite scarce, as most decision making was presented as result of work by committees, working groups or organizational entities. Among the mentioned practices were thesis supervision (including stakeholder communication), tutoring and regular staff or student meetings.

The educational strategy process was presented quite similarly by the applicants. The process included discussion of degree requirements often including stakeholders, core content analysis and deployment from a programme level to module and course levels. Self-developed pedagogical models and international standards were used to support strategy formation. Differences existed between systematic regular improvement work and reactive strategy work.

Regarding people, pedagogical training and qualification of staff was found in all of the applications. Policies of researchers teaching and teachers allocated research time were mentioned in some applications. New positions to support education, pedagogy or new strategic teaching areas had been created by a few applicants. Various reward mechanisms were also presented.

Practices related to partnerships and resources included national and international educational research participation, international student activity organization and participation in committees and consortiums. Students and stakeholders participated in planning, development work, tutoring, mentoring and

teaching in a multitude of ways. Training periods were supported by both human resources and training centres. Studies were also supported by e-learning support resources and providing study spaces. Regular alumni meetings and thesis work were seen as good ways to gather information from stakeholders.

The processes, products and services area was by far the most highlighted area in the applications. Pedagogical practices such as teamwork, small group learning, introduction of outside clients, practical exercises, problem-based learning, integrated training periods, other forms of assessment than literature examinations, regular reflection, feedback throughout studies and portfolio work were all highlighted by several applicants. Course learning objectives were defined as a continuum of strategic programme work by several applicants, and actively used in teaching.

Development of researcher skills through e.g. reading scientific articles, integration of studies with the unit's research work, scientific method courses were present in the majority of the applications. Integration into the programme and academia was supported by tutoring by both peers and teachers, including the creation and monitoring of personal study plans. Orientation courses introducing learning skills and illustration of potential future work had been developed by several units. E-learning and blended learning was supported by assessment manuals and tools.

Data to support development was collected through thesis supervision, various metrics, course feedback and regular feedback seminars. Development work often took place through a teaching development team and sometimes through thesis work.

Summary of the most common practices

The most often mentioned practices are demonstrated in Table 11, along with a count of how many times the practice was found in the ten applications. The cut-off for the table was set at four findings.

Table 11. The most common practices found in the analysis (Reproduced by permission of Sakarya University.)

Practice	N	Practice	N
A steering committee for the study programme(s) is in place	8	An e-learning-support resource has been established	5
Feedback sessions involving staff and students are held at regular intervals	8	Students participate in committees and working groups	5
Analysis of core content, workload and learning objectives has been performed	7	The unit organizes pedagogical training for teaching staff	5
Researcher training is included in the studies	7	The unit participates in international educational research	5
Stakeholders are involved in the planning of degree requirements	7	A 'researchers teach' policy is in place	4
The unit has developed tools, manuals or guidelines to support assessment	7	A development seminar is held at regular intervals	4
A web-based regularly used feedback system is in place	6	A project course with teamwork and an outside client has been established	4
An orientating skill course has been developed	6	A teacher-tutoring system has been established	4
Regular feedback is collected in forms of, e.g. career surveys or working life feedback	6	Indicators have been defined and are regularly used to measure progress	4
The unit organizes international summer schools or educational programmes	6	Students compile personal study plans and progress is followed	4
A resource for vocational training support has been established	5		

Table 11 above highlights commonalities between Finnish units of excellence in university teaching, and shows that common elements can be found, and can be applied for benchmarking purposes, for instance. The comparison with earlier studies showed that practices analogous to the findings could be found in previous work on the Norwegian Centres of Excellence. This suggests that good practice may be interchangeable within similar cultural contexts. Reflection against more general studies on teaching excellence confirmed that it is difficult to show evidence related to more culture-related organizational and personal practices and processes, meaning that collections of best practices could be complemented with holistic frameworks of excellence.

3.4 Integrated management systems

Article IV contributes to RQ4 by taking a non-HE management point of view on the current state and trends in integrated management systems. The topic is approached from three angles including: developments regarding the most popular management standards; the state of IMS research and experiences from a long-term research project involving an industrial cluster; and integrated management systems and their assessment.

The review on ISO 9001, ISO 14001 and OHSAS 18001 highlighted ISO's ongoing project of harmonizing the structure of all management standards. All three of these standards will be revised during 2015 and 2016, and OHSAS will join the ISO family as ISO 45001. Having the same structure should ease integration, particularly at a documental level.

A literature review of recent IMS related research articles shed light on current IMS topics and good practice as indicated by the research results. These results include success factors of integration, ways to view integration both based on the depth as well as from a supply chain viewpoint. Some metrics had been proposed to assess an IMS and some research suggested that an excellence based approach could be successful. Audits of different management systems can also be integrated in various ways, while this places certain requirements on auditor skills.

The HSEQ Assessment Procedure (AP) has its roots in a chain of collaborative projects beginning in 1994 between the University of Oulu, the local process industry and other stakeholders. The driving force is an industry-led network originally consisting of five process industry companies operating in Northern and central Finland and their supplier network comprising of hundreds of companies. The cluster has since expanded to include companies from other industry areas as

well. In the early 2000s a need for holistic HSEQ systems for supplier partners, particularly at shared sites was identified and the HSEQ AP was born as a product of this interest. HSEQ AP aims to enhance general HSEQ capability, support developing systematic processes and to improve well-being at work. It can also ease supplier selection and increase supplier competitiveness.

The criteria and underlying logic of the HSEQ Assessment Procedure are based on the EFQM excellence model. It is designed as a series of assessment statements that measure the maturity level of a company's HSEQ functions. The assessments are performed by assessors from a third company auditing company along with assessors from the principal companies, trained in HSEQ AP. Suppliers can choose to participate in the assessment. The results of these voluntary assessments are stored on the HSEQ AP website. Participants of the cluster can view the results from the online database, and assessed companies can share also further share their result. The assessment process is illustrated in Figure 5.

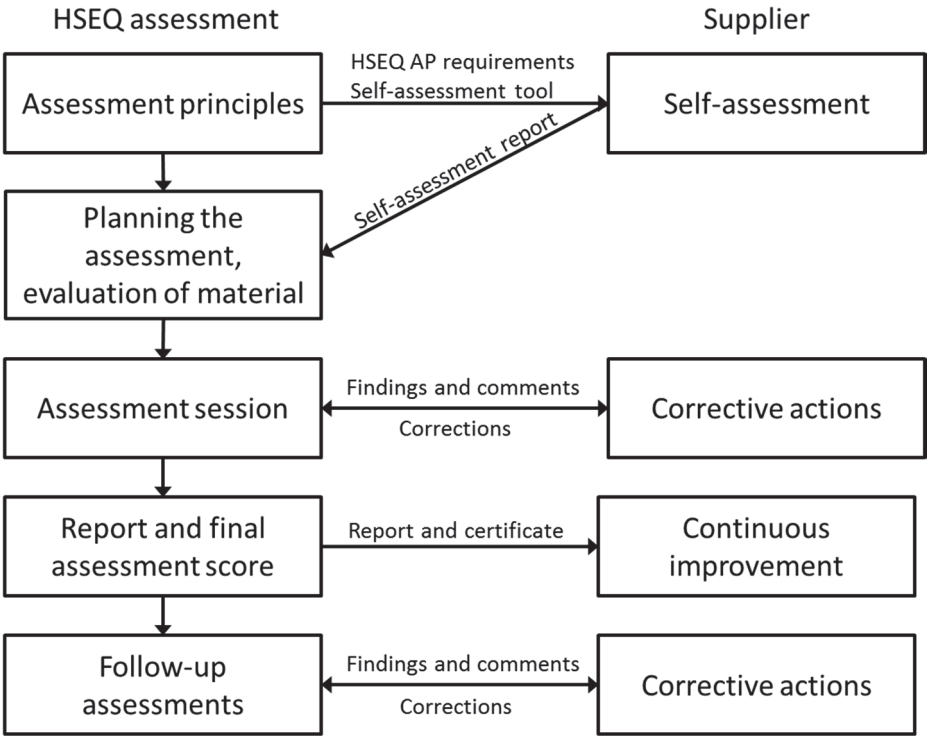

Fig. 5. The HSEQ Assessment Procedure (HSEQ 2013).

The validity of the HSEQ AP has been studied on several occasions through surveys, interviews, comparisons with non-project companies and statistical analysis. The results have supported the view that the system is seen to be beneficial both for the principal companies and suppliers, and that the assessment results are consistent.

Common themes between the three points were identified. The findings from both current literature and the HSEQ AP suggest that integrated management systems may help an organisation in its efforts towards comprehensive excellence. The results also suggest that the holistic viewpoint of the EFQM model could be useful in assessing an integrated management system. Taking the supply chain and operational context into account was the original motivation for the HSEQ AP, while this topic is also discussed in research literature, as well as in the new standard requirements. Branching IMS considerations into the areas of sustainability and risk also arose from all viewpoints.

3.5 Summary of the contributions

The contributions presented in the previous chapters are not a direct continuum of each other, but rather seek to understand the observed phenomena using different viewpoints and research approaches. The relationship between these contributions and the research questions of this dissertation are summarized in Table 12.

Table 12. Summary of the results for each research question.

Research question	Results
1. How can internal and external evaluation be integrated in a higher education institution?	Internal evaluation should be subordinate to institutional level management to function as top-down quality assurance. It should be transparent, adapted to the external evaluation context and the people who can utilize the evaluation results should be involved throughout the process. Internal evaluation should be based on peer review. To produce value for participants each unit evaluated should be treated uniquely. Internal evaluation should be integrated with QA systems to function as bottom-up QA.

Research question	Results
2. Can university-industry collaboration be evaluated using criteria based on the EFQM excellence model?	The success factors for university-industry collaboration were identified based on previous research and an EFQM based assessment tool was created based on a cross-analysis of the factors and the EFQM criteria. A pilot evaluation suggested the created tool is a valid option to use in self-assessment of an organization's collaborative activities.
3. Which practices can be identified in the applications of Centres of Excellence in Finnish university education 2010–2012?	A systematic analysis of the practices and a categorization of these practices identified common processes between the units. The role of excellence awards and transferability of good practice were discussed.
4. What are the current state and trends in integrated management systems in the private sector?	Integrated management systems have become a mainstream concept. Management standards are becoming more unified regarding high level content in order to ease integration. State of current research highlights key issues such as level of integration, success factors and barriers of implementation and issues related to assessment and auditing. The case example presents an assessment procedure combining aspects such as excellence, external audits and the use of audit results as benchmarks.

Besides observing how the contributions relate to the individual research questions, it could be interesting to analyze how they relate to the different functions of the university and different aspects of evaluation and excellence. Table 13 aims to demonstrate how each article is linked to these themes.

Table 13. Summary of contributions regarding the three missions of a university.

Article #	Teaching	Research	Third mission
I		Internal evaluation of enhancement activities following an external evaluation of research excellence.	
II		Self-assessment of university-industry collaboration based on key success factors and an excellence model.	

Article #	Teaching	Research	Third mission
III	Analysis of the results of an external evaluation: practices adopted by Finnish Centres of Excellence in Finnish university education 2010-2012.		
IV	Current state of industry-led IMS practice. Case example of an excellence based HSEQ audit scheme developed for the needs of a Finnish industry cluster. The results can be reflected upon the integration of the university's three missions in its quality management and assurance.		

It should be noted that teaching is not included in the above table within the scope of Article II, as the case organization was a research umbrella organization by nature. The role of teaching and education as a part of university-industry collaboration is nevertheless important and should not be ignored. Overall, Table 13 shows that the research articles included in this dissertation approach the issue of organizing QM, QA and various evaluations from multiple viewpoints, and covering all three functions to at least some extent.

4 Discussion

Achieving value and synergy in various quality evaluations in higher education is often found challenging. The reasons for this are multifaceted and arise from organizational complexity. Issues such as the multiplicity of stakeholders, their various and sometimes conflicting demands, finding balance and synergy between the three core missions, and cultural differences between and within organizations all together create an environment in which managing and assuring quality is a daunting task. This study does not claim to solve this wicked problem, but addresses some aspects of it through an inspection of various evaluations, their design, and their integration.

The integration of evaluations taking place within a unit, within the HEI, by external evaluators can be viewed as vertical integration. To achieve the integration of evaluations, the HEI level picture of various evaluations, their aims and their linkages should be created at the institution's management level as a result of strategic planning. If the HEI has a quality policy, it may bridge the gap between QA activities and strategy. A clear description of the process of evaluations within an institution could well be beneficial. It could help to avoid having to resort to ad hoc evaluations to fulfil requirements, such as "cleaning up house" for an upcoming audit. The description could include issues such as what is going to be evaluated when the evaluations take place, who are the stakeholders of the evaluation and what criteria are used. Evaluations should build upon each other both top-down and bottom-up in order for them to be integrated and not just coordinated. This could be useful in achieving what evaluations in the end should aim for – continuous improvement. It is natural that internal evaluation activities are more focused on enhancement and external activities tend to be more focused on compliance.

The integration between the three missions of HEI can be viewed as horizontal integration. To account for all the missions like this in planning and carrying out evaluations would constitute a part of integrated higher education management. For this to be possible, the evaluation tools should take a holistic view. This could also promote stakeholder management and societal impact. A holistic view might also aid in avoiding sub-optimization that can occur when a certain area is assessed using criteria that does not sufficiently address the whole. A rich body of research exists, both on good practices and success factors of fulfilling the three missions. These can be a valuable help in developing integrated evaluation approaches.

Ideally, external and internal evaluations and self-assessment would form a planned, justified and context-specific whole. For instance, evaluations and metrics

that impact the strategy of the University of Oulu include the FINHEEC quality audit, the funding model, the Research Assessment Exercise among others. How do these link to the university's strategy and the three missions, with each other and with internal QA activities? Such systematic planning could decrease evaluation workload and increase the impact of various evaluations. They would be clearly linked with the institution's management system and operations as well as across the three missions, and they would build upon each other. To summarize thoughts on integrated quality evaluation that have arisen during the creation of the research articles and the preparation of this compilation part of the dissertation, Fig. 6 highlights some aspects of vertical and horizontal integration of quality evaluation.

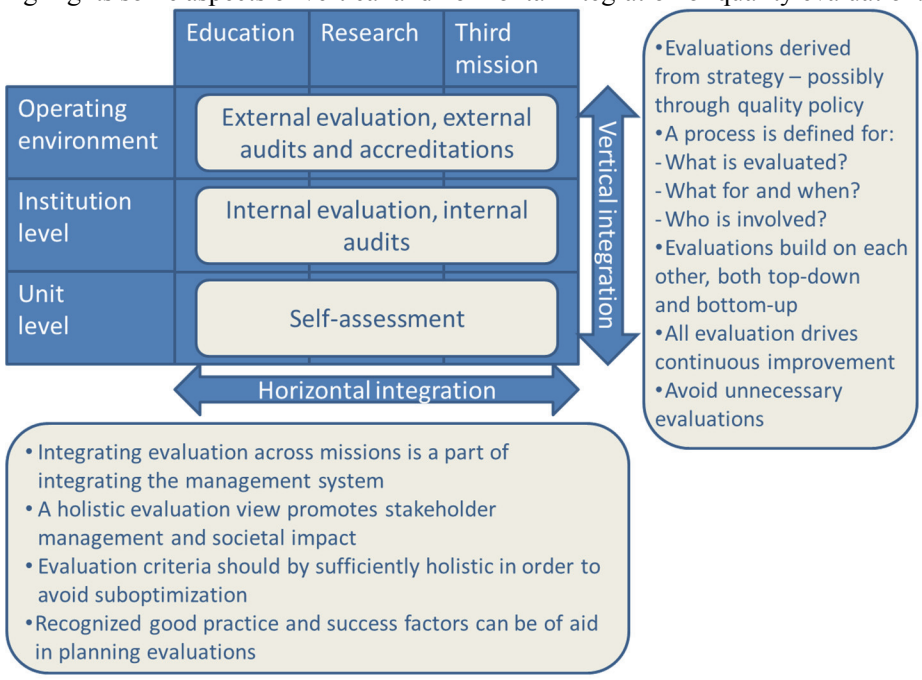

Fig. 6. Horizontal and vertical integration of quality evaluation.

The presented research shows how in designing evaluations issues such as contextual factors, earlier evaluations, recognized success factors and links to management systems could be accounted for. The three missions of the university are all covered to some extent in the presented research. Integration between different types of evaluation and between the three missions are both discussed, and it is suggested that the emerging research area of integrated management

systems could bring value to a higher education context as well. The now ubiquitous concept of excellence can be seen as a linking factor, both through the higher education concepts and through the use of an excellence framework as a holistic and adaptable assessment tool. Such tools can also be worthwhile in creating a common language within the evaluation context of an HEI. For practitioners, this dissertation provides tools for analysing and enhancing quality and integrating activities on both unit and institutional levels.

4.1 Theoretical implications

Article I advanced the scientific debate on quality evaluation in higher education. The integration of evaluation has proven problematic (e.g. Bazargan 2007, Stensaker *et al.* 2008, Harvey & Williams 2010). Practical papers regarding internal evaluation have been relatively few (Blackmore 2004, Dixon 2009, Reid & Ashelby 2002). Article I presents a detailed account of designing and implementing an internal evaluation project based on an earlier external evaluation. The roles and activities of stakeholders during evaluation have been discussed in earlier literature (e.g. Morabito 2002, Blackmore 2004, Patton 1997, Stufflebeam & Shinkfield 2007). In the article these findings are consolidated and enrichened through the observations made during the pilot evaluation.

Success in societal impact and university-industry collaboration has become a key strategic factor in higher education, both in policy and in practice (e.g. Benneworth *et al.* 2015, Brink 2010, EC 2011a, Perkmann & Salter 2012, Pinheiro *et al.* 2015). The measuring of success in U-I collaboration is recognized as important (Perkmann *et al.* 2011) and an emerging research topic (Teixeira & Mota 2012). Article II makes a contribution through presenting a self-assessment tool for this evaluation based on recognized success factors and the European excellence model.

Article II also contributes in the area of applying industry-based management tools, in particular the EFQM Excellence Model, in a higher education context. Earlier research (e.g. Calvo-Mora *et al.* 2006, Davies 2008, Hides *et al.* 2004, Montesinos *et al.* 2008, Osseo-Asare & Longbottom 2002, Tarí & Molina-Azorín 2010) has demonstrated various applications of the model. Still, in application of private sector management tools the HE context should be accounted for (Tarí 2008, Montesinos et al 2008). Article II provides a concrete method of doing this by linking HE literature to the model, upon which the evaluation instrument is created.

While teaching excellence has been much discussed conceptually and through personal accounts (e.g. Brusoni *et al.* 2013, Elton 1998, Gunn & Fisk 2013, Skelton 2009), Article III provides a practice-based view through an analysis of Centres of Excellence in Finnish university education. These excellence applications are a precious resource (Raaheim & Karjalainen 2012) but systematic analysis has been scarce. A comparison with earlier studies on teaching excellence and quality dimensions (Chickering & Gamson 1987, Gunn & Fisk 2013, Owlia & Aspinwall 1998, Skelton 2009) highlights that while institutional level mechanisms seem to be captured in the analyzed applications, issues related to cultural and personal values and individual teacher excellence are hard to capture in an excellence award application and must also be accounted for when utilizing analysis results. A comparison with an earlier work on the Norwegian excellence awards (Bråten 2014) showed a lot of similarity, suggesting some transferability of recognized excellent practices at least within a similar cultural context. Article III also demonstrates another method for utilizing the EFQM Excellence model, in this as a classification framework for the recognized practices of the centres of excellence.

In the context of integrated management systems, article IV provides a current state view of the evolving research area and contributes in the discussion through a comparison between a review of research literature, standardization and experiences from a Finnish IMS assessment project. This comparison identified common themes such as accounting for the supply chain, and sustainability and addressing risk. The comparison with the ISO standard development (e.g. Hotti 2014, Pojasek 2013, Tangen & Warris 2012) and literature on integration level (e.g. Jørgensen *et al.* 2006, Abad *et al.* 2014) suggests that the Annex SL format may be helpful in documental harmonization of an IMS. The presented excellence-based HSEQ assessment scheme has been well tested, and is consistent with suggestions from earlier research that an IMS should be assessed on MS and integration level (de Oliveira 2013, Karapetrovic 2003, Rebelo *et al.* 2014), and that the use of excellence models can support IMS implementation (Garengo & Biazzo 2012, Manzanera *et al.* 2014, Tarí & Molina-Azorín 2010).

The HSEQ AP presented in publication IV could also be compared with current HE audit practice. In the presented case the evaluation results are structured according to the used criteria and saved in an online database. In comparison, HE audit reports tend to be written in opaque academic language, which has reduced trust in audits and contributed to the rise of the ranking movement (Hazelkorn 2013). Considering the current Finnish FINEEC audit scheme (FINEEC 2015), a database format similar to the one presented in the HSEQ case could offer a more

fertile format for sharing audit results than the current policy of publishing lengthy individual audit reports. Possibly this idea could be linked or benchmarked with the new U-Multirank (Jongbloed *et al.* 2013) concept. Such a database could also be built around the current FINEEC criteria or the ESG (ENQA 2015).

As Manatos *et al.* (2015) observe, it seems that universities are following the trend of seeking stronger integration of various management practices. Interestingly, looking at integrated management systems literature, cross-reference between higher education quality assurance and management seems to practically be non-existent. Kohoutek & Westerheijden (2014) point out that quality assurance and management policies in HE center on education, and this misalignment between QA, QM and the three core missions can potentially be damaging (Kohoutek & Westerheijden 2014). This suggests that the IMS topics covered in publication IV could be of use in aligning the QM of the three core functions. This view is also supported by Manzanera *et al.* (2014), whose description of an instance in which IMS could particularly be beneficial matches with the qualities of an HEI.

Articles II, III and IV all relate to the use of an excellence Model. In article I the model was also used a starting point for planning the internal evaluation questionnaire. Brdulak (2014) states that QA in higher education should be holistic. Excellence models are holistic by nature which suggests that basing QA approaches on them could be beneficial. The approaches used were adapted to context, as suggested as necessary by Tarí (2008) among others. This situational tailoring may alleviate the suggested issues of excellence models being too generic (Asif *et al.* 2013) or too prescriptive (Osseo-Asare & Longbottom 2002) for HE use. The adoption of a holistic idea of excellence may also help avoid the issue pointed out by (Sørensen *et al.* 2015); defining excellence through a narrow set of metrics can lead to important but not measured tasks receiving less priority.

In summary, the theoretical contribution addresses the planning and organization of quality evaluation in HE and provides some insight on excellence and on integrated management systems. The research results may be useful in achieving integration in quality assurance and evaluation, i.e. in achieving unity of effort (Lawrence & Lorsch 1967) between different evaluations and between the three core missions.

4.2 Practical implications

Article I provides a process for organizing an internal evaluation to support enhancement work. The presented pilot study presents the roles of the evaluation

stakeholders during the different stages of the evaluation, as well as the key requirements to success. The evaluation process described in the article can be used to complement the university's quality system, and to function as a QA mechanism between the institutional and unit levels. It can potentially aid in linking internal and external evaluations to an institution's management system.

The results of Article II suggest that excellence-based self-assessment is a plausible way to create input for the development of U-I collaboration. The presented and piloted assessment framework is based on recognized success factors and the holistic view of the European excellence model. The non-descriptive nature of excellence based evaluation can allow the use of the results in diverse organizational contexts. Similarly, the maturity level of the university-industry collaborative activity can be accounted for in the rigor of the self-assessment.

A compilation of the practices highlighted by excellent Finnish university teaching units in their award applications is presented in Article III. The analysis highlights some commonalities between the units, such as certain QA related practices, researcher training, use of core analysis in programme development, development of assessment tools and active participation of stakeholders. The results of the analysis summarize excellent practices from an award viewpoint and can be used as a benchmark in development work both on institutional and programme levels.

The results of the comparison performed in article IV suggest that excellence-based thinking and the use of the EFQM model can be of use in the assessment of integrated management systems. Risk management, sustainability and a supply chain view are themes arising both from the research literature and practice and could be accounted for in IMS work. The ongoing ISO Annex SL change addresses the issue of documental harmonization level. This also implies that systems integration will still have to be addressed separately. Possibly practically relevant and HE applicable issues from the IMS research body include the analysis of different levels of integration, barriers, success factors and benefits of IMS implementation, integrated audits and auditor skill requirements (which could also be viewed as manager skill requirements) and stakeholder management in the IMS context.

In summary, the results approach the practical challenges of designing evaluations in a synergetic and meaningful manner in a HEI and their integration across the three core missions of the institution from several viewpoints. Examples of designing an evaluation in relation to a previous one or recognized success factors are presented. The second case directly involves two missions of the HEI.

The implementation of these evaluations is also described. The excellence award analysis shows how such results could be summarized in order to link them back to institutional QM and QA work. The IMS practices can provide ideas on the design of university level QM and QA systems. The use of an excellence model is a common theme between the articles. The results suggest that using such a model may support holistic quality assurance accounting for the relevant stakeholders and all three missions.

4.3 Critical reflection of the research

Ketokivi & Choi (2014) posit that the essence of case research is the duality of being situationally grounded while also seeking a sense of generality. Being situationally grounded implies an empirical disposition and addressing contextual issues already in the data collection phase. A sense of generality implies an attempt to transcend the empirical context of the research and contribute to more general theory through abstraction.

No single agreed upon criteria for judging qualitative research exists, and in the end every researcher should choose his/her own (Lichtman 2013). For the reflection of this dissertation work, the "eight big-tent" criteria for quality qualitative research (Tracy 2010) were applied. A reflection against this criteria while keeping the duality criterion noted above in mind is presented in Table 14.

Table 14. Reflection against the eight big-tent criteria.

Criterion	Reflection
Worthy topic	The topic of this dissertation is a global issue in higher education, and theory on the highlighted topics is still very much in a developing stage. Effort has been made to demonstrate this through the literature review, research results and accompanying discussion. The results are not necessary particularly ground-breaking but hopefully extend the existing state of theory and are of worth to practitioners.
Rich rigor	Tracy (2010) referes to Weick (2007) on the concept of "requisite variety", meaning that the study of complex systems requires complex tools and instruments. The purpose of the study has been approached from multiple directions with a holistic mind-set. This has introduced at least some variety in the methods that the complex topic of study requires. The presented research papers each demonstrate data, collection methods and analysis methods to some extent, with the goal of making these research processes sufficiently transparent for their rigor to be assessed. Therefore the rigor can be seen as adequate.

Criterion	Reflection
Sincerity	The researcher(s) have attempted to be sincere through reflection and by being transparent throughout the dissertation process. Challenges and limitations are reported where they were felt to arose during the dissertation work.
Credibility	Sufficient depth of illustration about the study context allows the reader to draw their own conclusions and is an important aspect of achieving credibility. Attention has been paid to providing the amount of detail to allow for this. This compilation work attempts to triangulate and crystallize and triangulate the individual findings of the research articles.
Resonance	While this dissertation work is somewhat unlikely to resonate with its audience through vivid and colourful storytelling, it strives for resonance through transferability and naturalistic generalizability. It is hoped that the readers involved in research and practice of quality management in higher education can relate to the presented work and related context and thus can apply the results in their work.
Significant contribution	The theoretical significance of this work does not come in the format of creating new theory, but rather from extending current theoretical views on quality management in higher education. The idea of further investigating integration, possibly in conjunction with the integrated management systems research body, could give the study some heuristic significance. Practical significance is achieved by presenting some tools that can be applied to daily evaluation and enhancement work.
Ethical	The topics used in this work were not particularly ethically sensitive. When using interview materials, the subjects were always requested to review and provide corrections if needed before publication of results. Best effort has been given to remain ethical throughout the dissertation process.
Meaningful coherence	Best attempts have been made to achieve the study goals and using appropriate methods in this attempt. Literature, findings and interpretations have been interconnected with each other to the extent of the dissertation worker's ability.

Therefore, on the basis of reflecting on the quality of this dissertation, the whole formed by the individual publications and the summarizing elements can be seen as adequate for the intended purpose.

4.4 Recommendations for further research

Covering the vast topic of various evaluations and their integration thoroughly is beyond the scope of this research, and hence a multitude of interesting directions of research have emerged during the dissertation work. Just as the research literature and practices of evaluation and quality assurance in higher education are still developing, so is the theoretical body of integrated management systems. These two will inevitably intersect with potentially interesting results.

With regards to integration, the integration of evaluation and quality management systems across functions and across HEI organizational levels remain fairly new and scarcely researched topics. The analysis could also be extended to cover topics such as stakeholder requirements, a supply chain view, strategic planning and strategy implementation and even sustainability.

Looking in a more general context, the research area of integrated management systems has arisen from a process management and quality management basis, not from organizational theory. Issues such as integration and differentiation mechanisms seem very comparable to IMS literature and fertile grounds for research could possibly be found there.

It seems that currently a lot of the valuable data resulting from, for example, audit reporting, excellence applications and other evaluations is not utilized nearly to the extent that could be beneficial. Solutions to make these types of information more accessible for benchmark use could enhance their use and consequently increase the usefulness of said evaluations.

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