Toward a Model of Academic Competencies to Enhance First-Year Student Retention in Higher Education

INAUGURALDISSERTATION
zur Erlangung des akademischen Grades
eines Doktors der Wirtschaftswissenschaften
der Universität Mannheim

vorgelegt von
Dana-Kristin Mah, M.A.
Berlin

Berlin, November 2017

Dekan: Prof. Dr. Dieter Truxius
Referent: Prof. Dr. Dirk Ifenthaler
Korreferent: Prof. Dr. Andreas Rausch

Tag der mündlichen Prüfung: 19. Dezember 2017

Abstract

Enhancing student retention in higher education has been a global issue for many years; however, withdrawals prior to degree completion remain at about 30% in member countries of the Organisation for Economic Cooperation and Development (OECD). As early withdrawals have consequences on different levels, such as for the individual, higher education institutions, and society, further research on student retention is still important and necessary. In Germany, empirical evidence describing student retention remains rare. Recently, however, some government initiatives on student retention in Germany have been funded, such as with regard to the demographic change and the demand for qualified academic employees for the German economy. The first year of higher education is considered particularly crucial, as students often decide to withdraw at this stage. Important factors for discontinuing higher education include the choice of the wrong course, lack of motivation, overload, an unsatisfactory first-year experience, lack of institutional support services, and personal factors, such as financial problems, health, and family circumstances. First-year students' academic unpreparedness, perceptions, and expectations have also been found to contribute to discontinuing higher education studies. First-year students' academic preparedness for higher education studies, which can be linked to the concept of generic skills, has not been thoroughly examined in the extant literature.

Therefore, in the presented thesis, a conceptual model of decisive academic competencies for higher education was constructed, following a competency-based approach and with a focus on the first year in higher education. This model is designed to complement established models and theories addressing student retention in higher education, with a focus on five academic competencies: time management, learning skills, self-monitoring, technology proficiency, and research skills. This thesis aims to provide insight into students' (student perspective) and academic staff (academic staff perspective) expectations and perceptions concerning academic competencies for higher education studies as well as the potential of learning analytics and digital badges (educational technology perspective). The thesis includes three quantitative studies (Study 1, Study 2, Study 3), one qualitative study (Study 4), and one theoretical research effort (Integrative review) to enhance first-

year student retention in higher education and contribute to research in Germany. The proposed model of academic competencies may address the research gap relating to generic skills in higher education studies and serve as a platform for discussion about required academic competencies for higher education studies. Regarding the student perspective (Study 1, Study 2), one main finding indicated that first-year students assessed their skill levels in all five academic competencies as rather high. The findings also indicated first-year students' perceptions of the role of academic staff in supporting student development, especially in research skills, and low self-reported confidence in this competency. Study 3 indicates that first-year students' intention to leave the institution prior to degree completion may be influenced by their perceptions and expectations with regard to academic competencies, especially research skills. Regarding the academic staff perspective (Study 4), interviews with members of the academic staff indicated that their perceptions of first-year students' academic competencies are lower than staff expectations. Academic staff often expect first-year students either to have already developed competencies for higher education studies based on their prior secondary education or to be responsible for developing these competencies on their own. Regarding the educational technology perspective (Integrative review), first learning analytics and then digital badges were presented, with an explanation of their objectives, purposes, functions, opportunities, and challenges concerning their potential to enhance student retention in higher education. Lastly, a conceptual model was proposed that synthesizes learning analytics, digital badges, and academic competencies.

The findings of this thesis are discussed, practical implications are derived, and ideas for future research are presented. The findings in this thesis may contribute to the development of adequate support services that meet individual needs and move research on the first-year experience and academic competencies forward to enhance student retention in higher education.

Zusammenfassung

Die Erhöhung des Studienverbleibs ist seit Jahren ein wichtiges Bestreben, gleichwohl verbleibt die Studienabbruchquote bei durchschnittlich 30 Prozent in den Ländern der Organisation für wirtschaftliche Zusammenarbeit und Entwicklung (OECD). Konsequenzen von Studienabbrüchen zeigen sich auf unterschiedlichen Ebenen, wie individueller, hochschulischer und sozialer Ebene, so dass Forschung zum Studienverbleib nach wie vor relevant und erforderlich ist. Bislang wird in Deutschland der Studienverbleib unzureichend untersucht. Aktuell erfährt der Studienverbleib an deutschen Hochschulen erhöhte Aufmerksamkeit, beispielsweise vor dem Hintergrund des demografischen Wandels und des prognostizierten Fachkräftemangels für die deutsche Wirtschaft. Die Studieneingangsphase wurde als besonders relevant für den Studienverbleib identifiziert, da im ersten Studienjahr die höchsten Studienabbrüche zu verzeichnen sind. Zu den Hauptfaktoren für einen Studienabbruch zählen eine falsche Studiengangwahl, fehlende Motivation, Überforderung, persönliche Gründe wie finanzielle Mittel, Krankheit oder familiäre Umstände, eine unerfüllte Studieneingangsphase, fehlende institutionelle Unterstützung. Weiterhin wurden die mangelnde Fähigkeit von Studienanfängern, die akademischen Anforderungen zu bewältigen sowie unrealistische Vorstellungen und Erwartungen vom Hochschulstudium als entscheidende Faktoren des Studienabbruchs identifiziert. Akademische Anforderungen können sich auf generische Anforderungen für ein Hochschulstudium beziehen, die bislang jedoch unzureichend erforscht wurden.

Vor diesem Hintergrund wurde in der vorliegenden Dissertation ein konzeptuelles Modell akademischer Kompetenzen entwickelt. Basierend auf einer Literaturrecherche empirischer Studien wurden zentrale und zugleich herausfordernde fachübergreifende Faktoren im Studium, insbesondere in der Studieneingangsphase, identifiziert: Zeitmanagement, Lerntechniken, Technologieanwendung, Selbstreflexion und Forschungsmethoden. Das konzeptionelle Modell bezieht sich inhaltlich auf einen kompetenzorientierten Ansatz zur erfolgreichen Bewältigung von Aufgaben in variablen Situationen und wird als Ergänzung und neue Perspektive zu etablierten Modellen verstanden, die Faktoren für Studienerfolg umfassend berücksichtigen. Auf der Grundlage des

konzeptuellen Modells und mit der Fokussierung auf die Studieneingangsphase wurden die Vorstellungen und Erwartungen von Studienanfängern (Studierendenperspektive) und Dozierenden (Dozierendenperspektive) hinsichtlich akademischer Kompetenzen sowie das Potential von Learning Analytics sowie Digital Badges (Technologieunterstützende Perspektive) mittels drei quantitativer Studien (Studie 1, Studie 2, Studie 3), einer qualitativen Studie (Studie 4) und einem theoretischen Beitrag (Integratives Review) erforscht. Das entwickelte konzeptionelle Modell akademischer Kompetenzen leistet einen Beitrag zur bisher unzureichenden Forschung zu relevanten generischen Fähigkeiten für ein Hochschulstudium und kann ebenso als Diskussionsgrundlage hierfür fungieren. Die Analysen zur Studierendenperspektive (Studie 1, Studie 2) verweisen auf eine hohe selbsteingeschätzte Kompetenz der untersuchten Studienanfänger in allen fünf akademischen Kompetenzen. Die Studienanfänger erwarten insbesondere universitäre Unterstützungsleistung in der Entwicklung von Forschungsmethoden, die sie auch als geringste selbsteingeschätzte Kompetenz angeben. Weiterhin verweisen die Ergebnisse der Studie 3 auf einen Zusammenhang zwischen der Häufigkeit des Studienabbruchsgedankens von Studienanfänger mit ihren Vorstellungen und Erwartungen hinsichtlich akademischer Kompetenzen. Die Ergebnisse der Dozierendenperspektive (Studie 4) deuten darauf hin, dass die Dozierende Studienanfänger als weniger kompetent wahrnehmen als sie erwarten würden. Häufig erwarten Dozierende von Studienanfängern bereits bestimmte generische Fähigkeiten für das Hochschulstudium auf der Grundlage der erworbenen Hochschulreife bzw. erwarten sie häufig, dass sich Studienanfänger diese generischen Fähigkeiten selbstständig aneignen. Mit Fokus auf die technologieunterstützende Perspektive (Integratives Review) wurden zum einen Learning Analytics und zum anderen Digital Badges hinsichtlich ihrer Ziele, Funktionen, Potenziale und Herausforderungen, insbesondere zum Studienverbleib betrachtet. Darüber hinaus wurde ein konzeptionelles Modell entwickelt, dass Learning Analytics, Digital Badges und akademische Kompetenzen verbindet.

Das übergeordnete Ziel der Beiträge besteht in der Erhöhung des Studienverbleibs und neuer Erkenntnisse für die deutsche Hochschulforschung. Diese Forschungserkenntnisse können zur Generierung adäquater individueller Unterstützungsangebote genutzt werden. Ebenso wird angestrebt die Forschung zur Studieneingangsphase weiterzuentwickeln und den Studienverbleib in den

Hochschulen zu erhöhen. Hierzu werden die präsentierten Resultate diskutiert, praxisbezogene Implikationen abgeleitet sowie Ideen für fortführende Forschungsstudien beschrieben.

Preface

This thesis is the result of my interest in the important issue of first-year student retention in higher education. It is not part of any research program (for example, by a higher education institution, the government, a research organization, or cooperation with a research group).

I would like to thank every person who encouraged my research and supported me in the process of creating this thesis.

First and foremost, I thank my doctoral supervisor, professor Dr. Dirk Ifenthaler. I appreciate all his academic advice, his trust in my work, and the research opportunities that he offered, such as the position of coeditor for two edited volumes and writing a project proposal for and collaborating on this successfully funded project. He encouraged and motivated me during my doctoral studies with continuous enthusiasm for my research. His enthusiasm and success inspired me, and I am thankful for the time and ideas that he contributed.

I thank professor Dr. Andreas Rausch for his time and his willingness to act as the second reviewer of this thesis.

I thank my colleague Dr. Nicole Bellin-Mularski for all her academic advice and support, motivation, patience, and continuous encouragement during my time at the University of Potsdam, and particularly during the time that I worked on this thesis.

I also thank Nadine Böckmann for her support in organizing and providing the instructed literature for this thesis as a student assistant.

Last but not least, I thank my family and friends for their support, advice, and friendship during the time I worked on this thesis.

Table of contents

List of figures

List of tables

1 Introduction

1.1 Motivation

Student retention has been a global concern for many years. Even though many academic support programs have been implemented, and research on this topic is extensive, dropout rates remain at about 30% in the Organisation for Economic Cooperation and Development member countries (OECD, 2013a). Student dropout has consequences on different levels, such as for the individual, higher education institutions, and society (Larsen, Kornbeck, Kristensen, Larsen, & Sommersel, 2013). For example, dropouts often represent a waste of resources for the individual and society and reflect insufficient quality of the higher education institution (In der Smitten & Heublein, 2013)

Factors that contribute to student retention and that may impact students' decision to discontinue higher education are various and complex (Heublein, Hutzsch, Schreiber, Sommer, & Besuch, 2010; Tinto, 1993). Important factors that have been consistently found in international studies include the choice of the wrong study program, lack of motivation, personal circumstances, an unsatisfying first-year experience, lack of university support services, and academic unpreparedness (Heublein, 2014; Thomas, 2002; Willcoxson, Cotter, & Joy, 2011; Yorke & Longden, 2008).

Academic unpreparedness with regard to generic skills for higher education studies, however, has not yet been researched in depth (Lombardi, Conley, Seburn, & Downs, 2013). Different terms apply in the scant research on this aspect of discontinuing higher education, which include *study skills*, *generic skills*, *academic preparedness*, *academic competencies*, and *coping with academic demands* (Clanchy & Ballard, 1995; Wingate, 2006; Zlatkin-Troitschanskaia, Shavelson, & Kuhna, 2015). An explicit definition and operationalization of this construct, however, is largely absent from those studies. Nonetheless, a clear understanding of generic study skills for higher education is crucial, such as within the framework of the Bologna reform and the focus on learning outcomes and competencies (Education Audiovisual and Culture Executive Agency, 2012). *Competencies* refers to the individual's ability to cope adequately with demanding tasks in different situations, with an emphasis on successful problem solving (Weinert, 2001a, 2001b). For higher education studies, both subject-related and interdisciplinary competencies are

important. Interdisciplinary aspects may include generic skills, such as critical thinking, time management, and problem solving (N. Bennett, Dunne, & Carré, 1999; Binkley et al., 2012; Clanchy & Ballard, 1995; Griffin, McGaw, & Care, 2012; Leggett , Kinnear, Boyce, & Bennett, 2004). Research on generic skills with a focus on first-year student retention in higher education, as well as theoretical models, is still rare.

There are a variety of theoretical perspectives and models on student retention and student dropout (e.g., Bean & Metzner, 1985; Heublein et al., 2010; Rovai, 2003; Tinto, 1975, 1993). The first-year experience in higher education has been identified as a crucial period for student retention and so has been an international issue for many years (A. Bowles, Fisher, McPhail, Rosenstreich, & Dobson, 2014; Jansen, André, & Suhre, 2013). Research on this period, however, has been predominantly conducted in English-speaking countries, such as the United States, the United Kingdom, and Australia (Brinkworth, McCann, Matthews, & Nordström, 2009; Jansen & Suhre, 2011).

In Germany, there has been an increasing interest in enhancing student retention, increasing student success, and reducing student dropout (Bosse, 2015; Heublein, 2014). The changing demographics in Germany and the growing demand for academically trained specialists for the German economy are important aspects in the debate about student retention in higher education (BMBF, 2012; Heublein et al., 2017). Increasing the participation of underrepresented groups in higher education is a target within the framework of equality of opportunity regardless of social or economic disadvantages or background (Education Audiovisual and Culture Executive Agency, 2012; OECD, 1998; Schuetze & Slowey, 2002). Thus, student diversity, such as with regard to students' prerequisites and individual needs, has been gaining relevance in higher education (Tolstrup Holmegaard, Møller Madsen, & Ulriksen, 2017). Expanding access to higher education is determined as a method to counter the labor trend, which is particularly relevant for industries in science, technology, engineering, and mathematics (STEM) (Heublein et al., 2017).

Within this framework, the German government has been initiating programs to contribute to student retention in higher education. For example, the *Quality Pact of*

Teaching[1] program and the 2016 initiative *Study Success and Study Dropout*[2] are both funded by the German Federal Ministry of Education and Research. The aim of these German programs is to increase student success and to reduce dropout rates. Dropout rates differ with regard to subject groups. The most recent study on student dropout in Germany reveals an overall dropout rate of 32% in the Bachelor program for the student cohort 2010/11 (Heublein et al., 2017). The highest dropout rates are found for mathematics and natural sciences (39%) and engineering (32%), followed by language/cultural studies/sports (30%) and law/economics/business administration/social sciences (30%), agricultural/forestry/ nutritional sciences (28%), and finally arts/cultural studies (23%). The data is based on statistical estimations, as statistics on students' study status are not yet available (Heublein, 2014). However, the amendment of the law for higher education statistics will enable recording students' study status by the year 2018 (Bundestag, 2017).

With regard to the timing of dropout, the first-year experience has been identified as a crucial period, as most students who decide to withdraw do so within or shortly after their first year (Heublein et al., 2017; Tinto, 1975, 1993). Challenges in the first year of higher education include aspects such as social transition (e.g., building peer relationships), academic transition (e.g., coping with academic demands for higher education studies, adjustment to learning and teaching style), and the matching of expectations and perceptions (Byrne & Flood, 2005; Cook & Leckey, 1999; Maunder, 2017). Thus, many academic support programs, such as summer bridge courses, orientation seminars, and freshman courses, are offered right before or at the beginning of higher education studies (Barefoot, Warnock, Dickinson, Richardson, & Roberts, 1998; Clark & Cundiff, 2011; Keup, 2005; Tinto, 2012).

Nonetheless, dropout rates in higher education remain high, highlighting that further research is needed. In particular, first-year students' academic unpreparedness for higher education is an aspect that fewer studies have investigated in depth. Academic preparedness for higher education studies, however, is crucial for incoming students and may also be important with regard to students' diversity (Bosse, 2015; Reason, Terenzini, & Domingo, 2006). Adaptive and personalized

---

[1] https://www.bmbf.de/de/qualitaetspakt-lehre-524.html

[2] https://www.wihoforschung.de/de/studienerfolg-und-studienabbruch-620.php

academic support services should be offered to meet students' individual needs.

Educational technologies for teaching and learning have shown promise for this purpose. For instance, learning analytics as a research field in higher education aims to analyze the student process and recommends personalized feedback for further learning (Arnold & Pistilli, 2012; Ifenthaler, 2015). Digital badges are symbols for certifying students' achievements and competencies on web-based platforms (Derryberry, Everhart, & Knight, 2016; Gibson, Ostashewski, Flintoff, Grant, & Knight, 2013). Studies on the motivational element of badges revealed students' high motivation for studies (Abramovich, Schunn, & Higashi, 2013; Põldoja & Laanpere, 2014).

To contribute to first-year student retention, this thesis is dedicated to the exploration of academic competencies for higher education studies, with a focus on the first-year students' and academic staff perspective. The potential of learning analytics and digital badges to enhance student retention in higher education is also analyzed.

1.2 Overarching research question

Academic competencies for higher education have been investigated in relatively few studies; however, such competencies have been identified as an important factor for student retention and are already somewhat integrated into certain theoretical perspectives and models on student retention (e.g., Bean & Metzner, 1985; Rovai, 2003; Tinto, 1975, 1993).

Taking this lack of extant research as a basis, the purpose of this thesis is to contribute to first-year student retention in higher education by gaining insight into and exploring

- first-year students' perceptions and expectations of academic competencies for higher education studies,
- academic staff perceptions of required academic competencies for higher education studies,
- the potential of learning analytics and digital badges to enhance first-year student retention in higher education, and
- the German first-year experience.

Both empirical research was conducted and conceptual models were proposed. This thesis consists of three quantitative studies, one qualitative study, and an integrative review, which are organized in four separate papers.

The overarching research question of this thesis, which the four papers address, is the following:

What are first-years students' and academic staff perceptions on academic competencies for higher education studies, and what potential do learning analytics and digital badges have to enhance first-year student retention?

Hereinafter, the specific research question and the structure of the presented thesis are described.

1.3 Specific research questions

Within the framework of first-year student retention in higher education and the context of the need for further research, four studies were conducted and one integrative review is presented. On the basis of a newly developed conceptual model of academic competencies, academic competencies will be investigated in this thesis, with regard to three main focuses:

(1) First-year student perspective (Study 1, Study 2, Study 3)
(2) Academic staff perspective (Study 4)
(3) Educational technologies perspective (Integrative review).

Figure 1.1 provides an overview of the three perspectives, which were analyzed with regard to academic competencies to enhance first-year student retention.

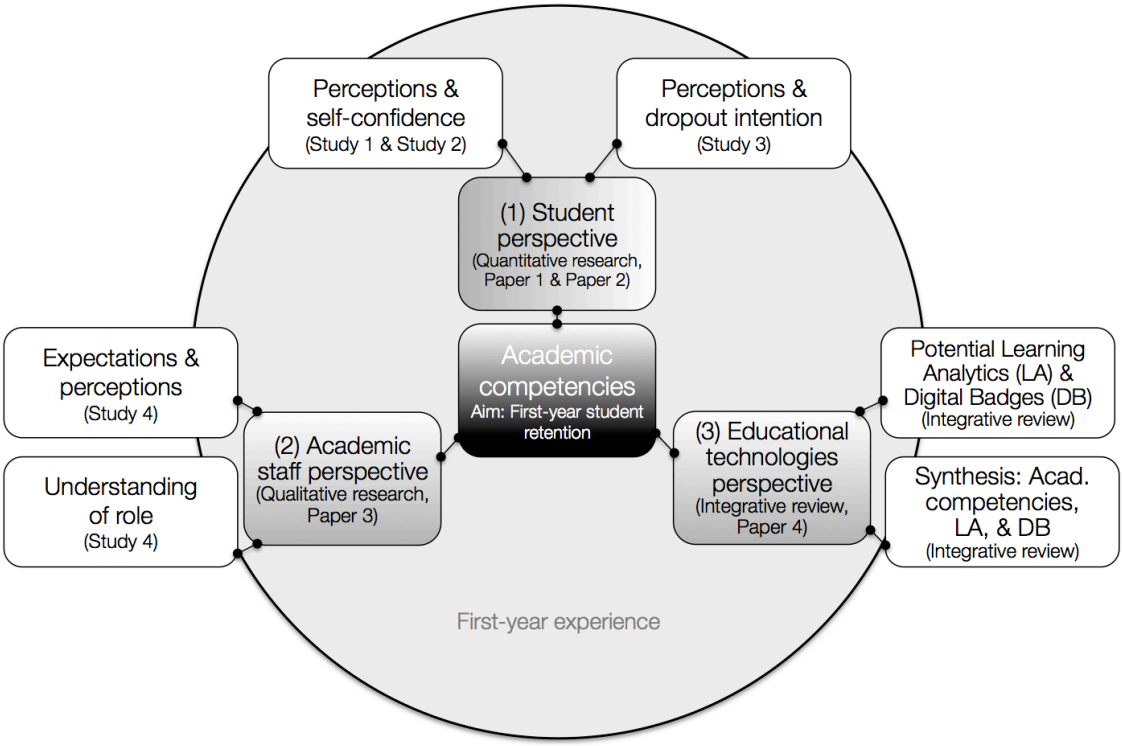

Figure 1.1. Overview of the three main focuses of the thesis.

The main focus of each individual paper and the specific research questions can be summarized as the following.

1.3.1 First-year student perspective (Study 1, Study 2, Study 3)

The first paper (Study 1, Study 2) explores first-year students' perceptions and expectations of academic competencies for higher education studies with regard to the proposed model of academic competencies. The focus is on first-year students' self-reported confidence and expected support in developing the academic competencies. To gain an initial insight into first-year students' perceptions, a quantitative research design was chosen.

Research questions for Study 1 (Paper 1):

- What are first-year students' perceptions of academic competencies with regard to support from their academic staff?
- How do first-year students self-report their academic competencies?

On the basis of the findings of Study 1, Study 2 was conducted as a follow-up that concentrated on research skills. The following research questions were analyzed:

Research questions for Study 2 (Paper 1):

- What are first-year students' perceptions with regard to different aspects of research skills?
- How do first-year students self-rate their competencies in different aspects of research skills?
- Is there a relation between first-year students' perceptions and their self-rated confidence with regard to different aspects of research skills?

The second paper (Study 3) addresses first-year students' perspective, with a focus on their perceptions of required academic competencies and expected academic support. Using quantitative data, the impact of their perceptions on their intention to leave the institution prior to degree completion was analyzed.

Research questions for Study 3 (Paper 2):

- Does the frequency of first-year students' intention to leave the institution prior to degree completion differ by faculty?
- Do first-year students' perceptions and expectations impact the frequency of intention to leave the institution prior to degree completion regarding (a) the total sample and (b) the faculty level?
- Do first-year students' perceptions and expectations of academic support services impact the frequency of intention to leave the institution prior to degree completion regarding (a) the total sample and (b) the faculty level?

1.3.2 Academic staff perspective (Study 4)

The third paper (Study 4) discusses the academic staff perspective on first-year students' academic competencies using a qualitative research design.

Research questions for Study 4 (Paper 3):

- Which generic skills do academic staff view as being important for first-year students?
- What are academic staff (a) expectations and (b) perceptions concerning first-year students' academic competencies with regard to the proposed model of academic competencies?

- How do academic staff understand their role in supporting first-year students in developing academic competencies for higher education?

1.3.3 Educational technologies perspective (integrative review)

The fourth paper (the integrative review) analyzes the potential of emerging educational technologies and research fields in higher education to contribute to student retention. An overview of learning analytics is presented, including theoretical considerations, current practices, experience, and the potential impact on student retention to enhance students' first-year experience. Second, digital badges for higher education are described. Third, a conceptual model that connects learning analytics, digital badges, and academic competencies is proposed.

Research questions for the integrative review (Paper 4):

- What is the current foundation of empirical studies and current practice of learning analytics in higher education, with a focus on student retention?
- What is the current foundation of empirical studies and current practice of digital badges in higher education, with a focus on student retention?
- How may learning analytics, digital badges, and generic skills be synthesized in a meaningful way to enhance student retention?

Table 1.1 gives an overall overview of the four papers, including the investigative perspective, title, research design, method, sample, and main research focus.

Table 1.1
Overview of research perspectives and studies included in this thesis

Paper	*Paper 1*	*Paper 2*	*Paper 3*	*Paper 4*
Study	Study 1, Study 2	Study 3	Study 4	Integrative review
Focus/ Perspective	Student perspective	Student perspective	Academic staff perspective	Educational technologies perspective
Title	Students' perceptions toward academic competencies: The case of German first-year students	Einfluss akademischer Kompetenz-vorstellungen auf den Studienabbruch-gedanken von Studienanfängern (Impact of perceptions of academic competencies on first-year students' dropout intention)	Academic staff perspectives on first-year students' academic competencies	Learning analytics and digital badges: Potential impact on student retention in higher education
Research design Method	Quantitative research Questionnaire	Quantitative research Questionnaire	Qualitative research Interviews	Theoretical research Integrative review
Sample (*N*)	Study 1 = 155 Study 2 = 717	770	10	-
Main research focus	• Introduction of a model of academic competencies • Self-confidence • Perceptions of academic support • Perceptions of different aspects of research skills • Perceptions of support of different aspects of research skills	• Perceptions of required academic competencies • Perceptions of academic support • Impact of first-year students' perceptions of academic competencies (demands and support services) on their dropout intention	• Expectations of first-year students' generic skills for higher education studies • Expectations of first-year students' academic competencies • Perceptions of first-year students' academic competencies	• Potential of learning analytics and digital badges to enhance student retention • Synthesis of academic competen-cies, learning analytics, and digital badges in a proposed model

The thesis focuses on different perspectives: the first-year students' perspective (Paper 1, Paper 2), the academic staff perspective (Paper 3), and the educational technology perspective (Paper 4). A quantitative research design was chosen to explore a large number of first-year students' perceptions, expectations, and self-confidence with regard to academic competencies. In contrast, the academic staff perspective was analyzed by using interviews, a qualitative approach that was suitable to investigate the academic staff perspective of required generic skills for higher education studies in general and their view of the proposed model of five academic competencies. The educational technology perspective regarding the potential impact of learning analytics and digital badges on student retention was analyzed by conducting an integrative review of empirical evidence and current practices (Paper 4). This analysis was necessary for the proposed synthesis of learning analytics, digital badges, and generic skills into a conceptual model.

1.4 Structure of the thesis

This thesis consists of seven chapters.

The first chapter presents the motivation by providing an introduction to student retention and the need for further research on academic competencies for higher education studies. The overarching research question is described as well as the four studies and the integrative review, with their specific research questions.

The second chapter presents the conceptual foundation of the thesis. This includes the conceptualization of student retention and student dropout in higher education by providing an overview of terms, theoretical perspectives on student retention, and factors for student dropout. The importance of the first-year experience and first-year students' perceptions and expectations are emphasized. A developed model of academic competencies is proposed and contextualized in the research of first-year student retention in higher education.

The next four chapters are dedicated to the individual studies. Chapter Three describes the first paper (student perspective; Study 1 and Study 2), Chapter Four the second paper (student perspective; Study 3), Chapter Five the third paper (academic staff perspective; Study 4), and Chapter Six the fourth paper (educational technology perspective; Integrative review).

Chapter Seven provides a general discussion of the thesis, including main findings and theoretical contributions, practical implications, and limitations and future research, and a final conclusion.

1.5 References

Abramovich, S., Schunn, C., & Higashi, R. M. (2013). Are badges useful in education?: It depends upon the type of badge and expertise of learner. *Educational Technology Research and Development 61*(2), 217–232. doi: 10.1007/s11423-013-9289-2

Arnold, K. E., & Pistilli, M. D. (2012). Course signals at Purdue: Using learning analytics to increase student success *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge*. New York: ACM

Barefoot, B. O., Warnock, C. L., Dickinson, M. P., Richardson, S. E., & Roberts, M. R. (Eds.). (1998). *Exploring the evidence: Reporting outcomes of first-year seminars.* (Vol. II). Columbia, SC: University of South Carolina, National Resource Center for the First-Year Experience and Students in Transition.

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*(4), 485–540.

Bennett, N., Dunne, E., & Carré, C. (1999). Patterns of core and generic skill provision in higher education. *Higher Education, 37*(1), 71–93. doi: 10.1023/A:1003451727126

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw & E. Care (Eds.), *Assessment and teaching of 21st century skills* (pp. 17–66). New York Springer.

BMBF. (2012). Perspektive MINT. Wegweiser für MINT-Förderung und Karrieren in Mathematik, Informatik, Naturwissenschaften und Technik. Berlin: Bundesministerium für Bildung und Forschung (BMBF).

Bosse, E. (2015). Exploring the role of student diversity for the first-year experience. *Zeitschrift für Hochschulentwicklung, 10*(4), 45–66.

Bowles, A., Fisher, R., McPhail, R., Rosenstreich, D., & Dobson, A. (2014). Staying the distance: Students' perception of enablers of transition to higher education. *Higher Education Research & Development, 33*(2), 212–225.

Brinkworth, R., McCann, B., Matthews, C., & Nordström, K. (2009). First year expectations and experiences: Student and teacher perspectives. *Higher Education, 58*(2), 157–173.

Bundestag, D. (2017). *16. Bericht des Ausschusses für die Hochschulstatistik*. Retrieved from https://http://www.bundestag.de/presse/hib/2017_01/-/489986.

Byrne, M., & Flood, B. (2005). A study of accounting students' motives, expectations and preparedness for higher education. *Journal of Further and Higher Education, 29*(2), 111–124.

Clanchy, J., & Ballard, B. (1995). Generic skills in the context of higher education. *Higher Education Research & Development, 14*(2), 155–166. doi: 10.1080/0729436950140202

Clark, M. H., & Cundiff, N. L. (2011). Assessing the effectiveness of a college freshman seminar using propensity score adjustments. *Research in Higher Education, 52*(6), 616–639. doi: 10.1007/s11162-010-9208-x

Cook, A., & Leckey, J. (1999). Do expectations meet reality? A survey of changes in first-year student opinion. *Journal of Further and Higher Education, 23*(2), 157–171. doi: 10.1080/0309877990230201

Derryberry, A., Everhart, D., & Knight, E. (2016). Badges and competencies: New currency for professional credentials. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education: Trends, issues, and cases* (pp. 12–20). New York; London: Routledge.

Education Audiovisual and Culture Executive Agency. (2012). The european higher education area in 2012: Bologna process implementation report. Brussels.

Gibson, D., Ostashewski, N., Flintoff, K., Grant, S., & Knight, E. (2013). Digital badges in education. *Education and Information Technologies, 20*(2), 403–410. doi: 10.1007/s10639-013-9291-7

Griffin, P., McGaw, B., & Care, E. (Eds.). (2012). *Assessment and teaching of 21st century skills*. New York: Springer.

Heublein, U. (2014). Student drop-out from German higher education institutions. *European Journal of Education, 49*(4), 497–513.

Heublein, U., Ebert, J., Hutzsch, C., Isleib, S., König, R., Richter, J., & Woisch, A. (2017). Zwischen Studienerwartungen und Studienwirklichkeit. Ursachen des Studienabbruchs, beruflicher Verbleib der Studienabbrecherinnen und Studienabbrecher und Entwicklung der Studienabbruchquote an deutschen Hochschulen *Forum Hochschule* (Vol. 1). Hannover: Deutsches Zentrum für Hochschul- und Wissenschaftsforschung.

Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D., & Besuch, G. (2010). Ursachen des Studienabbruchs in Bachelor- und in herkömmlichen Studiengängen *HIS: Forum Hochschule* (Vol. 2). Hannover: HIS Hochschul-Informations-System.

Ifenthaler, D. (2015). Learning analytics. In J. M. Spector (Ed.), *The SAGE encyclopedia of educational technology* (Vol. 2, pp. 447–451). Thousand Oaks, CA: Sage.

In der Smitten, S., & Heublein, U. (2013). Qualitätsmanagement zur Vorbeugung von Studienabbrüchen. *Zeitschrift für Hochschulentwicklung, 8* (2), 98–109.

Jansen, E. P. W. A., André, S., & Suhre, C. (2013). Readiness and expectations questionnaire: A cross-cultural measurement instrument for first-year university students. *Educational Assessment, Evaluation and Accountability, 25*(2), 115–130. doi: 10.1007/s11092-013-9161-2

Jansen, E. P. W. A., & Suhre, C. (2011). *Preparedness, first-year experiences and outcomes. A comparison between students in domestic and international degree programmes in a Dutch university*. Paper presented at the Research and Development in Higher Education: Higher Eduation on the Edge Gold Coast, Australia.

Keup, J. R. (2005). The impact of curricular interventions on intended second year re-enrollment. *Journal of college Student Retention, 7*(1-2), 61–89.

Larsen, M. S., Kornbeck, K. P., Kristensen, R. M., Larsen, M. B., & Sommersel, H. B. (2013). Dropout phenomena at universities: What is dropout? Why does dropout occur? What can be done by the universities to prevent or reduce it? A systematic review. Copenhagen: Danish Clearinghouse for Educational Research.

Leggett , M., Kinnear, A., Boyce, M., & Bennett, I. (2004). Student and staff perceptions of the importance of generic skills in science. *Higher Education Research & Development, 23*(3), 295–312. doi: 10.1080/0729436042000235418

Lombardi, A., Conley, D. T., Seburn, M. A., & Downs, A. M. (2013). College and career readiness assessment: Validation of the key cognitive strategies framework. *Assessment for Effective Intervention, 38*(3), 163–171. doi: 10.1177/1534508412448668

Maunder, R. E. (2017). Students' peer relationships and their contribution to university adjustment: the need to belong in the university community. *Journal of Further and Higher Education*. doi: 10.1080/0309877X.2017.1311996

OECD. (1998). *Redefining tertiary education*. Paris France.

OECD. (2013). *Education at a glance 2013: OECD indicators.* Retrieved from http://dx.doi.org/10.1787/eag-2013-en

Põldoja, H., & Laanpere, M. (2014). Exploring the potential of open badges in blog-based university courses. In Y. Cao, T. Väljataga, J. K. T. Tang, H. Leung & M. Laanpere (Eds.), *New Horizons in Web Based Learning* (pp. 172–178). Switzerland: Springer.

Reason, R. D., Terenzini, P. T., & Domingo, R. J. (2006). First things first: Developing academic competence in the first year of college. *Research in Higher Education, 47*(2), 149–175.

Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet und Higher Education, 6*, 1–16.

Schuetze, H. G., & Slowey, M. (2002). Participation and exclusion: A comparative analysis of non-traditional students and lifelong learners in higher education. *Higher Education*(44), 309–327.

Thomas, L. (2002). Student retention in higher education: The role of institutional habitus. *Journal of Education Policy, 17*(4), 423–442. doi: 10.1080/02680930210140257

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125. doi: 10.3102/00346543045001089

Tinto, V. (1993). *Leaving college. Rethinking the causes and cures of student attrition*. Chicago; London: The University of Chicago Press.

Tinto, V. (2012). *Completing college. Rethinking institutional action*. Chicago; London: The University of Chicago Press.

Tolstrup Holmegaard, H., Møller Madsen, L., & Ulriksen, L. (2017). Why should European higher education care about the retention of non-traditional students? *European Educational Research Journal, 16*(1), 3–11. doi: 10.1177/1474904116683688

Weinert, F. E. (2001a). Concept of competence: A conceptual clarification. In D. S. Rychen & L. H. Salganik (Eds.), *Defining and Selecting Key Competencies* (pp. 45–65). Seattle (et. al.): Hofgrefe & Huber Publishers.

Weinert, F. E. (2001b). Vergleichende Leistungsmessung in Schulen - eine umstrittene Selbstverständlichkeit. In F. E. Weinert (Ed.), *Leistungsmessungen in Schulen* (pp. 17-31). Weinheim und Basel: Beltz Verlag.

Willcoxson, L., Cotter, J., & Joy, S. (2011). Beyond the first-year experience: The impact on attrition of student experiences throughout undergraduate degree

studies in six diverse universities. *Studies in Higher Education, 36*(3), 331–352.

Wingate, U. (2006). Doing away with "study skills". *Teaching in Higher Education, 11*(4), 457–469. doi: 10.1080/13562510600874268

Yorke, M., & Longden, B. (2008). The first-year experience of higher education in the UK. York: The Higher Education Academy.

Zlatkin-Troitschanskaia, O., Shavelson, R. J., & Kuhna, C. (2015). The international state of research on measurement of competency in higher education. *Studies in Higher Education, 40*(3), 393–411. doi: 10.1080/03075079.2015.1004241

2 Conceptual foundation of the thesis

2.1 Student retention in higher education

Student retention in higher education has been of global concern for years (Beer & Lawson, 2017; A. Bowles et al., 2014; Jansen et al., 2013). On average, across the OECD countries, approximately one third of students entering higher education withdraw from the institution prior to degree completion (OECD, 2013a).

Various terms are used to describe student retention and withdrawal in higher education (R. Jones, 2008; Larsen et al., 2013). The most common terms include *retention*, *success*, *persistence*, *completion*, *graduation rate*, *withdrawal*, *dropout*, *noncompletion*, *attrition*, and *failure*. The rather positive term *student retention* focuses on the institutional and governmental perspective and can be described as **"**the extent to which learners remain within a higher education institution, and complete a programme of study in a predetermined time-period" (R. Jones, 2008, p. 1). With a focus on the student perspective, positive terms include *success*, *completion*, and *persistence*, and rather negative terms include *dropout*, *withdrawal*, and *failure*. Tinto (1993) emphasizes the importance of defining student dropout and encourages higher education institutions to distinguish different forms of departure. This is particularly relevant with regard to students' reasons for leaving the institution prior to degree completion and the institutional strategy and actions to avoid student dropout (Tinto, 1993). The term *dropout* mainly refers to "withdrawal from a university degree program before it has been completed", which also includes "dropout from single courses of study within a given university degree program" (Larsen et al., 2013, p. 18). Heublein (2014) refers to a narrow and common understanding of student dropout in empirical research on higher education (e.g., Heublein, Schmelzer, & Sommer, 2005; Schröder-Gronostay, 1999) that "only includes students who leave the higher education system without obtaining a (first) degree and do not complete their studies at a later stage" (p. 498). Following the latter definition, other forms of mobility or fluctuation, such as going abroad or changing the study program, the institution, or the type of higher education, can be summarized as shrinkage and measured as shrink rate (Heublein, 2014). Heublein (2014) emphasizes the lack of differentiation between system departure and varieties of fluctuation. Fluctuation can occur on different institutional levels. Within the higher education system, a student can leave a specific study program, the

department, the faculty, or the university. These forms of fluctuation are often termed as *institutional departure* (Tinto, 1993) or *mobility* (Heublein, 2014). The last level refers to dropping out of the higher education system, also labeled *system departure* (Tinto, 1993). System departure is the focus of many studies when analyzing student dropout in higher education (Heublein et al., 2017).

In Germany, statistics on individual students' achievements and course progression are currently not available due to data privacy concerns (Heublein, 2014). However, the amendment of the law for higher education statistics will allow the collection of data on individual students' study status beginning in the year 2018 (Bundestag, 2017). This data may provide an more precise and in-depth understanding of student dropout and retention and contribute to more adequate institutional actions and initiatives (European Commission, 2015). In the interim, research is still based on statistical estimations, such as retrospective comparisons between graduates and first-year students (Heublein, Richter, Schmelzer, & Sommer, 2012) or the calculation of academic success rates (Hetmeier, Bihler, Brugger, Scharfe, & Willand, 2008; Scharfe, 2010). Reasons for dropout are based on surveys of deregistered students (e.g., Heublein et al., 2017; Heublein et al., 2010), as students do not have to state the reason for their decision when they withdraw from the higher education system. Dropout from higher education institutions can be distinguished into two individual student perspectives: voluntary and involuntary. First, students can decide to withdraw from the higher education system due to better alternatives, such as a job opportunity or another educational perspective. Second, financial difficulties or personal problems could be factors in the decision to discontinue higher education (Larsen et al., 2013). The timing of dropout can also vary. Studies show that most students who decide to leave higher education do so within or after the first year (Heublein et al., 2017; Tinto, 1993).

Student dropout from the higher education system may have an effect on different levels: the individual, the university, and society (Larsen et al., 2013). At the individual level, involuntary dropout from university is often associated with negative emotions, such as self-doubts, lack of skills, and failure to belong. Dropout may also be associated with a waste of personal resources, such as time and finances. In contrast, more voluntary withdrawal can also be seen as positive for the individual, as with a student who has a better alternative, such as a job that corresponds with the desire for more practical work (Heublein et al., 2017). At the

university level, negative consequences occur with regard to the pedagogical approach, which aims to support every student in completing their studies, and the university loses a potential academic. Furthermore, high dropout rates could relate to the quality of the institution and the higher education system overall (In der Smitten & Heublein, 2013). At the society level, student dropout is related to socioeconomic consequences. For example, the returns to education and economic growth are affected by students' successful degree completion (Bound & Turner, 2011). Studies show that fewer academics are unemployed in contrast to people without a higher education degree, who more often rely on welfare benefits (Söhnlein, Weber, & Weber, 2013).

Overall, this first overview of student retention in higher education reveals a diversity of terms and definitions on this topic. The emphasis on either positive or negative terms as well as the notion of voluntary or involuntary withdrawals requires consideration.

The focus in this thesis is on first-year student retention. Following the definition by Heublein (2014), this thesis aims to contribute to first-year student retention for students obtaining a first higher education degree (usually a Bachelor degree). As the importance of the first year in higher education has been identified in several studies, this thesis focuses on this period. The presented studies concentrate on students' first-year experience in higher education and are conducted with students in their first year (first and second semester) of higher education studies.

Taking the understanding of student retention as a basis (Section 2.1), the following sections provide an insight into the theoretical conceptualization of this thesis. First, a brief overview of theoretical perspectives on student retention and factors for student dropout is provided (Section 2.1.1); second, the importance of the first year in higher education is described (Section 2.1.2); and third, the importance of students' perceptions and expectations is outlined (Section 2.1.3). Finally, a model of academic competencies, which is taken as the basis for the conducted studies in this thesis, is proposed and described with its intersections with the presented theoretical perspectives and models (Section 2.2).

2.2 Theoretical perspectives on student retention and factors for student dropout

Student retention has been researched for many years. Research includes different theoretical perspectives that aim to explain contributing factors for student retention in higher education. The factors for students' decisions to drop out have been researched, and these can be assigned to the different theoretical perspectives as a common basis.

There are several theoretical perspectives and models of student retention in higher education (e.g., Bean & Metzner, 1985; Heublein et al., 2012; Rovai, 2003; Tinto, 1975, 1993), and many share common aspects, even though their emphasis varies. The common aspects include students' sociodemographic factors (e.g., gender, ethnicity, family background), cognitive capacity, or prior academic performance (e.g., grade point average [GPA]), and individual attributes (e.g., personal traits, and motivational or psychosocial contextual influences).

The main theoretical perspectives can be organized in different ways. Sarcletti and Müller (2011) suggest the categorization into four theoretical perspectives: integration (e.g. Tinto, 1975), cultural capital (e.g., Bourdieu, 1992; Thomas, 2002), psychological attributes (e.g. Bean & Eaton, 2000), and rational choice (e.g. Stinebrickner & Stinebrickner, 2008). Similarly, Larsen et al. (2013) also distinguish four main theoretical perspectives: (a) sociology aspects, (b) psychological aspects, (c) organizational aspects, and (d) economic aspects. Of the sociologically grounded theories, the most influential model is Tinto's *Longitudinal model of institutional departure* (Tinto, 1975, 1993). The model indicates that students' retention is most directly related to their academic and social integration into the system of higher education and considers students' precollege experience and family background as well as various individual attributes, such as ability and sex. These factors are all presumed to impact students' performance in higher education. The model emphasizes student dropout as the result of a longitudinal process between the student with the individual pre-entry attributes and the institutional experience, such as interaction and integration. Psychologically grounded theoretical models focus on students' psychological attributes with regard to studying and learning, such as study behavior and attitude toward studying. For instance, Bean and Eaton (2000) propose a student retention model that includes four psychological theories as well as academic and social integration (e.g. Tinto, 1975; Tinto, 1993): attitude-behavior

theory (Ajzen & Fishbein, 1997), coping behavioral theory (e.g. French, Rodgers, & Cobb, 1974), self-efficacy theory (e.g. Bandura & Cervone, 1983), and attribution theory (e.g. Weiner, 1986). Organizationally grounded theories focus on participation, membership in academic communities, and communication (Metzner & Bean, 1987). Economically inspired perspectives focus on student retention and dropout as a rational decision that is based on the relationship between the individual student's investment in education and estimated returns from education (Bound & Turner, 2011).

Based on the abovementioned theoretical perspectives on student retention, numerous instruments aim to measure students' readiness and predict their success before entry into higher education. Such instruments include the *Scholastic Attitude Test* (SAT) (Hannon & McNaughton-Cassill, 2011) and the *American College Testing Program* (ACT) (ACT, 2008), both standardized tests used to assess learning potential and prior learning and knowledge (Coyle & Pillow, 2008). The SAT measures verbal comprehension, mathematics, and writing skills, and the ACT measures knowledge and skills in major subjects (essentially, English, mathematics, reading, and science). Other factors widely believed to affect college readiness and success are high school GPA, college entrance exam scores, and personal factors, including gender, health behavior, and social support (Clark & Cundiff, 2011).

Many theoretical models and studies on student retention in higher education are based in English-speaking countries, such as the United States and Australia. The interpretation of results as well as the transferability to national higher education systems requires individual consideration. Cross-country comparisons of student retention are also difficult to interpret, due to diverse definitions of terms, data collection, indicators, and context (European Commission, 2015). Nonetheless, the different theoretical perspectives on student retention inspire national research. For instance, Tinto's model (1975, 1993) served as the basis for a refined model of the dropout process at German higher education institutions (Heublein et al., 2017; Heublein et al., 2010). This model distinguishes different phases (pre-university phase, within-university phase, and decision making phase) (Heublein et al., 2017; Heublein et al., 2010). The main difference from Tinto (1975, 1993) is the inclusion of more specific factors that may impact the dropout decision, such as living conditions, financial situation, and counseling service (Larsen et al., 2013).

Reasons for student dropout prior to degree completion are multiperspective and can affect one another (Heublein, Besuch, Hutzsch, Schreiber, & Sommer, 2009; Tinto, 1975, 1993). The main factors found in studies for dropout prior to degree completion include the choice of the wrong course, lack of motivation, an unsatisfactory first-year experience, academic unpreparedness, a lack of university support services, and personal issues, such as financial problems, illness, and family circumstances (Brooker, Brooker, & Lawrence, 2017; Heublein, 2014; Thomas, 2002; Willcoxson et al., 2011; Yorke & Longden, 2008). These factors for discontinuing studies are mostly consistent in international research. For example, British research found seven aspects for discontinuing higher education, including poor quality of the learning experience, inability to cope with academic demands, and the choice of the wrong field of study as the most important factors (Yorke & Longden, 2008). In a recent German study, nine factors were found for dropout prior to degree completion; the most important include problems in performance, lack of study motivation, preference for practical work, and financial problems (Heublein et al., 2017).

Overall, in addition to theoretical perspectives and research on student retention in higher education, the research presents an analysis of factors for students' decisions to leave higher education. These factors can be assigned to different theoretical perspectives on student retention and are not limited to specific grounded theories.

2.2.1 The first-year experience in higher education

The first year of higher education has been identified as a difficult and challenging period for many students (A. Bowles et al., 2014; Brinkworth et al., 2009). Studies reveal that the majority of students who decide to withdraw from higher education prior to degree completion do so within or shortly after the first year (Heublein et al., 2017; Tinto, 1975, 1993). Heublein et al. (2017) report that in Germany, 47% of the Bachelor students leave higher education after their first or second semester. The first-year experience is especially relevant due to its impact on student retention (Brinkworth et al., 2009; Reason et al., 2006; Trautwein & Bosse, 2017).

The first year in higher education may be challenging with regard to aspects such as social transition, academic transition, and meeting expectations and perceptions. Socially, many students live on their own for the first time and are separated from their families and friends (Kantanis, 2000; Smith & Wertlieb, 2005; Tinto, 1993).

The building of peer relationships is suggested as particularly relevant in the process of transition to university (Kantanis, 2000; Scutter, Palmer, Luzeckyj, Burke da Silva, & Brinkworth, 2011). Academically, students have to adjust to different teaching styles, manage workloads, and match universities' expectations (A. Bowles et al., 2014; Kantanis, 2000). Even though secondary education may help prepare students for higher education, it will not prevent them from adjustment difficulties (Tinto, 1993). Research indicates that students are not academically prepared for entering university (McCarthy & Kuh, 2006; Thomas, 2002). Weak school preparation is often associated with incomplete study skills, especially in academic writing (Tinto, 1993). Wingate (2006) argues that different levels of learning are involved in academic writing, including techniques for and understanding of knowledge and construction.

Trautwein and Bosse (2017) categorize four aspects that first-year students perceive as critical in their transition from secondary to higher education: personal, organizational, content-related, and social requirements. Personal requirements refer to the new role as a student and include managing general study skills and work-life balance. The organizational dimension is composed of higher education rules, regulations, and conditions, such as overall orientation within the institution, the organization of teaching and learning, and using information and support services. The content-related dimension is focused on discipline-specific skills for and identification with the study program. The social dimension includes the establishment of friends, collaboration in teams, and coping with the institution's social climate.

Overall, the first year of higher education incorporates challenging aspects for incoming students. Students' perceptions and expectations of their first year in higher education and higher education studies in general are especially important for a successful transition from secondary education to higher education. This aspect is described in the following section.

2.2.2 First-year student perceptions and expectations

First-year students often enter university with unrealistic expectations, as studies have identified a mismatch with their actual first-year experiences (Crisp, Palmer, Turnbull, Nettelbeck, & Ward, 2009; Smith & Wertlieb, 2005; Tinto, 1993). Expectations arise in terms of social aspects, such as gaining friendships and

organizing leisure time, as well as in an institutional and educational context, including workload, complexity of subjects, and regular access to teachers (Crisp et al., 2009; Nadelson et al., 2013; Scutter et al., 2011). Focusing on adjustment, Jackson, Pancer, Pratt, and Hunsberger (2000) investigated students' expectations about academics and social and personal life at university. They found students' expectations to be an important predictor of alignment in the transition to university. Robinson, Pope, and Holyoak (2013) also found a mismatch between students' and university teachers' perceptions of feedback quality. M. Long, Ferrier, and Heagney (2006) indicated that delivering feedback makes new students feel supported and enhances adjustment to the university environment.

Fewer studies have investigated the expectations of incoming students (Crisp et al., 2009; Nadelson et al., 2013). Pre-entry expectations are more likely to lead to an effective match and success if these are accurate and realistic (Crisp et al., 2009; Tinto, 1993). Disappointment may result if expectations are not fulfilled in the first year. Some students may be able to adjust their expectations, but others could feel betrayed and be at greater risk of failing. Smith and Wertlieb (2005) analyzed first-year students' changes in expectations and alignment at the middle and the end of their first year in higher education. They found that students' social and academic expectations did not align with their actual first-year experiences and that students with unrealistically high expectations showed a lower GPA for their first year of study than students with average or below-average expectations.

Two central perspectives can be distinguished. First, students frequently enter higher education with unrealistically high expectations of various aspects of university life. For instance, they often have unrealistic expectations regarding the chosen institution, teachers' attitudes toward academic commitment and use of resources, interaction with faculty members, assessment, and feedback (Brinkworth et al., 2009; Crisp et al., 2009; Surgenor, 2013; Tinto, 1975). Second, they enroll with unrealistic conceptions and perceptions of what is expected from them at the university (Bailey, Ifenthaler, Gosper, Kretzschmar, & Ware, 2015; Jansen & van der Meer, 2007b; McCarthy & Kuh, 2006; Surgenor, 2013). The latter fact is especially relevant regarding the academic skills students are expected to have when entering university (Jansen & Suhre, 2011; Jansen & van der Meer, 2007b; Taylor & Bedford, 2004). Waters (2003) surveyed teachers' attitudes toward first-year students. One third of the respondents thought that students do not know what is expected from

them, especially in terms of independent learning and study and writing skills. Academic staff, however, often expect first-year students to already possess generic skills for higher education studies on the basis of their prior school education (Barrie, 2007).

Some measurements are available with which institutions may survey incoming students' expectations, such as the *Beginning College Survey of Student Engagement* (BCSSEE) and, until 2014, the *College Student Expectations Questionnaire* (CSXQ). Both instruments provide insight into first-year students' secondary education background and expectations of higher education. This information can enhance curriculum development, orientation programs, and student services. Various research projects also aim to develop new measurements, such as the *Readiness and Expectations Questionnaire* (REQ), which addresses prospective students' expectations of university and their perceived readiness with scales such as teachers' induction, similarity to school, time management, and writing (Jansen et al., 2013; Jansen & van der Meer, 2007a; Jansen & van der Meer, 2012) or comparisons between expectations and realities (Nadelson et al., 2013; Nelson & Kift, 2008).

Overall, one common aspect of the presented theoretical perspectives, factors contributing to students' decision to withdraw, the challenging first-year experience, and students' perceptions and expectations is students' preparedness for academic requirements. These requirements are often not further operationalized but often described by terms such as *study skills*, *interdisciplinary skills*, and *generic skills*. To contribute to research on this aspect, the following section proposes a newly developed conceptual model of academic competencies.

2.3 A model of academic competencies

There are diverse theoretical perspectives on student retention in higher education and factors for student dropout (e.g., Bean & Eaton, 2000; Tinto, 1975). A common theme is that study skills are an important factor for student retention. *Study skills* often refers to time management and learning skills; however, a specific conceptualization and operationalization in studies is often absent and has not yet been researched in depth (Lombardi et al., 2013).

A conceptual model of academic competencies was developed to contribute to a better understanding of important study skills for higher education studies. This

proposed conceptual model complements established models on student retention (e.g., Bean & Eaton, 2000; Heublein, 2014; Tinto, 1993) and functions as a platform for discussion about important academic competencies for higher education studies.

The term *academic competencies* focuses on the competency-based approach, which refers to the individual's ability to cope adequately with demanding tasks in different situations, with an emphasis on successful problem solving (Weinert, 2001a, 2001b). The competency for successful problem solving is based on the connection of knowledge, skills, and attitudes, as well as cognitive and noncognitive aspects, such as motivation and social skills (Baartmann, Bastiaens, Kirschner, & van der Vleuten, 2007; Weinert, 2001a). Competencies relate to particular contexts and can improve through learning and experience, and the term *academic competencies* refers to study skills for higher education studies, with a focus on generic skills. Generic skills, often also labeled *21st-century skills* or *soft skills*, focus on interdisciplinary aspects, such as critical thinking, time management, and problem solving (N. Bennett et al., 1999; Binkley et al., 2012; Clanchy & Ballard, 1995; Griffin et al., 2012; Leggett et al., 2004). Generic skills are relevant for all levels of education; however, applicable studies are scarce. There are a few international large-scale studies at the school level, such as the *Program for International Student Assessment* (PISA) (OECD, 2014), at the higher education level, such as the *Assessment of Higher Education Learning Outcomes* (AHELO) (Tremblay, Lalancette, & Roseveare, 2012), and at the lifelong learning level/post-education level, such as the *Programme for the International Assessment for Adult Competencies* (PIAAC) (OECD, 2013b, 2013c).

This thesis focuses on decisive generic skills for higher education studies, and an in-depth analysis of the existing literature was conducted (e.g., Leggett et al., 2004; Reid & Moore, 2008; Taylor & Bedford, 2004). On the basis of this literature review, five competencies are included in the proposed conceptual model of academic competencies: time management, learning skills, technology proficiency, self-monitoring, and research skills (Table 2.1).

Table 2.1
Short description of the five academic competencies

Construct	Short description	Selected references
Time management	Competence in managing time effectively, organizing a range of study tasks, and setting long-term goals.	Van der Meer, Jansen, and Torenbeek (2010)
Learning skills	Competence in selecting, organizing, elaborating, and remembering information. Competence in relating new information to old information, adapting the learning environment to individual needs, and using learning styles and techniques adequately to cope with different tasks and demands.	Cassidy (2010), Weinstein and Underwood (1985)
Technology proficiency	Competence in using technologies in educational contexts, such as university's online systems, learning management systems, online research, and word processing programs.	JISC (2013) Kennedy, Judd, Churchward, Gray, and Krause (2008) Lai and Hong (2014)
Self-monitoring	Competence in reflecting one's learning process, such as with regard to study-related strengths, areas of improvements, learning styles and interests.	Lombardi, Seburn, and Conley (2011)
Research skills	Competence in research skills, which includes academic writing, communication, methodological knowledge, and skills in statistical and qualitative analysis, information seeking, and problem solving.	Gilmore and Feldon (2010), Meerah et al. (2012)

The proposed model focuses on five requisite academic competencies for students. There are various generic skills and other factors that may impact student retention, so the proposed model should be viewed as a complement to established models and theories on student retention in higher education (e.g. Bean & Eaton, 2000; Heublein et al., 2010; Tinto, 1975). With a focus on the presented theoretical perspectives on student retention, the proposed model of academic competencies has several intersections.

Academic competencies focuses on the individual's ability for successful problem solving within a competency-based approach (Weinert, 2001a, 2001b). The definition of *competence* by Weinert (2001b) includes the individual's cognitive abilities and motivational, volitional, and social readiness. The model refers to psychological theories with regard to students' attributes for studying and learning, such as study behavior, motivation, and volition (e.g. Bean & Eaton, 2000). Sociologically grounded theories emphasize academic and social integration into the

higher education institution (e.g. Tinto, 1975). The proposed model serves as a platform for transparent communication about required generic skills for higher education studies. Individual students' academic competencies should be identified at the beginning, and adequate academic support services should be recommended. This procedure should increase the interaction with the institution (e.g., support services, staff, organization, orientation) and with peers (e.g., when attending support services). The aspect of increased interaction may also connect with organizationally grounded theories, which concentrate on participation and communication. When academic support services are recommended for successful studying, students may consider a cost-benefit analysis, which might refer to the economical perspective on student retention (e.g. Bound & Turner, 2011). Many theoretical models on student retention include pre-entry variables, such as prior education. The proposed model of academic competencies aims to counterbalance unequal prior education conditions by recommending personalized academic support guidance at the beginning of higher education studies.

Figure 2.1 illustrates how the proposed model of academic competencies may be included into theoretical perspectives on student retention and factors of student dropout. The listed factors are derived from numerous overviews of factors that impact student retention, such as by Larsen et al. (2013), M. Richardson, Abraham, and Bond (2012), and T. V. Bowles and Brindle (2017).

Various models distinguish factors into time phases, such as prior to or within higher education studies. Factors prior to higher education studies mainly refer to static background variables, such as sociodemographic background, socialization, and personality. Factors within higher education studies often include the adjustment to the institution, such as social and academic integration, matching of expectations, and satisfaction with the study program. The proposed model of five academic competencies is placed between these two time periods (Figure 2.1). Overall, all three composed constructs (boxes) may have a direct impact on student retention (arrows to *student retention*). These can be understood as dynamic factors that influence one another (arrows between the boxes). Thus, academic competencies may impact factors prior to higher education studies; for example, when they are taught in school as preparation for higher education studies. Schools can also help to develop realistic expectations and perceptions about demands for higher education studies by communicating requirements in generic skills. Academic competencies

may impact factors within higher education studies when the institution offers academic support services for their development and thus aids in the adjustment to higher education demands. For example, when students develop academic competencies at the beginning of their studies, effective time management and self-monitoring may help them to better assess or manage their psychological resources.

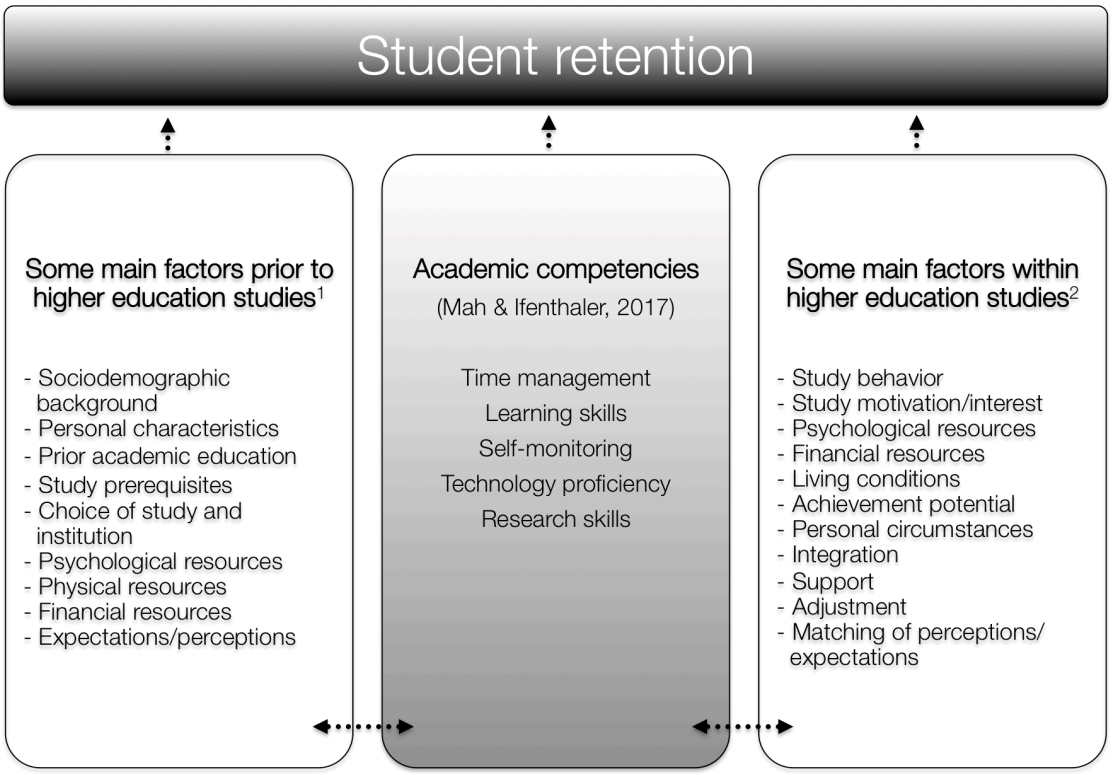

Figure 2.1. Positioning of academic competencies in the research field of student retention.

Selected references: [1]Bean & Eaton (2000); Brouwer, Jansen, Hofman, & Flache, (2016); Tinto (1975); Van Bragt, Bakx, Bergen, & Croon (2011); [2]Heublein (2014); Jackson et al. (2000); Kantanis (2000); Thomas (2002); Tinto (1975); Wilcox, Winn, & Fyvie-Gauld (2005); Yorke & Longden (2008).

Overall, generic study skills are an important factor for student retention. An explicit operationalization of this concept, however, is absent. Thus, a conceptual competency-based model of five academic competencies (time management, learning skills, technology proficiency, self-monitoring, and research skills) is proposed (Table 2.1). This model aims for inclusion into theoretical perspectives on student retention and factors of student dropout. With its intersections with established models on student retention (e.g., Bean & Eaton, 2000; Heublein, 2014; Tinto, 1993), the proposed model complements those perspectives and functions as a

platform for discussion about important academic competencies for higher education studies.

In summary, this chapter provides the conceptualization of student retention in higher education. Student withdrawal prior to degree completion is a complex and important issue with consequences on different levels. Various models and studies aim to explain student retention and factors for dropout. The first-year experience has been identified as especially relevant for student retention. Studies indicate that students' perceptions and expectations as well as academic competencies are important; however, there is less in-depth research on these. In this thesis, a model of academic competencies is proposed to contribute to student retention in higher education.

Hereinafter, the next four chapters present the different perspectives with regard to the model of academic competencies in individual papers:

- Chapter Three: Students' Perceptions Toward Academic Competencies: The Case of German First-Year Students
- Chapter Four: Einfluss akademischer Kompetenzvorstellungen auf den Studienabbruchgedanken (Impact of perceptions of academic competencies on students' dropout intention)
- Chapter Five: Academic staff perspectives on first-year students' academic competencies
- Chapter Six: Learning analytics and digital badges: Potential impact on student retention in higher education

After Chapters Three through Six present the individual studies, the last chapter (Chapter Seven) provides a general discussion of the findings and directions for future research.

2.4 References

ACT. (2008). *College readiness standards. For EXPLORE, PLAN, and the ACT. Includes ideas for progress.* Retrieved from http://files.eric.ed.gov/fulltext/ED510457.pdf

Ajzen, I., & Fishbein, M. (1997). Attitude-behavior relations: A theoretical analysis and review of emperical research. *Psychological Bulletin, 84*(5), 888–918.

Baartmann, L. K. J., Bastiaens, T. J., Kirschner, P. A., & van der Vleuten, C. P. M. (2007). Evaluating assessment quality in competence-based education: A qualitative comparison of two frameworks. *Educational Research Review, 2*(2), 114–129.

Bailey, M., Ifenthaler, D., Gosper, M., Kretzschmar, M., & Ware, C. (2015). The changing importance of factors influencing students' choice of study mode. *Technology, Knowledge and Learning, 20*(2), 169–184. doi: 10.1007/s10758-015-9253-9

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45*(5), 1017–1028.

Barrie, S. C. (2007). A conceptual framework for the teaching and learning of generic graduate attributes. *Studies in Higher Education, 32*(4), 439–458. doi: 10.1080/03075070701476100

Bean, J. P., & Eaton, S. B. (2000). A psychological model of college student retention. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 48–61). Nashville: Vanderbilt University Press.

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*(4), 485–540.

Beer, C., & Lawson, C. (2017). The problem of student attrition in higher education: An alternative perspective. *Journal of Further and Higher Education, 41*(6), 777–784. doi: 10.1080/0309877X.2016.1177171

Bennett, N., Dunne, E., & Carré, C. (1999). Patterns of core and generic skill provision in higher education. *Higher Education, 37*(1), 71–93. doi: 10.1023/A:1003451727126

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw & E. Care (Eds.), *Assessment and teaching of 21st century skills* (pp. 17–66). New York Springer.

Bound, J., & Turner, S. (2011). Chapter 8 - Dropouts and Diplomas: The Divergence in Collegiate Outcomes. In E. A. Hanushek, S. Machin & L. Woessmann (Eds.), *Handbook of the economics of education* (Vol. 4, pp. 573–613): Elsevier.

Bourdieu, P. (1992). *Homo academicus*. Frankfurt am Main: Suhrkamp.

Bowles, A., Fisher, R., McPhail, R., Rosenstreich, D., & Dobson, A. (2014). Staying the distance: Students' perception of enablers of transition to higher education. *Higher Education Research & Development, 33*(2), 212–225.

Bowles, T. V., & Brindle, K. A. (2017). Identifying facilitating factors and barriers to improving student retention rates in tertiary teaching courses: A systematic review. *Higher Education Research & Development*. doi: 10.1080/07294360.2016.1264927

Brinkworth, R., McCann, B., Matthews, C., & Nordström, K. (2009). First year expectations and experiences: Student and teacher perspectives. *Higher Education, 58*(2), 157–173.

Brooker, A., Brooker, S., & Lawrence, J. (2017). First year students' perceptions of their difficulties. *Student Success, 8*(1), 49–62.

Brouwer, J., Jansen, E., Hofman, A., & Flache, A. (2016). Early tracking or finally leaving? Determinants of early study success in first- year university students. *Research in Post-Compulsory Education, 21*(4), 376–393. doi: 10.1080/13596748.2016.1226584

Bundestag, D. (2017). *16. Bericht des Ausschusses für die Hochschulstatistik*. Retrieved from https://http://www.bundestag.de/presse/hib/2017_01/-/489986.

Cassidy, S. (2010). Learning Styles: An overview of theories, models, and measures. *Educational Psychology: An International Journal of Experimental Educational Psychology, 24*(4), 419-444.

Clanchy, J., & Ballard, B. (1995). Generic skills in the context of higher education. *Higher Education Research & Development, 14*(2), 155–166. doi: 10.1080/0729436950140202

Clark, M. H., & Cundiff, N. L. (2011). Assessing the effectiveness of a college freshman seminar using propensity score adjustments. *Research in Higher Education, 52*(6), 616–639. doi: 10.1007/s11162-010-9208-x

Coyle, T. R., & Pillow, D. R. (2008). SAT and ACT predict college GPA after removing g. *Intelligence, 36*, 719–729. doi: 10.1016/j.intell.2008.05.001

Crisp, G., Palmer, E., Turnbull, D., Nettelbeck, T., & Ward, L. (2009). First year student expectations: Results from a university-wide student survey. *Journal of University Teaching & Learning Practice, 6*(1), 13–26.

European Commission. (2015). Dropout and completion in higher education in Europe. Luxembourg: European Union.

French, J. R., Rodgers, W., & Cobb, S. (1974). Adjustment as person-environmental fit. In G. V. Coelho, D. A. Hamburg & J. E. Adams (Eds.), *Coping and adaptation* New York: Basic Books.

Gilmore, J., & Feldon, D. (2010). *Measuring graduate students' teaching and research skills through self-report: Descriptive findings and validity evidence*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver, CO.

Griffin, P., McGaw, B., & Care, E. (Eds.). (2012). *Assessment and teaching of 21st century skills*. New York: Springer.

Hannon, B., & McNaughton-Cassill, M. (2011). SAT performance: Understanding the contributions of cognitive/learning and social/personality factors. *Applied Cognitive Psychology, 25*, 528–535. doi: 10.1002/acp.1725

Hetmeier, H., Bihler, W., Brugger, P., Scharfe, S., & Willand, I. (2008). Weiterentwicklung von Indikatoren im Rahmen der nationalen Bildungsberichterstattung. Wiesbaden: Statistisches Bundesamt.

Heublein, U. (2014). Student drop-out from German higher education institutions. *European Journal of Education, 49*(4), 497–513.

Heublein, U., Besuch, G., Hutzsch, C., Schreiber, J., & Sommer, D. (2009). Zwischen Studienerwartungen und Studienwirklichkeit – Gründe für den Studienabbruch – Ergebnisse einer bundesweiten Befragung von Exmatrikulierten in Maschinenbau-Studiengängen. Hannover: IMPULS-Stiftung.

Heublein, U., Ebert, J., Hutzsch, C., Isleib, S., König, R., Richter, J., & Woisch, A. (2017). Zwischen Studienerwartungen und Studienwirklichkeit. Ursachen des Studienabbruchs, beruflicher Verbleib der Studienabbrecherinnen und Studienabbrecher und Entwicklung der Studienabbruchquote an deutschen Hochschulen *Forum Hochschule* (Vol. 1). Hannover: Deutsches Zentrum für Hochschul- und Wissenschaftsforschung.

Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D., & Besuch, G. (2010). Ursachen des Studienabbruchs in Bachelor- und in herkömmlichen Studiengängen *HIS: Forum Hochschule* (Vol. 2). Hannover: HIS Hochschul-Informations-System.

Heublein, U., Richter, J., Schmelzer, R., & Sommer, D. (2012). Die Entwicklung der Schwund- und Studienabbruchquoten an den deutschen Hochschulen. Statistische Berechnungen auf der Basis des Absolventenjahrgangs 2010. *Forum Hochschule, 2012*(3), 16–24.

Heublein, U., Schmelzer, R., & Sommer, D. (2005). Studienabbruchstudie 2005. Die Studienabbrecherquoten in den Fächergruppen und Studienbereichen der Universitäten und Fachhochschulen. Hannover: Hichschul-Informations-System.

In der Smitten, S., & Heublein, U. (2013). Qualitätsmanagement zur Vorbeugung von Studienabbrüchen. *Zeitschrift für Hochschulentwicklung, 8* (2), 98–109.

Jackson, L. M., Pancer, S. M., Pratt, M. W., & Hunsberger, B. E. (2000). Great expectations: The relation between expectancies and adjustment during the transition to university. *Journal of Applied Social Psychology, 30*(10), 2100–2125.

Jansen, E. P. W. A., André, S., & Suhre, C. (2013). Readiness and expectations questionnaire: A cross-cultural measurement instrument for first-year university students. *Educational Assessment, Evaluation and Accountability, 25*(2), 115–130. doi: 10.1007/s11092-013-9161-2

Jansen, E. P. W. A., & Suhre, C. (2011). *Preparedness, first-year experiences and outcomes. A comparison between students in domestic and international degree programmes in a Dutch university*. Paper presented at the Research and Development in Higher Education: Higher Eduation on the Edge Gold Coast, Australia.

Jansen, E. P. W. A., & van der Meer, J. (2007a). *Feeling prepared for university? Perceived preparedness and expectations of prospective students*. Paper presented at the 10th First-year in higher education Pacific-rim conference: Regenerate, engage, experiment, Queensland University of Technology, Brisbane.

Jansen, E. P. W. A., & van der Meer, J. (2007b). *First-year students' expectations and perceptions of readiness before they start university*. Paper presented at the 30th Annual HERDSA Conference: Enhancing higher education: Theory and scholarship, Adelaide.

Jansen, E. P. W. A., & van der Meer, J. (2012). Ready for university? A cross-national study of students' perceived preparedness for university. *The Australian Educational Researcher 39*(1), 1–16. doi: 10.1007/s13384-011-0044-6

JISC. (2013). Developing digital literacies. Overview., from http://www.webarchive.org.uk/wayback/archive/20130607091442/http://www.jisc.ac.uk/whatwedo/programmes/elearning/developingdigitalliteracies.aspx

Jones, R. (2008). *Student retention and success: A synthesis of research*.

Kantanis, T. (2000). The role of social transition in students' adjustment to the first-year of university. *Journal of Institutional Research, 9*(1), 100–110.

Kennedy, G., Judd, T. S., Churchward, A., Gray, K., & Krause, K.-L. (2008). First year students' experiences with technology: Are they really digital natives? *Australasian Journal of Educational Technology, 24*(1), 108–122.

Lai, K.-W., & Hong, K.-S. (2014). Technology use and learning characteristics of students in higher education: Do generational differences exist? *British Journal of Educational Technology, 46*(4), 725–738. doi: doi:10.1111/bjet.12161

Larsen, M. S., Kornbeck, K. P., Kristensen, R. M., Larsen, M. B., & Sommersel, H. B. (2013). Dropout phenomena at universities: What is dropout? Why does dropout occur? What can be done by the universities to prevent or reduce it? A systematic review. Copenhagen: Danish Clearinghouse for Educational Research.

Leggett , M., Kinnear, A., Boyce, M., & Bennett, I. (2004). Student and staff perceptions of the importance of generic skills in science. *Higher Education Research & Development, 23*(3), 295–312. doi: 10.1080/0729436042000235418

Lombardi, A., Conley, D. T., Seburn, M. A., & Downs, A. M. (2013). College and career readiness assessment: Validation of the key cognitive strategies framework. *Assessment for Effective Intervention, 38*(3), 163–171. doi: 10.1177/1534508412448668

Lombardi, A., Seburn, M., & Conley, D. (2011). Development and initial validation of a measure of academic behaviors associated with college and career readiness. *Journal of Career Assessment, 19*(4), 375–391. doi: 10.1177/1069072711409345

Long, M., Ferrier, F., & Heagney, M. (2006). Stay, play or give it away? Students continuing, changing or leaving university study in first year.

McCarthy, M., & Kuh, G. D. (2006). Are students ready for college? What student engagement data say. *Phi Delta Kappan, 87*(9), 664–669.

Meerah, T. S. M., Osman, K., Zakaria, E., Ikhsan, Z. H., Krish, P., Lian, D. K. C., & Mahmod, D. (2012). Developing an instrument to measure research skills. *Procedia – Social and Behavioral Sciences, 60*, 630–636. doi: 10.1016/j.sbspro.2012.09.434

Metzner, B. S., & Bean, J. P. (1987). The estimation of a model of nontraditional undergraduate student attrition. *Research in Higher Education, 27*(1), 15–38.

Nadelson, L. S., Semmelroth, C., Martinez, G., Featherstone, M., Fuhriman, C. A., & Sell, A. (2013). Why did they come here?–The influences and expectations of first-year students' college experience. *Higher Education Studies, 3*(1), 50–62.

Nelson, K. J., & Kift, S. M. (2008). *Expectations and realities for first year students at an Australian university*. Paper presented at the 11th Pacific Rim First Year in Higher Education Conference 2008, Hobart.

OECD. (2013a). *Education at a glance 2013: OECD indicators.* Retrieved from http://dx.doi.org/10.1787/eag-2013-en

OECD. (2013b). *OECD skills outlook 2013: First results from the survey of adult skills.* Retrieved from http://dx.doi.org/10.1787/9789264204256-en

OECD. (2013c). *Skilled for life? Key findings from the survey of adult skills.* Retrieved from https://http://www.oecd.org/site/piaac/SkillsOutlook_2013_ebook.pdf

OECD. (2014). *PISA 2012 results in focus. What 15-year-old know and what they can do with what they know.* Retrieved from https://http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf

Reason, R. D., Terenzini, P. T., & Domingo, R. J. (2006). First things first: Developing academic competence in the first year of college. *Research in Higher Education, 47*(2), 149–175.

Reid, M. J., & Moore III, J. L. (2008). College readiness and academic preparation for postsecondary education: Oral histories of first-generation urban college students. *Urban Education, 43*(2), 240–261. doi: 10.1177/0042085907312346

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 138*(2), 353–387.

Robinson, S., Pope, D., & Holyoak, L. (2013). Can we meet their expectations? Experiences and perceptions of feedback in first year undergraduate students. *Assessment & Evaluation in Higher Education, 38*(3), 260–272. doi: 10.1080/02602938.2011.629291

Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet und Higher Education, 6*, 1–16.

Sarcletti, A., & Müller, S. (2011). Zum Stand der Studienabbruchforschung. Theoretische Perspektiven, zentrale Ergebnisse und methodische Anforderungen an künftige Studien. *Zeitschrift für Bildungsforschung, 1*(3), 235–248. doi: 10.1007/s35834-011-0020-2

Scharfe, S. (2010). Neue Informationen mit alten Daten: Studienverlaufsbezogene Auswertungen durch Verknüpfung von Erhebungen der amtlichen Hochschulstatistik. In M. Baethge, J. Brunke, K. Dedering, H. Döbert, M. Fest, H.-W. Freitag, B. Fritzsch, K. Fuchs-Rechlin, C. Kerst, S. Kühne, S. Scharfe, B. Skripski, M. Wieck & A. Wolter (Eds.), *Indikatorenentwicklung für den nationalen Bildungsbericht 'Bildung in Deutschland'. Grundlagen, Ergebnisse, Perspektiven* (pp. 133–156). Bonn/Berlin: BMBF.

Schröder-Gronostay, M. (1999). Studienabbruch - Zusammenfassung des Forschungsstandes. In M. Schröder-Gronostay & H. D. Daniel (Eds.), *Studienerfolg und Studienabbruch. Beiträge aus Forschung und Praxis* (pp. 209–240). Neuwied, Kriftel, Berlin: Luchterhand Verlag.

Scutter, S., Palmer, E., Luzeckyj, A., Burke da Silva, K., & Brinkworth, R. (2011). What do commencing undergraduate students expect from first year university? *The International Journal of the First Year in Higher Education, 2*(1), 8–20. doi: 10.5204/intjfyhe.v2i1.54

Smith, J. S., & Wertlieb, E. C. (2005). Do first-year college students' expectations align with their first-year experiences? *NASPA Journal, 42*(2), 153–174.

Söhnlein, D., Weber, B., & Weber, E. (2013). Qualifikationsspezifische Arbeitslosenquote. Nürnberg: Institut für Arbeitsmarkt- und Berufsforschung.

Stinebrickner, R., & Stinebrickner, T. (2008). The effect of credit constraints on the college dropout decision: A direct approach using a new panel study. *American Economic Review, 98*(5), 2163–2184.

Surgenor, P. W. G. (2013). Measuring up: Comparing first year students' and tutors' expectations of assessment. *Assessment & Evaluation in Higher Education, 38*(3), 288–302. doi: 10.1080/02602938.2011.630976

Taylor, J. A., & Bedford, T. (2004). Staff perceptions of factors related to non-completion in higher education. *Studies in Higher Education, 29*(3), 375–394.

Thomas, L. (2002). Student retention in higher education: The role of institutional habitus. *Journal of Education Policy, 17*(4), 423–442. doi: 10.1080/02680930210140257

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125. doi: 10.3102/00346543045001089

Tinto, V. (1993). *Leaving college. Rethinking the causes and cures of student attrition*. Chicago; London: The University of Chicago Press.

Trautwein, C., & Bosse, E. (2017). The first year in higher education—critical requirements from the student perspective. *Higher Education, 73*(3), 371–387.

Tremblay, K., Lalancette, D., & Roseveare, D. (2012). Assessment of higher education learning outcomes. Feasibility study report. Design and implementation (Vol. 1): OECD.

Van Bragt, C. A. C., Bakx, A. W. E. A., Bergen, T. C. M., & Croon, M. A. (2011). Looking for students' personal characteristics predicting study outcome. *Higher Education, 61*(1), 59–75. doi: 10.1007/s10734-010-9325-7

Van der Meer, J., Jansen, E., & Torenbeek, M. (2010). It's almost a mindset that teachers need to change: First-year students need to be inducted into time management. *Studies in Higher Education, 35*(7), 777–791. doi: 10.1080/03075070903383211

Waters, D. (2003). Supporting first-year students in the bachelor of arts: An investigation of academic staff attitudes. *Arts and Humanities in Higher Education, 2*(3), 293–312. doi: 10.1177/14740222030023006

Weiner, B. (1986). *An atrributional theory of motivation and emotion*. New York: Springer.

Weinert, F. E. (2001a). Concept of competence: A conceptual clarification. In D. S. Rychen & L. H. Salganik (Eds.), *Defining and Selecting Key Competencies* (pp. 45–65). Seattle (et. al.): Hofgrefe & Huber Publishers.

Weinert, F. E. (2001b). Vergleichende Leistungsmessung in Schulen - eine umstrittene Selbstverständlichkeit. In F. E. Weinert (Ed.), *Leistungsmessungen in Schulen* (pp. 17-31). Weinheim und Basel: Beltz Verlag.

Weinstein, C. E., & Underwood, V. L. (1985). Learning strategies: The how of learning. In J. W. Segal, S. F. Chipman & R. Glaser (Eds.), *Thinking and learning skills: Relating instruction to research* (Vol. 1, pp. 241– 258). London: Lawrence erlbaum Associates, Pub.

Wilcox, P., Winn, S., & Fyvie-Gauld, M. (2005). 'It was nothing to do with the university, it was just the people': The role of social support in the first‐year experience of higher education. *Studies in Higher Education, 30*(6), 707‐722. doi: 10.1080/03075070500340036

Willcoxson, L., Cotter, J., & Joy, S. (2011). Beyond the first-year experience: The impact on attrition of student experiences throughout undergraduate degree studies in six diverse universities. *Studies in Higher Education, 36*(3), 331–352.

Wingate, U. (2006). Doing away with "study skills". *Teaching in Higher Education, 11*(4), 457–469. doi: 10.1080/13562510600874268

Yorke, M., & Longden, B. (2008). The first-year experience of higher education in the UK. York: The Higher Education Academy.

3 Students' perceptions toward academic competencies: The case of German first-year students

3.1 Abstract

Students often enter higher education academically unprepared and with unrealistic perceptions and expectations regarding academic competencies for their studies. However, preparedness and realistic perceptions are important factors for student retention. With regard to a proposed model of five academic competencies (time management, learning skills, technology proficiency, self-monitoring, and research skills), incoming students' perceptions concerning academic staff support and students' self-reported confidence at a German university were examined. Using quantitative data, an initial exploratory study was conducted (N = 155), which revealed first-year students' perceptions of the role of academic staff in supporting their development, especially in research skills, as well as low self-reported confidence in this competence. Thus, a follow up study (N = 717) was conducted to confirm these findings as well as to provide an in-depth understanding of research skills. Understanding students' perceptions is crucial if higher education institutions are to meet students' needs and provide adequate support services in the challenging first year. Thus, in order to increase student retention, it is suggested that universities assist first-year students in developing academic competencies through personalized competence-based programmes and with the help of emerging research fields and educational technologies such as learning analytics and digital badges.

Keywords

First-year experience, retention, perceptions, academic competencies, research skills

3.2 Introduction

First-year students' perceptions and expectations as well as the way they cope with academic requirements have been identified as important factors for student retention (Thomas, 2002; Tinto, 1993; Yorke & Longden, 2008). Overall, student retention in higher education has been a global concern for years, as withdrawals from higher education remain at about 30% in the member countries of the Organisation for Economic Cooperation and Development (OECD, 2013a). The first year of higher education is considered particularly crucial, as students often decide to leave the institution prior to degree completion within this period (Brinkworth et al., 2009; Reason et al., 2006). Thus, several studies have been conducted on students' first-year experience in higher education (e.g., Pascarella & Terenzini, 2005; Yorke & Longden, 2008). Nonetheless, first-year students' perceptions and expectations as well as their academic competencies for coping with academic requirements have not yet been researched in-depth.

Further, research on student retention has been conducted predominantly in English-speaking countries such as the United States, Australia, and the United Kingdom (e.g., Bean, 1982; Krause, Hartley, James, & McInnis, 2005; Tinto, 1993). Recently, many universities in Germany have developed academic success initiatives and conducted research on students' first-year experience (Bosse, 2015; Heublein, 2014; Heublein et al., 2017). In the face of changing demographics and the growing demand for academically trained specialists in the German economy, reducing the dropout rate is seen as an effective method for countering this labour market trend.

The presented study contributes to the exploration of first-year students' perceptions and self-reported confidence concerning academic competencies for higher education. The finding may enable higher education institutions to understand students' perceptions of guidance and self-assessed strengths and areas for improvement if they wish to meet their students' needs and provide them necessary support services (Longden, 2006; Morison & Cowley, 2017; Voss, Gruber, & Szmigin, 2007). Institutional support is crucial for student retention, as students reported that a lack of staff support was one factor in their decision to withdraw (Yorke, 2000).

3.3 First-year students' perceptions and preparedness concerning higher education

Students enter higher education institutions with a range of perceptions and expectations concerning university life, for example in terms of social aspects as well as in an institutional and educational context, including workload, access to academic staff, feedback, and support (e.g., Houser, 2004; Scutter et al., 2011). However, research shows a mismatch between first-year students' perceptions and reality (Cook & Leckey, 1999; Smith & Wertlieb, 2005). Furthermore, research indicates that many first-year students do not know what is expected of them at university and that they are often academically unprepared (Jansen & van der Meer, 2007a; Mah & Ifenthaler, 2017a; McCarthy & Kuh, 2006). Students' preparedness is particularly relevant with regard to generic skills such as academic competencies, which they are supposed to already possess when entering university (Barrie, 2007; Taylor & Bedford, 2004). Generic skills are often also labelled as *21st century skills* or *soft skills* (Binkley et al., 2012). They are important determinants of student retention in higher education but have received limited attention in previous research (Lombardi et al., 2011). There are a few studies on students' generic skills and their performance in higher education, for example the *Assessment of Higher Education Learning Outcomes* (AHELO) (Tremblay et al., 2012) carried out by the OECD and, with a focus on Germany, the research programme *Modeling and Measuring Competencies in Higher Education* (KoKoHs) (Zlatkin-Troitschanskaia, Pant, Kuhn, Toepper, & Lautenbach, 2016). Studies by Jansen and van der Meer (2007a) and Byrne and Flood (2005) revealed a self-reported high confidence of preparedness for studies among first-year students with regard to aspects of time management, self-monitoring, and learning skills. With a focus on subject-specific knowledge, several standardized tests exist that assess first-year students' prior knowledge, such as the *American College Testing Program* (ACT) (ACT, 2008) and the *Scholastic Aptitude Test* (SAT) (Hannon & McNaughton-Cassill, 2011). University support services mostly provide students with the subject-specific knowledge they might need for their first year of studies, for example in science, technology, engineering, and mathematics (STEM) (Tinto, 2012). However, institutional support to enhance both subject-specific knowledge and generic skills may be particularly important for first-year students. Thus, an in-depth understanding of generic skills such as academic competencies is necessary to provide adequate support services.

3.4 Conceptual model of academic competencies

Several factors have been identified in studies which influence student retention in higher education, such as students' sociodemographic characteristics, choice of studies, cognitive capacity, motivation, personal situation, and academic and social integration (Bean & Eaton, 2000; Kantanis, 2000; Tinto, 1993). With a focus on students' academic unpreparedness in generic skills, an in-depth literature review was conducted to identify important generic skills for higher education studies (e.g., Leggett et al., 2004; Reid & Moore, 2008; Taylor & Bedford, 2004). Consistent generic skills for higher education studies were identified which were taken as a basis to develop a conceptual model of academic competencies. The proposed model consists of five academic competencies for successful degree completion: time management, learning skills, self-monitoring, technology proficiency, and research skills (Mah & Ifenthaler, 2017a). With this regard, the model concentrates on generic skills and follows a competence-based approach that refers to the individual's ability to cope adequately with demanding tasks in different situations with a focus on successful problem solving (Weinert, 2001a). With its focus on academic competencies, the model aims to serve as a complement to established models on student retention (e.g., Bean & Eaton, 2000; Heublein, 2014; Tinto, 1993). *Time management* comprises strategies for organizing study tasks effectively, setting long-term goals, independently organizing constant workload, and keeping up with academic requirements (Van der Meer et al., 2010). Research indicates that students feel inadequately prepared for this transition challenge and have difficulties keeping up with academic requirements and understanding the level of independent study as well as academic staff expectations and demands (Reid & Moore, 2008; Van der Meer et al., 2010). *Learning skills* refers to strategies for effective, situational, and intentional learning. They encompass the ability to select, organize, elaborate, and remember information, the ability to relate new information to old information, to adapt the learning environment to individual needs, and to use learning techniques adequately to cope with different tasks and demands (Boyatzis & Kolb, 1991; Weinstein & Underwood, 1985). Research shows that academic staff often view first-year students' inadequate learning skills as problematic, however, and expect them to be independent learners right from the start (Kantanis, 2000; Waters, 2003). *Technology proficiency* refers to using digital tools for academic research, critical thinking, and writing (JISC, 2013), including skills such as basic computer

operations, e-mail, Internet, word processing programs, and presentation programs (Ogwu & Ogwu, 2012). On the basis of the digital native myth (Prensky, 2001), higher education institutions often take students' technology proficiency for granted, which is seen as an important prerequisite for academic education (Margaryan, Littlejohn, & Vojt, 2011b). However, students are often unprepared to transfer their skills for personal digital use to an educational context (Lai & Hong, 2014). *Self-monitoring* comprises 'the ability to reflect on what worked and what needed improvement in any particular academic task' (Conley, 2007, p. 16), for instance students' interests, strengths and areas for improvement. As a form of metacognition, it is related to similar concepts such as self-regulation, self-directed learning, and self-reflection, but focuses instead on intrapersonal processes (Healy, 2009). *Research skills* includes facets such as academic writing, communication, and methodological knowledge, as well as skills in statistical and qualitative analysis, information seeking, and problem solving (Gilmore & Feldon, 2010; Meerah et al., 2012). Although conducting research is the main emphasis of the doctoral level of higher education (Ministry of Science Technology and Innovation, 2005), the undergraduate level also requires understanding and knowledge about literature reviews and research as well as the ability to gather and interpret data. This is true particularly with regard to academic writing, in which many students are unprepared to meet universities' requirements (Goldfinch & Hughes, 2007; Wingate, 2006).

3.5 Study 1

3.5.1 Research questions and hypotheses

Taking the presented conceptual model of academic competencies as a basis, it is aimed to explore first-year students' perceptions of academic competencies with a focus on support from academic staff (RQ1) and their self-reported competencies (RQ2) with relevance to higher education. The following research questions and hypotheses are addressed in Study 1:

RQ1: What are first-year students' perceptions of academic competencies with regard to support from their academic staff? Research shows that students expect regular access to academic staff and that a lack of staff support may influence students' decision to leave the institution prior to degree completion (Crisp et al., 2009; Yorke, 2000). Furthermore, many first-year students experience research

skills as challenging and academic staff assess their competence as rather low at the beginning of higher education studies (Blair, 2017; Yorke & Longden, 2008). Hence, it is hypothesized that first-years students expect the highest degree of support for the academic competence research skills (Hypothesis 1).

RQ2: How do first-year students self-report their academic competencies? Research has found that students lack academic preparedness for the transition to higher education (Thomas, 2002; Tinto, 1993). Nonetheless, studies show that first-year students self-report high confidence for their studies (Byrne & Flood, 2005; Jansen & van der Meer, 2007a). It is assumed that the five competencies will receive different ratings, especially research skills, as many incoming students are unprepared for this requirement (Goldfinch & Hughes, 2007; Wingate, 2006) (Hypothesis 2).

3.6 Method

3.6.1 Sample and data collection

The sample for this exploratory study consists of 155 first-year students with a mean age of 21.0 years (*SD* = 4.2). Most of the participants were enrolled at the Faculty of Arts (36.0%), followed by the Faculty of Science (25.9%), the Faculty of Human Sciences (18.8%), the Faculty of Economics and Social Sciences (16.8%), and the Faculty of Law (2.5%). Data collection occurred in the early weeks of the 2014/2015 winter semester at a German university. The questionnaire was mainly completed online but was also administered in a paper version.

3.6.2 Instrument and data analysis

With regard to the proposed model of academic competencies, a questionnaire was developed to measure first-semester students' perceptions and expectations (19 items), their self-reported competencies (21 items), and sociodemographic information (26 items). Most of the items were derived from the literature (e.g., Ipsos MORI 2008; Jansen et al., 2013; Meerah et al., 2012), modified and translated into German, and some items were newly developed to suit the focus of the study (Table 3.1).

Table 3.1
Sample items and descriptive statistics for the five academic competencies with regard to first-year students' perceptions and self-reported confidence, Study 1

Academic competencies	Sample items	Descriptive statistics	
		M	*SD*
Perceptions		3.46	.90
1. Time management	I will be told each week what to do.	3.48	1.44
2. Learning skills	I will be taught how to find and select information for assignments.	2.51	1.01
3. Technology proficiency	I will be taught how to use the university's systems (e.g. accessing library online, registering for courses, Moodle, PULS etc.).	3.95	1.61
4. Self-monitoring	I will be taught methods on how to reflect my learning progress (e.g. in a journal, blog, e-portfolio).	3.28	1.01
5. Research skills	I will be taught how to write academic essays and short reports.	4.09	1.31
Confidence		4.56	.49
1. Time management	I am good at planning and organizing my study.	4.69	.74
2. Learning skills	I am confident in identifying the main ideas or main points in a text.	4.95	.66
3. Technology proficiency	I am able to find information efficiently using a search engine (e.g. Google).	4.69	.79
4. Self-monitoring	I can evaluate my own learning outcomes.	4.69	.77
5. Research skills	I can independently write essays/ short reports.	3.77	.93

Note. $N = 155$. Perceptions: Scale ranges from 1 = strong disagreement to 6 = strong agreement; Cronbach's Alpha varied between .51 and .77. Confidence: Scale ranges from 1 = needs strong improvement to 6 = very good; Cronbach's Alpha varied between .41 and .85.

Two exploratory factor analyses were conducted on all items with orthogonal rotation (varimax) to identify clusters of variables for both parts of the questionnaire. For the first part (perceptions), the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity verified the sampling adequacy for the analysis, KMO = .74, $\chi^2(153) = 761.72$, $p < .001$. Five factors in the data had eigenvalues over Kaiser's criterion of 1 and in combination explained 58.67% of the variance and the scree plot showed inflexions, which would justify a five-factor model.

For the second part of the questionnaire (confidence), the Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .82, $\chi^2(153) = 1123.92$, $p < .001$. Kaiser's criterion of 1 and the scree plot justify a five-factor model (58.84% variance). Initial data checks showed that the distributions of ratings and scores satisfied the assumptions underlying the analysis procedures. All effects were assessed at the 0.05 level and effect sizes were reported using Cohen's *d* measures (small effect $d < .50$, medium effect $d \leq .80$, strong effect $d > .80$).

3.7 Results

Descriptive statistics show that participants expected the lowest amount of support for learning skills and the highest degree of support from their academic staff for the competency research skills (Table 3.1). With a focus on the highest degree of expected support, four dependent t-tests were computed to determine whether research skills varied as a function of the other academic competencies of the conceptual model of academic competencies. Results of the analysis revealed significant differences for time management, $t(154) = 4.35$, $p < .05$, $d = .44$, learning skills, $t(154) = 16.60$, $p < .001$, $d = 1.36$, and self-monitoring, $t(154) = 8.00$, $p < .001$, $d = 0.69$. No significant difference was found for technology proficiency, $t(154) = 1.00$, $p > .05$. Accordingly, Hypothesis 1 is accepted with regard to participants' significantly higher expectation of support from their academic staff in research skill development in comparison to time management, learning skills, and self-monitoring.

With regard to Hypothesis 2, descriptive statistic revealed that participants self-reported their competence levels as high for the competencies learning skills, technology proficiency, time management, and self-monitoring but as rather low for research skills (Table 3.1). Dependent t-tests showed that participants self-rated their confidence in research skills significantly lower in comparison to time management, $t(154) = 10.96$, $p < .001$, $d = 1.09$, learning skills, $t(154) = 16.51$, $p < .001$, $d = 1.46$, technology proficiency, $t(154) = 14.60$, $p < .001$, $d = 1.33$, and self-monitoring, $t(154) = 11.38$, $p < .001$, $d = 1.08$. These results confirm Hypothesis 2, that first-year students report different confidence levels in their skills with respect to the five academic competencies. Moreover, participants self-rate their skills significantly lower with regard to research skills than to the other four academic competencies.

3.8 Discussion of Study 1 and introduction to Study 2

Study 1 explored first-year students' expectations regarding academic staff support and their self-reported confidence concerning a proposed model of academic competencies. Results show that participants expect different degrees of support from their academic staff with respect to the five academic competencies (Table 3.1). They expect the lowest amount of support for the competency learning skills and the highest amount of support for the competency research skills. With regard to first-year students' self-reported competencies, results show that overall, participants assess their skill levels in all five academic competencies of the conceptual model as already very high at the beginning of their university studies (Table 3.1). The highest self-reported competency was learning skills, and the lowest self-reported competency was research skills.

Thus, the findings of Study 1 indicate that research skills are a crucial academic competency for first-year students. In order to gain in-depth insight into research skills, a second study was conducted. Hence, Study 2 focuses on different aspects of research skills, such as academic writing, developing research questions, and designing experimental studies. The exploration of research skills also includes the relation between students' perceptions and self-reported confidence in this competence.

3.9 Research questions

In order to explore different aspects of research skills, the following research questions are addressed in Study 2:

RQ3: What are first-year students' perceptions with regard to different aspects of research skills?

RQ4: How do first-year students self-rate their competencies in different aspects of research skills?

RQ5: Is there a relation between first-year students' perceptions and their self-rated confidence with regard to different aspects of research skills?

3.10 Method

3.10.1 Sample and data collection

Data for Study 2 was collected within the context of a complete quality assurance online questionnaire conducted at the same university as in Study 1 at the end of the winter semester 2014/2015. The total sample consists of 717 first-year students and their mean age was 22.0 years (*SD* = 4.8). The answering of the questionnaires' items was voluntary. Due to missing data in the sample, the sample sizes for analyses vary between 476 and 717. Most of the 717 participants were enrolled at the Faculty of Arts (32.4%), followed by the Faculty of Science (26.6%), the Faculty of Human Sciences (19.0%), the Faculty of Economics and Social Sciences (15.6%), and the Faculty of Law (6.4%).

3.10.2 Instrument and data analysis

For Study 2, the same items for the competence research skills were used as in Study 1. The items were ranked on a five-point Likert scale to meet university guidelines for the standardized quality assurance questionnaire. To analyse the research questions, descriptive statistics were applied and dependent t-tests and correlation analyses computed.

3.11 Results

Table 3.2 depicts the descriptive statistics for first-year students' perceptions of different aspects of research skills. With a focus on first-year students' perceptions of support by their academic staff (RQ3), the majority of participants strongly/somewhat strongly expected to be taught how to conduct academic research (64.2%) and how to write academic reports (59.6%) by their academic staff. With a focus on first-year students' perceptions of involvement in research skills, the majority of the participants strongly/somewhat strongly disagreed that they would conduct research projects on their own (76.6%) and that they would be actively involved in research projects (61.5%) in their first year. However, only 13.8% did not/somewhat did not expect to deal with academic research questions. Hence, participants showed higher expectations in dealing with academic questions than in being involved in research projects and conducting them. Besides, participants

reported high perceptions of support by their academic staff in developing research skills.

Table 3.2
Descriptive statistics for research skills, Study 2

			Frequencies in percentages				
Items	*M*	*SD*	1	2	3	4	5
Perceptions	2.63	.81					
I will be taught how to do academic research.	3.73	1.09	4.3	9.5	22.0	37.0	27.2
I will be taught how to write academic essays and short reports.	3.60	1.18	7.1	10.9	22.5	33.9	25.7
I will be actively involved in research projects.	2.23	1.14	33.9	27.6	23.5	11.3	3.7
I will conduct many research projects on my own.	1.83	0.95	46.7	29.9	18.8	3.0	1.6
I will often deal with academic research questions (e.g., in class, literature).	3.73	1.09	4.3	9.5	22.0	37.0	27.2
Confidence	2.73	.85					
I can independently write academic essays and short reports.	3.15	1.16	9.9	19.0	29.3	29.3	12.4
I can independently develop a research question.	3.14	1.08	8.1	19.3	32.1	32.1	8.5
I can do research on academic research questions.	3.67	0.98	3.5	6.4	29.5	40.2	20.3
I can design an experimental study.	2.40	1.04	23.2	29.9	33.9	9.8	3.1
I can interpret the results of a research study.	3.12	0.96	5.4	19.1	39.5	30.4	5.6
I can orally communicate the results of research projects.	3.25	0.98	5.2	15.2	36.5	35.2	7.9

Note. $N = 717$. Scale ranges from 1 = strong disagreement to 5 = strong agreement; Perceptions: Cronbach's Alpa = .75; Confidence: Cronbach's Alpha = .88.

With regard to confidence (RQ4), participants reported the highest confidence in doing research on academic research questions ($M = 3.67$, $SD = 0.98$). Dependent t-tests revealed that participants' confidence in this aspect differed significantly when compared to the other aspects of research skills, which are academic writing, $t(480) = 11.95$, $p < .001$, $d = .48$, developing research questions, $t(480) = 12.36$,

$p < .001$, $d = .52$, designing experimental studies, $t(476) = 25.19$, $p < .001$, $d = 1.26$, interpreting study results, $t(479) = 12.87$, $p < .001$, $d = .57$, and communicating research results, $t(478) = 9.47$, $p < .001$, $d = .43$. In contrast, participants reported the lowest confidence in designing experimental studies ($M = 2.40$, $SD = 1.04$). Dependent t-tests revealed significant differences for this self-report with regard to academic writing, $t(476) = 14.65$, $p < .001$, $d = .68$, developing research questions, $t(476) = 16.24$, $p < .001$, $d = .70$, doing research on academic questions, $t(476) = 25.19$, $p < .001$, $d = 1.26$, interpreting study results, $t(476) = 16.91$, $p < .001$, $d = .72$, and communicating research results, $t(475) = 19.52$, $p < .001$, $d = .85$.

With regard to RQ5, Table 3.3 shows the zero-order correlations between first-year students' perceptions and self-reported confidence in research skills overall ((see perception scale (1) and confidence scale (7)) as well as in different aspects of research skills (8-13). Overall, participants' perceptions (1) were positively related with their self-reported confidence in research skills (7) ($r = .25$, $p < .01$). With a focus on the different aspects of research skills (8-13), the strongest positive correlation regarding students' perceptions (2-6) was found for students' perception to deal with academic research questions (item 6) and their self-reported competence to independently develop a research question (9) ($r = .27$, $p < .01$) and doing research on academic research questions (10) ($r = .27$, $p < .01$). Hence, findings indicate that participants with low perceptions of research skills reported low self-confidence while participants with high perceptions reported high self-confidence in research skills.

Table 3.3
Zero-order correlations for first-year students' perceptions and self-rated confidence in research skills, Study 2

Table 3.3
Zero-order correlations for first-year students' perceptions and self-rated confidence in research skills, Study 2

Variable (Paraphrased)[1]	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Perceptions	-												
2. Taught doing research	.74**	-											
3. Taught writing essays	.63**	.67**	-										
4. Involvement research projects	.68**	.33**	.22**	-									
5. Conducting research projects	.64**	.24**	.20**	.67**	-								
6. Dealing with research questions	.61**	.53**	.33**	.29**	.26**	-							
7. Confidence	.25**	.22**	.13**	.19**	.17**	.29**	-						
8. Writing essays	.20**	.21**	.15**	.08	.10*	.25**	.73**	-					
9. Developing research questions	.26**	.25**	.15**	.11*	.13**	.27**	.77**	.67**	-				
10. Doing research	.16**	.18**	.08	.09	.03	.27**	.72**	.61**	.58**	-			
11. Designing experimental studies	.25**	.17**	.10*	.24**	.24**	.21**	.76**	.48**	.55**	.41**	-		
12. Interpreting results	.17**	.16**	.04	.16**	.14**	.24**	.74**	.39**	.51**	.52**	.58**	-	
13. Communicating results	.18**	.16**	.10*	.15**	.12*	.25**	.75**	.42**	.52**	.52**	.56**	.79**	-

Note. **$p < .01$, *$p < 0.5$, $p > 0.5$.
[1]Original phrasing of the items: 1. Perception scale, 2. I will be taught how to do academic research, 3. I will be taught how to write academic essays and short reports, 4. I will be actively involved in research projects, 5. I will conduct many research projects on my own, 6. I will often deal with academic research questions, 7. Confidence scale, 8. I can independently write academic essays and short reports, 9. I can independently develop a research question, 10. I can do research on academic research questions, 11. I can design an experimental study, 12. I can interpret the results of a research study, 13. I can orally communicate the results of research projects.

3.12 General discussion and conclusion

Coping with academic requirements is seen as an important factor in student retention in higher education (Thomas, 2002). Moreover, students' perceptions for their first year can affect student success (Crisp et al., 2009; Keup, 2007). Research on academic competencies focusing on first-year student perceptions and confidence is limited though. Thus, the purpose of this study was to gain insight into incoming students' perceptions of academic staff support and involvement as well as their self-reported confidence with regard to a proposed model of academic competencies. Furthermore, this study aimed to provide empirical evidence describing the first-year experience in Germany, where research is still rare.

Study 1 found that first-year students expect little support on self-monitoring and learning skills but a lot of support on research skills. Students' little expectation of support in self-monitoring may be related to its' focus on intrapersonal processes (Lombardi et al., 2011) and learning skills may be related to their school preparation which is in line with students' high self-perceived confidence in learning skills (Byrne & Flood, 2005). The high expectation of support in research skills was expected since research skills are often not taught in school (Wingate, 2006). Overall, studies reveal that academic staff often regard generic skills as a prerequisite for entering higher education studies and feel responsible for teaching discipline-specific skills (Barrie, 2007; Mah & Ifenthaler, 2017a). In general, students' self-reported high confidence is in line with research that analyses students' self-perceived preparedness for higher education (Jansen & van der Meer, 2007a). Their high confidence may be based on their school experience, however, this school preparation may not be adequately enough to meet the requirements for higher education studies (Cook & Leckey, 1999). Participants showed the lowest confidence in research skills and studies revealed first-year students' unpreparedness in academic writing (Goldfinch & Hughes, 2007).

The follow-up study was based on the findings in Study 1 and focused solely on research skills as a means of validating the initial results as well as gaining an in-depth understanding of this competency. Overall, the results of Study 2 reinforce the assumption that first-year students enter university with high expectations concerning support from academic staff, which is in line with research findings on this topic (Brinkworth et al., 2009; Scutter et al., 2011). Further, Study 2 reinforces first-year students' rather low confidence in their research skills, which indicates that

they are not adequately prepared for this academic requirement when entering higher education. This result is consistent with studies that emphasize the development of research skills as challenging for students in higher education (Blair, 2017; Yorke & Longden, 2008). Moreover, findings indicate that first-year students' perceptions of research skills were positively related to their self-reported confidence, which is in line with results on incoming students' expectations of higher education studies and their self-reported readiness for these requirements (Jansen & van der Meer, 2007a).

3.13 Implications

It is important to provide first-year students with academic support at the beginning of their studies (Tinto, 2012; Yorke, 2000). Thus, it is suggested that universities support incoming students in developing academic competencies and especially research skills as early as possible. For instance, concepts and approaches of embedding academic skills have been developed and requires further exploration such as articulated learning and service learning (Gökmenoğlu, 2017; Warner & Picard, 2013). Academic competencies are prerequisites for success at higher education institutions and should be supported through personalized programmes and adaptive services. Personalized programmes and adaptive services offer the opportunity to meet learners' individual needs, for example with regard to traditional and non-traditional students (Wyatt, 2011).

Recently, higher education institutions have gained interest in educational technologies, which have the potential to enhance student retention. With a focus on personalized learning to improve academic competencies, three ideas are presented which consider the potential of educational technology and emerging research fields in educational science: online tutorials, learning analytics, and digital badges.

First, universities could offer personalized competence-based programmes to prepare students for the university's academic demands (Burnette, 2016b). In competency-based online learning environments, adaptable learning programmes generate personalized content and learning activities (Hill, 2012).

Second, in order to constantly focus on learning processes in real-time, learning analytics uses static and dynamic information about learners and learning environments to assess, elicit, and analyse them for modelling, prediction, and optimization (Ifenthaler & Widanapathirana, 2014). Learning analytics can predict who are potentially at risk of failing courses and suggest academic support that may

improve students' chances of being successful in courses (Arnold & Pistilli, 2012). Feedback and support services with regard to academic competencies could be included in order to contributing to student retention.

Third, digital badges as symbols of learning achievements, skills, and competencies may contribute to student retention in higher education, for example by motivating students and by showing transparent academic requirements (Gibson et al., 2013; Ifenthaler, Bellin-Mularski, & Mah, 2016). If academic requirements are transparent, first-year students will know what is expected of them and thus develop the academic competencies needed for higher education right from the beginning. Hence, higher education institutions could define digital badges that students need to achieve and thus show transparency in their academic requirements. With this regard, digital badges as representation of competencies may also contribute to students' self-reported confidence, which is positively related to their perceptions. Moreover, digital badges may serve as an indicator for students who need academic support. Thus, digital badges may serve as a platform for communication between staff and students about demands and adaptive support services in order to contribute to student retention.

Furthermore, findings presented here could be included in a model that aims to connect academic competencies, digital badges, and learning analytics (Mah, 2016). For example, students' research skills can be assessed and then represented as a digital badge, which can be used as a variable for learning analytics algorithms to predict student success and to suggest personalized support services.

3.14 Limitations and further research

The two studies presented have obvious limitations that require consideration. There is a potential for respondent bias, because respondents from Study 1 might have also participated in Study 2. Besides, the sample size in Study 2 varies for the different analyses since the answering of the questionnaires' items was voluntary. In addition, data collection occurred at one German university, thus prohibiting a generalization of results. Therefore, future studies should collect data from various institutions, allowing more general conclusions to be drawn. Moreover, it is necessary to further discuss and validate the proposed conceptual model of academic competencies as well as to modify the questionnaire to increase reliability of the scales. Furthermore, research indicated that students may have different confidence levels (Atherton,

2017) and that students may lack the competence for accurate self-assessment (Kruger & Dunning, 1999). Future research should include instruments for analysing whether students make realistic assessments of their skills, for comparing students' and academic staff assessments, and for testing competencies.

3.15 References

ACT. (2008). *College readiness standards. For EXPLORE, PLAN, and the ACT. Includes ideas for progress.* Retrieved from http://files.eric.ed.gov/fulltext/ED510457.pdf

Arnold, K. E., & Pistilli, M. D. (2012). Course signals at Purdue: Using learning analytics to increase student success *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge*. New York: ACM

Barrie, S. C. (2007). A conceptual framework for the teaching and learning of generic graduate attributes. *Studies in Higher Education, 32*(4), 439–458. doi: 10.1080/03075070701476100

Bean, J. P. (1982). Student attrittion, intentions and confidence: Interaction effects in a path model. *Research in Higher Education, 17*(4), 291–320.

Bean, J. P., & Eaton, S. B. (2000). A psychological model of college student retention. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 48–61). Nashville: Vanderbilt University Press.

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw & E. Care (Eds.), *Assessment and teaching of 21st century skills* (pp. 17–66). New York Springer.

Blair, A. (2016). Understanding first-year students' transition to university: A pilot study with implications for student engagement, assessment, and feedback. *Politics*, 1–14.

Bosse, E. (2015). Exploring the role of student diversity for the first-year experience. *Zeitschrift für Hochschulentwicklung, 10*(4), 45–66.

Boyatzis, R. E., & Kolb, D. A. (1991). Assessing individuality in learning: The learning skills profile. *Educational Psychology: An International Journal of Experimental Educational Psychology, 11*(3-4), 279–295. doi: 10.1080/0144341910110305

Brinkworth, R., McCann, B., Matthews, C., & Nordström, K. (2009). First year expectations and experiences: Student and teacher perspectives. *Higher Education, 58*(2), 157–173.

Burnette, D. M. (2016). The renewal of competency-based education: A review of the literature. *The Journal of Continuing Higher Education, 66*(2), 84–93. doi: 10.1080/07377363.2016.1177704

Byrne, M., & Flood, B. (2005). A study of accounting students' motives, expectations and preparedness for higher education. *Journal of Further and Higher Education, 29*(2), 111–124.

Conley, D. T. (2007). Redefining college readiness. Eugene, OR: Educational Policy Improvement Center.

Cook, A., & Leckey, J. (1999). Do expectations meet reality? A survey of changes in first-year student opinion. *Journal of Further and Higher Education, 23*(2), 157–171. doi: 10.1080/0309877990230201

Crisp, G., Palmer, E., Turnbull, D., Nettelbeck, T., & Ward, L. (2009). First year student expectations: Results from a university-wide student survey. *Journal of University Teaching & Learning Practice, 6*(1), 13–26.

Gibson, D., Ostashewski, N., Flintoff, K., Grant, S., & Knight, E. (2013). Digital badges in education. *Education and Information Technologies, 20*(2), 403–410. doi: 10.1007/s10639-013-9291-7

Gilmore, J., & Feldon, D. (2010). *Measuring graduate students' teaching and research skills through self-report: Descriptive findings and validity evidence*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver, CO.

Goldfinch, J., & Hughes, M. (2007). Skills, learning styles and success of first-year undergraduates. *Active Learning in Higher Education, 8*(3), 259–273. doi: 10.1177/1469787407081881

Hannon, B., & McNaughton-Cassill, M. (2011). SAT performance: Understanding the contributions of cognitive/learning and social/personality factors. *Applied Cognitive Psychology, 25*, 528–535. doi: 10.1002/acp.1725

Healy, J. J. (2009). *A case study of students entering an early college high school: Changes in academic behavior perceptions.* (Doctor of Education), University of Oregon.

Heublein, U. (2014). Student drop-out from German higher education institutions. *European Journal of Education, 49*(4), 497–513.

Hill, P. (2012). Online education delivery models: A descriptive view. *EDUCAUSE Review, 47*(6), 85–97.

Houser, M. L. (2004). We Don't Need The Same Things! Recognizing Differential Expectations of Instructor Communication Behavior for Nontraditional and Traditional Students. *The Journal of Continuing Higher Education, 52*(1), 11–24. doi: 10.1080/07377366.2004.10400271

Ifenthaler, D., Bellin-Mularski, N., & Mah, D.-K. (2016). *Foundations of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies*. New York: Springer.

Ifenthaler, D., & Widanapathirana, C. (2014). Development and validation of a Learning Analytics framework: Two case studies using support vector machines. *Technology, Knowledge and Learning 19*(1–2), 221–240.

Ipsos MORI (2008). Great expectations of ICT. How higher education institutions are measuring up. Research study conducted for the Joint Information Systems Committee (JISC)–Report June 2008. London.

Jansen, E. P. W. A., André, S., & Suhre, C. (2013). Readiness and expectations questionnaire: A cross-cultural measurement instrument for first-year university students. *Educational Assessment, Evaluation and Accountability, 25*(2), 115–130. doi: 10.1007/s11092-013-9161-2

Jansen, E. P. W. A., & van der Meer, J. (2007). *Feeling prepared for university? Perceived preparedness and expectations of prospective students*. Paper presented at the 10th First-year in higher education Pacific-rim conference: Regenerate, engage, experiment, Queensland University of Technology, Brisbane.

JISC. (2013). Developing digital literacies. Overview., from http://www.webarchive.org.uk/wayback/archive/20130607091442/http://ww

w.jisc.ac.uk/whatwedo/programmes/elearning/developingdigitalliteracies.aspx

Kantanis, T. (2000). The role of social transition in students' adjustment to the first-year of university. *Journal of Institutional Research, 9*(1), 100–110.

Keup, J. R. (2007). Great expectations and the ultimate reality check: Voices of students during the transition from high school to college. *NASPA Journal, 44*(1), 3–31. doi: 10.2202/1949-6605.1752

Krause, K.-L., Hartley, R., James, R., & McInnis, C. (2005). The first year experience in Australian universities: Findings from a decade of national studies. Australia: Department of education, science and training.

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology, 77*(6), 1121–1134.

Lai, K.-W., & Hong, K.-S. (2014). Technology use and learning characteristics of students in higher education: Do generational differences exist? *British Journal of Educational Technology, 46*(4), 725–738. doi: doi:10.1111/bjet.12161

Leggett , M., Kinnear, A., Boyce, M., & Bennett, I. (2004). Student and staff perceptions of the importance of generic skills in science. *Higher Education Research & Development, 23*(3), 295–312. doi: 10.1080/0729436042000235418

Lombardi, A., Seburn, M., & Conley, D. (2011). Development and initial validation of a measure of academic behaviors associated with college and career readiness. *Journal of Career Assessment, 19*(4), 375–391. doi: 10.1177/1069072711409345

Longden, B. (2006). An institutional response to changing student expectations and their impact on retention rates. *Journal of Higher Education Policy and Management, 28*(2), 173–187. doi: 10.1080/13600800600751044

Mah, D.-K. (2016). Learning analytics and digital badges: Potential impact on student retention in higher education. *Technology, Knowledge and Learning, 21*(3), 285–305. doi: 10.1007/s10758-016-9286-8

Mah, D.-K., & Ifenthaler, D. (2017). Academic staff perspectives on first-year students' academic competencies. Journal of Applied Research in Higher Education, 9(4), 630–640. https://doi.org/10.1108/JARHE-03-2017-0023

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students´ use of digital technologies. *Computers & Education*(56), 429- 400.

McCarthy, M., & Kuh, G. D. (2006). Are students ready for college? What student engagement data say. *Phi Delta Kappan, 87*(9), 664–669.

Meerah, T. S. M., Osman, K., Zakaria, E., Ikhsan, Z. H., Krish, P., Lian, D. K. C., & Mahmod, D. (2012). Developing an instrument to measure research skills. *Procedia – Social and Behavioral Sciences, 60*, 630–636. doi: 10.1016/j.sbspro.2012.09.434

Ministry of Science Technology and Innovation (Ed.). (2005). *A framework for qualifications of the European higher education area*. Copenhagen: Ministry of Science Technology and Innovation.

Morison, A., & Cowley, K. (2017). An exploration of factors associated with student attrition and success in enabling programs. *Issues in Educational Research, 27*(2), 330–346.

OECD. (2013). *Education at a glance 2013: OECD indicators*. Retrieved from http://dx.doi.org/10.1787/eag-2013-en

Ogwu, F. J., & Ogwu, E. N. (2012). Computer proficiency skills and implication for curriculum transformation among fresh undergraduate of Botswana university. *International Journal of Computer Science Issues, 9*(5), 384–390.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: Findings and insights from twenty years of research. A thrid decade of research* (Vol. 2). San Francisco: Jossey-Bass.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1–6.

Reason, R. D., Terenzini, P. T., & Domingo, R. J. (2006). First things first: Developing academic competence in the first year of college. *Research in Higher Education, 47*(2), 149–175.

Reid, M. J., & Moore III, J. L. (2008). College readiness and academic preparation for postsecondary education: Oral histories of first-generation urban college students. *Urban Education, 43*(2), 240–261. doi: 10.1177/0042085907312346

Scutter, S., Palmer, E., Luzeckyj, A., Burke da Silva, K., & Brinkworth, R. (2011). What do commencing undergraduate students expect from first year university? *The International Journal of the First Year in Higher Education, 2*(1), 8–20. doi: 10.5204/intjfyhe.v2i1.54

Smith, J. S., & Wertlieb, E. C. (2005). Do first-year college students' expectations align with their first-year experiences? *NASPA Journal, 42*(2), 153–174.

Taylor, J. A., & Bedford, T. (2004). Staff perceptions of factors related to non-completion in higher education. *Studies in Higher Education, 29*(3), 375–394.

Thomas, L. (2002). Student retention in higher education: The role of institutional habitus. *Journal of Education Policy, 17*(4), 423–442. doi: 10.1080/02680930210140257

Tinto, V. (1993). *Leaving college. Rethinking the causes and cures of student attrition*. Chicago; London: The University of Chicago Press.

Tinto, V. (2012). *Completing college. Rethinking institutional action*. Chicago; London: The University of Chicago Press.

Tremblay, K., Lalancette, D., & Roseveare, D. (2012). Assessment of higher education learning outcomes. Feasibility study report. Design and implementation (Vol. 1): OECD.

Van der Meer, J., Jansen, E., & Torenbeek, M. (2010). It's almost a mindset that teachers need to change: First-year students need to be inducted into time management. *Studies in Higher Education, 35*(7), 777–791. doi: 10.1080/03075070903383211

Voss, R., Gruber, T., & Szmigin, I. (2007). Service quality in higher education: The role of student expectations. *Journal of Business Research 60*(9), 949–959.

Waters, D. (2003). Supporting first-year students in the bachelor of arts: An investigation of academic staff attitudes. *Arts and Humanities in Higher Education, 2*(3), 293–312. doi: 10.1177/14740222030023006

Weinert, F. E. (2001). Concept of competence: A conceptual clarification. In D. S. Rychen & L. H. Salganik (Eds.), *Defining and Selecting Key Competencies* (pp. 45–65). Seattle (et. al.): Hofgrefe & Huber Publishers.

Weinstein, C. E., & Underwood, V. L. (1985). Learning strategies: The how of learning. In J. W. Segal, S. F. Chipman & R. Glaser (Eds.), *Relating Instruction to Research* (Vol. 1). London: Lawrence erlbaum Associates, Pub.

Wingate, U. (2006). Doing away with "study skills". *Teaching in Higher Education, 11*(4), 457–469. doi: 10.1080/13562510600874268

Wyatt, L. G. (2011). Nontraditional Student Engagement: Increasing Adult Student Success and Retention. *The Journal of Continuing Higher Education, 59*(1), 10–20. doi: 10.1080/07377363.2011.544977

Yorke, M. (2000). Smoothing the transition into higher education: What can be learned from student non-completion? *Australasian Association for Institutional Research Journal, 9*(1).

Yorke, M., & Longden, B. (2008). The first-year experience of higher education in the UK. York: The Higher Education Academy.

Zlatkin-Troitschanskaia, O., Pant, H. A., Kuhn, C., Toepper, M., & Lautenbach, C. (2016). Assessment practices in higher education & results of the German research program modeling and measuring competencies in higher education (KoKoHs). *Research & Practice in Assessment, 11*, 46–54.

4 Einfluss akademischer Kompetenzvorstellungen auf den Studienabbruchgedanken von Studienanfängern (Impact of perceptions of academic competencies on first-year students' dropout intention)

4.1 Zusammenfassung

Vor dem Hintergrund eines Modells akademischer Kompetenzen wird mittels einer quantitativen Studie (N = 730) der Einfluss auf die Häufigkeit des Studienabbruchgedankens von Studienanfängern ermittelt. Die Ergebnisse ergänzen den Forschungsstand zu Faktoren von Studienverbleib und dienen der Ableitung adressatenorientierter Unterstützungsangebote.

Schlüsselwörter

Studieneingangsphase, Akademische Kompetenzen, Erwartungen, Unterstützungsangebote

4.2 Abstract

With regard to a model of academic competencies a quantitative study (N = 730) was conducted to analyze first-year students' intention to leave the institution prior to degree completion. The findings contribute to the literature regarding student retention and may serve as a basis to provide adequate support services for first-year students.

Keywords

First-year experience, academic competencies, perceptions, academic support services

4.3 Einleitung

Faktoren für Studienabbrüche sind vielseitig, bedingen und verstärken sich oftmals gegenseitig und sind gemeinhin von einem langen Denk- und Abwägungsprozess

geprägt (Heublein et al., 2009; Tinto, 1975). Zu den Hauptfaktoren zählen eine falsche Studiengangwahl, fehlende Motivation, Überforderung, persönliche Gründe wie finanzielle Mittel, Krankheit oder familiäre Umstände (Bean & Eaton, 2000; Heublein et al., 2010; Krause et al., 2005). Weiterhin wurden die mangelnde Fähigkeit, die akademischen Anforderungen zu bewältigen sowie unrealistische Vorstellungen und Erwartungen vom Hochschulstudium als entscheidende Faktoren des Studienabbruchs identifiziert, die bislang jedoch unzureichend erforscht wurden (Thomas, 2002; Tinto, 1993; Yorke & Longden, 2008).

Für den Studienverbleib wird die Relevanz des ersten Studienjahres, der sogenannten Studieneingangsphase, national wie international konstatiert (Huber, 2010; Pascarella & Terenzini, 2005). Die Studieneingangsphase stellt für viele Studienanfänger eine herausfordernde Phase dar, die beispielsweise mit einer akademischen und sozialen Transition verbunden ist (Kantanis, 2000; Smith & Wertlieb, 2005). Folglich konzentrieren sich viele theoretische Perspektiven zu Studienerfolg und Studienabbruch auf das erste Studienjahr und die Startbedingungen der Studierenden, beispielsweise hinsichtlich demografischer- und sozioökonomischer Aspekte, Note der Hochschulzugangsberechtigung, Integration in das akademische System sowie institutionelle und externe Faktoren (Bean & Eaton, 2000; Kantanis, 2000; Tinto, 1993). Diese und weitere Schwerpunkte bisheriger Forschung zu Studienverbleib kategorisieren Larsen, Kornbeck, Kristensen, Larsen und Sommersel (2013) in einem systematischen Review, wobei das theoretische *Modell des Studienabbruchsprozesses* von Heublein et al. (2010) als Orientierungsrahmen dient. Dieses Modell differenziert zwischen Bedingungsfaktoren (äußere Bedingungsfaktoren wie schulische Vorbereitung und Studienbedingungen sowie innere Bedingungsfaktoren wie psychische/physische Stabilität und Leistungsfähigkeit) und Motiven (z.B. zu hohe Leistungsanforderungen, finanzielle Probleme, mangelnde Studienmotivation) der Entscheidung für den Studienabbruch sowie drei Phasen (Studienvorphase, aktuelle Studiensituation und Entscheidungssituation) (Heublein et al., 2010).

Die Forschung zu Studienerfolg und Studienabbruch wird dominiert von englischsprachigen Ländern wie den Vereinigten Staaten von Amerika, Australien und Großbritannien (Brinkworth et al., 2009). In Deutschland erfährt der Qualifizierungserfolg Studierender etwa im Rahmen des Bologna-Prozesses, des globalen Wettbewerbs und des prognostizierten Fachkräftemangels zunehmend

Aufmerksamkeit. Bund-Länder-Programme wie der *Qualitätspakt Lehre* (QPL) sowie die 2016 initiierte BMBF-Förderlinie *Studienerfolg und Studienabbruch* verdeutlichen das aktuelle Interesse sowie die Relevanz von Studienerfolg für die Bundesrepublik. Beispielsweise konzentriert sich eine Vielzahl von QPL-Projekten des Clusters *Studieneingang* auf Maßnahmen im Bereich Mathematik, Informatik, Naturwissenschaften und Technik (MINT), da diese Fächer überdurchschnittliche Abbruchquoten aufweisen (Heublein et al., 2017; Heublein et al., 2012). So berichtet das Deutsche Zentrum für Hochschul- und Wissenschaftsforschung (DZHW) für die Bezugsgruppe der Studienanfänger 2010/11 die höchsten Abbruchquoten im Bachelorstudium (insgesamt 32%) für die Fächergruppen Mathematik und Naturwissenschaften (39%), gefolgt von den Ingenieurwissenschaften (32%), den Sprach- Kulturwissenschaften und Sport (30%) sowie den Rechts-/Wirtschafts-/Sozialwissenschaften (30%). Leicht geringere Abbruchquoten werden für die Fächergruppen Agrar-/Forst-/Ernährungswissenschaften (28%) sowie Kunst-/Kunstwissenschaften (23%) angegeben (Heublein et al., 2017).

Universitäre Unterstützungsangebote setzen ihren Fokus häufig auf fachspezifische Defizite sowie wissenschaftliches Schreiben (Banscherus & Pickert, 2013). Zu generischen Fähigkeiten für die Hochschule wie Lerntechniken oder Technologieanwendung werden hingegen kaum Kurse angeboten, möglicherweise da diese Fähigkeiten von Studienanfängern oftmals vorausgesetzt werden (Barrie, 2007; Margaryan, Littlejohn, & Vojt, 2011a; Waters, 2003). So verstehen viele Dozenten ihre Rolle in der Vermittlung fachspezifischer Inhalte und erwarten fachübergreifende Fähigkeiten der Studienanfänger aufgrund ihrer Studienzugangsberechtigung (Mah & Ifenthaler, 2017a). Eine Vielzahl Studierender ist für diese generischen akademischen Anforderungen jedoch ungenügend qualifiziert (S. Bennett, Maton, & Kervin, 2008; Leggett et al., 2004). Weiterhin werden Vorstellungen und Erwartungen von Studienanfängern zu fächerübergreifenden Anforderungen und Kompetenzen bisher unzureichend in Modellen zum Studienverbleib integriert und erforscht. Wenngleich fächerübergreifende Anforderungen wie Lerntechniken, Zeitmanagement, Selbstständigkeit sowie die Anpassung an akademische Lehrstile verbunden mit Studierendenerwartungen bereits als Einflussfaktoren für den Studienverbleib identifiziert wurden (Thomas, 2002; Yorke & Longden, 2008).

Der vorliegende Beitrag knüpft an dieses Forschungsdesiderat an, indem ein theoretisches Modell akademischer Kompetenzen für die Hochschule präsentiert wird (Mah & Ifenthaler, 2017a). Darauf basierend wird der Einfluss akademischer Kompetenzvorstellungen auf die Häufigkeit des Studienabbruchgedankens für die Gesamtstichprobe sowie auf Fakultätsebene ermittelt. Weiterhin wird die Häufigkeit des Studienabbruchgedankens in den Fakultäten untersucht.

4.4 Vorstellungen und Erwartungen von Studienanfängern

Studienanfänger beginnen ihr Studium mit Vorstellungen und Erwartungen hinsichtlich fachspezifischer Inhalte, Studienbedingungen und Studienanforderungen, sozialer und akademischer Integration sowie beruflicher Perspektive (Balloo, Pauli, & Worrell, 2015; Jackson et al., 2000). Nicht erfüllte oder falsche Studienerwartungen können zu Enttäuschung führen und die Wahrscheinlichkeit eines Studienfachwechsels, Hochschulwechsels oder Studienabbruchs erhöhen sowie einen wichtigen Prädiktor für eine erfolgreiche Anpassung an die Hochschule darstellen (Heublein et al., 2009; Jackson et al., 2000). Forschung zu Erwartungen zum Hochschulleben konzentrieren sich häufig auf Studieninhalte, soziale sowie persönliche Aspekte, werden im zeitlichen Verlauf analysiert und hinsichtlich ihrer Passung mit der Realität untersucht (Crisp et al., 2009; Smith & Wertlieb, 2005). Studierende mit unrealistisch hohen Studienerwartungen zeigen schlechtere Studienleistungen im ersten Studienjahr als Studierende mit durchschnittlichen oder eher unterdurchschnittlichen Studienerwartungen (Smith & Wertlieb, 2005; Weissberg, Owen, Jenkins, & Harburg, 2003). Beispielsweise verweisen Studien auf eine fehlende Übereinstimmung von Studienerwartungen und Studienrealität hinsichtlich Dozentenrückmeldungen: Viele Studierende erwarten häufigere Dozentenrückmeldungen zu ihren Studienleistungen sowie eine höhere Qualität von Dozentenfeedback als stattfindet (Brinkworth et al., 2009; Robinson et al., 2013). Dozentenfeedback ist jedoch insbesondere für Studienanfänger wichtig, da dieses unterstützend wirkt und die Anpassung an das Hochschulsystem positiv beeinflusst (M. Long et al., 2006). Universitäre Unterstützungsangebote sind bedeutend für den Studienerfolg, insbesondere im herausfordernden ersten Studienjahr (Tinto, 2012).

So zeigen Willcoxson, Cotter und Joy (2011), dass Studierendenerwartungen hinsichtlich Lehre und Unterstützung mit ihrer Intention das Studium im ersten Jahr abzubrechen verbunden sind.

4.5 Modell akademischer Kompetenzen

Generische Fähigkeiten wie Problemlösefähigkeit, kritisches Denken und Zeitmanagement werden als fachunspezifisch betrachtet (Binkley et al., 2012; Griffin & Care, 2015). Bezogen auf den Hochschulkontext werden generische Fähigkeiten beispielsweise im OECD-Projekt *Assessment of Higher Education Learning Outcomes* (AHELO) sowie im Rahmen des BMBF-Förderprogramms *Kompetenzmodelle und Instrumente der Kompetenzerfassung im Hochschulsektor – Validierungen und methodische Innovationen* (KoKoHs) untersucht. Operationalisierungen generischer Fähigkeiten und Anforderungen für die Hochschule sind bisher kaum vorhanden, wenngleich die Bewältigung akademischer Studienanforderungen bereits als relevant für den Studienverbleib identifiziert wurde (z.B. Yorke & Longden, 2008).

Vor diesem Hintergrund integriert das konzeptionelle Modell akademischer Kompetenzen (Mah & Ifenthaler, 2017a) fünf akademische Kompetenzen, die auf der Basis einer Literaturrecherche empirischer Studien (z.B. Goldfinch & Hughes, 2007; Yorke & Longden, 2008) als zentrale und zugleich herausfordernde Faktoren im Studium, insbesondere in der Studieneingangsphase, identifiziert wurden: Zeitmanagement, Lerntechniken, Technologieanwendung, Selbstreflexion und Forschungsmethoden (Tabelle 4.1 und Tabelle 4.2). Das konzeptionelle Modell bezieht sich inhaltlich auf einen kompetenzorientierten Ansatz zur erfolgreichen Bewältigung von Aufgaben in variablen Situationen (Weinert, 2001c). So ist insbesondere die Kombination von Wissen, Fähigkeiten und Einstellungen, um Probleme adäquat und handlungsorientiert zu bewältigen, von Interesse (Baartmann et al., 2007). Weiterhin wird das Modell als Ergänzung und neue Perspektive zu etablierten Modellen verstanden, die Faktoren für Studienerfolg umfassend berücksichtigen (z.B. Bean & Eaton, 2000; Heublein et al., 2010; Tinto, 1993).

Tabelle 4.1
Kurzdefinition der Konstrukte des Modells akademische Kompetenzen

Konstrukt	Kurzdefinition	Zentrale Referenz
Zeit-management	Effektive Organisation des Studiums, z.B. eigenständige Planung des Studienverlaufs und termingerechte Bewältigung von studienrelevanten Aufgaben und Leistungsanforderungen.	Van der Meer et al. (2010)
Lern-techniken	Differenzierte Lerntechniken und -strategien zum effizienten Lernen in Abhängigkeit von Situation und Anforderung.	Cassidy (2010)
Technologie-anwendung	Technologien für den Hochschulkontext, z.B. universitäre Onlinesysteme, Textverarbeitungs- und Präsentationsprogramme, Internetrecherche.	JISC (2013)
Selbst-reflexion	Kritische Reflexion des eigenen Lernprozesses, Stärken und Schwächen sowie Interesse.	Lombardi et al. (2011)
Forschungs-methoden	Wissenschaftliche Informationsrecherche und -auswahl, wissenschaftliches Schreiben, spezifische Forschungsmethoden zur Aufgabenbearbeitung.	Gilmore and Feldon (2010)

4.6 Forschungsfragen und Methode

4.6.1 Forschungsfragen

Vor dem Hintergrund des skizzierten Forschungsbedarfs und dem Modell zu akademischen Kompetenzen wird folgenden Forschungsfragen nachgegangen:

1. Unterscheidet sich die Häufigkeit des Studienabbruchgedankens nach Fakultäten?
2. Beeinflussen Vorstellungen zu akademischen Kompetenzerwartungen die Häufigkeit des Abbruchgedankens von Studienanfängern in der (a) Gesamtstichprobe sowie (b) auf Fakultätsebene?
3. Beeinflussen Unterstützungserwartungen die Häufigkeit des Abbruchgedankens von Studienanfängern in (a) der Gesamtstichprobe sowie (b) auf Fakultätsebene?

4.6.2 Datenerhebung und Stichprobe

Die Datenerhebung fand als Online-Befragung im Herbstsemester 2015 an der Universität Mannheim statt. Die Stichprobe besteht aus N = 730 Studierenden im ersten Jahr ihres Studiums. Der Altersdurchschnitt war 20.1 Jahre (SD = 2.0) (59.7% weiblich). Die Mehrheit der Befragten ist der Fakultät Betriebswirtschaftslehre zugehörig (52.5%), gefolgt von den Fakultäten Philosophie (17.4%), Wirtschaftsinformatik und Wirtschaftsmathematik (11.9%) Rechtswissenschaften und Volkswirtschaftslehre (11.2%) und Sozialwissenschaften (7.0%). Die durchschnittliche Note der Hochschulzugangsberechtigung war 2.2 (SD = 0.6, $Min.$ = 1.0, $Max.$ = 3.7). Auf die Frage nach der Häufigkeit des Gedankens an einen Studienabbruch antworteten 66.7% mit nie, 20.7% selten, 9.7% gelegentlich, 2.5% häufig und 0.5% sehr häufig.

Für die Stichprobe zeigen sich keine signifikanten Unterschiede in der Häufigkeit des Studienabbruchgedankens hinsichtlich personenbezogener Angaben wie Geschlecht (U = 61215.50, p > .05) und Alter [F(15,714) = .951, p > .05] sowie die durchschnittliche Note der Hochschulzugangsberechtigung [F(27,700) = 1.050, p > .05]. Weiterhin zeigen sich keine signifikanten Unterschiede in der Häufigkeit des Studienabbruchgedankens hinsichtlich des höchsten Schulabschlusses des Vaters [χ2(5) = 3.82, p > .05] und der Mutter [χ2(5) = 3.76, p > .05], des höchsten beruflichen Abschlusses des Vaters [χ2(5) = 3.00, p > .05] und der Mutter [χ2(5) = 3.46, p > .05] sowie der Berufsgruppe des Vaters [χ2(4) = 7.79, p > .05] und der Mutter [χ2(4) = 8.81, p > .05].

4.6.3 Instrument und Datenanalyse

Vor dem Hintergrund des theoretischen Modells zu akademischen Kompetenzen wurde als Erhebungsinstrument ein Fragebogen konzipiert. Zur Operationalisierung der (a) Vorstellungen von Studienanfängern an die an sie gestellten Kompetenzerwartungen sowie ihrer (b) Vorstellungen zu Unterstützungsleistungen wurden Skalen aus der Literatur adaptiert und weiterentwickelt (z.B. Ipsos MORI 2008; Jansen et al., 2013). Zur Überprüfung der Konstruktvalidität wurden konfirmatorische Faktorenanalysen mit Mplus durchgeführt (Muthén, Muthén, & Asparouhov, 2016). Es wurde ein robuster Maximum-Likelihood-Schätzer verwendet und Modellspezifikationen durchgeführt, sofern dieses inhaltlich vertretbar war. Zur Beurteilung der Modellgüte werden mehrere Indizes verwendet

(Hu & Bentler, 1999; Marsh, Hau, & Wen, 2004), die als Alternative zu dem hinsichtlich der Stichprobengröße sensiblen χ2-Test dienen (Kline, 2005). Abbildung 4.1 zeigt das postulierte fünffaktorielle Modell für (a) erwartete akademischen Kompetenzanforderungen [$\chi 2$ = 436.55; df = 160; p < .001; CFI = .920; RMSEA = .049 (90% CI = .043/.054); SRMR = .051] sowie für (b) erwartete Unterstützungsangebote [$\chi 2$ = 698.18; df = 199; p < .001; CFI = .930; RMSEA = .059 (90% CI = .054/.063); SRMR = .060] mit zufriedenstellenden Modell-Fits. Die Items wurden auf einer fünfstufigen Likert-Skala beantwortet. Weiterhin wurden studienrelevante und soziodemografische Angaben (30 Items) erhoben.

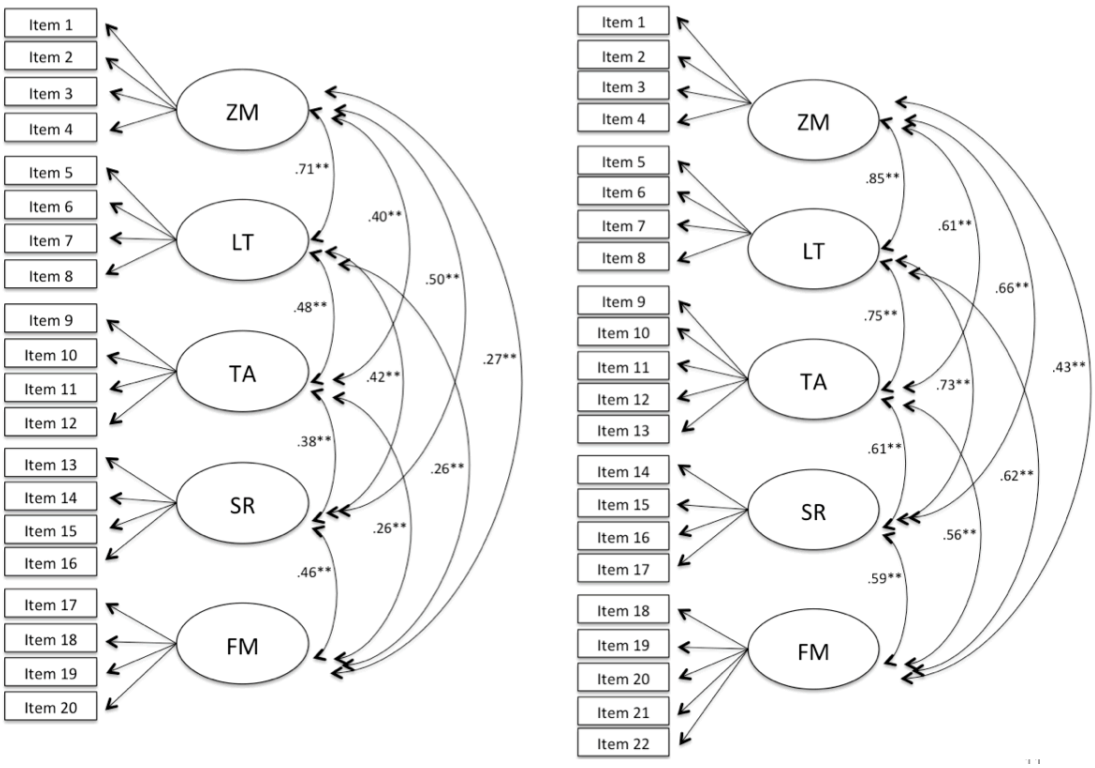

Abbildung 4.1. Fünffaktorielles Modell für (a) Kompetenzerwartungen (links) und (b) Unterstützungserwartungen (rechts) mit standardisierten Parameterschätzungen, **p < .001. ZM = Zeitmanagement, LT = Lerntechniken,
TA = Technologieanwendung, SR = Selbstreflexion, FM = Forschungsmethoden.

Tabelle 4.2 zeigt Beispielitems sowie statistische Angaben zu den modifizierten Modellen. Zur Beantwortung der Forschungsfragen werden deskriptive Statistiken und der Kruskall-Wallis-Test durchgeführt. In ordinalen Regressionsanalysen wird der Einfluss akademischer Kompetenzvorstellungen sowie erwarteter Unterstützungsangebote auf die Häufigkeit des Studienabbruchgedankens ermittelt. Die abhängige Variable *Studienabbruchgedanke* ist ordinalskaliert (z.B. „Denken Sie

derzeit darüber nach Ihr Studium abzubrechen?“, Skala: 1 = sehr häufig bis 5 = nie), die unabhängigen Variablen sind intervallskalliert.

Tabelle 4.2
Beispielitems des Fragebogens und statistische Angaben

		Deskriptive Statistiken			
Faktor	Beispielitem	*k*	*α*	*M*	*SD*
Kompetenz-erwartungen					
1. Zeit-management	Ich werde meine Zeit gut organisieren, um die bevorstehenden studienrelevanten Aufgaben und Leistungsanforderungen bewältigen zu können. (Item 3)	4	.69	3.79	.66
2. Lern-techniken	Ich werde verschiedene Lerntechniken anwenden (z.B. Visualisierungen. Wiederholungsstrategien, Karteikarten, etc.). (Item 6)	4	.63	3.60	.72
3. Technologie-anwendung	Ich werde das Internet zur Bearbeitung studienrelevanter Aufgaben benutzen. (Item 12)	4	.75	3.84	.80
4. Selbst-reflexion	Ich werde meine eigenen Lernresultate bewerten, um mich weiterzuentwickeln. (Item 14)	4	.77	3.43	.75
5. Forschungs-methoden	Ich werde zur Bearbeitung wissenschaftlicher Fragestellungen recherchieren. (Item 18)	4	.79	3.08	.87
Unterstützungs-erwarungen					
6. Zeit-management	Die Dozenten erklären mir, wie ich ein Semester zeitlich am besten organisiere. (Item 2)	4	.87	2.34	.91
7. Lern-techniken	Die Dozenten erklären mir, wie ich mir große Informationsmengen einpräge. (Item 7)	4	.80	2.43	.87
8. Technologie-anwendung	Die Dozenten erklären mir, wie ich das Internet zur Bearbeitung studienrelevanter Aufgaben benutze. (Item 10)	5	.84	2.28	.91
9. Selbst-reflexion	Die Dozenten vermitteln mir Methoden, mit denen ich meinen Lernprozess reflektieren kann (z.B. in einem Journal, Blog, e-Portfolio). (Item 14)	4	.83	2.52	.87
10. Forschungs-methoden	Die Dozenten erklären mir, wie ich wissenschaftliche Berichte verfasse (z.B. Hausarbeiten). (Item 20)	5	.90	3.00	1.7

4.7 Ergebnisse

4.7.1 Studienabbruchgedanke nach Fakultäten

Auf die Frage nach der Häufigkeit des Studienabbruchgedankens antworteten 66.7% der Gesamtstichprobe mit nie, 20.7% selten, 9.7% gelegentlich, 2.5% häufig und 0.5% sehr häufig. Innerhalb der Fakultäten wurden Abbruchgedanken (Antwortoptionen = gelegentlich, häufig, sehr häufig) am häufigsten angeben in der Fakultät Wirtschaftsinformatik und Wirtschaftsmathematik (25.3%), gefolgt von den Fakultäten Betriebswirtschaftslehre (11.7%), Philosophie (11.0%), Rechtswissenschaften und Volkswirtschaftslehre (9.8%) und am wenigsten in der Fakultät Sozialwissenschaften (7.8%). Dieser Unterschied ist signifikant $\chi^2(4) = 19.855$, $p = .001$. Post-hoc Tests (Dunn-Bonferroni-Tests) zeigen signifikante Unterschiede für die Fakultät Wirtschaftsinformatik und Wirtschaftsmathematik mit den Fakultäten Rechtswissenschaften und Volkswirtschaftslehre ($z = -2.49$, $p < .05$, $d = .39$), Betriebswirtschaftslehre ($z = -4.26$, $p < .001$, $d = .40$), Sozialwissenschaften ($z = -3{,}74$, $p < .05$, $d = .67$) und Philosophie ($z = -3.60$, $p < .05$, $d = .51$). Folglich unterscheidet sich die Häufigkeit des Studienabbruchgedankens nach Fakultäten. Studierende der Fakultät Wirtschaftsinformatik und Wirtschaftsmathematik, die sich dem MINT-Bereich zuordnen lässt, geben signifikant häufiger Abbruchgedanken an als Studierende anderer Fakultätszugehörigkeit.

4.7.2 Einfluss von Kompetenzerwartungen auf den Studienabbruchgedanken

In Tabelle 4.3 werdem die Interkorrelationen und Korrelationen zwischen den Vorstellungen zu akademischen Kompetenzanforderungen und der Häufigkeit des Abbruchgedankens von Studienanfängern dargestellt.

Tabelle 4.3
Interkorrelationen und Korrelationen mit Abbruchgedanke für Vorstellungen zu Kompetenzerwartungen

	Korrelationen					
Faktor	1	2	3	4	5	Abbruch-gedanke
1. Zeitmanagement	-	.39**	.32**	.39**	.18**	-.09*
2. Lerntechniken		-	.57**	.32**	.32**	-.05
3. Technologieanwendung			-	.26**	.26**	-.05
4. Selbstreflexion				-	.41**	-.11**
5. Forschungsmethoden					-	-.17**

Anmerkungen. $N = 730$. Faktor von 1 = trifft überhaupt nicht zu bis 5 = trifft voll und ganz zu. Abbruchgedanke von 1 = nie bis 5 = sehr häufig. *$p < .05$, **$p < .001$.

Die ordinale Regressionsanalyse zeigt einen Einfluss der Vorstellungen auf die Häufigkeit des Studienabbruchsgedankens hinsichtlich Zeitmanagement, Selbstreflexion und Forschungsmethoden ($\chi 2 = 35.81$; $df = 3$; $p < .001$; $R^2 = .06$). Die Varianzaufklärung des Modells beträgt nach Nagelkerke für die Gesamtstichprobe 6.0% und ist damit gering. Die Analyse auf Fakultätsebene zeigt unterschiedlich signifikante Korrelationen (Tabelle 4.4).

Tabelle 4.4
Korrelationen mit Abbruchgedanke für Vorstellungen zu Kompetenzerwartungen nach Fakultäten

	Korrelationen Abbruchgedanke					
	Fakultäten					
Faktor	Gesamt	1	2	3	4	5
1. Zeitmanagement	-.09**	-.15	-.05	-.36**	-.07	-.12
2. Lerntechniken	-.05	.11	-.04	-.17	-.06	-.02
3. Technologieanwendung	-.05	-.16	-.07	-.05	.06	-.03
4. Selbstreflexion	-.11**	.08	-.08	-.17	-.27**	-.17*
5. Forschungsmethoden	-.17**	-.04	-.15**	-.34**	-.20	-.14
N	730	82	383	51	127	87

Anmerkungen. $N = 730$. Faktor von 1 = trifft überhaupt nicht zu bis 5 = trifft voll und ganz zu. Abbruchgedanke von 1 = nie bis 5 = sehr häufig. *$p < .05$, **$p < .001$. Fakultäten: 1 = Rechtswissenschaften und Volkswirtschaftslehre, 2 = Betriebswirtschaftslehre, 3 = Sozialwissenschaften, 4 = Philosophie, 5 = Wirtschaftsinformatik und Wirtschaftsmathematik.

Die ordinale Regressionsanalyse zeigt die höchste Varianzaufklärung für die Fakultät Sozialwissenschaften mit 39.0% ($\chi 2 = 17.58$; $df = 2$; $p < .001$; $R^2 = .39$), gefolgt von den Fakultäten Philosophie ($\chi 2 = 16.83$; $df = 2$; $p < .001$; $R^2 = .15$), Betriebswirtschaftslehre ($\chi 2 = 12.89$; $df = 1$; $p < .001$; $R^2 = .04$) sowie Wirtschaftsinformatik und Wirtschaftsmathematik ($\chi 2 = 2.10$; $df = 1$; $p > .05$;

R^2 = .04). Insgesamt können häufige Abbruchgedanken mit geringen Erwartungen in Kompetenzanforderungen hinsichtlich Zeitmanagement, Selbstreflexion und Forschungsmethoden erklärt werden (2a). Die Fakultät Sozialwissenschaften weist die größte Varianzaufklärung auf Fakultätsebene auf (2b): Geringe Studierendenerwartungen hinsichtlich Kompetenzanforderungen in Zeitmanagement und Forschungsmethoden beeinflussen häufige Studienabbruchgedanken.

4.7.3 Einfluss von Unterstützungsvorstellungen auf den Studienabbruchgedanken

In Tabelle 4.5 sind die Interkorrelationen und Korrelationen mit dem Studienabbruchgedanken für Vorstellungen zu Unterstützungsleistungen abgebildet.

Tabelle 4.5
Interkorrelationen und Korrelationen mit Abbruchgedanke für Vorstellungen zu Unterstützungsleistungen

	Korrelationen					
Faktor	6	7	8	9	10	Abbruch-gedanke
6. Zeitmanagement	-	.71**	.55**	.61**	.38**	.01
7. Lerntechniken		-	.63**	.67**	.52**	.02
8. Technologieanwendung			-	.58**	.50**	-.02
9. Selbstreflexion				-	.59**	-.01
10. Forschungsmethoden					-	-.09**

Anmerkungen. N = 730. Faktor von 1 = trifft überhaupt nicht zu bis 5 = trifft voll und ganz zu. Abbruchgedanke von 1 = nie bis 5 = sehr häufig. *p < .05, **p < .001.

Die ordinale Regressionsanalyse zeigt einen Einfluss auf die Häufigkeit des Studienabbruchgedankens hinsichtlich Unterstützungserwartungen für die akademische Kompetenz Forschungsmethoden mit einer Varianzaufklärung von 1.0% nach Nagelkerke für die Gesamtstichprobe ($\chi 2$ = 8.67; df = 1; p < .05; R^2 = .01) und damit sehr gering. Hingegen kann auf Fakultätsebene eine signifikante Korrelation für die Fakultät Sozialwissenschaften (r = -.28, p < .05) hinsichtlich Forschungsmethoden mit 15.0% Varianzaufklärung ($\chi 2$ = 6.08; df = 1; p < .05; R^2 = .15) festgestellt werden. Insgesamt können häufige Abbruchgedanken mit der Vermutung geringer Unterstützungsleistung in Forschungsmethoden erklärt werden (3a). Insbesondere Studierende der Fakultät Sozialwissenschaften geben häufige Abbruchgedanken an, wenn sie wenig universitäre Unterstützung in Forschungsmethoden vermuten (3b).

4.8 Diskussion und Ausblick

Das präsentierte Modell akademischer Kompetenzen ergänzt existierende Perspektiven der Studienerfolgs- und Studienabbruchsforschung und bietet eine erweiterte Diskussionsgrundlage hinsichtlich Implikationen zu adressatenorientierten universitären Unterstützungsangeboten.

Studienabbruchgedanken gaben Studierende der Fakultät Wirtschaftsinformatik und Wirtschaftsmathematik am häufigsten und Studierende der Fakultät Sozialwissenschaften am seltensten an. Dieses Ergebnis ist übereinstimmend mit unterschiedlichen Studienabbruchquoten nach Fächergruppen; insbesondere mit überdurchschnittlich hohen Abbruchquoten in den MINT-Fächern (Heublein et al., 2017; Heublein et al., 2012).

Bezugnehmend auf das Modell akademischer Kompetenzen bedeuten die negativen Korrelationen zwischen Studienabbruchgedanke und erwarteter Kompetenzanforderungen, dass Studierende mit häufigen Abbruchgedanken von geringen an sie gestellten Kompetenzanforderungen ausgehen. Dieses Ergebnis könnte als falsche Vorstellung zu universitären Anforderungen interpretiert werden, die einen Studienabbruch begünstigen können (Heublein et al., 2010). Studienanfänger sind häufig unsicher, was von ihnen im Studium erwartet wird (Jansen & van der Meer, 2007b) und falsche Studienvorstellungen wurden als ein Abbruchsgrund identifiziert (Heublein et al., 2010). Beispielsweise wird die Anwendung von Forschungsmethoden von Studienanfängern eher weniger vermutet, wohingegen Studien auf unzureichende Fähigkeiten von Studierenden im wissenschaftlichen Arbeiten verweisen (Goldfinch & Hughes, 2007; Wingate, 2006). Die Fakultätsunterschiede könnten ein Hinweis auf eine fächerspezifische Gewichtung generischer Anforderungen sein. Weiterhin zeigen sich negative Korrelationen zwischen Abbruchgedanke und erwarteter Unterstützungsleistung. Häufige Abbruchgedanken hegen Studierende, die geringe universitäre Unterstützung vermuten. Studien verweisen darauf, dass Unterstützungsangebote insbesondere in der Studieneingangsphase wichtig sind (Tinto, 2012) und Unterstützungserwartungen den Studienverbleib beeinflussen können (Jackson et al., 2000; Tinto, 2012; Willcoxson et al., 2011). Studierende könnten Überforderung befürchten und sich alleingelassen fühlen, so dass sie häufiger an einen Studienabbruch denken. Studierende mit hoher Unterstützungserwartung denken hingegen seltener an einen Studienabbruch. Möglicherweise erwarten diese

Studienanfänger eine ähnliche Unterstützungskultur, wie sie es oftmals aus der Schule gewöhnt sind (Jansen & van der Meer, 2007b). Allerdings werden von der Universität bestimmte generische Fähigkeiten häufig bereits zu Studienbeginn vorausgesetzt (Mah & Ifenthaler, 2017a), so dass sich Unterstützungsangebote vorwiegend auf Fachwissen fokussieren (Barrie, 2007). Mit Ausnahme der Fakultät für Sozialwissenschaften ergeben sich keine Fakultätsunterschiede, so dass die Annahme fächerübergreifender generischer Fähigkeiten hier gestärkt wird.

Als Implikationen für eine verbesserte Transition in das Hochschulsystem werden adressatengerechte Unterstützungsangebote empfohlen, die nicht auf „propädeutische Crashkurse zur Bewältigung inhaltlicher Anforderungen“ beschränkt sein sollten (Bosse & Trautwein, 2014, S. 57). Unterstützungsleistungen wie Vorbereitungskurse und Mentorenprogramme mit dem Ziel der Entwicklung akademischer Kompetenzen sollten als Standard in Hochschulen implementiert werden. Diese sollten der jeweiligen hochschulspezifischen Zielgruppe angepasst werden und auch fakultätsspezifische Kompetenzanforderungen integrieren. Individuelle Unterstützungsleistungen werden als zukünftige Aufgabe von Hochschulen betrachtet, beispielsweise um der zunehmend heterogenen Studierendenschaft gerecht zu werden (Kerres, Hanft, & Wilkesmann, 2012). Studien verweisen jedoch auf eine oftmals geringe Partizipation der intendierten Zielgruppe an freiwilligen Unterstützungsangeboten (Attewell, Lavin, Domina, & Levey, 2006). Möglicherweise wären Konzepte zur Entwicklung akademischer Kompetenzen als integraler Bestandteil des Curriculums effektiv (Tinto, 2012). Weiterhin sollte die Information und Beratung beim Übergang von der Schule in die Hochschule erhöht werden, beispielsweise mittels Online-Self-Assessments (Hasenberg et al., 2014) sowie intensivierten Kooperationen mit Schulen, um zu realistischen Studienerwartungen beizutragen.

Als Limitation der Studie kann die Modellgüte der akademischen Kompetenzen betrachtet werden. Der Modell-Fit entspricht den moderateren Empfehlungen von Marsh et al. (2004), die die strengen Grenzen von Hu and Bentler (1999) kritisieren. Weiterhin ist die Varianzaufklärung von Vorstellungen zu Kompetenzerwartungen und Unterstützungserwartungen hinsichtlich der Häufigkeit des Studienabbruchgedankens gering. Ähnlich geringe Werte berichten Yorke und Longden (2008) für allgemein unzureichende Fähigkeiten zur Bewältigung von Studienanforderungen sowie Heublein et al. (2010) für falsche oder unerfüllte

Studienerwartungen als Abbruchsursache. Hauptfaktoren, die den Studienabbruch beeinflussen (z.B. Studienfachwahl, Studienmotivation, persönliche und finanzielle Situation), waren nicht Bestandteil der hier präsentierten Forschungsfragen und Analysen. Weiterhin ist zu berücksichtigen, dass in der vorliegenden Studie nicht der finale Studienabbruch, sondern die Häufigkeit an den Studienabbruchgedanken von Studierenden in der Studieneingangsphase erhoben wurde.

Zukünftige Studien sollten im Längsschnitt erfolgen, um die Veränderung der Studierendenerwartungen zu akademischen Kompetenzen an verschiedenen Messzeitpunkten zu analysieren. Außerdem sollten Studienabbrecher hinsichtlich der Relevanz akademischer Kompetenzen als Abbruchsursache befragt werden. Weiterhin werden aktuell technologieunterstützenden Systemen und Forschungsfeldern, wie beispielsweise Learning Analytics und Digital Badges, ein hohes Potenzial zur Erhöhung von Studienverbleib zugeschrieben. Learning Analytics als Prognoseinstrument kann die Analyse und Interpretation von elektronisch vorhandenen Studierendendaten Risikostudierende frühzeitig identifizieren und individuelle Rückmeldung zu adäquaten Unterstützungsangeboten anbieten (Ifenthaler, 2015). Weiterhin können mit Digital Badges individuelle Fähigkeiten und Kompetenzen visualisiert und personalisierter Entwicklungsbedarf abgeleitet werden (Gibson et al., 2013). Studien zur Generierung empirischer Evidenz sind erforderlich, insbesondere mit dem Fokus auf akademische Kompetenzen zur Erhöhung von Studienverbleib (Mah, 2016).

4.9 Literaturverzeichnis

Attewell, P. A., Lavin, D. E., Domina, T., & Levey, T. (2006). New evidence on college remediation. *The Journal of Higher Education, 77*(5), 886–924. doi: 10.1353/jhe.2006.0037

Baartmann, L. K. J., Bastiaens, T. J., Kirschner, P. A., & van der Vleuten, C. P. M. (2007). Evaluating assessment quality in competence-based education: A qualitative comparison of two frameworks. *Educational Research Review, 2*, 114–129.

Balloo, K., Pauli, R., & Worrell, M. (2015). Undergraduates' personal circumstances, expectations and reasons for attending university. *Studies in Higher Education*.

Banscherus, U., & Pickert, A. (2013). Unterstützungsangebote für nicht-traditionelle Studierende. Stand und Perspektiven: Carl von Ossietzky Universität Oldenburg, Humboldt-Universität zu Berlin, Deutsche Universität für Weiterbildung.

Barrie, S. C. (2007). A conceptual framework for the teaching and learning of generic graduate attributes. *Studies in Higher Education, 32*(4), 439–458. doi: 10.1080/03075070701476100

Bean, J. P., & Eaton, S. B. (2000). A psychological model of college student retention. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 48–61). Nashville: Vanderbilt University Press.

Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *Britisch Journal of Educational Technology, 39*(5), 775–786. doi: 10.1111/j.1467-8535.2007.00793.x

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw & E. Care (Eds.), *Assessment and teaching of 21st century skills* (pp. 17–66). New York Springer.

Bosse, E., & Trautwein, C. (2014). Individuelle und institutionelle Herausforderungen der Studieneingangsphase. *Zeitschrift für Hochschulentwicklung, 9*(5), 41–62.

Brinkworth, R., McCann, B., Matthews, C., & Nordström, K. (2009). First year expectations and experiences: Student and teacher perspectives. *Higher Education, 58*(2), 157–173.

Cassidy, S. (2010). Learning Styles: An overview of theories, models, and measures. *Educational Psychology: An International Journal of Experimental Educational Psychology, 24*(4), 419-444.

Crisp, G., Palmer, E., Turnbull, D., Nettelbeck, T., & Ward, L. (2009). First year student expectations: Results from a university-wide student survey. *Journal of University Teaching & Learning Practice, 6*(1), 13–26.

Gibson, D., Ostashewski, N., Flintoff, K., Grant, S., & Knight, E. (2013). Digital badges in education. *Education and Information Technologies, 20*(2), 403–410. doi: 10.1007/s10639-013-9291-7

Gilmore, J., & Feldon, D. (2010). *Measuring graduate students' teaching and research skills through self-report: Descriptive findings and validity evidence*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver, CO.

Goldfinch, J., & Hughes, M. (2007). Skills, learning styles and success of first-year undergraduates. *Active Learning in Higher Education, 8*(3), 259–273. doi: 10.1177/1469787407081881

Griffin, P., & Care, E. (Eds.). (2015). *Assessment and teaching of 21st century skills. Methods and approach*. Dordrecht: Springer.

Hasenberg, S., Guttschick, K., Schmidt-Atzert, L., Stemmler, G., Kohlhaas, G., Schütz, M., & Prüssner, M. (2014). Unterstützung beim Übergang von der Schule zur Hochschule durch präzise Studieninformationen und Online-Self-Assessments. *Zeitschrift für Hochschulentwicklung, 9*(5), 115–129.

Heublein, U., Besuch, G., Hutzsch, C., Schreiber, J., & Sommer, D. (2009). Zwischen Studienerwartungen und Studienwirklichkeit – Gründe für den Studienabbruch – Ergebnisse einer bundesweiten Befragung von Exmatrikulierten in Maschinenbau-Studiengängen. Hannover: IMPULS-Stiftung.

Heublein, U., Ebert, J., Hutzsch, C., Isleib, S., König, R., Richter, J., & Woisch, A. (2017). Zwischen Studienerwartungen und Studienwirklichkeit. Ursachen des Studienabbruchs, beruflicher Verbleib der Studienabbrecherinnen und Studienabbrecher und Entwicklung der Studienabbruchquote an deutschen

Hochschulen *Forum Hochschule* (Vol. 1). Hannover: Deutsches Zentrum für Hochschul- und Wissenschaftsforschung.

Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D., & Besuch, G. (2010). Ursachen des Studienabbruchs in Bachelor- und in herkömmlichen Studiengängen *HIS: Forum Hochschule* (Vol. 2). Hannover: HIS Hochschul-Informations-System.

Heublein, U., Richter, J., Schmelzer, R., & Sommer, D. (2012). Die Entwicklung der Schwund- und Studienabbruchquoten an den deutschen Hochschulen. Statistische Berechnungen auf der Basis des Absolventenjahrgangs 2010. *Forum Hochschule, 2012*(3), 16–24.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. doi: 10.1080/10705519909540118

Huber, L. (2010). Anfangen zu Studieren. Einige Erinnerungen zur „Studieneingangsphase". In W. D. Webler (Ed.), *Studieneingangsphase? Das Bachelor-Studium braucht eine neue Studieneingangsphase! Band I: Studierfähigkeit für ein frei(er)es Studium* (pp. 99–114). Bielefeld: Universitäts-Verlag Webler.

Ifenthaler, D. (2015). Learning analytics. In J. M. Spector (Ed.), *The SAGE encyclopedia of educational technology* (Vol. 2, pp. 447–451). Thousand Oaks, CA: Sage.

Ipsos MORI (2008). Great expectations of ICT. How higher education institutions are measuring up. Research study conducted for the Joint Information Systems Committee (JISC)–Report June 2008. London.

Jackson, L. M., Pancer, S. M., Pratt, M. W., & Hunsberger, B. E. (2000). Great expectations: The relation between expectancies and adjustment during the transition to university. *Journal of Applied Social Psychology, 30*(10), 2100–2125.

Jansen, E. P. W. A., André, S., & Suhre, C. (2013). Readiness and expectations questionnaire: A cross-cultural measurement instrument for first-year university students. *Educational Assessment, Evaluation and Accountability, 25*(2), 115–130. doi: 10.1007/s11092-013-9161-2

Jansen, E. P. W. A., & van der Meer, J. (2007). *First-year students' expectations and perceptions of readiness before they start university*. Paper presented at the 30th Annual HERDSA Conference: Enhancing higher education: Theory and scholarship, Adelaide.

JISC. (2013). Developing digital literacies. Overview., from http://www.webarchive.org.uk/wayback/archive/20130607091442/http://www.jisc.ac.uk/whatwedo/programmes/elearning/developingdigitalliteracies.aspx

Kantanis, T. (2000). The role of social transition in students' adjustment to the first-year of university. *Journal of Institutional Research, 9*(1), 100–110.

Kerres, M., Hanft, A., & Wilkesmann, U. (2012). Implikationen einer konsequenten Öffnung der Hochschule für lebenslanges Lernen - eine Schlussbetrachtung. In M. Kerres, A. Hanft, U. Wilkesmann & K. Wolff-Bendik (Eds.), *Studium 2020: Positionen und Perspektiven zum lebenslangen Lernen an Hochschulen* (pp. 285–290). Münster, New York, München, Berlin: Waxmann.

Kline, R. B. (2005). *Principles and practices of structural equation modelling*. New York: The Guilford Press.

Krause, K.-L., Hartley, R., James, R., & McInnis, C. (2005). The first year experience in Australian universities: Findings from a decade of national studies. Australia: Department of education, science and training.

Larsen, M. S., Kornbeck, K. P., Kristensen, R. M., Larsen, M. B., & Sommersel, H. B. (2013). Dropout phenomena at universities: What is dropout? Why does dropout occur? What can be done by the universities to prevent or reduce it? A systematic review. Copenhagen: Danish Clearinghouse for Educational Research.

Leggett , M., Kinnear, A., Boyce, M., & Bennett, I. (2004). Student and staff perceptions of the importance of generic skills in science. *Higher Education Research & Development, 23*(3), 295–312. doi: 10.1080/0729436042000235418

Lombardi, A., Seburn, M., & Conley, D. (2011). Development and initial validation of a measure of academic behaviors associated with college and career readiness. *Journal of Career Assessment, 19*(4), 375–391. doi: 10.1177/1069072711409345

Long, M., Ferrier, F., & Heagney, M. (2006). Stay, play or give it away? Students continuing, changing or leaving university study in first year.

Mah, D.-K. (2016). Learning analytics and digital badges: Potential impact on student retention in higher education. *Technology, Knowledge and Learning, 21*(3), 285–305. doi: 10.1007/s10758-016-9286-8

Mah, D.-K., & Ifenthaler, D. (2017a). Academic staff perspectives on first-year students' academic competencies. *Journal of Applied Research in Higher Education, 9*(4).

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education, 56*(2), 429–440.

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling: A Multidisciplinary Journal, 11*(3), 320–341. doi: 10.1207/s15328007sem1103_2

Muthén, B. O., Muthén, L. K., & Asparouhov, T. (2016). *Regression and mediation analysis using Mplus*. Los Angeles, CA: Muthén & Muthén.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: Findings and insights from twenty years of research. A thrid decade of research* (Vol. 2). San Francisco: Jossey-Bass.

Robinson, S., Pope, D., & Holyoak, L. (2013). Can we meet their expectations? Experiences and perceptions of feedback in first year undergraduate students. *Assessment & Evaluation in Higher Education, 38*(3), 260–272. doi: 10.1080/02602938.2011.629291

Smith, J. S., & Wertlieb, E. C. (2005). Do first-year college students' expectations align with their first-year experiences? *NASPA Journal, 42*(2), 153–174.

Thomas, L. (2002). Student retention in higher education: The role of institutional habitus. *Journal of Education Policy, 17*(4), 423–442. doi: 10.1080/02680930210140257

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125. doi: 10.3102/00346543045001089

Tinto, V. (1993). *Leaving college. Rethinking the causes and cures of student attrition*. Chicago; London: The University of Chicago Press.

Tinto, V. (2012). *Completing college. Rethinking institutional action*. Chicago; London: The University of Chicago Press.

Van der Meer, J., Jansen, E., & Torenbeek, M. (2010). It's almost a mindset that teachers need to change: First-year students need to be inducted into time management. *Studies in Higher Education, 35*(7), 777–791. doi: 10.1080/03075070903383211

Waters, D. (2003). Supporting first-year students in the bachelor of arts: An investigation of academic staff attitudes. *Arts and Humanities in Higher Education, 2*(3), 293–312. doi: 10.1177/14740222030023006

Weinert, F. E. (2001). Vergleichende Leistungsmessung in Schulen – eine umstrittene Selbstverständlichkeit. In F. E. Weinert (Ed.), *Leistungsmessungen in Schulen* (pp. 17–31). Weinheim und Basel: Beltz Verlag.

Weissberg, N. C., Owen, D. R., Jenkins, A. H., & Harburg, E. (2003). The incremental variance problem: Enhancing the predictability of academic success in an urbal, commuter institution. *Genetic, Social, and General Psychology Monographs, 129*(2), 153–180.

Willcoxson, L., Cotter, J., & Joy, S. (2011). Beyond the first-year experience: The impact on attrition of student experiences throughout undergraduate degree studies in six diverse universities. *Studies in Higher Education, 36*(3), 331–352.

Wingate, U. (2006). Doing away with "study skills". *Teaching in Higher Education, 11*(4), 457–469. doi: 10.1080/13562510600874268

Yorke, M., & Longden, B. (2008). The first-year experience of higher education in the UK. York: The Higher Education Academy.

5 Academic staff perspectives on first-year students' academic competencies

5.1 Abstract

Purpose – This qualitative case study examined the expectations, perceptions and role understanding of academic staff using a model of academic competencies (i.e. time management, learning skills, technology proficiency, self-monitoring, and research skills).

Design/methodology/approach – Semi-structured interviews were conducted with ten members of academic staff at a German university. Participants' responses to the open-ended questions were coded inductively, while responses concerning the proposed model of academic competencies were coded deductively using a priori categories.

Findings – Participating academic staff expected first-year students to be most competent in time management and in learning skills; they perceived students' technology proficiency to be rather high but their research skills as low. Interviews indicated a mismatch between academic staff expectations and perceptions.

Practical implications – These findings may enable universities to provide support services for first-year students to help them to adjust to the demands of higher education. They may also serve as a platform to discuss how academic staff can support students to develop the required academic competencies, as well as a broader conversation about higher education pedagogy and competency assessment.

Originality/value – Little research has investigated the perspectives of academic staff concerning the academic competencies they expect of first-year students. Understanding their perspectives is crucial for improving the quality of institutions; their input into the design of effective support services is essential, as is a constructive dialogue to identify strategies to enhance student retention.

Paper type – Research paper

Keywords

First-year experience, academic competencies, academic staff perspectives, expectations, support

5.2 Introduction

Academic unpreparedness is one factor that discourages students from continuing higher education (Thomas, 2002; Yorke & Longden, 2008). The first year of higher education is considered particularly crucial, as students often decide to leave higher education at this stage (Brinkworth et al., 2009; Reason et al., 2006). The literature regarding the first-year experience is extensive (Bean & Eaton, 2000; Krause et al., 2005; Tinto, 1975, 2012). However, withdrawals from higher education prior to degree completion remain at about 30% in the member countries of the Organisation for Economic Co-operation and Development (OECD, 2013a). Many first-year students enter higher education with unrealistic expectations and perceptions; meanwhile, research shows that matching expectations and experience can contribute to a better transition and adjustment to higher education and improve student retention (Crisp et al., 2009; Herr, 1971; Jackson et al., 2000). For example, studies indicate that students' intention to leave the institution during their first-year is related to their expectations of institutional support services (Su & Wood, 2012; Willcoxson et al., 2011). Academic support service offerings (e.g., summer bridge programs, first-year seminars, mentoring programs), however, differ by institution as well as between national contexts (Padgett, Keup, & Pascarella, 2013). Also, many students do not participate in voluntary academic support programs, even though studies report that they are effective (Attewell et al., 2006; Schmied & Hänze, 2015). Thus, making the expectations held by academic staff transparent for incoming students should contribute to first-year students establishing realistic expectations and perceptions and may help them to prepare for the academic demands of higher education.

However, the perspectives of academic staff on the academic competencies they expect first-year students to possess has not been thoroughly examined; research on students' academic preparedness has focused mainly on the perspective of incoming students (Hughes & Smail, 2015; Jackson et al., 2000). These studies are often based on student self-reporting, and show that many new students perceive their readiness for higher education as being rather high (Byrne & Flood, 2005). However, other scholarship has shown that students often overestimate their own abilities, reducing the validity of self-reported data (Kruger & Dunning, 1999). Thus, other instruments must be used to determine whether students' assessments of their abilities are realistic, such as academic staff assessments. Understanding the perspectives of

academic staff members regarding first-year students is crucial for improving the quality of institution; their input into the design of adequate support services is essential, as is constructive dialogue to identify strategies to enhance student retention (Crisp et al., 2009; Maitland Schilling & Schilling, 2005; Rao, 2016).

Therefore, the present study aims to provide insight into academic staff expectations and perceptions concerning first-year students' academic competencies. The paper also investigates how academic staff understand their role in supporting first-year students to develop the academic competencies needed for higher education. To this end, semi-structured interviews were conducted with ten members of academic staff at a German university. The term academic staff is applied for consistency and also refers to other similar terms found in the literature, such as lecturers, university teachers, and teaching staff (e.g., Waters, 2003; Surgenor, 2013; Taylor and Bedford, 2004).

5.3 Academic staff perspectives on first-year students' academic competencies

Research shows that academic staff view the major factors resulting in students' non-completion of their programs as being related to the generic skills required for higher education (Leggett et al., 2004; Taylor & Bedford, 2004). However, little research has yet been conducted on academic staff perspectives concerning the academic competencies required for higher education. Indeed, coherent definitions of academic competencies are rare, much less effective operationalization for research purposes. A study by Waters (2003) revealed that the majority of academic staff perceive inadequate learning skills, lack of preparation, unrealistic perceptions about higher education, and the lack of writing skills to be the main problems confronting first-year students. Thus, academic support is essential to retain students in higher education programs, especially in the crucial first year (Tinto, 2012). However, academic staff often expect first-year students to already be prepared academically for higher education and to have the capacity to cope with its demands on the basis of their prior school experience (Barrie, 2007).

5.4 A conceptual model of academic competencies

Various factors influence student retention in higher education, including socio-demographic variables, field of study, cognitive capacity, motivation, personal situation and academic and social integration (e.g., Bean & Eaton, 2000; Tinto, 1975). The academic preparedness of students has less frequently been researched. The authors of this study have therefore constructed a model of decisive academic competencies for higher education, following a competency-based approach (Weinert, 2001a). On the basis of a literature review that focused on key generic skills for higher education, consistent generic skills were identified (e.g., Leggett et al., 2004; Reid & Moore, 2008; Taylor & Bedford, 2004). The resulting conceptual model consists of five academic competencies: time management, learning skills, self-monitoring, technology proficiency, and research skills. *Time management* refers to managing time efficiently, organizing a range of study tasks and setting effective long-term goals (Van der Meer *et al.*, 2010). *Learning skills* include the ability to select, organize, elaborate and remember information, as well as the ability to relate new to old information, to adapt the learning environment to individual needs and to use learning styles and techniques to cope with different tasks and demands (Weinstein & Underwood, 1985). *Technology proficiency* refers to the competent use of technologies for learning (Kennedy et al., 2008; Lai & Hong, 2014). *Self-monitoring* can be described as "the ability to reflect on what worked and what needed improvement in any particular academic task" (Conley, 2007), such as students' self-evaluation of their interests, strengths and learning styles. *Research skills* include academic writing, communication and methodological knowledge, as well as skills in statistical and qualitative analysis, information seeking and problem solving (Gilmore & Feldon, 2010; Meerah et al., 2012). This conceptual model, with its focus of five decisive academic competencies, is designed to complement established models and theories addressing student retention in higher education (e.g. Bean & Eaton, 2000; Heublein et al., 2010; Tinto, 1975).

5.5 Research questions and method

5.5.1 Research questions

To gain initial insight into academic staff expectations, perceptions and understanding of support requirements concerning first-year students' academic competencies, this paper focuses on the following three research questions:

RQ1. Which generic skills do academic staff view as being important for first-year students?

RQ2. What are academic staff expectations (a) and perceptions (b) of first-year students' academic competencies, in relation to the proposed model of academic competencies?

RQ3. How do academic staff understand their role in supporting first-year students to develop the academic competencies required for higher education?

5.5.2 Method, participants and sampling

A qualitative research design was chosen for this case study to obtain insight into academic staff expectations and perceptions of first-year students' academic competencies (Schwandt & Gates, 2011). Eligible participants were identified using purposive a priori sampling, also known as selective sampling or criterion sampling (Flick, 2014; Patton, 1990), on the basis of five criteria of theoretical interest. The criteria were chosen to capture a maximum variation within the sample, with a focus on academic staff who interact frequently with first-year students. Thus, academic staff were chosen who (1) currently offer seminars for first-year students, (2) have at least two years of experience teaching first-year students (3) represent each of the university's five faculties and from different departments were chosen to account for the heterogeneous structure of the selected German university. The sample (4) consisted of participants representing different levels of academics, including doctoral candidates, postdocs and assistant professors. The demographic characteristics of the participants (5) varied in age and gender. On the basis of these criteria, potential participants were selected and contacted by phone and email to describe the research project and make an appointment for the interview. An appropriate sample size for a qualitative inquiry is one that adequately meets the purpose of the research question (Patton, 1990). For the current case study, ten members of academic staff from a German university were interviewed in their

offices on campus; like many academics, all respondents were involved in both teaching and research activities (Adam, 2013). The age of those interviewed ranged from 29 to 52 years of age (M = 37.20; SD = 7.96); three were female and seven were male. All interviewees participated voluntarily, agreeing to an audio recording of the interview.

5.5.3 Data collection, coding and analysis

The semi-structured interviews were conducted by two experienced researchers between May 2015 and July 2015 and were between 23 and 39 minutes in length. The researchers had expertise in students' first-year experience, teaching, and conducting interviews. All interview sessions were recorded, fully transcribed with f4 transcription software and coded using MAXQDA analysis software. Responses to the open-ended questions concerning important generic skills and discussing the participants' perspectives on their own role in supporting student development were coded inductively. Meanwhile, participants' expectations and perceptions in terms of the proposed model of academic competencies were coded deductively, using an a priori code system (Kelle & Kluge, 2010); participants were asked to prioritize each expected and perceived academic competency of the proposed model using three categories (high, moderate, low). Participants' statements were translated and paraphrased in preparation of this article, since the interviews were held in German.

5.6 Results

5.6.1 Academic staff views concerning the important generic skills for first-year students (RQ1)

Overall, participating academic staff regarded generic skills to be important for higher education; their perspectives fell into two main themes. Concerning students' behavior and personal attitudes toward their studies, participants emphasized such aspects as students' interest and curiosity about their field of study, their degree of responsibility and ability to perform independent work, the motivation and self-discipline required to overcome challenges and the persistence needed to achieve long-term goals, along with the social skills that facilitate interaction with fellow students and academic staff.

Interview 3: On the one hand, I would expect students to be interested in their field of study. On the other hand, I would expect them to be reliable and to have a sense of responsibility, personal responsibility. That would be very important.

In second category, participants referred to students' methodological expertise and the academic competencies required to perform adequately in higher education studies, including aspects such as the time management skills needed to organize their studies, research and learning skills, writing, text comprehension, self-monitoring and critical thinking skills.

Interview 5: For me, one important aspect is that students should set themselves clear and realistic goals. This is especially relevant for the first semesters in higher education.

Interview 10: One of the most important skills that students should have when they start their studies at the university is the skill to comprehend texts.

5.6.2 Academic staff expectations regarding first-year students' academic competencies (RQ2a)

In general, the academic staff interviewed had rather high expectations for the academic competencies of first-year students. In relation to the proposed model, the level of expectations varied from element to element. The interviews revealed the two competencies those interviewed expected first-year students to be most competent in: time management (eight interviewees with high expectations) and learning skills (seven interviewees with high expectations).

Interview 4: I would actually give learning skills even higher priority, because you should have found out after twelve to thirteen years of school education which method works best for you to acquire knowledge, keep it in mind, and connect it to prior knowledge.

Eight of the ten participants expected students' technology proficiency to be high or moderate. They often explained this expectation by referring to the fact that today's students belong to a generation that grew up with these technologies.

Interview 1: I expect them to know about technology. Ok, that is actually mean, because I did not know anything about that at the start of university. I just did not grow up with all the technology. I am in the generation that was not exposed to it. Still, I would rank my expectations as being rather high.

Meanwhile, perspectives on self-monitoring covered all levels of expectations: four respondents expected students to monitor themselves in depth, while three respondents expressed moderate and three, low expectations. Nine out of ten academic staff interviewed expected first-year students to have low research skills; participants expected them to be less competent in research skills than in any of the four other competencies.

> *Interview 3*: Concerning research skills, I would not expect much of the students because that is what they should learn here at the university.

5.6.3 Academic staff perceptions of first-year students' academic competencies (RQ2b)

The interviews revealed that the academic staff generally perceived the majority of first-year students as having insufficient academic competencies. Those interviewed emphasized first-year students' deficiencies, as shown in statements such as "It is partly problematic that students come to the university with huge deficiencies in skills" (Interview 2) and "In my opinion, students do not receive adequate preparation on how to begin and deal with their studies in higher education, at least most of them" (Interview 4). The participants associated this perspective with students' prior school experience, in which they had not been expected to be independent learners. In contrast, a minority of academic staff argued that they expected first-year students to lack academic competencies at the beginning of their studies:

> *Interview 7*: So, I perceive them as completely academically incompetent, but that does not surprise me. That is what the university is for. Nobody has to be academically competent at the beginning of their studies. They all have school-related competencies. That is enough to begin their studies at the university.

Most interviewees tried not to generalize and argued that incoming students are heterogeneous in academic competencies and general preparedness for higher education.

> *Interview 9*: The group of students that starts university is very heterogeneous, and one mostly notices the students who do not do so well. Therefore, I do not want to generalize. (…) Some of the students who come here are very problematic. You simply have to say that, but there are also students who belong to the opposite side, students who are very well prepared.

With regard to the five academic competencies, first-year students were perceived to be most competent in technology use (three interviewees held high perceptions):

> *Interview 3*: I have the impression that most students are familiar with the use of technology, especially the Internet. (…) Here I would consider them to be at a very good level of expertise. I think those skills are taught quite well in school.

By contrast, those interviewed argued that research skills are usually neither taught nor utilized in the students' earlier schooling, which explains incoming students' perceived low level of competence in this area (nine interviewees with low perceptions):

> *Interview 2*: I think that most students do not know anything about research skills because they just do not come into contact with them until university.

Participants' perceptions of first-year students' competencies in time management and learning skills were almost equally distributed between the three levels offered (high, moderate and low). One interviewee expressed surprise at how well-developed first-year students' learning skills are, while another stated that most students arrive unprepared with learning skills and need to develop this competency to meet university requirements. Six academic staff perceived first-year students' competence in time management as moderate or high, while four perceived first-year students as showing low competence in time management. The latter group argued that students have to organize their time independently to study in higher education, which is different from studying in school.

> *Interview 8*: So, I think time management is an important topic on which most of the students feel overburdened.

Most interviewees assessed students' competence in self-monitoring as either low (four interviewees) or moderate (five interviewees), because they do not typically take advantage of services offered, such as reviews of exam results or general feedback. Moreover, some interviewees had the impression that students tend to blame others for their own failures instead of taking personal responsibility and looking for areas in which they can improve.

> *Interview 2*: With regard to self-monitoring, I have the impression that students do not perceive their studies and their own responsibility in the way they should.

5.6.4 How academic staff understand their role in supporting first-year students to develop required academic competencies (RQ3)

The interviews revealed two main aspects of how academic staff understand their role in supporting first-year students' development of academic competencies. First, academic staff expected students to enter higher education with adequate academic competencies on the basis of their prior education. Thus, most participants emphasized that they focus primarily on teaching discipline-specific skills in their courses. However, some interviewees stated that higher education should also provide support services for students, such as mentoring programs to develop generic skills.

> *Interview 4*: I think that students should acquire most of the skills they need for studying in higher education during their time in school, because their secondary school diploma qualifies them to attend university. Then again, I think that higher education institutions should offer students support services to develop specific skills.

Second, some interviewees understood their role in contributing to a successful first-year experience as including motivating students and supporting students with deficiencies in academic competencies, especially in research skills.

> *Interview 3*: I think that we as members of the academic staff are also responsible for teaching research skills.

5.7 Discussion

Overall, the academic staff interviewed believed that generic skills are important for student success in higher education. They also rated the proposed model of academic competencies as useful, being for the most part in line with their own expectations while reflecting the factors studies have found to contribute to student retention and higher education preparedness (Conley, 2007; Tinto, 1975). Furthermore, the participants mentioned important generic skills for higher education, including aspects of students' study behavior such as self-discipline and responsibility as well as such basic skills as text comprehension. These aspects are consistent with available studies and models identifying the important factors for student retention (e.g., Bean & Eaton, 2000; Leggett et al., 2004), which the proposed model aims to

complement. Moreover, the interviews revealed that academic staff expect students to be independent learners (Waters, 2003), view students as being responsible for developing these academic competencies more on their own, and expect their prior education to have prepared them to cope with the demands of higher education (Barrie, 2007). The low expectations held by participants for first-year students' research skills were in line with results from studies undertaken from a student perspective, which indicate that the development of research skills is a challenging aspect of the transition from school to higher education (Blair, 2017; Yorke & Longden, 2008).

In general, the academic staff interviewed perceived first-year students' academic competencies as being rather low overall, but also emphasized differences among students concerning their preparation for higher education. This finding is consistent with research that shows differences in incoming students' self-perceived preparedness for higher education (Jansen & van der Meer, 2007a). The participating academic staff members perceived first-year students as having a high degree of technology proficiency, which may be related to their school education or based on their status as digital natives (Prensky, 2001). Furthermore, most of those interviewed assessed students' time management as moderate or high, which is consistent with findings on students' self-reported confidence in time management (Jansen & van der Meer, 2007a). By contrast, participants assessed first-year students' research skills as low. Studies show that first-year students are often unprepared for the demands of academic writing (Goldfinch & Hughes, 2007; Wingate, 2006), even though they often feel confident and well-prepared for this requirement (Jansen & van der Meer, 2007a). The interviews in this case study imply that academic staff perceive incoming students' levels of academic competencies as lower than their expectations. When comparing expectations to perceptions, the largest mismatches were found for time management and learning skills, while the smallest mismatch was for research skills. These mismatches may relate to expectations that academics have developed concerning student competencies based on their own prior educational experience (Barrie, 2007).

The members of academic staff participating in this study understand their role in supporting students' first-year higher education experience mainly in the teaching of discipline-specific skills, since they often regard generic skills as prerequisites for entering higher education (Barrie, 2007). Some of those interviewed mentioned that

higher education institutions have a responsibility to help students develop generic skills by offering them remedial classes and mentoring programs. However, previous research suggests that academic staff should be involved directly in processes to improve teaching, interaction and student quality in higher education (A. Jones, 2014). Hence, topics that merit further discussion as factors contributing to a successful student experience include the roles, responsibilities and pedagogical approaches of academic staff, particularly in relation to first-year students (S. Richardson & Radloff, 2014).

The current study has certain limitations. The sample could have included more interviewees or concentrated on selected departments in depth. Also, the sample could have identified more experienced academic staff who also have recent experience teaching first-year students. Moreover, the comparison of the participants' expectations and their perceptions of first-year students' academic competencies is just an indicator of possible mismatches. Additional studies involving a larger sample of interviewees, or quantitative studies, are required for generalization of this studies' findings.

5.8 Implications and further research

The findings may be valuable for higher education institutions, enabling them to enhance students' first-year experience through improved support services. These services should be personalized to meet the diversity of students and their individual needs (Ballard & Butler, 2016; Bosse, 2015), which was also recognized by those interviewed in the present study. For instance, academic staff reported a mismatch between their expectations and their perceptions of first-year students' competence in time management. Higher education institutions might be encouraged to further investigate this finding and to provide academic support programs, such as remedial classes, mentoring programs, learning communities, personalized competency-based programs, and web-based support services, to develop students' competencies in the required areas (e.g., Burnette, 2016a; Tinto, 2012). However, not all students directed to academic support programs attend them, so student support might be more effective as an integrated part of the curriculum aligned in the classroom (Tinto, 2012).

As far as academic staff are concerned, studies imply that their attitudes toward and interaction with students as well as their understanding of their own pedagogical

role influence student retention in higher education (Barr & Tagg, 1995; Tinto, 1975; Umbach & Wawrzynski, 2005). Thus, the academic staff perspective about how to support first-year students should be analyzed in more depth and possibly using a more refined model that would incorporate teaching experience, field of study, and international as well as cultural aspects. In Germany, academic staff in higher education tend to emphasize their research activity (Adam, 2013), which has the potential to influence the quality, expectations and demands reflected in their teaching practice. Higher education institutions may reinforce the value of teaching and support professional development through didactic and interdisciplinary collaborations to enhance students' academic competencies. Academic staff also require adequate use of assessment methods, in particular with regard to competency-based education (Baartmann et al., 2007). Further research should include a comparison between academic staff and student perspectives on academic competencies, since studies have already revealed mismatches between these groups on several aspects of higher education, such as assessment, learning habits and workload (Brinkworth et al., 2009; Crisp et al., 2009; Surgenor, 2013). With a focus on transparent communication of expectations, digital badges (Gibson *et al.*, 2013) are a relatively new educational technology to display and define academic requirements and could serve as a platform to foster an academic staff-student conversation about expectations and demands for a successful first-year experience, which could also be discussed in schools to encourage adequate preparation (Mah, 2017).

Overall, these results may have important implications for higher education institutions, such as encouraging them to provide support services for first-year students to help them adjust to higher education, fostering a discussion of the role of academic staff in supporting students' development of required academic competencies, and building constructive dialogues. If academic requirements are transparent, first-year students will know what is expected of them and will be encouraged to develop the academic competencies needed for higher education right from the beginning; this has the potential to contribute to student retention.

Acknowledgements

The authors would like to thank Tobias Kistner for his assistance in conducting the interviews.

5.9 References

Adam, S. (2013), "Studienbeginn, Studienbedingungen und Studienprobleme. Die Hochschule als ein Ort des programmierten Chaos der Massenabfertigung", in J. Asdonk (Ed.), *Von der Schule zur Hochschule. Analysen, Konzeptionen und Gestaltungsperspektiven des Übergangs,* Waxmann, Münster [u.a.].

Attewell, P. A., Lavin, D. E., Domina, T. and Levey, T. (2006), "New evidence on college remediation", *The Journal of Higher Education,* Vol. 77 No. 5, pp. 886–924. doi: 10.1353/jhe.2006.0037

Baartmann, L. K. J., Bastiaens, T. J., Kirschner, P. A. and van der Vleuten, C. P. M. (2007), "Evaluating assessment quality in competence-based education: a qualitative comparison of two frameworks", *Educational Research Review,* No. 2, pp. 114–129.

Ballard, J. and Butler, P. I. (2016), "Learner enhanced technology: can activity analytics support understanding engagement a measurable process?", *Journal of Applied Research in Higher Education,* Vol. 8 No. 1, pp. 18–43.

Barr, R. B., and Tagg, J. (1995), "From teaching to learning: a new paradigm for Undergraduate Education", *Change,* November/December, pp. 13–25.

Barrie, S. C. (2007), "A conceptual framework for the teaching and learning of generic graduate attributes", *Studies in Higher Education,* Vol. 32 No. 4, pp. 439–458. doi: 10.1080/03075070701476100

Bean, J. P. and Eaton, S. B. (2000), "A psychological model of college student retention", in J. M. Braxton (Ed.), *Reworking the Student Departure Puzzle* pp. 48–61. Vanderbilt University Press, Nashville, TN.

Blair, A. (2017), "Understanding first-year students' transition to university: a pilot study with implications for student engagement, assessment, and feedback", *Politics*, Vol. 37 No. 2, pp. 1–14.

Bosse, E. (2015), "Exploring the role of student diversity for the first-year experience" *Zeitschrift für Hochschulentwicklung,* Vol. 10 No. 4, pp. 45–66.

Brinkworth, R., McCann, B., Matthews, C. and Nordström, K. (2009), "First year expectations and experiences: student and teacher perspectives", *Higher Education,* Vol. 58 No. 2, pp. 157–173.

Burnette, D. M. (2016), "The renewal of competency-based education: a review of the literature", *The Journal of Continuing Higher Education,* Vol. 64 No. 2, pp. 84–93. doi: 10.1080/07377363.2016.1177704

Byrne, M. and Flood, B. (2005), "A study of accounting students' motives, expectations and preparedness for higher education", *Journal of Further and Higher Education,* Vol. 29 No. 2, pp. 111–124.

Conley, D. T. (2007), *Redefining College Readiness,* Educational Policy Improvement Center, Eugene, OR.

Crisp, G., Palmer, E., Turnbull, D., Nettelbeck, T. and Ward, L. (2009), "First year student expectations: results from a university-wide student survey", *Journal of University Teaching & Learning Practice,* Vol. 6 No. 1, pp. 13–26.

Flick, U. (2014), *An Introduction to Qualitative Research*, Sage, London.

Gibson, D., Ostashewski, N., Flintoff, K., Grant, S. and Knight, E. (2013), "Digital badges in education", *Education and Information Technologies* Vol. 20 No. 2, pp. 403–410. doi: 10.1007/s10639-013-9291-7

Gilmore, J. and Feldon, D. (2010), "Measuring graduate students' teaching and research skills through self-report: descriptive findings and validity evidence", Paper presented at the Annual Meeting of the American

Educational Research Association, Dates of conference, Denver, CO, 30 April–5 May 2010.

Goldfinch, J. and Hughes, M. (2007), "Skills, learning styles and success of first-year undergraduates", *Active Learning in Higher Education,* Vol. 8 No. 3, pp. 259–273. doi: 10.1177/1469787407081881

Herr, E. L. (1971), "Student needs, college expectations, and 'reality' perceptions", *The Journal of Educational Research,* Vol. 65 No. 2, pp. 51–56.

Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D. and Besuch, G. (2010), "Ursachen des Studienabbruchs in Bachelor- und in herkömmlichen Studiengängen", *HIS: Forum Hochschule* (Vol. 2). HIS Hochschul-Informations-System, Hannover.

Hughes, G. and Smail, O. (2015), "Which aspects of university life are most and least helpful in the transition to HE? A qualitative snapshot of student perceptions", *Journal of Further and Higher Education,* Vol. 39 no. 4, pp. 466–480. doi: 10.1080/0309877X.2014.971109

Jackson, L. M., Pancer, S. M., Pratt, M. W. and Hunsberger, B. E. (2000), "Great expectations: the relation between expectancies and adjustment during the transition to university", *Journal of Applied Social Psychology,* Vol. 30 No. 10, pp. 2100–2125.

Jansen, E. P. W. A. and van der Meer, J. (2007), "Feeling prepared for university? Perceived preparedness and expectations of prospective students", paper presented at the 10th First-year in higher education Pacific-rim conference: Regenerate, engage, experiment, Dates of Conference, Queensland University of Technology, Brisbane, 4–6 July 2007.

Jones, A. (2014), "Perspectives on change: a study of the multiple dimensions of changing teaching", *Teaching in Higher Education,* Vol. 19 No. 2, pp. 170–182. doi: 10.1080/13562517.2013.836088

Kelle, U., and Kluge, S. (2010), *Vom Einzelfall zum Typus: Fallvergleich und Fallkontrastierung in der qualitative Sozialforschung,* VS Verlag für Sozialwissenschaften, Wiesbaden.

Kennedy, G., Judd, T. S., Churchward, A., Gray, K. and Krause, K.-L. (2008), "First year students' experiences with technology: are they really digital natives?", *Australasian Journal of Educational Technology,* Vol. 24 no. 1, pp. 108–122.

Krause, K.-L., Hartley, R., James, R. and McInnis, C. (2005), "The first year experience in Australian universities: findings from a decade of national studies", Department of education, science and training, Australia.

Kruger, J. and Dunning, D. (1999), "Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments", *Journal of Personality and Social Psychology,* Vol. 77 No. 6, pp. 1121–1134.

Leggett , M., Kinnear, A., Boyce, M. and Bennett, I. (2004), "Student and staff perceptions of the importance of generic skills in science" *Higher Education Research & Development,* Vol. 23 No. 3, pp. 295–312. doi: 10.1080/0729436042000235418

Maitland Schilling, K. and Schilling, K. L. (2005), "Expectations and performance", In M. L. Upcraft, J. N. Gardner and B. O. Barefoot (Eds.), *Challenging and Supporting the First-year Student* pp. 108–120. Jossey-Bass, San Francisco, CA.

Meerah, T. S. M., Osman, K., Zakaria, E., Ikhsan, Z. H., Krish, P., Lian, D. K. C. and Mahmod, D. (2012), "Developing an instrument to measure research skills", *Procedia – Social and Behavioral Sciences,* No. 60, pp. 630–636. doi: 10.1016/j.sbspro.2012.09.434

OECD. (2013), *Education at a glance 2013: OECD indicators,* available at http://dx.doi.org/10.1787/eag-2013-en (accessed 31 July 2017).

Padgett, R. D., Keup, J. R. and Pascarella, E. T. (2013), "The Impact of First- Year Seminars on College Students' Life-long Learning Orientations", *Journal of Student Affairs Research and Practice,* Vol. 50 No. 2, pp. 133–151.

Patton, M. Q. (1990), *Qualitative Evaluation and Research Methods*. Sage Publications, London.

Prensky, M. (2001), "Digital natives, digital immigrants", *On the Horizon,* Vol. 9 No. 5, pp. 1–6.

Rao, M. B. (2016), "Motivation of teachers in higher education", *Journal of Applied Research in Higher Education,* Vol. 8 No. 4, pp. 469–488.

Reason, R. D., Terenzini, P. T. and Domingo, R. J. (2006), "First things first: developing academic competence in the first year of college", *Research in Higher Education,* Vol. 47 No. 2, pp. 149–175.

Reid, M. J. and Moore III, J. L. (2008), "College readiness and academic preparation for postsecondary education: oral histories of first-generation urban college students", *Urban Education,* Vol. 43 No. 2, pp. 240–261. doi: 10.1177/0042085907312346

Richardson, S. and Radloff, A. (2014), "Allies in learning: critical insights into the importance of staff–student interactions in university education", *Teaching in Higher Education,* Vol. 19 No. 6, pp. 603–615. doi: 10.1080/13562517.2014.901960

Schmied, V. and Hänze, M. (2015), "The effectiveness of study skills courses: do they increase general study competences? " *Zeitschrift für Hochschulentwicklung,* Vol. 10 No. 4, pp. 176–187.

Schwandt, T. A. and Gates, E. F. (2011), "Case Study Methodology", In N. K. Denzin and Y. S. Lincoln (Eds.), *The SAGE Handbook of Qualitative Research*, pp. 341–358. Sage, Los Angeles, CA.

Su, F., and Wood, M. (2012), "What makes a good university lecturer? Students' perceptions of teaching excellence", *Journal of Applied Research in Higher Education,* Vol. 4 No. 2, pp. 142–155.

Surgenor, P. W. G. (2013), "Measuring up: comparing first year students' and tutors' expectations of assessment", *Assessment & Evaluation in Higher Education,* Vol. 38 No. 3, pp. 288–302. doi: 10.1080/02602938.2011.630976

Taylor, J. A. and Bedford, T. (2004), "Staff perceptions of factors related to non-completion in higher education", *Studies in Higher Education,* Vol. 29 No. 3, pp. 375–394.

Thomas, L. (2002), "Student retention in higher education: the role of institutional habitus", *Journal of Education Policy,* Vol. 17 No. 4, pp. 423–442. doi: 10.1080/02680930210140257

Tinto, V. (1975), "Dropout from higher education: a theoretical synthesis of recent research", *Review of Educational Research,* Vol. 45 No. 1, 89–125. doi: 10.3102/00346543045001089

Tinto, V. (2012), *Completing College: Rethinking Institutional Action*. The University of Chicago Press, Chicago, IL.

Umbach, P. D. and Wawrzynski, M. R. (2005), "Faculty do matter: the role of college faculty in student learning and engagement", *Research in Higher Education,* Vol. 46 No. 2, pp. 153–184.

Van der Meer, J., Jansen, E. and Torenbeek, M. (2010), "It's almost a mindset that teachers need to change: first-year students need to be inducted into time

management", *Studies in Higher Education,* Vol. 35 No. 7, pp. 777–791. doi: 10.1080/03075070903383211

Waters, D. (2003), "Supporting first-year students in the bachelor of arts: an investigation of academic staff attitudes", *Arts and Humanities in Higher Education,* Vol. 2 No. 3, pp. 293–312. doi: 10.1177/14740222030023006

Weinert, F. E. (2001), "Concept of competence: a conceptual clarification", in D. S. Rychen and L. H. Salganik (Eds.), *Defining and Selecting Key Competencies* pp. 45–65. Hofgrefe & Huber Publishers, Seattle, WA.

Weinstein, C. E. and Underwood, V. L. (1985), "Learning strategies: the how of learning", in J. W. Segal, S. F. Chipman and R. Glaser (Eds.), *Relating Instruction to Research* (Vol. 1), Lawrence Erlbaum Associates, London.

Willcoxson, L., Cotter, J. and Joy, S. (2011), "Beyond the first-year experience: the impact on attrition of student experiences throughout undergraduate degree studies in six diverse universities", *Studies in Higher Education,* Vol. 36 No. 3, pp. 331–352.

Wingate, U. (2006), "Doing away with 'study skills', *Teaching in Higher Education,* Vol. 11 No. 4, pp. 457–469. doi: 10.1080/13562510600874268

Yorke, M. and Longden, B. (2008), "The first-year experience of higher education in the UK", The Higher Education Academy, York.

6 Learning analytics and digital badges: Potential impact on student retention in higher education

6.1 Abstract

Learning analytics and digital badges are emerging research fields in educational science. They both show promise for enhancing student retention in higher education, where withdrawals prior to degree completion remain at about 30% in Organisation for Economic Cooperation and Development member countries. This integrative review provides an overview of the theoretical literature as well as current practices and experience with learning analytics and digital badges in higher education with regard to their potential impact on student retention to enhance students' first-year experience. Learning analytics involves measuring and analyzing dynamic student data in order to gain insight into students' learning processes and optimize learning and teaching. One purpose of learning analytics is to construct predictive models to identify students who risk failing a course and thus are more likely to drop out of higher education. Personalized feedback provides students with information about academic support services, helping them to improve their skills and therefore be successful in higher education. Digital badges are symbols for certifying knowledge, skills, and competencies on web-based platforms. The intention is to encourage student persistence by motivating them, recognizing their generic skills, signaling their achievements, and capturing their learning paths. This article proposes a model that synthesizes learning analytics, digital badges, and generic skills such as academic competencies. The main idea is that generic skills can be represented as digital badges, which can be used for learning analytics algorithms to predict student success and to provide students with personalized feedback for improvement. Moreover, this model may serve as a platform for discussion and further research on learning analytics and digital badges to increase student retention in higher education.

Keywords

Learning analytics, Digital badges, Student retention, Generic skills, Academic competencies

6.2 Introduction and purpose of this integrative review

Student retention is an important issue for higher education institutions as withdrawals from higher education prior to degree completion remain at about 30% in the member countries of the Organisation for Economic Cooperation and Development. The first year of higher education is considered particularly crucial, as students often decide to leave higher education within this period (Brinkworth et al., 2009; Reason et al., 2006; Tinto, 1993). Several studies on student retention exist (Bean & Metzner, 1985; A. Bowles et al., 2014; Kuh & al., 2005; OECD, 2013a; Rovai, 2003; Tinto, 1975, 1993, 2012) and higher education institutions have been offering academic support programs, such as summer bridge programs, first-year seminars, mentoring programs, and learning communities in an effort to enhance student retention (Barefoot et al., 1998; Clark & Cundiff, 2011; Keup, 2005; Scott, Shah, Grebennikov, & Singh, 2008; Tinto, 2012).

In recent years, educational technology for teaching and learning has become more established in everyday academic practices. Most higher education institutions in the U.S. and Australia already use a learning management system (LMS), a software application that integrates teaching, learning activities, and course administration tools (Dahlstrom, Brooks, & Bichsel, 2014). The number of higher education institutions that offer online courses, such as massive open online courses (MOOCs), has increased (Cormier & Siemens, 2010). Students' digital trails are captured when they learn online and use LMSs, mobile devices, and social media (P. Long & Siemens, 2011; Siemens, 2013).

Thus, higher education institutions have recently gained interest in collecting and mining these dynamic student data with learning analytics to gain insight into learners' experiences and to predict and optimize learning processes (Ferguson, 2012; Fiaidhi, 2014; Ifenthaler, 2015; Ifenthaler et al., 2014; P. Long & Siemens, 2011). Furthermore, digital badges are a relatively new technology in educational settings for representing learners' achievements, knowledge, skills, and competencies in formal and informal learning environments (EDUCAUSE, 2012; Gibson et al., 2013; Ifenthaler et al., 2016).

The purpose of this integrative review is to analyze the potential of learning analytics and digital badges in order to enhance student retention in the all-important first year of higher education. Hence, this review provides an overview of (1) student retention in higher education and the relevance of generic skills, such as academic

competencies. Then, (2) learning analytics and (3) digital badges are described separately, including their main objectives, opportunities and challenges, as well as current research and practices in higher education, with a focus on student retention. Further, (4) a synthesis of learning analytics and digital badges with links to generic skills is proposed here. Digital badges may certify generic skills for a prediction of student success based on learning analytics, and increase student retention by providing personalized support. Early guidance in particular may contribute to first-year students' persistence, as they often describe the transition to higher education as challenging, for example with regard to coping with academic demands (Evans, 2000; Hughes & Smail, 2015; Yorke, 2000; Yorke & Longden, 2008). This synthesis is illustrated in a model that aims to contribute to further discussion and future research on the interconnectedness of learning analytics and digital badges in efforts to enhance student retention in higher education.

6.3 Student retention and generic skills in higher education

There are numerous approaches to investigating students' experiences in their first year of studies. They often concentrate on conceptual models for student retention (Bean & Metzner, 1985; Tinto, 1975, 1993), measurements for readiness and success (ACT, 2008; Conley, 2011; Jansen et al., 2013), the transition to higher education (A. Bowles et al., 2014; Hughes & Smail, 2015; Kantanis, 2000), expectations (Brinkworth et al., 2009; Crisp et al., 2009; Nadelson et al., 2013), and reasons for dropout decisions (Krause, 2005; Yorke & Longden, 2008). Consistent factors for discontinuing higher education found in studies include wrong choice of course, lack of motivation, personal factors such as financial problems, health, and family circumstances, an unsatisfactory first-year experience, lack of university support services, and academic unpreparedness (Heublein, 2014; Nadelson et al., 2013; Thomas, 2002; Tinto, 1993, 2012; Willcoxson et al., 2011; Yorke & Longden, 2008). Yorke and Longden (2008), for example, surveyed 462 students in the UK and found seven factors that accounted for 60.9% of variance for leaving higher education prior to degree completion, with poor quality of learning experience (16.6%), not coping with academic demands (9.6%), and wrong choice of field of study (8.7%) being the most important aspects. The inability to cope with academic demands is associated

with insufficient study skills for higher education, for example academic writing and note taking (Goldfinch & Hughes, 2007; Tinto, 1993; Wingate, 2006). Research shows that university teachers often expect first-year students to enter with certain study skills. However, studies reveal that not all students are academically prepared for higher education requirements, for instance independent studying, time management, and digital literacy (Brinkworth et al., 2009; Jansen & Suhre, 2011; Jansen & van der Meer, 2007b; Prensky, 2001; Taylor & Bedford, 2004; Waters, 2003). Students' digital literacy is often taken for granted by higher education institutions based on the myth of the net generation (Margaryan et al., 2011a; Murray & Pérez, 2014; Selwyn, 2009). However, research has shown that even people with sophisticated technology skills for leisure activities are not automatically competent in using technologies for learning (Lai & Hong, 2014; Schulmeister, 2010). Thus, students are often unprepared to transfer their skills for personal digital use to an educational context.

This academic unpreparedness can be linked to the concept of generic skills, which, in contrast to subject-specific skills, focus on interdisciplinary aspects, such as critical thinking, independent learning, time management, and problem solving (N. Bennett et al., 1999; Clanchy & Ballard, 1995; Griffin et al., 2012; Leggett et al., 2004). Generic skills, often also labeled as *soft skills* or *21st century skills*, have been examined and internationally assessed by large-scale studies focusing on learning outcomes and competencies carried out by the OECD, such as the *Program for International Student Assessment* (PISA) (OECD, 2014), the *Assessment of Higher Education Learning Outcomes* (AHELO) (Tremblay et al., 2012), and the *Programme for the International Assessment for Adult Competencies* (PIAAC) (OECD, 2013c). Binkley et al. (2012), for instance, provide a broad overview and analysis of *21st century skills* and organize these skills into four groups: ways of thinking (creativity and innovation, critical thinking, problem solving, decision making, learning to learn, metacognition), ways of working (communication, collaboration), tools for working (information literacy, ICT literacy), and living in the world (citizenship, life and career, personal and social responsibility).

While these studies indicate the relevance for generic skills for all levels of education, traditional degrees normally do not certify them. Reasons for this may include discussions about generic skills' complexity and interactiveness with different contexts, instruments for assessment, standards for certification, trust and

validation. Digital badges may function as an alternative form of recognition and validation in competency-based education and assessment (Gibson et al., 2013; Hickey, 2014; Sullivan, 2013). Furthermore, learning analytics may contribute to student retention by using learners' data for prediction and by providing meaningful real-time feedback on students' learning status, strengths, and areas for improvement (Ifenthaler, 2015; Lauría, Moody, Jayaprakash, Jonnalagadda, & Baron, 2013).

6.4 Learning analytics in higher education

Learning analytics uses dynamic information about learners and learning environments to assess, elicit, and analyze them for modeling, prediction, and optimization of learning processes (Ifenthaler, 2015; Ifenthaler et al., 2014). Campbell and Oblinger (2007) postulate five steps of the analytic process: capture, report, predict, act, and refine. Student data for analytics is captured on the basis of multiple resources, such as student information systems (SIS), LMSs, financial systems, and several online devices students use for learning. The SIS, for example, provides student data, such as demographics, academic ability, and academic performance. The LMS provides information about academic effort, such as student engagement in the LMS, and the financial system provides information such as student aid usage (Campbell & Oblinger, 2007). In using these student data, however, it is necessary to discuss topics like data quality, ethics of use, data privacy, and learner rights (Campbell, DeBlois, & Oblinger, 2007; P. Long & Siemens, 2011; Siemens, 2012; Siemens, Dawson, & Lynch, 2013; Slade & Galpin, 2012). Reports requested by educators on demand provide insight into learning progress. Therefore, data from the SIS, LMS, and financial system is used to generate a statistical algorithm for predictions, for instance about students' likelihood of passing a course. On the basis of the model's result, the institution can provide feedback and support services (Bach, 2010; de Freitas et al., 2015).

Since learning analytics is an emerging field of study in the area of education, numerous frameworks have been proposed which focus on objectives, potentials, and challenges (Chatti, Dyckhoff, Schroeder, & Thüs, 2012; Ferguson, 2012; Greller & Drachsler, 2012; Ifenthaler & Widanapathirana, 2014; Scheffel, Drachsler, & Specht, 2015). Greller and Drachsler (2012) propose a learning analytics framework considering six critical dimensions, including stakeholders, objectives, data, instruments, external constraints, and internal limitations. Regarding objectives, they

make a fundamental distinction between reflection and prediction. Reflection is seen as critical self-evaluation, while learning analytics can support reflection by suggesting interventions or activities designed to enhance the learning process. Predicting and modeling learners' activities can be used for early interventions to prevent dropouts, as well as to adapt services and curricula. Scheffel, Drachsler, Stoyanov, and Specht (2014) introduce a framework of five quality indicators for learning analytics, including objectives (awareness, reflection, motivation, behavioral change), learning support (perceived usefulness, recommendation, activity classification, detection of students at risk), learning measures and output (comparability, effectiveness, efficiency, helpfulness), data aspects (transparency, data standards, data ownership, privacy), and organizational aspects (availability, implementation, training of educational stakeholders, organizational change). Ifenthaler and Widanapathirana (2014) propose a holistic learning analytics framework that combines various types of educational information in a meaningful way. Components include users' individual characteristics and physical data, their interactions within social networks and online learning environments, as well as curricular elements, stakeholder groups (institutions, governance), a learning analytics engine, a personalization and adaptive engine, and a reporting engine. Papamitsiou and Economides (2014) examined the literature on experimental case studies conducted within the domains of learning analytics and educational data mining from 2008 to 2013. They classified 40 core case studies with regard to learning settings, analysis methods, research objectives, algorithmic-oriented findings, and pedagogy-oriented findings. Focusing on research objectives, they classified the case studies into six categories, with the majority exploring student behavior modeling and predictions of performance, followed by students' and teachers' increased reflection and awareness, predictions of dropout and retention, improvement of assessment services and feedback, as well as recommendations for resources.

These frameworks describe aspects of learning analytics that should be considered as guidelines for developing learning analytics projects and for designing and implementing learning analytics applications. In order to contribute to student retention in the first year of higher education, three common aspects derived from the presented frameworks are crucial, including (1) predictive models and algorithms,

(2) learning support recommendations and feedback, and (3) data privacy and ethical issues.

One objective of learning analytics is the prediction of which students are at risk of failing a course. In this regard, learning analytics is used as an early warning system, which may be particularly relevant for the crucial first year of higher education (Brinkworth et al., 2009; Jayaprakash, Moody, Lauría, & Baron, 2014; Reason et al., 2006; Tinto, 1993). Data used for the predictive algorithms is usually derived from LMS and SIS, including such variables as high school grades, course grades, activities in the learning environment, socio-economic status, gender, and citizenship (Campbell & Oblinger, 2007; Chatti et al., 2012). Predictive models enable institutions to forecast learner processes and to model student success rates. The institution can use this information in a proactive approach to intervene at an early stage of risk, and create and adapt appropriate support services in order to enhance teaching quality, students' first-year experience, and thus student retention in higher education (Arnold & Pistilli, 2012; Colvin et al., 2015; Gašević, Dawson, Rogers, & Gasevic, 2016). For educators, learning analytics provides real-time insight into students' performance and progress (Corrin, Kennedy, & Mulder, 2013) and therefore the opportunity to refine their practice, plan teaching activities, and create a learning environment that is highly adaptive for students as well as to intervene early enough by providing appropriate support to improve students' chances of success and prevent them from failing a course (Arnold & Pistilli, 2012; Barber & Sharkey, 2012; Greller, Ebner, & Schön, 2014). Hence, teachers need to be competent in interpreting the data (Papamitsiou & Economides, 2014; Romero, Ventura, Espejo, & Hervás, 2008). While some educators may appreciate this support and view the student information as beneficial for their teaching (Arnold & Pistilli, 2012), concerns may arise with regard to objectivity and fairness in dealing with students (Slade & Galpin, 2012). Moreover, learning analytics tools provided by researchers may be too complex for practitioners, and a lack of acceptance and knowledge of learning analytics can make it challenging to implement in educational settings (Siemens, 2012; Siemens et al., 2013). As learners receive notifications concerning their chances of failing or passing a course, they can reflect on their learning progress. Personalized recommendations are provided and expected to support students in achieving their learning outcomes, ultimately increasing student retention (Colvin et al., 2015; de Freitas et al., 2015).

Learning analytics provides automated real-time feedback and suggestions for academic guidance through multiple sources (e.g., learning analytics dashboard, LMS visualization, email) that can contribute to learners' self-regulated learning, motivation, goal achievement, and success (Corrin & de Barba, 2014; Hattie & Timperley, 2007; P. Long & Siemens, 2011; Siemens et al., 2011). Corrin and de Barba (2014) analyzed 28 students to gain insights into how students interpret and act upon the feedback delivered through learning analytics dashboards. Their findings indicate that the majority of participants reported increased motivation after seeing the feedback, which was mainly associated with the regulation of effort and the awareness of progress. Arnold and Pistilli (2012) reported a positive impact of the learning analytics application Course Signals on students' learning and motivation. Tanes, Arnold, Selzer King, and Remnet (2011) examined the content and nature of the feedback given in Course Signals and found, for example, that student success was associated with instructional rather than motivational feedback. These results are promising for student retention, and especially first-year students may benefit from early feedback and guidance. Further research is needed to verify the impact of feedback on students' engagement, performance, and retention in higher education (Verbert, Duval, Klerkx, Govaerts, & Santos, 2013). Moreover, it should be considered that detailed information about progress and support services may motivate some students, continuous feedback and guidance may disempower students from becoming independent learners and developing competencies, such as critical thinking, metacognition, reflection, learning-to-learn skills, and autonomous learning (Buckingham Shum & Deakin Crick, 2012; Ifenthaler et al., 2014; P. Long & Siemens, 2011).

As learning analytics uses student data collection to measure and analyze learning processes, it also necessitates a discussion of privacy and ethical issues. Pardo and Siemens (2014) define privacy as "the regulation of how personal digital information is being observed by the self or distributed to other observers" and ethics as "the systematization of correct and incorrect behavior in virtual spaces according to all stakeholders" (p. 438). Several privacy and ethical issues have emerged, and frameworks and guidelines have been proposed (Drachsler & Greller, 2016; Ferguson, Hoel, Scheffel, & Drachsler, 2016; Prinsloo & Slade, 2013; Sclater & Bailey, 2015; Slade & Galpin, 2012; Willis, Campbell, & Pistilli, 2013). Pardo and Siemens (2014) identified four principles with which to categorize the numerous

issues concerning data privacy and ethics of learning analytics: transparency, student control over the data, security, and accountability and assessment. Transparency means that all stakeholder groups should be informed about when, how, and what type of data is collected, stored, and processed. Student control over the data empathizes with users' right to access and correct the data obtained about them. Institutions should ensure data security to avoid users' highly sensitive data being exposed. Accountability refers to the identification of responsible entities, and assessment refers to the constant evaluation, revision, and refinement of data collection, security, transparency, and accountability. Slade and Prinsloo (2013) classify issues for learning analytics into three categories (location and interpretation of data; informed consent, privacy, and the de identification of data; and classification and management of data) and introduce an ethical framework featuring six principles. For example, they argue that student identity and performance are temporal and dynamic constructs, and that student data may be incomplete and analyses misinterpreted and biased. Thus, student success should be seen as a complex and multidimensional phenomenon. While students' control over their data is emphasized in most guidelines, ethics and data protection affects teachers as well. For instance, institutions also use learning analytics to assure the quality of teaching performance (Greller & Drachsler, 2012). With the focus on student retention, further research and discussion should address questions such as how long the institution will keep students' data, whether the institution will use students' data after graduation (e.g. for longitudinal studies over several years and cohorts), and whether instructors can still remain objective toward students when they have access to this data and know which of them are at risk of failing (Pardo & Siemens, 2014; Slade & Galpin, 2012).

Some higher education institutions have already implemented learning analytics. Sclater, Peasgood, and Mullan (2016) present ten prominent examples in the U.S., Australia, and the UK. These and other examples of universities that utilize learning analytics to identify at-risk students include Purdue University (Arnold, 2010; Arnold & Pistilli, 2012; Pistilli & Arnold, 2010), the University of Phoenix (Barber & Sharkey, 2012), the Open University UK (Wolff, Zdrahal, Herrmannova, Kuzilek, & Hlosta, 2014; Wolff, Zdrahal, Nikolov, & Pantucek, 2013), and the University of Wisconsin (Shehata & Arnold, 2015).

Employed since 2007, Purdue's application Course Signals indicates students' status of failing a course using an algorithm of four components: students' performance as indicated by grades in the course; students' effort as measured by interactions with the university's LMS in comparison to peers; students' past academic history, such as GPA and scores on standardized tests; and demographic variables, such as age, attempted credits, and residency (Arnold, 2010; Arnold & Pistilli, 2012). Real-time feedback in the LMS is provided and displayed by a traffic light that signals whether students are likely to be successful in the course (green), have potential problems (yellow), or are at high risk to fail (red), as well as via personalized emails from instructors, text messages, reminders, referral to academic advisors, and face-to-face meetings. According to Arnold and Pistilli (2012), nearly 24,000 students and more than 145 instructors used Course Signals in 2012. Quantitative research revealed a positive impact on students' academic performance in courses that implemented Course Signals, with increased A/B grades (12%) and less D/F grades (9%) than the control group. Furthermore, the authors reported a significantly higher retention rate for the 2007, 2008 and 2009 cohorts that used Course Signals compared to students who had no Course Signals classes. For example, in 2007 the retention rate of 5134 students with no Course Signals courses was 83.4% in the first year and decreased to 69.4% in the fourth year, compared to the experimental group of 1518 students with at least one Course Signals course, which had a retention rate of 96.7% in the first year and 87.4% in the fourth year. To gain insight into students' perspective on Course Signals, more than 1500 students who used Course Signals participated in surveys, focus groups, and interviews across five semesters. According to quantitative data, 89% reported positive experiences with Course Signals and 74% stated that their motivation to change their learning behavior was positively affected by Course Signals (Arnold & Pistilli, 2012).

The University of Phoenix developed several prediction models and discussed variables on the basis of a literature review in order to create a valid model to predict students' likelihood of failing a course (Barber & Sharkey, 2012). To create the algorithms, the university aimed to use only existing data from the SIS, LMS, and the financial aid system, therefore not considering unavailable variables, such as self-discipline, motivation, locus of control, and self-efficacy. In a test of different models, the percentage of cumulative points students earned was found to be the strongest predictor for potential problems for undergraduate students enrolled in

online courses, followed by the students' financial status. The model, constructed using a tenfold cross-validation procedure, was reported to be highly accurate for predicting whether students would pass or fail a course, with 85% accuracy at week 0 and 95% by week 3 of 5.

Predictive models of student success in courses are promising and already feature good accuracy. To further increase accuracy, generic skills should be included in predictive models, as they have been identified as one of the contributing factors to student retention (Thomas, 2002; Tinto, 1993; Yorke & Longden, 2008). Ifenthaler (2015) identified the missing connection between learner characteristics, learning behavior and curricular requirements as a limitation of learning analytics frameworks and proposed linking various types of education information, including competencies such as digital literacy, in a meaningful way. One reason for the exclusion of generic skills thus far may be because data about students' generic skills is usually not available in the SIS or LMS. Digital badges provide the opportunity to assess and certify generic skills, which could then be included as a variable in predictive models.

6.5 Digital badges in higher education

Described as a "new way to capture and communicate what an individual knows and can demonstrate" (Finkelstein, Knight, & Manning, 2013, p. 1), digital badges are symbols or indicators of learning achievements, skills, competencies, and interests across educational contexts use (EDUCAUSE, 2012; Gibson et al., 2013; Ifenthaler et al., 2016). Learners can collect the digital images in their personal badge system, such as Mozilla's freely available Open Badges framework, and display them on other social media platforms and professional networks like LinkedIn (Glover & Latif, 2013; Põldoja & Laanpere, 2014).

In 2012, the Mozilla Foundation and Peer 2 Peer University introduced digital badges as a valuable technology for educational settings. Since then, digital badges have been implemented in various educational institutions. Oliver (2016) gives an overview of 19 higher education institutions that utilize digital badges, including examples such as *Coursera* by Stanford University, *Open2Study* backed up by Open Universities Australia, and *Passport* by Purdue University.

The concept of awarding badges for achievements has a long tradition. For instance, earning badges is a concept scouting programs use to certify the acquisition

of knowledge or skills (Halavais, 2012; Wu, Whiteley, & Sass, 2015). Moreover, badges have been used in games with features such as scores and levels to encourage players to continue the game (Ahn, Pellicone, & Butler, 2014). Thus, digital badges in education are related to the concept of gamification, the use of game design elements, such as scores and levels, in non-game contexts (Deterding, Dixon, Khaled, & Nacke, 2011).

Transparency is an important aspect of digital badges and aims to validate and justify the badges. Thus, the badge image file includes information about the issuing organization, for example a higher education institution, the criteria for obtaining the badge, the date of issue, and evidence of the accomplishment, such as an artifact or document (Gibson et al., 2013; Grant, 2014; Jovanovic & Devedžić, 2015). Wright and O'Shea (2014) documented these criteria in a worksheet that should be completed by the badge developer prior to badge creation in a badge platform. Newby, Wright, Besser, and Beese (2016) introduce guidelines for designing digital badges in the Passport platform. For instance, students' digital literacy can be presented in a digital badge such as *Being Digitally Literate in the 21st Century*, which is one of multiple digital badges designed to achieve the key competencies for the course *Intro to Educational Technology*. Examples of potential learning activities include ones in which students have to "review how current teachers are modeling digital literacy and the teaching of 21st century skills", activities where they "create ways to effectively teach digital literacy and 21st century skills to other teachers", and those which stipulate that required evidence and assessment criteria consist of a "clear written summary of what it means to be digitally literate". In terms of learners' orientation and motivation, the purpose and objectives of digital badges, key questions, case scenarios, requirements, and the value of the skills and knowledge when accomplishing the badge are all described in the platform as well as any prerequisite badges (e.g., basic badges for 21st century skills, and learning and technology).

As discussed by Mozilla Foundation and Peer 2 Peer University (2012), Hickey (2012), Gibson et al. (2013), Jovanovic and Devedžić (2015), for example, digital badges can play four main roles in education: (1) motivation, (2) recognition of learning, (3) signaling of achievements, and (4) capturing of learning paths. These functions of digital badges have the potential to contribute to student retention in higher education (5).

Motivation is perhaps the aspect of digital badges that has been discussed most. Motivation is a crucial aspect of learning and performance and has been broadly researched in motivation theories, for example with respect to intrinsic and extrinsic motivation (e.g., Bandura & Cervone, 1983; Bandura & Schunk, 1981; Deci, Vallerand, Pelletier, & Ryan, 1991; Försterling, 2001; Heckhausen, Schmalt, & Schneider, 1985; Malone & Lepper, 1987; Schuster, 1989; Weiner, 1986). In this perspective, digital badges can be recognized as rewards and thus may impact learners' motivation (Moon, Jahng, & Kim, 2011). Existing research on analogue programs aimed at earning points, such as sticker charts or reading points, may provide valuable insight into how the digital version may affect learner motivation and engagement (Deci, 1971; Lepper, Greene, & Nisbett, 1973). The motivational aspect has received attention in many studies. For example, Abramovich et al. (2013) found that the motivational effects of digital badges depend on learners' prior knowledge and that different types of badges (e.g., participatory badges and skill badges) have different effects on student motivation as well as on learning performance. Resnick (2012) argues that the collection of badges itself could become the motivational focus for students instead of the learning content. Badge designers should consider motivation theories when developing digital badges, for example by asking questions concerning target group, purpose, and relevance (Newby et al., 2016), as well as instructional design considerations such as Keller's (1987) *ARCD model* that describes four aspects of motivation: attention, relevance, confidence, and satisfaction. Furthermore, Tran, Schenke, and Hickey (2014) analyzed 30 digital badge projects and extracted eleven design principles for motivating learning, such as displaying badges to the public, setting goals, collaborating, and providing privileges.

Digital badges can serve to recognize and verify learning. Different types of badges, such as smaller badges for motivational aspects or feedback and larger badges for certification purposes, also allow a greater granularity of skills, knowledge, competencies, as well as capacity for work (Ahn et al., 2014; Mozilla Foundation and Peer 2 Peer University, 2012; Põldoja & Laanpere, 2014). Hence, digital badges can display informal skills, such as collaboration, entrepreneurial thinking, and social skills, as well as *21st century skills* like digital literacy skills, which are usually not recognized in university degrees (Gibson et al., 2013). As traditional tests focus mainly on knowledge assessment, digital badges may represent

generic competencies and soft skills or newer skills such as digital literacies (Jovanovic & Devedžić, 2015; Mozilla Foundation and Peer 2 Peer University, 2012). *Grading Soft Skills* (GRASS) (European Commission, 2014) is a research project carried out by the European Union (EU) that focuses on the development of pedagogical, technological, and administrative solutions for grading learners' soft skills at different levels of education as well as in formal and informal learning settings. The aim is to create digital badges as credentials, and gradual recognition for the development of soft skills by educational institutions and employers in a quantitative and measurable way. From this perspective, digital badges are not intended to replace traditional certificates and degrees, but to complement traditional assessment approaches and mechanisms of recognition. Moreover, frameworks for generic skills and key competencies such as the *Programme for the International Assessment for Adult Competencies* (PIAAC) (OECD, 2013c) may function as an orientation for creating standardized digital badges (Finkelstein et al., 2013).

Digital badges can signal achievements to relevant stakeholders, such as university teachers or potential employers (EDUCAUSE, 2012; Foster, 2013). Glover (2016) conducted a survey containing both quantitative and qualitative elements and found that 19 of 26 respondents used digital badges to show their experience in professional profiles to target potential employers. Research needs to be undertaken to investigate whether employers view digital badges as valuable for seeking employees and whether they trust and accept digital badges as symbols of skills and competencies (EDUCAUSE, 2012), even though employability might not be the most crucial aspect of students' first-year retention in higher education. When shared publicly in social networks or placed on user profiles (e.g., via Carney Labs' MARI: https://www.mari.com/, ADL's CASS: https://www.adlnet.gov/introducing-the-next-big-thing-cass/), digital badges also contain a social context, including such aspects as reputation and group identification (Antin & Churchill, 2011; Mozilla Foundation and Peer 2 Peer University, 2012). Moreover, open access to digital badges on web-based platforms raises questions about how to design technical and social systems for badge production (Ahn et al., 2014), as well as issues about data privacy such as whether badge data can be used against individuals if it exposes intellectual weaknesses (Willis, Quick, & Hickey, 2015).

Digital badges may support learners in capturing and planning their learning paths (Ahn et al., 2014). Digital badges represent skills earned in various contexts, such as

vocational education and professional experience (West & Lockley, 2016). Thus, they may connect learning pathways from different educational and professional backgrounds. As signposts, they can function as a means of guidance for learners and thus enhance their self-regulation (Jovanovic & Devedžić, 2015). In a quantitative study with 155 students participating in a MOOC, participants reported that digital badges were helpful for tracking their learning progress (Lokuge Dona, Gregory, Salmon, & Pechenkina, 2014).

Digital badges can contribute to students' first-year experience and enhance student retention. First-year students can feel motivated to achieve digital badges that recognize and verify their learning within the higher education institution, as well as in informal settings and from previous experiences. The signaling of learners' achievements and the capturing of learning paths can assist first-year students in the transition to higher education by providing structure, as well as targeting short-term and long-term goals. Glover and Latif (2013) believe that digital badges have the potential to assess less obvious learning and thus support retention and employability, and the Mozilla Foundation and Peer 2 Peer University (2012, p. 5) argue that digital badges can "encourage continued engagement and retention". Kelley and Hickey (2014) reported "high retention rates" in a big open online course (BOOC) on educational assessment in which digital badges were issued. Out of 460 registrants who started the course, over 160 (35%) completed the first assignment and 60 (37%) completed the course. Moreover, learning motivation is a crucial factor for student retention (Atkinson, 1957; Baik, Naylor, & Arkoudis, 2015; Tinto, 1975; Weiner, 1985, 1986). On account of their gamification elements, digital badges may encourage students to keep on track with their studies or make learners aware of their skills and therefore motivate them to either extend those skills or explore new learning paths (Gibson et al., 2013; Jovanovic & Devedžić, 2015). In a study by Põldoja and Laanpere (2014, p. 176) one participant revealed that "if there is a possibility to collect something, I want to achieve all the possible badges."

In addition to the open questions concerning the main roles of digital badges in education and student retention stated above, potential challenges to implementing digital badges in higher education institutions include stakeholders' understanding and acceptance of them (EDUCAUSE, 2012; Grant, 2014), technological frameworks (Dimitrijević, Devedzić, Jovanović, & Milikić, 2016; Mozilla Foundation and Peer 2 Peer University, 2012), and learning and instructional design

considerations (McDaniel & Fanfarelli, 2016; Randall, Harrison, & West, 2013). Moreover, digital badges' validity, transparency, and trust should be discussed in depth.

6.6 Synthesis: Interconnectedness of learning analytics, digital badges, and generic skills in enhancing student retention

So far, this integrative review provides a separate overview of learning analytics and digital badges. However, similarities and intersections exist, such as their motivational aspect and issues surrounding data privacy and ethics. Furthermore, learning analytics may be used to analyze digital badge data and to provide recommendations on which digital badges are appropriate to achieve next.

Figure 6.1 depicts a model that aims to synthesize learning analytics, digital badges, and generic skills with a focus on student retention. All three aspects may have an individual impact on student retention (dotted arrows) as described above; however, the model focuses on their interconnectedness (loops). Two loops can be distinguished. First, (1A) generic skills can be represented as digital badges, (1B) which can be used in algorithms to predict student success in courses and (1C) to provide students with personalized feedback about their strengths and weaknesses as well as guidance regarding support services. Second, (2A) when generic skills are considered as a variable for the predictive algorithm to identify students' status quo for higher education demands, (2B) learning analytics may directly suggest digital badges that can be earned to meet these requirements, and (3B) students may feel motivated to develop their skills on the basis of the gamification elements of digital badges and the visualization of their learning paths and learning progress.

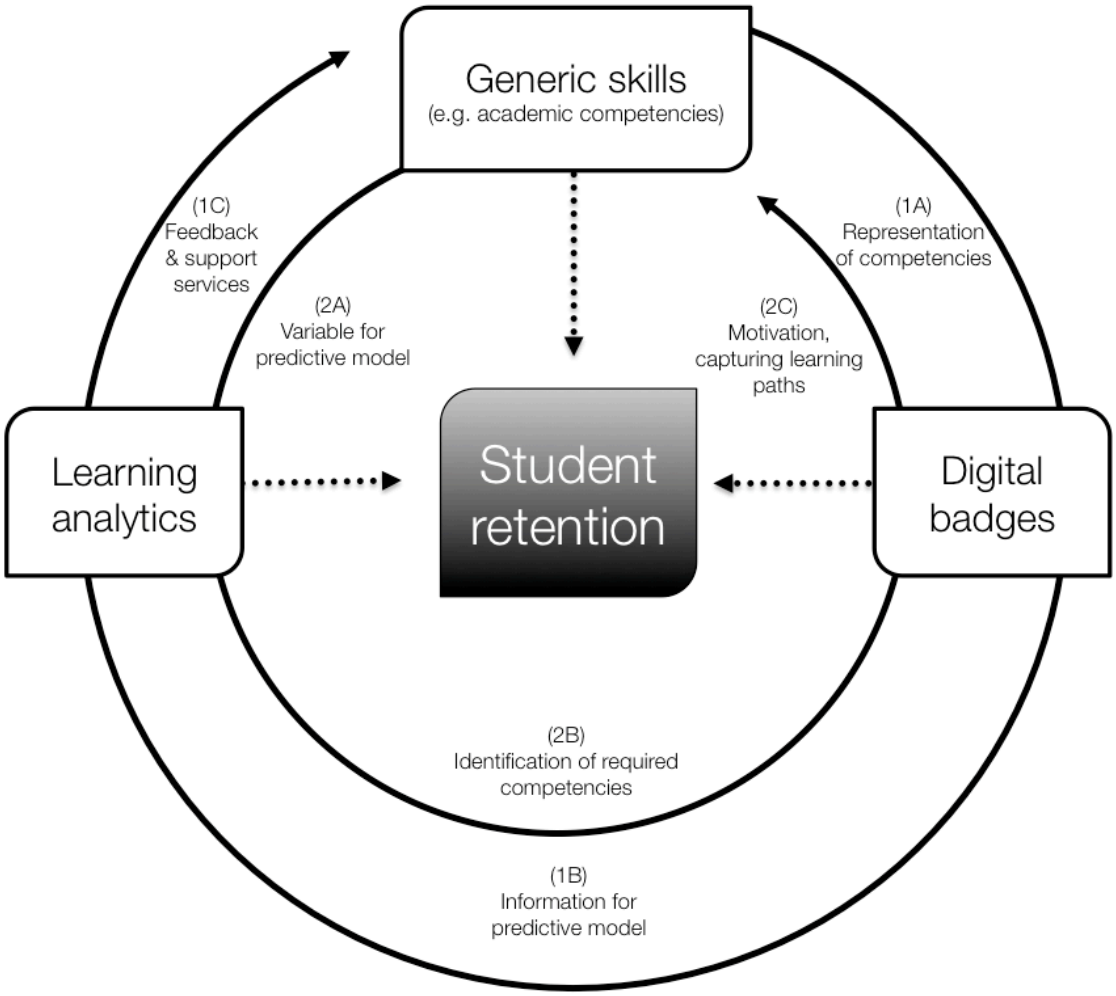

Figure 6.1. Model of learning analytics, digital badges, and generic skills.

(1A) Generic skills with regard to students' preparedness for higher education can be represented as digital badges. For example digital literacy, which higher education institutions often expect from incoming students. In a competence-based approach, digital badges offer a new opportunity to signal *21st century skills* (Binkley et al., 2012; Gibson et al., 2013; Sullivan, 2013). Digital badges visualize students' skills and competencies, allowing students to identify their achievements as well as share their digital badges with relevant stakeholders, such as university teachers and potential employers, via social networks. In this regard, Glover and Latif (2013, p. 1398) emphasize the potential to support employability as well as retention "by surfacing the less-obvious learning that is often hidden due to the focus on grades and transcripts". For example, digital literacy can be certified with digital badges.

(1B) While the student data is available in the form of digital badges in the badge ecosystem, it can be used for learning analytics to improve the predictive model for

student success in courses. For predictive models, the numbers and types of digital badges can be weighted and scored, such as academic performance measured by GPA or standardized test results. Ifenthaler and Widanapathirana (2014) introduce a learning analytics framework including individual characteristics and physical data, learners' interaction with the social web and online learning environments, and curricular requirements. In this regard, digital badges are assigned to individual characteristics, including sociodemographic information, interests, prior knowledge, and demonstrated skills and competencies, such as computer literacy. Universities have been developing different models to predict student success more precisely (Barber & Sharkey, 2012; Wolff et al., 2013). However, generic skills concerning academic demands and preparedness have been excluded in predictive models, although research has identified study skills as one of the contributing factors to student retention (Thomas, 2002; Tinto, 1993; Yorke & Longden, 2008).

(1C) On the basis of the results of the predictive model, students receive personalized feedback about their strengths and weaknesses as well as guidance for support services. Examples for support services to enhance student retention include tutoring and mentoring programs, first-year seminars, and learning communities (Barefoot et al., 1998; Chatti et al., 2012; Clark & Cundiff, 2011; Keup, 2005; Scott et al., 2008; Tinto, 2012).

Second, (2A) generic skills should be considered as a variable for the predictive algorithm identifying students' status quo for higher education demands. The inability to cope with academic demands is identified as one of the main reasons for withdrawals prior to degree completion (Tinto, 1993; Yorke & Longden, 2008). Some generic skills needed in higher education, such as time management and collaboration, are included in assessments of academic behavior and college readiness for incoming students [e.g. the *Learning and Study Strategies Inventory* (LASSI) (Weinstein & Palmer, 1990), the *Readiness and Expectations Questionnaire* (REQ) (Jansen et al., 2013)]. These test results may be used in the algorithm to predict first-year students' likelihood of being successful in a course; however, the instruments' validity and type (e.g. self-report, measurement of competencies) needs to be considered. Furthermore, generic skills and competencies, such as learning strategies and digital skills, are dynamic parameters that can change over time (Ifenthaler & Widanapathirana, 2014; Slade & Prinsloo, 2013). Certified as digital

badges, learners' progress and achieved competencies need to be regularly adapted for adequate predictions.

(2B) The predictive model recommends areas in which students need to improve and may directly suggest digital badges that can be earned in order to meet higher education demands. Thus, digital badges may make institutions' expectations of generic skills more transparent for students. Research has shown that students' adjustment to universities' expectations is an important factor in their successful transition to higher education and may contribute to enhancing student retention (Jackson et al., 2000; Smith & Wertlieb, 2005; Yorke, 2000). For instance, the *Assessment of Higher Education Learning Outcomes* (AHELO) framework provides examples of generic skills that may be important for students in higher education and thus valuable to obtain as digital badges. Moreover, Berge and Muilenburg (2016) argue that digital badges have relative or perceived value depending on the stakeholders' perspective.

(2C) Students may feel motivated to develop their skills on the basis of the gamification elements of digital badges and the visualization of their learning paths and learning progress. West and Lockley (2016) indicate that digital badges can build learning pathways between vocational education, higher education, and other training providers. In this perspective, digital badges can signal both subject-specific skills for courses as well as generic skills earned in various settings. Universities can provide guidance for learning pathways and support students in developing the competencies needed for higher education. Thus, these early interventions can enhance students' first year experience and thus contribute to student retention.

6.7 Discussion and further research

This integrative review provides an overview of learning analytics and digital badges in higher education with a focus on student retention. Research has shown that learning analytics has the potential to impact student success at universities (Arnold & Pistilli, 2012; Barber & Sharkey, 2012; Gibson & de Freitas, 2015; Slade & Galpin, 2012). Further empirical evidence and longitudinal research, however, are required to analyze whether learning analytics has a significant impact on first-year student progress and overall retention during their studies. Furthermore, Siemens (2012) suggests widening learning analytics research from its recent focus on identifying students at risk to include strategies for significantly optimizing the

learning process. While learning analytics in higher education is still an emerging field, little empirical evidence on the sustainability of feedback and recommended guidance is available. With focus on student retention, studies that examine the quality of suggested academic support are needed, also with regard to feedback on generic skills for higher education. Further, criteria for measuring and operationalizing generic skills and academic preparedness have to be defined in order to integrate them into predictive algorithms. In this respect, digital badges may function as a means of defining achievements that can be used for predictive models.

As the use of digital badges in higher education is relatively new, there is a large research field to explore. There are already some studies available that focus on different aspects of digital badges, especially on their motivational impact. There have been fewer studies on how digital badges can influence student retention in higher education. When implementing digital badges, higher education institutions should provide information in the form of an introduction to this technology. Digital literacy is a prerequisite for understanding the concept of digital badges and using them adequately. Although students are assumed to be digital natives with sophisticated digital skills, research indicates that this label is a myth and not a reality for all students (Margaryan et al., 2011a; Schulmeister, 2010). Additionally, it will be necessary to collect empirical evidence to gain insight into how students view, experience and value digital badges, for instance with regard to their learning process and academic success. Furthermore, research on digital badges should address whether educators are competent enough to create meaningful badges that certify the acquisition of generic skills, explore strategies for enhancing student retention, and focus on their potential impact on the first-year experience, as this period is crucial for student retention.

To provide an initial synthesis of learning analytics, digital badges, and generic skills for enhancing student retention in higher education, a model (Figure 6.1) was developed to serve as a platform for discussion, further research, and development. It will be necessary to conduct research to provide empirical evidence for the proposed model. For example, research needs to address the development of digital badges that aim to certify generic skills and how these digital badges may contribute to the predictive algorithm of learning analytics. In this light, studies observing the motivational impact of provided feedback and recommended digital badges are

suggested in order to provide valuable practical insight into the theoretical model presented here.

Moreover, there are various fields of education that will benefit from learning analytics and digital badges, for example within the context of higher education such as MOOCs (Fournier, Kop, & Sitlia, 2011; Lokuge Dona et al., 2014; Pursel, Stubbs, Woong Choi, & Tietjen, 2016), and outside of higher education such as K-12 (Elkordy, 2016) and professional development (Gamrat & Toomey Zimmerman, 2016; Metzger, Lubin, Patten, & Whyte, 2016). Future studies on learning analytics and digital badges, qualitative as well as quantitative, need to be conducted to obtain in-depth insight into these emerging research fields. In addition, studies should provide and report empirical evidence to enrich the discussion about the potential and limitations of learning analytics and digital badges. Many authors have predicted that learning analytics and digital badges will play a significant role in the future of higher education (Johnson et al., 2013; Johnson, Adams Becker, Estrada, & Freeman, 2014; P. Long & Siemens, 2011), and indeed, both show promise as means of impacting student learning and thus enhancing student retention in higher education.

6.8 References

Abramovich, S., Schunn, C., & Higashi, R. M. (2013). Are badges useful in education?: It depends upon the type of badge and expertise of learner. *Educational Technology Research and Development 61*(2), 217–232. doi: 10.1007/s11423-013-9289-2

ACT. (2008). *College readiness standards. For EXPLORE, PLAN, and the ACT. Includes ideas for progress.* Retrieved from http://files.eric.ed.gov/fulltext/ED510457.pdf

Ahn, J., Pellicone, A., & Butler, B. S. (2014). Open badges for education: What are the implications at the intersection of open systems and badging? *Research in Learning Technology, 22*, 1–13.

Antin, J., & Churchill, E. F. (2011). *Badges in social media: A social psychological perspective*. Paper presented at the CHI Vancouver, Canada.

Arnold, K. E. (2010). Signals: Applying academic analytics. *EDUCAUSE Quarterly, 33*, 1.

Arnold, K. E., & Pistilli, M. D. (2012). Course signals at Purdue: Using learning analytics to increase student success *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge*. New York: ACM

Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review, 64*(6), 359–372.

Bach, C. (2010). Learning analytics: Targeting instruction, curricula and student support *Proceedings of the 4th International Multi-Conference on Society,*

Cybernetics and Informatics. Orlando: International Institute of Informatics and Systematics.

Baik, C., Naylor, R., & Arkoudis, S. (2015). The first year experience in Australian universities: Findings from two decades, 1994-2014. Melbourne: Melbourne Centre for the Study of Higher Education The University of Melbourne.

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45*(5), 1017–1028.

Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41*(3), 586–598.

Barber, R., & Sharkey, M. (2012). Course correction: Using analytics to predict course success *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 259–262). New York: ACM

Barefoot, B. O., Warnock, C. L., Dickinson, M. P., Richardson, S. E., & Roberts, M. R. (Eds.). (1998). *Exploring the evidence: Reporting outcomes of first-year seminars.* (Vol. II). Columbia, SC: University of South Carolina, National Resource Center for the First-Year Experience and Students in Transition.

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*(4), 485–540.

Bennett, N., Dunne, E., & Carré, C. (1999). Patterns of core and generic skill provision in higher education. *Higher Education 37*(1), 71–93. doi: 10.1023/A:1003451727126

Berge, Z. L., & Muilenburg, L. Y. (2016). In the eye of the beholder: The value of digital badges. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education: Trends, issues, and cases* (pp. 102–108). New York, London: Routledge.

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw & E. Care (Eds.), *Assessment and teaching of 21st century skills* (pp. 17–66). New York Springer.

Bowles, A., Fisher, R., McPhail, R., Rosenstreich, D., & Dobson, A. (2014). Staying the distance: Students' perception of enablers of transition to higher education. *Higher Education Research & Development, 33*(2), 212–225.

Brinkworth, R., McCann, B., Matthews, C., & Nordström, K. (2009). First year expectations and experiences: Student and teacher perspectives. *Higher Education, 58*(2), 157–173.

Buckingham Shum, S., & Deakin Crick, R. (2012). *Learning dispositions and transferable competencies: Pedagogy, modelling and learning analytics*. Paper presented at the 2nd International Conference on Learning Analytics & Knowledge, Vancouver.

Campbell, J. P., DeBlois, P. B., & Oblinger, D. G. (2007). Academic analytics: A new tool for a new era. *EDUCAUSE Review, 42*(4), 40–57.

Campbell, J. P., & Oblinger, D. G. (2007). *Academic analytics.* Retrieved from http://net.educause.edu/ir/library/pdf/PUB6101.pdf

Chatti, M., Dyckhoff, A. L., Schroeder, U., & Thüs, H. (2012). A Reference Model for Learning Analytics. *International Journal of Technology Enhanced Learning, 4*(5-6), 318–331.

Clanchy, J., & Ballard, B. (1995). Generic skills in the context of higher education. *Higher Education Research & Development, 14*(2), 155–166. doi: 10.1080/0729436950140202

Clark, M. H., & Cundiff, N. L. (2011). Assessing the effectiveness of a college freshman seminar using propensity score adjustments. *Research in Higher Education, 52*(6), 616–639. doi: 10.1007/s11162-010-9208-x

Colvin, C., Rogers, T., Wade, A., Dawson, S., Gasevic, D., Buckingham Shum, S., . . . Fisher, J. (2015). Student retention and learning analytics: A snapshot of Australian practices and a framework for advancement. Sydney: Department of Education.

Conley, D. T. (2011). *Defining and measuring college and career readiness.* Retrieved from http://programs.ccsso.org/projects/Membership_Meetings/APF/documents/Defining_College_Career_Readiness.pdf

Cormier, D., & Siemens, G. (2010). The open course. Through the open door: Open courses as research, learning and engagement. *EDUCAUSE Review, 45*(4), 30–39.

Corrin, L., & de Barba, P. (2014). Exploring students' interpretation of feedback delivered through learning analytics dashboards. In B. Hegarty, J. McDonald & S.-K. Loke (Eds.), *Rhetoric and Reality: Critical perspectives on educational technology. Proceedings ascilite Dunedin 2014* (pp. 629–633). Dunedin, NZ.

Corrin, L., Kennedy, G., & Mulder, R. (2013). Enhancing learning analytics by understanding the needs of teachers *Proceedings Electric dreams, 30th ascilite conference*. Sydney, Australia.

Crisp, G., Palmer, E., Turnbull, D., Nettelbeck, T., & Ward, L. (2009). First year student expectations: Results from a university-wide student survey. *Journal of University Teaching & Learning Practice, 6*(1), 13–26.

Dahlstrom, E., Brooks, C., & Bichsel, J. (2014). The current ecosystem of learning management systems in higher education: Student, faculty, and IT perspectives. Louisville, CO: ECAR.

de Freitas, S., Gibson, D., Du Plessis, C., Halloran, P., Williams, E., Ambrose, M., . . . Arnab, S. (2015). Foundations of dynamic learning analytics: Using university student data to increase retention. *British Journal of Educational Technology, 46*(6), 1175–1188. doi: 10.1111/bjet.12212

Deci, E. L. (1971). Effects of externally mediated rewards of instrinsic motivation. *Journal of Personality and Social Psychology, 18*(1), 105–115.

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist, 26*(3-4), 325–346.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "Gamification" *MindTrek '11 Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, September 28-30, 2011* (pp. 9–15). New York: ACM New York.

Dimitrijević, S., Devedzić, V., Jovanović, J., & Milikić, N. (2016). Badging platforms: A scenario-based comparison features and uses. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 141–161). New York: Springer.

Dona, K. L., Gregory, J., Salmon, G., & Pechenkina, E. (2014). *Badges in the carpe diem MOOC*. Paper presented at the ascilite conference, Dunedin, New Zealand.

Drachsler, H., & Greller, W. (2016). Privacy and analytics – it's a DELICATE issue: A checklist for trusted learning analytics *LAK '16 Proceedings of the Sixth International Conference on Learning Analytics & Knowledge* (pp. 89–98). New York: ACM.

EDUCAUSE. (2012). 7 things you should know about badges. Retrieved March 8, 2016, from http://net.educause.edu/ir/library/pdf/eli7085.pdf

Elkordy, A. (2016). Development and implementation of digital badges for learning science, technology, engineering and math (stem) practices in secondary contexts: A pedagogical approach with empirical evidence. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 483–508). New York: Springer.

European Commission. (2014). The GRASS project. Retrieved May, 24, 2016, from http://grass.fon.bg.ac.rs

Evans, M. (2000). Planning for the transition to tertiary study: A literature review. *Australasian Association for Institutional Research Journal, 9*(1).

Ferguson, R. (2012). Learning analytics: drivers, developments and challenges. *International Journal of Technology Enhanced Learning, 4*(5/6), 304–317.

Ferguson, R., Hoel, T., Scheffel, M., & Drachsler, H. (2016). Guest editorial: Ethics and privacy in learning analytics. *Journal of Learning Analytics, 3*(1), 5–15.

Fiaidhi, J. (2014). The next step for Learning Analytics. *IT Professional, 16*(5), 4–8. doi: 10.1109/MITP.2014.78

Finkelstein, J., Knight, E., & Manning, S. (2013). The potential and value of using digital badges for adult learners. Washington, DC: American Institutes for Research.

Försterling, F. (2001). *Attribution. An introduction to theories, research and applications*. East Sussex, UK: Psychology Press Ltd.

Foster, J. C. (2013). The promise of digital badges. *Techniques: Connecting Education & Careers 88*(8), 31–34.

Fournier, H., Kop, R., & Sitlia, H. (2011). The value of learning analytics to networked learning on a personal learning environment *LAK '11 Proceedings of the 1st International Conference on Learning Analytics and Knowledge*. New York: ACM.

Gamrat, C., & Zimmerman, H. T. (2016). Teacher learning journeys: a design case study of a learners-centered STEM. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education. Trends, issues, and cases* (pp. 215–225). New York: Routledge.

Gašević, D., Dawson, S., Rogers, T., & Gasevic, D. (2016). Learning analytics should not promote one size fits all: The effects of instructional conditions in predicting academic success. *Internet and Higher Education, 28*, 68–84.

Gibson, D., & de Freitas, S. (2015). Exploratory analysis in learning analytics. *Technology, Knowledge and Learning 21*(1), 5–19.

Gibson, D., Ostashewski, N., Flintoff, K., Grant, S., & Knight, E. (2013). Digital badges in education. *Education and Information Technologies, 20*(2), 403–410. doi: 10.1007/s10639-013-9291-7

Glover, I. (2016). Student perceptions of digital badges as recognition of achievement and engagement in co-curricular activities. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and*

micro-credentials: Demonstrating and recognizing knowledge and competencies (pp. 443–455). New York: Springer.

Glover, I., & Latif, F. (2013). Investigating perceptions and potential of open badges in formal higher education. In J. Herrington, A. Couros & V. Irvine (Eds.), *Proceedings of EdMedia: World Conference on Educational Media and Technology 2013* (pp. 398–1402). Victoria, Canada: Association for the Advancement of Computing in Education (AACE).

Goldfinch, J., & Hughes, M. (2007). Skills, learning styles and success of first-year undergraduates. *Active Learning in Higher Education, 8*(3), 259–273. doi: 10.1177/1469787407081881

Grant, S. (2014). *What counts as learning: Open digital badges for new opportunities*. Irvine, CA: Digital Media and Learning Research Hub.

Greller, W., & Drachsler, H. (2012). Translating learning into numbers: A generic framework for learning analytics. *Educational Technology & Society, 15*(3), 42–57.

Greller, W., Ebner, M., & Schön, M. (2014). Learning analytics: From theory to practice – data support for learning and teaching. In M. Kalz & E. Ras (Eds.), *Computer Assisted Assessment. Research into E-Assessment* (pp. 79–87). Switzerland: Springer International Publishing.

Griffin, P., McGaw, B., & Care, E. (Eds.). (2012). *Assessment and teaching of 21st century skills*. New York: Springer.

Halavais, A. M. C. (2012). A genealogy of badges. *Information, Communication & Society, 15*(3), 354–373.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81–112. doi: 10.3102/003465430298487

Heckhausen, H., Schmalt, H.-D., & Schneider, K. (1985). *Achievement motivation in perspective*. Orlando, FL: Academic Press, Inc.

Heublein, U. (2014). Student drop-out from German higher education institutions. *European Journal of Education, 49*(4), 497–513.

Hickey, D. (2012). Intended purposes versus actual function of digital badges. Retrieved March 8, 2016, from http://hastac.org/blogs/slgrant/2012/09/11/intended-purposesversus-actual-function-digital-badges

Hickey, D. (2014). New Project: Open Badges in Open edX and Beyond. Retrieved March 8, 2016, from http://remediatingassessment.blogspot.com/2014/08/new-project-open-badges-in-open-edx-and.html

Hughes, G., & Smail, O. (2015). Which aspects of university life are most and least helpful in the transition to HE? A qualitative snapshot of student perceptions. *Journal of Further and Higher Education, 39*(4), 466–480. doi: 10.1080/0309877X.2014.971109

Ifenthaler, D. (2015). Learning analytics. In J. M. Spector (Ed.), *The SAGE encyclopedia of educational technology* (Vol. 2, pp. 447–451). Thousand Oaks, CA: Sage.

Ifenthaler, D., Adcock, A. B., Erlandson, B. E., Gosper, M., Greiff, S., & Pirnay-Dummer, P. (2014). Challenges for education in a connected world: Digital learning, data rich environments, and computer- based assessment—Introduction to the inaugural special issue of technology, knowledge and learning. *Technology, Knowledge and Learning, 19*(1), 121–126. doi: 10.1007/s10758-014-9228-2

Ifenthaler, D., Bellin-Mularski, N., & Mah, D.-K. (2016). *Foundations of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies*. New York: Springer.

Ifenthaler, D., & Widanapathirana, C. (2014). Development and validation of a Learning Analytics framework: Two case studies using support vector machines. *Technology, Knowledge and Learning 19*(1–2), 221–240.

Jackson, L. M., Pancer, S. M., Pratt, M. W., & Hunsberger, B. E. (2000). Great expectations: The relation between expectancies and adjustment during the transition to university. *Journal of Applied Social Psychology, 30*(10), 2100–2125.

Jansen, E. P. W. A., André, S., & Suhre, C. (2013). Readiness and expectations questionnaire: A cross-cultural measurement instrument for first-year university students. *Educational Assessment, Evaluation and Accountability, 25*(2), 115–130. doi: 10.1007/s11092-013-9161-2

Jansen, E. P. W. A., & Suhre, C. (2011). *Preparedness, first-year experiences and outcomes. A comparison between students in domestic and international degree programmes in a Dutch university*. Paper presented at the Research and Development in Higher Education: Higher Eduation on the Edge Gold Coast, Australia.

Jansen, E. P. W. A., & van der Meer, J. (2007). *First-year students' expectations and perceptions of readiness before they start university*. Paper presented at the 30th Annual HERDSA Conference: Enhancing higher education: Theory and scholarship, Adelaide.

Jayaprakash, S. M., Moody, E. W., Lauría, E. J. M., & Baron, J. D. (2014). Early alert of academically at-risk students: An open source analytics initiative. *Journal of Learning Analytics, 1*(1), 6–47.

Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Ludgate, H. (2013). NMC Horizon Report: 2013 Higher Education Edition. Austin, Texas: The New Media Consortium.

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). NMC Horizon Report: 2014 Higher Education Edition. Austin, Texas: The New Media Consortium.

Jovanovic, J., & Devedžić, V. (2015). Open badges: Novel means to motivate, scaffold and recognize learning. *Technology, Knowledge and Learning, 20*(1), 115–122. doi: 10.1007/s10758-014-9232-6

Kantanis, T. (2000). The role of social transition in students' adjustment to the first-year of university. *Journal of Institutional Research, 9*(1), 100–110.

Keller, J. M. (1987). Development and use of the ARCS Model of instructional design. *Journal of Instructional Development, 10*(3), 2–10.

Kelley, T., & Hickey, D. (2014). Major Highlights of the 2013 Educational Assessment BOOC. Retrieved March 8, 2016, from http://remediatingassessment.blogspot.com/2014/05/major-highlights-of-2013-educational.html

Keup, J. R. (2005). The impact of curricular interventions on intended second year re-enrollment. *Journal of college Student Retention, 7*(1-2), 61–89.

Krause, K.-L. (2005). Serious thoughts about dropping out in first year: Trends, patterns and implications for higher education. *Studies in Learning, Evaluation, Innovation and Development, 2*(3), 55–68.

Kuh, G., & al., e. (2005). *Student success in college: Creating conditions that matter*. San Francisco: Jossey-Bass.

Lai, K.-W., & Hong, K.-S. (2014). Technology use and learning characteristics of students in higher education: Do generational differences exist? *British Journal of Educational Technology, 46*(4), 725–738. doi: doi:10.1111/bjet.12161

Lauría, E. J. M., Moody, E. W., Jayaprakash, S. M., Jonnalagadda, N., & Baron, J. D. (2013). Open academic analytics initiative: Initial research findings *LAK '13 Proceedings of the 3rd International Conference on Learning Analytics and Knowledge* (pp. 150–154). New York: ACM

Leggett , M., Kinnear, A., Boyce, M., & Bennett, I. (2004). Student and staff perceptions of the importance of generic skills in science. *Higher Education Research & Development, 23*(3), 295–312. doi: 10.1080/0729436042000235418

Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality and Social Psychology, 28*(1), 129–137.

Long, P., & Siemens, G. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review, 46*(5), 31–40.

Malone, T. W., & Lepper, M. R. (1987). Making learning fun: A taxonomy of intrinsic motivations for learning. In R. E. Snow & M. J. Farr (Eds.), *Aptitude, learning and instruction III: Conative and affective process analyses* (pp. 223–253). Hilsdale, NJ: Erlbaum.

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education, 56*(2), 429–440.

McDaniel, R., & Fanfarelli, J. (2016). Building better digital badges: Pairing completion logic with psychological factors. *Simulation & Gaming, 47*(1), 1–30.

Metzger, E. C., Lubin, L., Patten, R., & Whyte, J. (2016). Applied gamification: Creating reward systems for organizational professional development. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 457–466). New York: Springer.

Moon, M.-K., Jahng, S.-G., & Kim, T.-Y. (2011). A computer-assisted learning model based on the digital game exponential reward system. *Turkish Online Journal of Educational Technology, 10*(1), 1–14.

Mozilla Foundation and Peer 2 Peer University. (2012). *Open badges for lifelong learning. Exploring an open badge ecosystem to support skill development and lifelong learning for real results such as jobs and advancement.* Retrieved from https://wiki.mozilla.org/images/b/b1/OpenBadges-Working-Paper_092011.pdf

Murray, M. C., & Pérez, J. (2014). Unraveling the digital literacy paradox: How higher education fails at the fourth literacy. *Issues in Informing Science and Information Technology, 11*, 85–100.

Nadelson, L. S., Semmelroth, C., Martinez, G., Featherstone, M., Fuhriman, C. A., & Sell, A. (2013). Why did they come here?–The influences and expectations of first-year students' college experience. *Higher Education Studies, 3*(1), 50–62.

Newby, T., Wright, C., Besser, E., & Beese, E. (2016). Passport to creating and issuing digital instructional badges. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials:*

Demonstrating and recognizing knowledge and competencies (pp. 179–201). New York: Springer.

OECD. (2013a). *Education at a glance 2013: OECD indicators*. Retrieved from http://dx.doi.org/10.1787/eag-2013-en

OECD. (2013b). *Skilled for life? Key findings from the survey of adult skills*. Retrieved from https://http://www.oecd.org/site/piaac/SkillsOutlook_2013_ebook.pdf

OECD. (2014). *PISA 2012 results in focus. What 15-year-old know and what they can do with what they know*. Retrieved from https://http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf

Oliver, B. (2016). Better 21C Credentials. Evaluating the promise, perils and disruptive potential of digital credentials. Australia: Deakin University.

Papamitsiou, Z., & Economides, A. (2014). Learning analytics and educational data mining in practice: A systematic literature review of empirical evidence. *Educational Technology & Society, 17*(4), 49–64.

Pardo, A., & Siemens, G. (2014). Ethical and privacy principles for learning analytics. *British Journal of Educational Technology, 45*(3), 438–450.

Pistilli, M. D., & Arnold, K. E. (2010). In practice: Purdue Signals: Mining real-time academic data to enhance student success. *About Campus, 15*(3), 22–24. doi: 10.1002/abc.20025

Põldoja, H., & Laanpere, M. (2014). Exploring the potential of open badges in blog-based university courses. In Y. Cao, T. Väljataga, J. K. T. Tang, H. Leung & M. Laanpere (Eds.), *New Horizons in Web Based Learning* (pp. 172–178). Switzerland: Springer.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1–6.

Prinsloo, P., & Slade, S. (2013). An evaluation of policy frameworks for addressing ethical considerations in learning analytics *LAK '13 Proceedings of the 3rd International Conference on Learning Analytics and Knowledge*. New York: ACM

Pursel, B. K., Stubbs, C., Woong Choi, G., & Tietjen, P. (2016). Digital badges, learning at scale, and big data. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education: Trends, issues, and cases* (pp. 93–101). New York, London: Routledge.

Randall, D. J., Harrison, J. B., & West, R. E. (2013). Giving credit where credit is due: Designing open badges for a technology integration course. *TechTrends, 57*(6), 88–95. doi: 10.1007/s11528-013-0706-5

Reason, R. D., Terenzini, P. T., & Domingo, R. J. (2006). First things first: Developing academic competence in the first year of college. *Research in Higher Education, 47*(2), 149–175.

Resnick, M. (2012). Still a badge skeptic. http://hastac.org/blogs/mres/2012/02/27/still-badge-skeptic

Romero, C., Ventura, S., Espejo, P. G., & Hervás, C. (2008). *Data Mining Algorithms to Classify Students*. Paper presented at the The 1st International Conference on Educational Data Mining, Montréal, Québec, Canada.

Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet und Higher Education, 6*, 1–16.

Scheffel, M., Drachsler, H., & Specht, M. (2015). Developing an evaluation framework of quality indicators for learning analytics *LAK '15 Proceedings of the 5th International Conference on Learning Analytics and Knowledge* (pp. 16–20). New York: ACM

Scheffel, M., Drachsler, H., Stoyanov, S., & Specht, M. (2014). Quality indicators for learning analytics. *Educational Technology & Society, 17*(4), 117–132.

Schulmeister, R. (2010). Students, internet, eLearning and web 2.0. In M. Ebner & M. Schiefner (Eds.), *Looking Toward the Future of Technology-Enhanced Education: Ubiquitous Learning and Digital Native*. Hershey, PA: IGI Global.

Schuster, B., Försterling, F., & Weiner, B. (1989). Perceiving the causes of success and failure. A cross-cultural examination of attributional concepts. *Journal of Cross-Cultural Psychology, 20*(2), 191–213.

Sclater, N., & Bailey, P. (2015). *Code of practice for learning analytics.* Retrieved from https://http://www.jisc.ac.uk/sites/default/files/jd0040_code_of_practice_for_learning_analytics_190515_v1.pdf

Sclater, N., Peasgood, A., & Mullan, J. (2016). *Learning analytics in higher education. A review of UK and international practice. Full report.* Retrieved from https://http://www.jisc.ac.uk/sites/default/files/learning-analytics-in-he-v3.pdf

Scott, G., Shah, M., Grebennikov, L., & Singh, H. (2008). Improving student retention: A university of Western Sydney case study. *Journal of Institutional Research, 14*(1), 9–23.

Selwyn, N. (2009). The digital native - myth and reality. *Aslib Proceedins: New Information Perspectives, 61*(4), 364–379. doi: 10.1108/00012530910973776

Shehata, S., & Arnold, K. E. (2015). Measuring student success using predictive engine *LAK '15 Proceedings of the 5th International Conference on Learning Analytics and Knowledge*. New York: ACM

Siemens, G. (2012). Learning analytics: Envisioning a research discipline and a domain of practice *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 4–8). New York: ACM

Siemens, G. (2013). Learning Analytics: The emergence of a discipline. *American Behavioral Scientist, 57*(10), 1380–1400.

Siemens, G., Dawson, S., & Lynch, G. (2013). *Improving the quality and productivity of the higher education sector. Policy and strategy for systems-level deployment of learning analytics.* Retrieved from http://solaresearch.org/Policy_Strategy_Analytics.pdf

Siemens, G., Gašević, D., Haythornthwaite, C., Dawson, S., Buckingham Shum, S., Ferguson, R., . . . Baker, R. S. J. d. (2011). *Open learning analytics: An integrated & modularized platform. Proposal to design, implement and evaluate an open platform to integrate heterogeneous learning analytics techniques.* Retrieved from http://solaresearch.org/OpenLearningAnalytics.pdf

Slade, S., & Galpin, F. (2012). Learning analytics and higher education: Ethical perspectives *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 16–17). New York: ACM

Slade, S., & Prinsloo, P. (2013). Learning Analytics: Ethical Issues and Dilemmas. *American Behavioral Scientist, 57*(10), 1509–1528.

Smith, J. S., & Wertlieb, E. C. (2005). Do first-year college students' expectations align with their first-year experiences? *NASPA Journal, 42*(2), 153–174.

Sullivan, F. M. (2013). New and alternative assessments, digital badges, and civics: An overview of emerging themes and promising directions (CIRCLE working paper no. 77): The center for information & research on civic learning & engagement.

Tanes, Z., Arnold, K. E., Selzer King, A., & Remnet, M. A. (2011). Using signals for appropriate feedback: Perceptions and practices. *Computers & Education, 57*(4), 2414–2422.

Taylor, J. A., & Bedford, T. (2004). Staff perceptions of factors related to non-completion in higher education. *Studies in Higher Education, 29*(3), 375–394.

Thomas, L. (2002). Student retention in higher education: The role of institutional habitus. *Journal of Education Policy, 17*(4), 423–442. doi: 10.1080/02680930210140257

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125. doi: 10.3102/00346543045001089

Tinto, V. (1993). *Leaving college. Rethinking the causes and cures of student attrition*. Chicago; London: The University of Chicago Press.

Tinto, V. (2012). *Completing college. Rethinking institutional action*. Chicago; London: The University of Chicago Press.

Tran, C., Schenke, K., & Hickey, D. T. (2014). Design principles for motivating learning with digital badges: Consideration of contextual factors of recognition and assessment *ICLS 2014 Proceedings*.

Tremblay, K., Lalancette, D., & Roseveare, D. (2012). Assessment of higher education learning outcomes. Feasibility study report. Design and implementation (Vol. 1): OECD.

Verbert, K., Duval, E., Klerkx, J., Govaerts, S., & Santos, J. S. (2013). Learning analytics dashboard applications. *American Behavioral Scientist, 57*(10), 1500–1509.

Waters, D. (2003). Supporting first-year students in the bachelor of arts: An investigation of academic staff attitudes. *Arts and Humanities in Higher Education, 2*(3), 293–312. doi: 10.1177/14740222030023006

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*(4), 548–573.

Weiner, B. (1986). *An atrributional theory of motivation and emotion*. New York: Springer.

Weinstein, C. E., & Palmer, D. R. (1990). LASSI-HS user's manual. Clearwater, Florida: H&H Publishing Company.

West, D., & Lockley, A. (2016). Implementing digital badges: The importance of institutional context. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 467–482). New York: Springer.

Willcoxson, L., Cotter, J., & Joy, S. (2011). Beyond the first-year experience: The impact on attrition of student experiences throughout undergraduate degree studies in six diverse universities. *Studies in Higher Education, 36*(3), 331–352.

Willis, J. E., Campbell, J. P., & Pistilli, M. D. (2013). Ethics, big data, and analytics: A model for application. Retrieved May 17, 2016, from http://er.educause.edu/articles/2014/4/~/link.aspx?_id=B0FD05F11CF14C49B6284C43DE06ECA5&_z=z

Willis, J. E., Quick, J., & Hickey, D. T. (2015). Digital badges and ethics: The uses of individual learning data in social contexts. In D. T. Hickey, J. Jovanovic, S. Lonn & J. E. Willis (Eds.), *Proceedings of the Open Badges in Education (OBIE 2015) Workshop*. Poughkeepsie, New York, USA: ceur-ws.

Wingate, U. (2006). Doing away with "study skills". *Teaching in Higher Education, 11*(4), 457–469. doi: 10.1080/13562510600874268

Wolff, A., Zdrahal, Z., Herrmannova, D., Kuzilek, J., & Hlosta, M. (2014). Developing predictive models for early detection of at-risk students on distance learning modules *Machine Learning and Learning Analytics Workshop at The 4th International Conference on Learning Analytics and Knowledge (LAK14)*. Indianapolis, Indiana, USA.

Wolff, A., Zdrahal, Z., Nikolov, A., & Pantucek, M. (2013). Improving retention: Predicting at-risk students by analysing clicking behaviour in a virtual learning environment *LAK '13 Proceedings of the 3rd International Conference on Learning Analytics and Knowledge* (pp. 145–149). New York: ACM

Wright, C. V., & O'Shea, K. (2014). Digital Badges and Outcomes-Based Learning. Retrieved May, 24, 2016, from http://www.educause.edu/events/educause-connect-baltimore/2014/digital-badges-and-outcomes-based-learning

Wu, M., Whiteley, D., & Sass, M. (2015). From girl scout to grown up: Emerging applications of digital badges in higher education. *The Online Journal of Distance Education and e-Learning, 3*(2), 48–52.

Yorke, M. (2000). Smoothing the transition into higher education: What can be learned from student non-completion? *Australasian Association for Institutional Research Journal, 9*(1).

Yorke, M., & Longden, B. (2008). The first-year experience of higher education in the UK. York: The Higher Education Academy.

7 Discussion and future research

7.1 Main findings and theoretical contribution

7.1.1 A model of academic competencies as a complement for established models on student retention

The proposed model of academic competencies contributes to the research gap of generic skills in higher education studies (Lombardi et al., 2011). The model follows a competency-based approach (Weinert, 2001a) and consists of five academic competencies on the basis of a literature review: time management, learning skills, self-reflection, technology proficiency, and research skills (e.g., Leggett et al., 2004; Reid & Moore, 2008; Taylor & Bedford, 2004). The model shows moderate reliability (Study 3). With its focus on five decisive academic competencies, this conceptual model is designed to complement established models and theories addressing student retention in higher education (e.g., Bean & Eaton, 2000; Heublein, 2014; Tinto, 1993) and to serve as a platform for discussion about required academic competencies for higher education studies (Barrie, 2007; N. Bennett et al., 1999; Leggett et al., 2004). In the qualitative study (Study 4), the interviewed academic staff valued the importance of generic skills for higher education. The respondents expressed a positive attitude toward the proposed model and suggested other decisive generic skills for higher education studies, such as students' behavior and personal attitude toward their studies, which includes aspects such as responsibility and independent work for studies, self-discipline, and critical thinking skills. Study 3 indicates that first-year students' intention to leave the institution prior to degree completion may be influenced by their perceptions and expectations about academic competencies, especially regarding research skills. However, the impact of the proposed five academic competencies on first-year students' dropout intention was rather small overall, which is in line with similar research (Heublein et al., 2010; Yorke & Longden, 2008). Nonetheless, these findings should be considered in the discussion about necessary academic competencies for higher education studies and the development of adequate academic support programs. Study 3 indicates that first-year students' perceptions of demands and expectations of academic support services differ from those of the faculty. Academic support programs, such as summer bridge programs, first-year seminars, mentoring programs, and learning communities to

enhance student retention, should not focus merely on subject-specific skills but also on generic skills. This is particularly relevant, as the focus on generic skills and competencies has become a crucial issue in higher education; for example, within the framework of the Bologna reform and increasing access to higher education (Education Audiovisual and Culture Executive Agency, 2012; European Commission, EACEA, & Eurydice, 2015). Thus, the focus on students' academic preparedness and academic competencies is needed in an effort to provide a learning environment in which adaptive and personalized learning is possible. The emphasis on personalized learning and individual needs is also essential to expanding access to higher education for nontraditional students and increasing student diversity. Overall, Study 1 shows that first-year students often enter higher education with high self-confidence with regard to academic competencies; however, academic staff perceived their academic competencies as rather low (Study 4). The findings also serve as a basis for a discussion about perceptions and expectations of first-year students, academic staff, and higher education institutions, such as with respect to their understanding of roles, responsibility and independence in higher education, to contribute to realistic perceptions and expectations that largely accord with students' first-year experiences.

7.1.2 First-year students' and academic staff perspective on academic competencies and academic support

This thesis contributes to new insights into first-year students' and academic staff perspectives on academic competencies and academic support for higher education studies.

With a focus on the first-year student perspective, one main finding of Study 1 was that participants assessed their skill levels in all five academic competencies of the conceptual model as rather high at the beginning of their studies. First-year students' high confidence may be based on their prior school experience; however, studies show that school preparation may not be adequate to meet the requirements for higher education studies and academic staff expectations (Barrie, 2007; Cook & Leckey, 1999; Goldfinch & Hughes, 2007). Interviews with members of the academic staff indicated that their perceptions of first-year students' academic competencies are lower than staff expectations (Study 4). Academic staff often expect first-year students either to have already developed competencies for higher

education studies based on their prior secondary education or to be responsible for developing these academic competencies on their own, which is in line with the few available studies (Barrie, 2007; Waters, 2003).

With regard to academic support services, Study 1 and Study 3 show that first-year students expect the most support for the academic competency of research skills. Study 3 indicates that first-year students' low expectation of academic support in developing generic skills is related to a higher intention to withdraw from the institution prior to degree completion. Study 4, however, shows that academic staff perspectives on their role in supporting first-year students mainly refers to the teaching of discipline-specific skills because they often regard generic skills as a prerequisite for entering higher education studies, which is consistent with available research (Barrie, 2007). The exploration of academic staff understanding of their role in supporting first-year students in developing decisive academic competencies for higher education studies offers a new insight and is a theoretical contribution (see Study 4). Some interviewed academic staff members understood their role in supporting first-year students with deficits in academic competencies, especially in research skills. Research reveals that academic support services are essential for and have shown positive effects on student retention, especially in the challenging first year of higher education (Tinto, 2012; Yorke, 2000). However, not all students directed to academic support programs attend, if these are voluntary (Attewell et al., 2006; Schmied & Hänze, 2015). Thus, the findings of Study 1, Study 2, Study 3, and Study 4 may serve as an initial basis for discussion about necessary support services, which might also be integrated into the curriculum and may be aligned in the classroom (Tinto, 2012).

Overall, the findings of this thesis contribute to a better understanding of first-year students' and academic staff perceptions and expectations, which may help higher education institutions to develop adequate academic support services to enhance student retention. Section 7.2 contains practical implications for adequate and personalized academic support services to meet students' individual needs as well as ideas for a more transparent communication of academic requirements.

7.1.3 Potential of educational technologies and research fields on student retention

The second proposed model (in the integrative review) of this thesis connects academic competencies with two emerging educational technologies and research fields: learning analytics and digital badges. As described in the integrative review (Chapter Six), learning analytics as a research field incorporates different objectives, purposes, functions, opportunities, and challenges than digital badges as digital symbols for achievements. Nonetheless, both show promise to enhance student retention in higher education. The presented synthesis of learning analytics, digital badges, and academic competencies may contribute to a new theoretical perspective on the effort to enhance student retention. This model may serve as a platform for discussion and future research on learning analytics and digital badges to increase student retention. Chapter Six provides an overview of theoretical frameworks, research studies, current practices, chances, and challenges, as well as considerations for further research for learning analytics and digital badges, with an explicit focus on student retention in higher education. Taking those separate overviews as a basis, the proposed model may be valuable for higher education institutions as a new approach to connect academic competencies as a factor for student success with emerging technologies for identifying students' areas of support and signaling students' competencies. Further research is required to test the impact of the conceptual model with regard to student progress and retention. This aspect is further described in Section 7.2 (Practical Implications) and Section 7.3 (Limitations and Future Research).

7.2 Practical implications

7.2.1 Implementation of adequate and personalized academic support services

Findings in this thesis indicate that academic support services should especially address the academic competency of research skills (Study 1, Study 2, Study 3, Study 4). However, support services for all academic competencies of the model are recommended because all five proposed academic competencies have been valued as important for higher education studies by the interviewed academic staff (Study 4).

Overall, academic support services should focus on the development of students' competencies (Burnette, 2016b; Voorhees, 2001). These academic support services should be personalized and adaptive to take student diversity into account and so meet students' individual needs (Wyatt, 2011). Thus, the suggested support services should be designed as competency-based programs and made available face-to-face and online. Examples include summer bridge courses, mentoring programs, adaptable learning programs, and online tutorials, which could be integrated into universities' web-based platforms. Academic support services might be an integrated part of the curriculum aligned in the classroom (Tinto, 2012) because not all students directed to academic support programs attend, even though studies report that these programs are effective (Attewell et al., 2006; A. Bowles et al., 2014; Hill, 2012; Olson & Klein-Collins, 2015; Schmied & Hänze, 2015).

Furthermore, educational technologies, such as learning analytics and digital badges, may be utilized to provide adequate and personalized academic support services (Chapter Six). For instance, learning analytics may predict students' risk of failing a course, especially in the crucial first year of higher education studies. Learning analytics may also help to suggest support services that address students' diversity and their individual needs. Moreover, digital badges can be used to display students' academic competencies and areas of academic development. As suggested in the proposed synthesis of generic skills, learning analytics, and digital badges, generic skills can be represented as digital badges, which can be used in learning analytics algorithms to recommend personalized support services (Mah, 2016).

Research with regard to nontraditional students shows that some of them are not informed about higher education support services (Banscherus, Kamm, & Otto, 2015), so information events, advertisement, networks, and transparent communication are required to introduce these services. This information may also be integrated into higher education web-based systems, such as the learning management system or the learning analytics dashboard. An evaluation of these support programs is also suggested; for example, with regard to quality assurance, target group analyses, and analyses of effectiveness.

7.2.2 Enhanced cooperation between higher education and secondary education

Study 1 reveals first-year students' high confidence about the five proposed academic competencies overall, which may be based on their school experience. Nevertheless, this school preparation may not be adequate to meet the requirements for higher education studies (Cook & Leckey, 1999). Academic staff often expect first-year students to enter higher education already prepared to cope with the academic demands on the basis of their prior education (Barrie, 2007). Many students, however, are often unsure of what is expected of them in academic terms, and inability to cope with academic requirements is one important factor for discontinuing higher education (Thomas, 2002; Yorke & Longden, 2008). Study 1 also reveals first-year students' rather high expectations concerning academic support services, which may be based on their school experience (Byrne & Flood, 2005). However, Study 4 shows that many academic staff do not feel responsible for teaching generic skills for higher education studies, which is in line with available research (Barrie, 2007). Students' realistic perceptions and expectations contribute to student retention, for which transparent communication of requirements may be essential (Jackson et al., 2000; Keup, 2007; Maitland Schilling & Schilling, 2005).

To contribute to realistic perceptions and expectations of prospective and first-year students, it is suggested that schools and higher education institutions should intensify their cooperation. This may include information events and materials, transparent information about requirements, and a more holistic preparation to meet higher education demands, for both subject-specific and academic competencies (Köller, 2013; Neumann & Trautwein, 2013). The latter may also be realized by using digital badges (Mah, 2016, 2017). Digital badges may signal the requirements in academic competencies for higher education and the criteria to assess these digital badges, which may be necessary for successful studying. Schools may discuss those requirements and offer opportunities to assess those badges within secondary school education to encourage adequate preparation for higher education studies. As diplomas represent qualifications and assume a readiness for higher education, digital badges may function as indicators for informal learning experience (Ellis, Nunn, & Avella, 2016) and symbolize incoming students' preparation and readiness in academic competencies.

7.2.3 Empowering prospective and first-year students

The transition from secondary to higher education is a challenging period (e.g., Jackson et al., 2000; Keup, 2007; Leese, 2010; Tinto, 1993) that includes aspects such as social transition, academic transition, and meeting expectations and perceptions. First-year students have to adjust to different styles of learning, teaching, and assessment in higher education (Surgenor, 2013). Study 4 shows that many academic staff expect first-year students to be independent learners and responsible for developing academic competencies unassisted because they believe first-year students' prior education will have prepared these students to cope with the demands of higher education. Thus, prospective and first-year students should be empowered to be independent and responsible for their own learning gains and success in higher education. Being informed about study programs is crucial for realistic perceptions and expectations (Heublein et al., 2009). With a focus on subject-specific content and skills, online self-assessments, such as the Career Counseling for Teachers (CCT) (Mayr, Müller, & Nieskens, 2016), have been attracting increased interest recently (Brunner, Ranft, & Wittig, 2015; Hasenberg et al., 2014). These can support prospective students in testing their skills and interests to gain a first insight into the program, which may help to verify whether skills and interests match (Mayr et al., 2016). With a focus on academic competencies, self-readiness tests prior to higher education studies could be developed and offered to contribute to students' self-evaluation and for transparent communication of requirements.

7.2.4 Utilization of learning analytics to enhance student retention

The integrative review provides an overview of current research findings and practical examples of utilizing learning analytics in higher education. Many studies report a positive impact of learning analytics in increasing student retention in higher education by the identification of students at risk of failing a course and guidance to academic support services (Arnold & Pistilli, 2012; Papamitsiou & Economides, 2016; Sclater et al., 2016). When learning analytics is used as an early warning system, it may help students, academic staff, and the institution to monitor learning progress, provide feedback, and recommend support services (Pistilli, 2017). It is

suggested that higher education institutions consider implementing learning analytics within a holistic framework of change management to contribute to first-year student retention (Ulriksen, Madsen, & Holmegaard, 2010). *Change management* refers to all actions that are required for the initiation and realization of new strategies, structures, systems, and behaviors (Anderson & Ackermann-Anderson, 2001; Gattermeyer & Al-Ani, 2001). Challenges for the implementation of learning analytics systems may include the understanding, acceptance, and preparedness of stakeholders (Howell, Roberts, Seaman, & Gibson, 2017; Ifenthaler, 2017; Schumacher & Ifenthaler, 2017), learning and instructional design considerations, including learning analytics student dashboards (Park & Jo, 2015; Roberts, Howell, & Seaman, 2017; Verbert et al., 2013), and data privacy and ethical issues (Arnold & Sclater, 2017; Drachsler & Greller, 2016; Gašević, Dawson, & Jovanović, 2016; Ifenthaler & Schumacher, 2016).

7.2.5 Utilization of digital badges to enhance student retention

Digital badges show promise in supporting student retention in higher education (Hickey, 2014; Moon et al., 2011), which is further described in Chapter Six. Practical implications regarding opportunities for utilizing digital badges may include encouraging first-year students to keep on track with their studies, making them aware of their academic competencies and areas of improvement, capturing their learning paths, and signaling their achievements (Blackburn, Porto, & Thompson, 2016; Mah, 2016; Mozilla Foundation and Peer 2 Peer University, 2012). Challenges in the implementation of digital badges may include students' and teaching staff perceptions and acceptance of them (Berge & Muilenburg, 2016; Glover, 2016), digital competence for developing and utilizing them (Devedžić & Jovanovic, 2015; Instefjord & Munthe, 2017; Newby et al., 2016), motivation to use them (Abramovich et al., 2013; Coleman, 2017; Fanfarelli & McDaniel, 2017), and data privacy and ethical issues (Willis et al., 2015).

7.3 Limitations and future research

As with all studies, this thesis has some limitations that require consideration for the interpretation of results. Overall, the generalization of results is limited. Data

collection for Study 1, Study 2, and Study 4 occurred at the same German university; however, Study 3 was conducted at a second German university. All studies and the integrative review provide an overview of the international research and current practice, so the theoretical contributions and suggestions for practical implications prohibit generalization and direct transfer for national higher education institutions. Limitations and future research of the individual papers are considered in the corresponding chapters. The following presentation focuses on overarching limitations, which inspire directions for future research.

7.3.1 Testing students' academic competencies

In this thesis, German first-year students' self-reported confidence, perceptions, and expectations regarding a model of academic competencies were addressed as an exploratory investigation of the field (Study 1, Study 2, Study 3). With a focus on self-reported confidence, students may lack the competence for accurate self-assessment (Kruger & Dunning, 1999; Lowman & Williams, 1987). On the basis of the presented findings in this thesis, future studies should include research questions as well as instruments for testing students' academic competencies. Research questions that merit further investigation could include the following:

1. How competent are first-year students with regard to the five academic competencies of the proposed model?
2. Does first-year students' level of academic competencies differ with regard to their perceptions and expectation of higher education studies?

First-year students' academic competencies could be tested using various instruments within a framework of a comprehensive evaluation strategy and quality assurance, such as self-assessments, competency tests, academic staff evaluation, and digital badges. Self-assessments and competency-based tests, such as the ACT (ACT, 2008), could provide information about prospective and first-year students' academic competencies and serve as readiness tests for higher education studies. Moreover, instruments for testing academic competencies must be developed. The questionnaire used for Study 1, Study 2, and Study 3 could function as a foundation, but it requires further development and validation using item response theory (Masters, 1988; Rost, 2004). Based on those self-assessments and competency tests, personalized feedback and support services could be suggested for the beginning of higher education studies. Academic staff could provide students with feedback

regarding academic competencies within specific teaching methods, such as research-based learning (Turner, Wuetherick, & Healey, 2008) for research and learning skills or project-based learning for time management skills (Bell, 2010). Digital badges can be implemented for the certification and representation of students' academic competencies, which higher education should define within curricula development strategies and transparent communication of requirements (Gibson et al., 2013; Mah, 2017). Furthermore, those test results could provide information about students' progress in developing academic competencies and should be integrated into longitudinal studies for evaluation and empirical data for quality assurance.

7.3.2 Impact of academic competencies on student retention

The presented studies in this thesis function as exploratory studies of first-year students' perceptions and expectations with regard to a proposed model of five academic competencies. First-year students' intention to leave the institution prior to degree completion was analyzed with regard to academic competencies, but the impact of academic competencies on student retention was not addressed. Students' intention to leave the institution prior to degree completion instead of actual student dropout or student retention is often researched; for example, due to a legal requirement to record students' study progress every semester and recognize difficulties in identifying actual student dropout (Fellenberg & Hannover, 2006; Heublein, 2014; Multrus, Ramm, & Bargel, 2011). In Study 3, first-year students' intention to leave the institution prior to degree completion was analyzed. The findings indicate that a high intention to leave is associated with rather low perceptions of higher education requirements in academic competencies. Low perceptions of academic support are associated with a higher intention to withdraw. Overall, the studies on first-year students' perspective and the academic staff perspective provide information about required academic support services for the development of adequate support programs for academic competencies.

Future studies should analyze the actual impact of academic competencies on first-year student retention and degree completion in higher education. Interesting research questions for further studies could include the following:

1. Do academic competencies impact first-year student retention?

2. Do academic support services for the development of academic competencies contribute to first-year student retention?
3. How can first-year students be motivated to participate in voluntary academic support services to develop academic competencies?

To test these research questions, a longitudinal research design is suggested to provide information about first-years students' academic competencies, their adjustment and development of academic competencies during their higher education studies, changes in their perceptions and expectations, participation in academic support services, and their intention to leave the institution and drop out. The amendment of the law for higher education statistics aims to provide data on students' study status and pathways to enhance study success (Bundestag, 2017). This data may be combined with data from testing students' academic competencies (see also 7.3.1) and may also include information about students' participation in academic support services. Furthermore, the impact of academic support services on first-year students' development of academic competencies and retention could be analyzed in experimental designs with control groups (Creswell, 2012). Moreover, a mixed method design (Bryman, 2012) is proposed: For instance, first-year students' motivation to participate in voluntary academic support and their preferences of academic support services could be investigated in focus group interviews (Creswell, 2012; Denzin & Lincoln, 2011), and on this basis, quantitative studies for generalization of the qualitative findings could be conducted.

7.3.3 Comparison of the student and academic staff perspectives

In this thesis, the first-year student perspective (Study 1, Study 2, Study 3) and the academic staff perspective (Study 4) on academic competencies were analyzed. These studies indicate a mismatch between these two perspectives. For example, many first-year students self-reported high confidence overall regarding the five academic competencies; however, academic staff perceived first-year students' competencies as rather low. First-year students also reported rather high expectations of being taught academic competencies by academic staff; in contrast, many academic staff expect first-year students to already possess these academic competencies. However, the comparison of the first-year student and academic staff perspectives is just one indicator of possible mismatches. The available research has

already revealed mismatches between the student and academic staff perspectives on several aspects of higher education, such as assessment, learning habits, and workload (Brinkworth et al., 2009; Crisp et al., 2009; Surgenor, 2013). Future research requires a direct comparison of these two perspectives to validate the assumption of mismatch regarding the five academic competencies. The following research questions could be analyzed in further studies:

1. Do first-year students' and academic staff expectations of required academic competencies for higher education studies match?
2. How do first-year students and academic staff understand each other's roles and responsibilities within higher education?

Focus groups interviews are proposed to compare the perspectives of first-year students and those of the academic staff (Creswell, 2012; Marshall & Rossman, 2016; Patton, 1990). These interviews can serve as a basis for quantitative studies with a larger sample size. The findings may help higher education institutions to communicate academic staff expectations transparently in an effort to provide first-year students with realistic perceptions of higher education studies. The findings may help first-year students and academic staff to understand each other's perspectives and may contribute to the building of a meaningful partnership between students and academic staff (Zaitseva, Clifford, Nixon, Deja, & Murphy, 2011).

7.3.4 Impact of learning analytics on student retention

The individual potential of learning analytics on student retention was presented by conducting an integrative review, which provides an initial overview of empirical studies and practical experiences in using learning analytics in higher education. However, empirical research, which focuses on the impact of learning analytics on student success and student retention in higher education, is still required (Ferguson, Brasher, et al., 2016). Relevant research questions could include the following:

1. What is the impact of learning analytics on student retention?
2. How can academic competencies be integrated into learning analytics algorithms to test their predictive impact on student retention?

To provide further insight into the impact of learning analytics on student retention, the author is a team member of the project *STELA. Utilizing Learning*

Analytics for Study Success[3] (Mah, Ifenthaler, & Yau, 2017), funded by the German Federal Ministry of Education and Research. The purpose of this project is to conduct a systematic review (Okoli & Schabram, 2010) that provides an overview of empirical evidence regarding learning analytics' contribution to student retention and study success in higher education. A set of policy recommendations for the implementation of learning analytics in German higher education institutions will also be suggested. The edited volume *Utilizing Learning Analytics for Student Success* (Ifenthaler, Mah, & Yau, in preparation) will provide an overview of recent research, case studies, and experiences with utilizing learning analytics for student success. To integrate academic competencies as a variable in learning analytics algorithms to test their predictive impact on student retention, one idea is to represent academic competencies in form of digital badges, which can be used for predictive models (Mah, 2016). The development of an outline for digital badges is addressed in the following section (7.3.5).

7.3.5 Impact of digital badges on student retention

The studies in this thesis may move the proposed synthesized model (Figure 6.1) forward by providing information for the development of required digital badges. For example, students' low self-reported confidence in research skills indicates the value of a digital badge for this academic competency in particular (Mah & Ifenthaler, 2017b), and the academic staff perspective can be used to define digital badges for required academic competencies to contribute to transparent communication of demands (Mah, 2017). Future research is required to test the proposed model and its impact on student retention as well as studies that focus on the further research questions, such as the following:

1. What are first-year students' and academic staff perspectives on utilizing digital badges to develop academic competencies in an effort to contribute to first-year student retention?
2. How can a digital badge outline for academic competencies be designed that takes into account aspects such as course outcomes, learning activities, and required evidence and assessment criteria?

---

[3] https://www.wihoforschung.de/de/stela-1328.php

3. How can digital badges be integrated into academic support services for the development of academic competencies to function as a variable for a learning analytics algorithm?

For instance, a qualitative exploratory study could be conducted to investigate first-year students' views of digital badges. The qualitative study (e.g. focus interviews) (Denzin & Lincoln, 2011) should include aspects such as the required functions of digital badges, expectations, current understanding, perceptions of advantages and disadvantages, and acceptance and privacy issues. The findings of this study could be complemented by a quantitative study with a larger sample size. Adequate digital badges for academic competencies could be developed on the basis of academic staff expectations (Study 4) and further studies (e.g., focus group interviews; see 7.3.3). The outline could follow the digital badge worksheet by Wright and O'Shea (2014), which includes information on the badge issuer, badge name and description, target audience, learning outcomes, learning activities, required evidence, and assessment criteria.

7.4 Conclusion

Academic competencies are important for first-year student retention in higher education; studies, however, are limited. This thesis contributes to the exploration of first-year students' and academic staff perspectives on academic competencies and of the potential of learning analytics and digital badges to enhance student retention. The conducted empirical studies and the integrative review provide insight into the first-year experience in Germany, where research is still scarce. Many programs have recently been initiated in Germany to increase student success and reduce student dropout. This thesis concentrates on a proposed model of academic competencies as a complement to established models regarding student retention. Thus, only one aspect is analyzed in the complex field of student retention. The findings of the four empirical studies and the integrative review in this thesis may help German and international higher education institutions to design adequate academic support services that consider students' diversity and individual needs. To move research on student retention forward, some ideas for future research are presented; there remains a large research field to explore. This thesis should contribute to first-year student retention in higher education.

7.5 References

Abramovich, S., Schunn, C., & Higashi, R. M. (2013). Are badges useful in education?: It depends upon the type of badge and expertise of learner. *Educational Technology Research and Development 61*(2), 217–232. doi: 10.1007/s11423-013-9289-2

ACT. (2008). *College readiness standards. For EXPLORE, PLAN, and the ACT. Includes ideas for progress.* Retrieved from http://files.eric.ed.gov/fulltext/ED510457.pdf

Adam, S. (2013). Studienbeginn, Studienbedingungen und Studienprobleme. Die Hochschule als ein Ort des programmierten Chaos der Massenabfertigung. In J. Asdonk (Ed.), *Von der Schule zur Hochschule. Analysen, Konzeptionen und Gestaltungsperspektiven des Übergangs.* (pp. 231–243). Münster [u.a.]: Waxmann.

Ahn, J., Pellicone, A., & Butler, B. S. (2014). Open badges for education: What are the implications at the intersection of open systems and badging? *Research in Learning Technology, 22*, 1–13.

Ajzen, I., & Fishbein, M. (1997). Attitude-behavior relations: A theoretical analysis and review of emperical research. *Psychological Bulletin, 84*(5), 888–918.

Anderson, D., & Ackermann-Anderson, L. (2001). *Beyond change management: Advanced strategies for today's transformational leaders. The Practicing organization development series*. San Francisco: Jossey-Bass/Pfeiffer.

Antin, J., & Churchill, E. F. (2011). *Badges in social media: A social psychological perspective*. Paper presented at the CHI Vancouver, Canada.

Arnold, K. E. (2010). Signals: Applying academic analytics. *EDUCAUSE Quarterly, 33*, 1.

Arnold, K. E., & Pistilli, M. D. (2012). Course signals at Purdue: Using learning analytics to increase student success *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge*. New York: ACM

Arnold, K. E., & Sclater, N. (2017). Student Perceptions of Their Privacy in Leaning Analytics Applications *Proceedings of the Seventh International Learning Analytics & Knowledge Conference* (pp. 66–69). New York, USA: ACM.

Atherton, M. (2017). A comparison of student confidence levels in open access and undergraduate university courses. . *Issues in Educational Research, 27*(1), 19–30.

Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review, 64*(6), 359–372.

Attewell, P. A., Lavin, D. E., Domina, T., & Levey, T. (2006). New evidence on college remediation. *The Journal of Higher Education, 77*(5), 886–924. doi: 10.1353/jhe.2006.0037

Baartmann, L. K. J., Bastiaens, T. J., Kirschner, P. A., & van der Vleuten, C. P. M. (2007). Evaluating assessment quality in competence-based education: A qualitative comparison of two frameworks. *Educational Research Review, 2*(2), 114–129.

Bach, C. (2010). Learning analytics: Targeting instruction, curricula and student support *Proceedings of the 4th International Multi-Conference on Society, Cybernetics and Informatics*. Orlando: International Institute of Informatics and Systematics.

Baik, C., Naylor, R., & Arkoudis, S. (2015). The first year experience in Australian universities: Findings from two decades, 1994-2014. Melbourne: Melbourne Centre for the Study of Higher Education The University of Melbourne.

Bailey, M., Ifenthaler, D., Gosper, M., Kretzschmar, M., & Ware, C. (2015). The changing importance of factors influencing students' choice of study mode. *Technology, Knowledge and Learning, 20*(2), 169–184. doi: 10.1007/s10758-015-9253-9

Ballard, J., & Butler, P. I. (2016). Learner enhanced technology Can activity analytics support understanding engagement a measurable process? *Journal of Applied Research in Higher Education, 8*(1), 18–43.

Balloo, K., Pauli, R., & Worrell, M. (2015). Undergraduates' personal circumstances, expectations and reasons for attending university. *Studies in Higher Education*.

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology, 45*(5), 1017–1028.

Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41*(3), 586–598.

Banscherus, U., Kamm, C., & Otto, A. (2015). Information, Beratung und Unterstützung von nicht-traditionellen Studierenden. Angebote der Hochschulen und deren Bewertung durch die Zielgruppe. In A. Hanft, O. Zawacki-Richter & W. B. Gierke (Eds.), *Herausforderung Heterogenität beim Übergang in die Hochschule* (pp. 81–96). Münster: Waxmann.

Banscherus, U., & Pickert, A. (2013). Unterstützungsangebote für nicht-traditionelle Studierende. Stand und Perspektiven: Carl von Ossietzky Universität Oldenburg, Humboldt-Universität zu Berlin, Deutsche Universität für Weiterbildung.

Barber, R., & Sharkey, M. (2012). Course correction: Using analytics to predict course success *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 259–262). New York: ACM

Barefoot, B. O., Warnock, C. L., Dickinson, M. P., Richardson, S. E., & Roberts, M. R. (Eds.). (1998). *Exploring the evidence: Reporting outcomes of first-year seminars.* (Vol. II). Columbia, SC: University of South Carolina, National Resource Center for the First-Year Experience and Students in Transition.

Barr, R. B., & Tagg, J. (1995). From teaching to learning: A new paradigm for Undergraduate Education. *Change, November/December*, 13–25.

Barrie, S. C. (2007). A conceptual framework for the teaching and learning of generic graduate attributes. *Studies in Higher Education, 32*(4), 439–458. doi: 10.1080/03075070701476100

Bean, J. P. (1982). Student attrittion, intentions and confidence: Interaction effects in a path model. *Research in Higher Education, 17*(4), 291–320.

Bean, J. P., & Eaton, S. B. (2000). A psychological model of college student retention. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 48–61). Nashville: Vanderbilt University Press.

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*(4), 485–540.

Beer, C., & Lawson, C. (2017). The problem of student attrition in higher education: An alternative perspective. *Journal of Further and Higher Education, 41*(6), 777–784. doi: 10.1080/0309877X.2016.1177171

Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83*(2), 39–43. doi: 10.1080/00098650903505415

Bennett, N., Dunne, E., & Carré, C. (1999). Patterns of core and generic skill provision in higher education. *Higher Education, 37*(1), 71–93. doi: 10.1023/A:1003451727126

Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *Britisch Journal of Educational Technology, 39*(5), 775–786. doi: 10.1111/j.1467-8535.2007.00793.x

Berge, Z. L., & Muilenburg, L. Y. (2016). In the eye of the beholder: The value of digital badges. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education: Trends, issues, and cases* (pp. 102–108). New York, London: Routledge.

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first century skills. In P. Griffin, B. McGaw & E. Care (Eds.), *Assessment and teaching of 21st century skills* (pp. 17–66). New York Springer.

Blackburn, R. D., Porto, S. C. S., & Thompson, J. J. (2016). Competency-based education and the relationship to digital badges. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education: Trends, issues, and cases* (pp. 30–38). New York, London: Routledge.

Blair, A. (2017). Understanding first-year students' transition to university: A pilot study with implications for student engagement, assessment, and feedback. *Politics, 37*(2), 1–14.

BMBF. (2012). Perspektive MINT. Wegweiser für MINT-Förderung und Karrieren in Mathematik, Informatik, Naturwissenschaften und Technik. Berlin: Bundesministerium für Bildung und Forschung (BMBF).

Bosse, E. (2015). Exploring the role of student diversity for the first-year experience. *Zeitschrift für Hochschulentwicklung, 10*(4), 45–66.

Bosse, E., & Trautwein, C. (2014). Individuelle und institutionelle Herausforderungen der Studieneingangsphase. *Zeitschrift für Hochschulentwicklung, 9*(5), 41–62.

Bound, J., & Turner, S. (2011). Chapter 8 - Dropouts and Diplomas: The Divergence in Collegiate Outcomes. In E. A. Hanushek, S. Machin & L. Woessmann (Eds.), *Handbook of the economics of education* (Vol. 4, pp. 573–613): Elsevier.

Bowles, A., Fisher, R., McPhail, R., Rosenstreich, D., & Dobson, A. (2014). Staying the distance: Students' perception of enablers of transition to higher education. *Higher Education Research & Development, 33*(2), 212–225.

Bowles, T. V., & Brindle, K. A. (2017). Identifying facilitating factors and barriers to improving student retention rates in tertiary teaching courses: A systematic review. *Higher Education Research & Development*. doi: 10.1080/07294360.2016.1264927

Boyatzis, R. E., & Kolb, D. A. (1991). Assessing individuality in learning: The learning skills profile. *Educational Psychology: An International Journal of Experimental Educational Psychology, 11*(3-4), 279–295. doi: 10.1080/0144341910110305

Brinkworth, R., McCann, B., Matthews, C., & Nordström, K. (2009). First year expectations and experiences: Student and teacher perspectives. *Higher Education, 58*(2), 157–173.

Brooker, A., Brooker, S., & Lawrence, J. (2017). First year students' perceptions of their difficulties. *Student Success, 8*(1), 49–62.

Brouwer, J., Jansen, E., Hofman, A., & Flache, A. (2016). Early tracking or finally leaving? Determinants of early study success in first- year university students. *Research in Post-Compulsory Education, 21*(4), 376–393. doi: 10.1080/13596748.2016.1226584

Brunner, S., Ranft, A., & Wittig, W. (2015). Online-Self-Assessments: die Bedeutung von Feedback und Implikationen für die (Weiter-)Entwicklung von Verfahren für beruflich qualifizierte Studieninteressierte. In A. Hanft, O. Zawacki-Richter & W. B. Gierke (Eds.), *Herausforderung Heterogenität beim Übergang in die Hochschule* (pp. 145–162). Münster: Waxmann.

Bryman, A. (2012). *Social research methods*. Oxford: Oxford University Press.

Buckingham Shum, S., & Deakin Crick, R. (2012). *Learning dispositions and transferable competencies: Pedagogy, modelling and learning analytics*. Paper presented at the 2nd International Conference on Learning Analytics & Knowledge, Vancouver.

Bundestag, D. (2017). *16. Bericht des Ausschusses für die Hochschulstatistik*. Retrieved from https://http://www.bundestag.de/presse/hib/2017_01/-/489986.

Burnette, D. M. (2016a). The Renewal of Competency-Based Education: A Review of the Literature. *The Journal of Continuing Higher Education, 64*(2), 84–93. doi: 10.1080/07377363.2016.1177704

Burnette, D. M. (2016b). The renewal of competency-based education: A review of the literature. *The Journal of Continuing Higher Education, 66*(2), 84–93. doi: 10.1080/07377363.2016.1177704

Byrne, M., & Flood, B. (2005). A study of accounting students' motives, expectations and preparedness for higher education. *Journal of Further and Higher Education, 29*(2), 111–124.

Campbell, J. P., DeBlois, P. B., & Oblinger, D. G. (2007). Academic analytics: A new tool for a new era. *EDUCAUSE Review, 42*(4), 40–57.

Campbell, J. P., & Oblinger, D. G. (2007). *Academic analytics.* Retrieved from http://net.educause.edu/ir/library/pdf/PUB6101.pdf

Cassidy, S. (2010). Learning Styles: An overview of theories, models, and measures. *Educational Psychology: An International Journal of Experimental Educational Psychology, 24*(4), 419-444.

Chatti, M., Dyckhoff, A. L., Schroeder, U., & Thüs, H. (2012). A Reference Model for Learning Analytics. *International Journal of Technology Enhanced Learning, 4*(5-6), 318–331.

Clanchy, J., & Ballard, B. (1995). Generic skills in the context of higher education. *Higher Education Research & Development, 14*(2), 155–166. doi: 10.1080/0729436950140202

Clark, M. H., & Cundiff, N. L. (2011). Assessing the effectiveness of a college freshman seminar using propensity score adjustments. *Research in Higher Education, 52*(6), 616–639. doi: 10.1007/s11162-010-9208-x

Coleman, J. D. (2017). Engaging undergraduate students in a co-curricular digital badging platform. *Education and Information Technologies*, 1–14. doi: 10.1007/s10639-017-9595-0

Colvin, C., Rogers, T., Wade, A., Dawson, S., Gasevic, D., Buckingham Shum, S., . . . Fisher, J. (2015). Student retention and learning analytics: A snapshot of Australian practices and a framework for advancement. Sydney: Department of Education.

Conley, D. T. (2007). Redefining college readiness. Eugene, OR: Educational Policy Improvement Center.

Conley, D. T. (2011). *Defining and measuring college and career readiness.* Retrieved from http://programs.ccsso.org/projects/Membership_Meetings/APF/documents/Defining_College_Career_Readiness.pdf

Cook, A., & Leckey, J. (1999). Do expectations meet reality? A survey of changes in first-year student opinion. *Journal of Further and Higher Education, 23*(2), 157–171. doi: 10.1080/0309877990230201

Cormier, D., & Siemens, G. (2010). The open course. Through the open door: Open courses as research, learning and engagement. *EDUCAUSE Review, 45*(4), 30–39.

Corrin, L., & de Barba, P. (2014). Exploring students' interpretation of feedback delivered through learning analytics dashboards. In B. Hegarty, J. McDonald & S.-K. Loke (Eds.), *Rhetoric and Reality: Critical perspectives on educational technology. Proceedings ascilite Dunedin 2014* (pp. 629–633). Dunedin, NZ.

Corrin, L., Kennedy, G., & Mulder, R. (2013). Enhancing learning analytics by understanding the needs of teachers *Proceedings Electric dreams, 30th ascilite conference*. Sydney, Australia.

Coyle, T. R., & Pillow, D. R. (2008). SAT and ACT predict college GPA after removing g. *Intelligence, 36*, 719–729. doi: 10.1016/j.intell.2008.05.001

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Boston: Pearson Education.

Crisp, G., Palmer, E., Turnbull, D., Nettelbeck, T., & Ward, L. (2009). First year student expectations: Results from a university-wide student survey. *Journal of University Teaching & Learning Practice, 6*(1), 13–26.

Dahlstrom, E., Brooks, C., & Bichsel, J. (2014). The current ecosystem of learning management systems in higher education: Student, faculty, and IT perspectives. Louisville, CO: ECAR.

de Freitas, S., Gibson, D., Du Plessis, C., Halloran, P., Williams, E., Ambrose, M., . . . Arnab, S. (2015). Foundations of dynamic learning analytics: Using university student data to increase retention. *British Journal of Educational Technology, 46*(6), 1175–1188. doi: 10.1111/bjet.12212

Deci, E. L. (1971). Effects of externally mediated rewards of instrinsic motivation. *Journal of Personality and Social Psychology, 18*(1), 105–115.

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist, 26*(3-4), 325–346.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The SAGE Handbook of qualitative research*. Los Angeles, CA: Sage.

Derryberry, A., Everhart, D., & Knight, E. (2016). Badges and competencies: New currency for professional credentials. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education: Trends, issues, and cases* (pp. 12–20). New York; London: Routledge.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "Gamification" *MindTrek '11 Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, September 28-30, 2011* (pp. 9–15). New York: ACM New York.

Devedžić, V., & Jovanovic, J. (2015). Developing open badges: A comprehensive approach. *Educational Technology Research and Development, 63*(4), 603–620. doi: 10.1007/s11423-015-9388-3

Dimitrijević, S., Devedzić, V., Jovanović, J., & Milikić, N. (2016). Badging platforms: A scenario-based comparison features and uses. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 141–161). New York: Springer.

Drachsler, H., & Greller, W. (2016). Privacy and analytics – it's a DELICATE issue: A checklist for trusted learning analytics *LAK '16 Proceedings of the Sixth International Conference on Learning Analytics & Knowledge* (pp. 89–98). New York: ACM.

Education Audiovisual and Culture Executive Agency. (2012). The european higher education area in 2012: Bologna process implementation report. Brussels.

EDUCAUSE. (2012). 7 things you should know about badges. Retrieved March 8, 2016, from http://net.educause.edu/ir/library/pdf/eli7085.pdf

Elkordy, A. (2016). Development and implementation of digital badges for learning science, technology, engineering and math (stem) practices in secondary contexts: A pedagogical approach with empirical evidence. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 483–508). New York: Springer.

Ellis, L. E., Nunn, S. G., & Avella, J. T. (2016). Digital badges and micro-credentials: Historical overview, motivational aspect, issues and challenges. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 3–21). New York: Springer.

European Commission. (2014). The GRASS project. Retrieved May, 24, 2016, from http://grass.fon.bg.ac.rs

European Commission. (2015). Dropout and completion in higher education in Europe. Luxembourg: European Union.

European Commission, EACEA, & Eurydice. (2015). The european higher education area in 2015: Bologna process implementation report. Luxembourg: Publications Office of the European Union.

Evans, M. (2000). Planning for the transition to tertiary study: A literature review. *Australasian Association for Institutional Research Journal, 9*(1).

Fanfarelli, J. R., & McDaniel, R. (2017). Exploring digital badges in university courses: relationships between quantity, engagement, and performance. *Online Learning, 21*(2).

Fellenberg, F., & Hannover, B. (2006). Kaum begonnen, schon zerronnen? Psychologische Ursachenfaktoren für die Neigung von Studienanfängern, das Studium abzubrechen oder das Fach zu wechseln. *Empirische pädagogik, 20*(4), 381–399.

Ferguson, R. (2012). Learning analytics: drivers, developments and challenges. *International Journal of Technology Enhanced Learning, 4*(5/6), 304–317.

Ferguson, R., Brasher, A., Clow, D., Cooper, A., Hillaire, G., Mittelmeier, J., . . . Vuorikari, R. (2016). Research Evidence on the Use of Learning Analytics - Implications for Education Policy. In R. Vuorikari & J. Castaño Muñoz (Eds.), *Joint Research Centre Science for Policy Report*. European Union: Joint Research Centre.

Ferguson, R., Hoel, T., Scheffel, M., & Drachsler, H. (2016). Guest editorial: Ethics and privacy in learning analytics. *Journal of Learning Analytics, 3*(1), 5–15.
Fiaidhi, J. (2014). The next step for Learning Analytics. *IT Professional, 16*(5), 4–8. doi: 10.1109/MITP.2014.78
Finkelstein, J., Knight, E., & Manning, S. (2013). The potential and value of using digital badges for adult learners. Washington, DC: American Institutes for Research.
Flick, U. (2014). *An introduction to qualitative research*. Los Angles, London, New Delhi, Singapore, Washington DC: Sage.
Försterling, F. (2001). *Attribution. An introduction to theories, research and applications*. East Sussex, UK: Psychology Press Ltd.
Foster, J. C. (2013). The promise of digital badges. *Techniques: Connecting Education & Careers 88*(8), 31–34.
Fournier, H., Kop, R., & Sitlia, H. (2011). The value of learning analytics to networked learning on a personal learning environment *LAK '11 Proceedings of the 1st International Conference on Learning Analytics and Knowledge*. New York: ACM.
French, J. R., Rodgers, W., & Cobb, S. (1974). Adjustment as person-environmental fit. In G. V. Coelho, D. A. Hamburg & J. E. Adams (Eds.), *Coping and adaptation* New York: Basic Books.
Gamrat, C., & Toomey Zimmerman, H. (2016). Teacher learning journeys: a design case study of a learners-centered STEM. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education. Trends, issues, and cases* (pp. 215–225). New York: Routledge.
Gašević, D., Dawson, S., & Jovanović, J. (2016). Ethics and privacy as enablers of learning analytics. *Journal of Learning Analytics, 3*(1), 1–4.
Gašević, D., Dawson, S., Rogers, T., & Gasevic, D. (2016). Learning analytics should not promote one size fits all: The effects of instructional conditions in predicting academic success. *Internet and Higher Education, 28*, 68–84.
Gattermeyer, W., & Al-Ani, A. (2001). *Change Management und Unternehmenserfolg*. Wiesbaden: Gabler Verlag.
Gibson, D., & de Freitas, S. (2015). Exploratory analysis in learning analytics. *Technology, Knowledge and Learning, 21*(1), 5–19.
Gibson, D., Ostashewski, N., Flintoff, K., Grant, S., & Knight, E. (2013). Digital badges in education. *Education and Information Technologies, 20*(2), 403–410. doi: 10.1007/s10639-013-9291-7
Gilmore, J., & Feldon, D. (2010). *Measuring graduate students' teaching and research skills through self-report: Descriptive findings and validity evidence*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver, CO.
Glover, I. (2016). Student perceptions of digital badges as recognition of achievement and engagement in co-curricular activities. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 443–455). New York: Springer.
Glover, I., & Latif, F. (2013). Investigating perceptions and potential of open badges in formal higher education. In J. Herrington, A. Couros & V. Irvine (Eds.), *Proceedings of EdMedia: World Conference on Educational Media and Technology 2013* (pp. 398–1402). Victoria, Canada: Association for the Advancement of Computing in Education (AACE).

Gökmenoğlu, T. (2017). More than just another course: Service learning as antidote to cultural bias. *Issues in Educational Research, 27*(4), 751–769.
Goldfinch, J., & Hughes, M. (2007). Skills, learning styles and success of first-year undergraduates. *Active Learning in Higher Education, 8*(3), 259–273. doi: 10.1177/1469787407081881
Grant, S. (2014). *What counts as learning: Open digital badges for new opportunities*. Irvine, CA: Digital Media and Learning Research Hub.
Greller, W., & Drachsler, H. (2012). Translating learning into numbers: A generic framework for learning analytics. *Educational Technology & Society, 15*(3), 42–57.
Greller, W., Ebner, M., & Schön, M. (2014). Learning analytics: From theory to practice – data support for learning and teaching. In M. Kalz & E. Ras (Eds.), *Computer Assisted Assessment. Research into E-Assessment* (pp. 79–87). Switzerland: Springer International Publishing.
Griffin, P., & Care, E. (Eds.). (2015). *Assessment and teaching of 21st century skills. Methods and approach*. Dordrecht: Springer.
Griffin, P., McGaw, B., & Care, E. (Eds.). (2012). *Assessment and teaching of 21st century skills*. New York: Springer.
Halavais, A. M. C. (2012). A genealogy of badges. *Information, Communication & Society, 15*(3), 354–373.
Hannon, B., & McNaughton-Cassill, M. (2011). SAT performance: Understanding the contributions of cognitive/learning and social/personality factors. *Applied Cognitive Psychology, 25*, 528–535. doi: 10.1002/acp.1725
Hasenberg, S., Guttschick, K., Schmidt-Atzert, L., Stemmler, G., Kohlhaas, G., Schütz, M., & Prüssner, M. (2014). Unterstützung beim Übergang von der Schule zur Hochschule durch präzise Studieninformationen und Online-Self-Assessments. *Zeitschrift für Hochschulentwicklung, 9*(5), 115–129.
Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81–112. doi: 10.3102/003465430298487
Healy, J. J. (2009). *A case study of students entering an early college high school: Changes in academic behavior perceptions*. (Doctor of Education), University of Oregon.
Heckhausen, H., Schmalt, H.-D., & Schneider, K. (1985). *Achievement motivation in perspective*. Orlando, FL: Academic Press, Inc.
Herr, E. L. (1971). Student needs, college expectations, and "reality" perceptions. *The Journal of Educational Research, 65*(2), 51–56.
Hetmeier, H., Bihler, W., Brugger, P., Scharfe, S., & Willand, I. (2008). Weiterentwicklung von Indikatoren im Rahmen der nationalen Bildungsberichterstattung. Wiesbaden: Statistisches Bundesamt.
Heublein, U. (2014). Student drop-out from German higher education institutions. *European Journal of Education, 49*(4), 497–513.
Heublein, U., Besuch, G., Hutzsch, C., Schreiber, J., & Sommer, D. (2009). Zwischen Studienerwartungen und Studienwirklichkeit – Gründe für den Studienabbruch – Ergebnisse einer bundesweiten Befragung von Exmatrikulierten in Maschinenbau-Studiengängen. Hannover: IMPULS-Stiftung.
Heublein, U., Ebert, J., Hutzsch, C., Isleib, S., König, R., Richter, J., & Woisch, A. (2017). Zwischen Studienerwartungen und Studienwirklichkeit. Ursachen des Studienabbruchs, beruflicher Verbleib der Studienabbrecherinnen und Studienabbrecher und Entwicklung der Studienabbruchquote an deutschen

Hochschulen *Forum Hochschule* (Vol. 1). Hannover: Deutsches Zentrum für Hochschul- und Wissenschaftsforschung.
Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D., & Besuch, G. (2010). Ursachen des Studienabbruchs in Bachelor- und in herkömmlichen Studiengängen *HIS: Forum Hochschule* (Vol. 2). Hannover: HIS Hochschul-Informations-System.
Heublein, U., Richter, J., Schmelzer, R., & Sommer, D. (2012). Die Entwicklung der Schwund- und Studienabbruchquoten an den deutschen Hochschulen. Statistische Berechnungen auf der Basis des Absolventenjahrgangs 2010. *Forum Hochschule, 2012*(3), 16–24.
Heublein, U., Schmelzer, R., & Sommer, D. (2005). Studienabbruchstudie 2005. Die Studienabbrecherquoten in den Fächergruppen und Studienbereichen der Universitäten und Fachhochschulen. Hannover: Hichschul-Informations-System.
Hickey, D. (2012). Intended purposes versus actual function of digital badges. Retrieved March 8, 2016, from http://hastac.org/blogs/slgrant/2012/09/11/intended-purposesversus-actual-function-digital-badges
Hickey, D. (2014). New Project: Open Badges in Open edX and Beyond. Retrieved March 8, 2016, from http://remediatingassessment.blogspot.com/2014/08/new-project-open-badges-in-open-edx-and.html
Hill, P. (2012). Online education delivery models: A descriptive view. *EDUCAUSE Review, 47*(6), 85–97.
Houser, M. L. (2004). We Don't Need The Same Things! Recognizing Differential Expectations of Instructor Communication Behavior for Nontraditional and Traditional Students. *The Journal of Continuing Higher Education, 52*(1), 11–24. doi: 10.1080/07377366.2004.10400271
Howell, J. A., Roberts, L. D., Seaman, K., & Gibson, D. (2017). Are we on our way to becoming a ‘‘Helicopter University’’? Academics’ views on learning analytics. *Technology, Knowledge and Learning*.
Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. doi: 10.1080/10705519909540118
Huber, L. (2010). Anfangen zu Studieren. Einige Erinnerungen zur „Studieneingangsphase“. In W. D. Webler (Ed.), *Studieneingangsphase? Das Bachelor-Studium braucht eine neue Studieneingangsphase! Band I: Studierfähigkeit für ein frei(er)es Studium* (pp. 99–114). Bielefeld: Universitäts-Verlag Webler.
Hughes, G., & Smail, O. (2015). Which aspects of university life are most and least helpful in the transition to HE? A qualitative snapshot of student perceptions. *Journal of Further and Higher Education, 39*(4), 466–480. doi: 10.1080/0309877X.2014.971109
Ifenthaler, D. (2015). Learning analytics. In J. M. Spector (Ed.), *The SAGE encyclopedia of educational technology* (Vol. 2, pp. 447–451). Thousand Oaks, CA: Sage.
Ifenthaler, D. (2017). Are higher education institutions prepared for learning analytics? *TechTrends, 61*.
Ifenthaler, D., Adcock, A. B., Erlandson, B. E., Gosper, M., Greiff, S., & Pirnay-Dummer, P. (2014). Challenges for education in a connected world: Digital

learning, data rich environments, and computer- based assessment—Introduction to the inaugural special issue of technology, knowledge and learning. *Technology, Knowledge and Learning, 19*(1), 121–126. doi: 10.1007/s10758-014-9228-2

Ifenthaler, D., Bellin-Mularski, N., & Mah, D.-K. (2016). *Foundations of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies*. New York: Springer.

Ifenthaler, D., Mah, D.-K., & Yau, J. (Eds.). (in preparation). *Utilizing learning analytics to support study success*. New York, NY: Springer.

Ifenthaler, D., & Schumacher, C. (2016). Student perceptions of privacy principles for learning analytics. *Educational Technology Research and Development*. doi: 10.1007/s11423-016-9477-y

Ifenthaler, D., & Widanapathirana, C. (2014). Development and validation of a Learning Analytics framework: Two case studies using support vector machines. *Technology, Knowledge and Learning, 19*(1–2), 221–240.

In der Smitten, S., & Heublein, U. (2013). Qualitätsmanagement zur Vorbeugung von Studienabbrüchen. *Zeitschrift für Hochschulentwicklung, 8* (2), 98–109.

Instefjord, E. J., & Munthe, E. (2017). Educating digitally competent teachers: A study of integration of professional digital competence in teacher education. *Teaching and Teacher Education, 67*, 37–45. doi: 10.1016/j.tate.2017.05.016

Ipsos MORI (2008). Great expectations of ICT. How higher education institutions are measuring up. Research study conducted for the Joint Information Systems Committee (JISC)–Report June 2008. London.

Jackson, L. M., Pancer, S. M., Pratt, M. W., & Hunsberger, B. E. (2000). Great expectations: The relation between expectancies and adjustment during the transition to university. *Journal of Applied Social Psychology, 30*(10), 2100–2125.

Jansen, E. P. W. A., André, S., & Suhre, C. (2013). Readiness and expectations questionnaire: A cross-cultural measurement instrument for first-year university students. *Educational Assessment, Evaluation and Accountability, 25*(2), 115–130. doi: 10.1007/s11092-013-9161-2

Jansen, E. P. W. A., & Suhre, C. (2011). *Preparedness, first-year experiences and outcomes. A comparison between students in domestic and international degree programmes in a Dutch university*. Paper presented at the Research and Development in Higher Education: Higher Eduation on the Edge Gold Coast, Australia.

Jansen, E. P. W. A., & van der Meer, J. (2007a). *Feeling prepared for university? Perceived preparedness and expectations of prospective students*. Paper presented at the 10th First-year in higher education Pacific-rim conference: Regenerate, engage, experiment, Queensland University of Technology, Brisbane.

Jansen, E. P. W. A., & van der Meer, J. (2007b). *First-year students' expectations and perceptions of readiness before they start university*. Paper presented at the 30th Annual HERDSA Conference: Enhancing higher education: Theory and scholarship, Adelaide.

Jansen, E. P. W. A., & van der Meer, J. (2012). Ready for university? A cross-national study of students' perceived preparedness for university. *The Australian Educational Researcher 39*(1), 1–16. doi: 10.1007/s13384-011-0044-6

Jayaprakash, S. M., Moody, E. W., Lauría, E. J. M., & Baron, J. D. (2014). Early alert of academically at‐risk students: An open source analytics initiative. *Journal of Learning Analytics, 1*(1), 6–47.

JISC. (2013). Developing digital literacies. Overview., from http://www.webarchive.org.uk/wayback/archive/20130607091442/http://www.jisc.ac.uk/whatwedo/programmes/elearning/developingdigitalliteracies.aspx

Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Ludgate, H. (2013). NMC Horizon Report: 2013 Higher Education Edition. Austin, Texas: The New Media Consortium.

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). NMC Horizon Report: 2014 Higher Education Edition. Austin, Texas: The New Media Consortium.

Jones, A. (2014). Perspectives on change: A study of the multiple dimensions of changing teaching. *Teaching in Higher Education, 19*(2), 170–182. doi: 10.1080/13562517.2013.836088

Jones, R. (2008). *Student retention and success: A synthesis of research*.

Jovanovic, J., & Devedžić, V. (2015). Open badges: Novel means to motivate, scaffold and recognize learning. *Technology, Knowledge and Learning, 20*(1), 115–122. doi: 10.1007/s10758-014-9232-6

Kantanis, T. (2000). The role of social transition in students' adjustment to the first-year of university. *Journal of Institutional Research, 9*(1), 100–110.

Kelle, U., & Kluge, S. (2010). *Vom Einzelfall zum Typus: Fallvergleich und Fallkontrastierung in der qualitative Sozialforschung*. Wiesbaden: VS Verlag für Sozialwissenschaften.

Keller, J. M. (1987). Development and use of the ARCS Model of instructional design. *Journal of Instructional Development, 10*(3), 2–10.

Kelley, T., & Hickey, D. (2014). Major Highlights of the 2013 Educational Assessment BOOC. Retrieved March 8, 2016, from http://remediatingassessment.blogspot.com/2014/05/major-highlights-of-2013-educational.html

Kennedy, G., Judd, T. S., Churchward, A., Gray, K., & Krause, K.-L. (2008). First year students' experiences with technology: Are they really digital natives? *Australasian Journal of Educational Technology, 24*(1), 108–122.

Kerres, M., Hanft, A., & Wilkesmann, U. (2012). Implikationen einer konsequenten Öffnung der Hochschule für lebenslanges Lernen - eine Schlussbetrachtung. In M. Kerres, A. Hanft, U. Wilkesmann & K. Wolff-Bendik (Eds.), *Studium 2020: Positionen und Perspektiven zum lebenslangen Lernen an Hochschulen* (pp. 285–290). Münster, New York, München, Berlin: Waxmann.

Keup, J. R. (2005). The impact of curricular interventions on intended second year re-enrollment. *Journal of college Student Retention, 7*(1-2), 61–89.

Keup, J. R. (2007). Great expectations and the ultimate reality check: Voices of students during the transition from high school to college. *NASPA Journal, 44*(1), 3–31. doi: 10.2202/1949-6605.1752

Kline, R. B. (2005). *Principles and practices of structural equation modelling*. New York: The Guilford Press.

Köller, O. (2013). Abitur und Studierfähigkeit. In J. Asdonk, S. U. Kuhnen & P. Bornkessel (Eds.), *Von der Schule zur Hochschule* (pp. 25–49). Münster: Waxmann.

Krause, K.-L. (2005). Serious thoughts about dropping out in first year: Trends, patterns and implications for higher education. *Studies in Learning, Evaluation, Innovation and Development, 2*(3), 55–68.

Krause, K.-L., Hartley, R., James, R., & McInnis, C. (2005). The first year experience in Australian universities: Findings from a decade of national studies. Australia: Department of education, science and training.

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology, 77*(6), 1121–1134.

Kuh, G., & al., e. (2005). *Student success in college: Creating conditions that matter*. San Francisco: Jossey-Bass.

Lai, K.-W., & Hong, K.-S. (2014). Technology use and learning characteristics of students in higher education: Do generational differences exist? *British Journal of Educational Technology, 46*(4), 725–738. doi: doi:10.1111/bjet.12161

Larsen, M. S., Kornbeck, K. P., Kristensen, R. M., Larsen, M. B., & Sommersel, H. B. (2013). Dropout phenomena at universities: What is dropout? Why does dropout occur? What can be done by the universities to prevent or reduce it? A systematic review. Copenhagen: Danish Clearinghouse for Educational Research.

Lauría, E. J. M., Moody, E. W., Jayaprakash, S. M., Jonnalagadda, N., & Baron, J. D. (2013). Open academic analytics initiative: Initial research findings *LAK '13 Proceedings of the 3rd International Conference on Learning Analytics and Knowledge* (pp. 150–154). New York: ACM

Leese, M. (2010). Bridging the gap: supporting student transitions into higher education. *Journal of Further and Higher Education, 34*(2), 239–251.

Leggett , M., Kinnear, A., Boyce, M., & Bennett, I. (2004). Student and staff perceptions of the importance of generic skills in science. *Higher Education Research & Development, 23*(3), 295–312. doi: 10.1080/0729436042000235418

Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality and Social Psychology, 28*(1), 129–137.

Lokuge Dona, K., Gregory, J., Salmon, G., & Pechenkina, E. (2014). *Badges in the carpe diem MOOC*. Paper presented at the ascilite conference, Dunedin, New Zealand.

Lombardi, A., Conley, D. T., Seburn, M. A., & Downs, A. M. (2013). College and career readiness assessment: Validation of the key cognitive strategies framework. *Assessment for Effective Intervention, 38*(3), 163–171. doi: 10.1177/1534508412448668

Lombardi, A., Seburn, M., & Conley, D. (2011). Development and initial validation of a measure of academic behaviors associated with college and career readiness. *Journal of Career Assessment, 19*(4), 375–391. doi: 10.1177/1069072711409345

Long, M., Ferrier, F., & Heagney, M. (2006). Stay, play or give it away? Students continuing, changing or leaving university study in first year.

Long, P., & Siemens, G. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review, 46*(5), 31–40.

Longden, B. (2006). An institutional response to changing student expectations and their impact on retention rates. *Journal of Higher Education Policy and Management, 28*(2), 173–187. doi: 10.1080/13600800600751044

Lowman, R., & Williams, R. E. (1987). Validity of self-ratings of abilities and competencies. *Journal of Vocational Behavior 31*, 1–13.

Mah, D.-K. (2016). Learning analytics and digital badges: Potential impact on student retention in higher education. *Technology, Knowledge and Learning, 21*(3), 285–305. doi: 10.1007/s10758-016-9286-8

Mah, D.-K. (2017). *Digital Badges for Transparent Communication of Academic Competencies*. Paper presented at the European First Year Experience Conference 2017, Birmingham, United Kingdom.

Mah, D.-K., & Ifenthaler, D. (2017a). Academic staff perspectives on first-year students' academic competencies. *Journal of Applied Research in Higher Education, 9*(4), 630-640. doi: https://doi.org/10.1108/JARHE-03-2017-0023

Mah, D.-K., & Ifenthaler, D. (2017b). *Toward a digital badge program for research skills: enhancing first-year students' academic competencies*. Paper presented at the AERA Annual Meeting, San Antonio, TX, USA.

Mah, D.-K., Ifenthaler, D., & Yau, J. (2017). STELA - Studienerfolg mittels Learning Analytics. Handlungsempfehlungen für deutsche Hochschulen. Fachtagung "Hochschulen im digitalen Zeitalter". Berlin, Deutschland: Bundesministerium für Bildung und Forschung, Berlin.

Maitland Schilling, K., & Schilling, K. L. (2005). Expectations and performance. In M. L. Upcraft, J. N. Gardner & B. O. Barefoot (Eds.), *Challenging and supporting the first-year student* (pp. 108–120). San Francisco: Jossey-Bass.

Malone, T. W., & Lepper, M. R. (1987). Making learning fun: A taxonomy of intrinsic motivations for learning. In R. E. Snow & M. J. Farr (Eds.), *Aptitude, learning and instruction III: Conative and affective process analyses* (pp. 223–253). Hilsdale, NJ: Erlbaum.

Margaryan, A., Littlejohn, A., & Vojt, G. (2011a). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education, 56*(2), 429–440.

Margaryan, A., Littlejohn, A., & Vojt, G. (2011b). Are digital natives a myth or reality? University students´ use of digital technologies. *Computers & Education*(56), 429- 400.

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling: A Multidisciplinary Journal, 11*(3), 320–341. doi: 10.1207/s15328007sem1103_2

Marshall, C., & Rossman, G. B. (2016). *Designing qualitative research*. Singapore: SAGE Publications.

Masters, G. N. (1988). Item discrimination: When more is worse. *Journal of Educational Measurement, 25*(1), 15–29.

Maunder, R. E. (2017). Students' peer relationships and their contribution to university adjustment: the need to belong in the university community. *Journal of Further and Higher Education*. doi: 10.1080/0309877X.2017.1311996

Mayr, J., Müller, F., & Nieskens, B. (2016). CCT–Career counselling for teachers: Genese, Grundlagen und Entwicklungsstand eines webbasierten Beratungsangebot. In A. Boeger (Ed.), *Eignung für den Lehrerberuf* (pp. 181–214). Wiesbaden: Springer Fachmedien.

McCarthy, M., & Kuh, G. D. (2006). Are students ready for college? What student engagement data say. *Phi Delta Kappan, 87*(9), 664–669.

McDaniel, R., & Fanfarelli, J. (2016). Building better digital badges: Pairing completion logic with psychological factors. *Simulation & Gaming, 47*(1), 1–30.

Meerah, T. S. M., Osman, K., Zakaria, E., Ikhsan, Z. H., Krish, P., Lian, D. K. C., & Mahmod, D. (2012). Developing an instrument to measure research skills. *Procedia – Social and Behavioral Sciences, 60*, 630–636. doi: 10.1016/j.sbspro.2012.09.434

Metzger, E. C., Lubin, L., Patten, R., & Whyte, J. (2016). Applied gamification: Creating reward systems for organizational professional development. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 457–466). New York: Springer.

Metzner, B. S., & Bean, J. P. (1987). The estimation of a model of nontraditional undergraduate student attrition. *Research in Higher Education, 27*(1), 15–38.

Ministry of Science Technology and Innovation (Ed.). (2005). *A framework for qualifications of the European higher education area*. Copenhagen: Ministry of Science Technology and Innovation.

Moon, M.-K., Jahng, S.-G., & Kim, T.-Y. (2011). A computer-assisted learning model based on the digital game exponential reward system. *Turkish Online Journal of Educational Technology, 10*(1), 1–14.

Morison, A., & Cowley, K. (2017). An exploration of factors associated with student attrition

and success in enabling programs. *Issues in Educational Research, 27*(2), 330–346.

Mozilla Foundation and Peer 2 Peer University. (2012). *Open badges for lifelong learning. Exploring an open badge ecosystem to support skill development and lifelong learning for real results such as jobs and advancement.* Retrieved from https://wiki.mozilla.org/images/b/b1/OpenBadges-Working-Paper_092011.pdf

Multrus, F., Ramm, M., & Bargel, T. (2011). Studiensituation und studentische Orientierungen. 11. Studierendensurvey an Universitäten und Fachhochschulen. Bonn; Berlin: Universität Konstanz / Arbeitsgruppe Hochschulforschung; Deutschland / Bundesministerium für Bildung und Forschung.

Murray, M. C., & Pérez, J. (2014). Unraveling the digital literacy paradox: How higher education fails at the fourth literacy. *Issues in Informing Science and Information Technology, 11*, 85–100.

Muthén, B. O., Muthén, L. K., & Asparouhov, T. (2016). *Regression and mediation analysis using Mplus*. Los Angeles, CA: Muthén & Muthén.

Nadelson, L. S., Semmelroth, C., Martinez, G., Featherstone, M., Fuhriman, C. A., & Sell, A. (2013). Why did they come here?–The influences and expectations of first-year students' college experience. *Higher Education Studies, 3*(1), 50–62.

Nelson, K. J., & Kift, S. M. (2008). *Expectations and realities for first year students at an Australian university*. Paper presented at the 11th Pacific Rim First Year in Higher Education Conference 2008, Hobart.

Neumann, M., & Trautwein, U. (2013). Schulleistungen und wissenschaftspropädeutische Bildung in der gymnasialen Oberstufe: Zentrale Befunde aus dem TOSCA-Projekt. In J. Asdonk, S. U. Kuhnen & P. Bornkessel (Eds.), *Von der Schule zur Hochschule. Analysen, Konzeptionen und Gestaltungsperspektiven des Übergangs* (pp. 129–146). Münster: Waxmann.

Newby, T., Wright, C., Besser, E., & Beese, E. (2016). Passport to creating and issuing digital instructional badges. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 179–201). New York: Springer.

OECD. (1998). *Redefining tertiary education*. Paris France.

OECD. (2013a). *Education at a glance 2013: OECD indicators.* Retrieved from http://dx.doi.org/10.1787/eag-2013-en

OECD. (2013b). *OECD skills outlook 2013: First results from the survey of adult skills.* Retrieved from http://dx.doi.org/10.1787/9789264204256-en

OECD. (2013c). *Skilled for life? Key findings from the survey of adult skills.* Retrieved from https://http://www.oecd.org/site/piaac/SkillsOutlook_2013_ebook.pdf

OECD. (2014). *PISA 2012 results in focus. What 15-year-old know and what they can do with what they know.* Retrieved from https://http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf

Ogwu, F. J., & Ogwu, E. N. (2012). Computer proficiency skills and implication for curriculum transformation among fresh undergraduate of Botswana university. *International Journal of Computer Science Issues, 9*(5), 384–390.

Okoli, C., & Schabram, K. (2010). A guide to conducting a systematic literature review of information systems research. *Sprouts: Working Papers on Information Systems, 10*(26).

Oliver, B. (2016). Better 21C Credentials. Evaluating the promise, perils and disruptive potential of digital credentials. Australia: Deakin University.

Olson, R., & Klein-Collins, R. (2015). Competency-based bachelor of business administration at Brandman University. A CBE case study: Council for Adult and Experiential Learning.

Padgett, R. D., Keup, J. R., & Pascarella, E. T. (2013). The Impact of First- Year Seminars on College Students' Life-long Learning Orientations. *Journal of Student Affairs Research and Practice,, 50*(2), 133–151.

Papamitsiou, Z., & Economides, A. (2014). Learning analytics and educational data mining in practice: A systematic literature review of empirical evidence. *Educational Technology & Society, 17*(4), 49–64.

Papamitsiou, Z., & Economides, A. (2016). Learning analytics for smart learning environments: A meta-analysis of empirical research results from 2009 to 2015. In J. M. Spector, B. B. Lockee & M. D. Childress (Eds.), *Learning, Design, and Technology* (pp. 1–23). Switzerland: Springer.

Pardo, A., & Siemens, G. (2014). Ethical and privacy principles for learning analytics. *British Journal of Educational Technology, 45*(3), 438–450.

Park, Y., & Jo, I.-H. (2015). Development of the learning analytics dashboard to support students' learning performance. *Journal of Universal Computer Science, 21*(1), 110–133.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: Findings and insights from twenty years of research. A thrid decade of research* (Vol. 2). San Francisco: Jossey-Bass.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. London: Sage Publications, Inc.

Pistilli, M. D. (2017). Learner analytics and student success interventions. *New Directions for higher education, 2017*(179), 43–52.

Pistilli, M. D., & Arnold, K. E. (2010). In practice: Purdue Signals: Mining real-time academic data to enhance student success. *About Campus, 15*(3), 22–24. doi: 10.1002/abc.20025

Põldoja, H., & Laanpere, M. (2014). Exploring the potential of open badges in blog-based university courses. In Y. Cao, T. Väljataga, J. K. T. Tang, H. Leung & M. Laanpere (Eds.), *New Horizons in Web Based Learning* (pp. 172–178). Switzerland: Springer.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1–6.

Prinsloo, P., & Slade, S. (2013). An evaluation of policy frameworks for addressing ethical considerations in learning analytics *LAK '13 Proceedings of the 3rd International Conference on Learning Analytics and Knowledge*. New York: ACM

Pursel, B. K., Stubbs, C., Woong Choi, G., & Tietjen, P. (2016). Digital badges, learning at scale, and big data. In L. Y. Muilenburg & Z. L. Berge (Eds.), *Digital badges in education: Trends, issues, and cases* (pp. 93–101). New York, London: Routledge.

Randall, D. J., Harrison, J. B., & West, R. E. (2013). Giving credit where credit is due: Designing open badges for a technology integration course. *TechTrends, 57*(6), 88–95. doi: 10.1007/s11528-013-0706-5

Rao, M. B. (2016). Motivation of teachers in higher education. *Journal of Applied Research in Higher Education, 8*(4), 469–488.

Reason, R. D., Terenzini, P. T., & Domingo, R. J. (2006). First things first: Developing academic competence in the first year of college. *Research in Higher Education, 47*(2), 149–175.

Reid, M. J., & Moore III, J. L. (2008). College readiness and academic preparation for postsecondary education: Oral histories of first-generation urban college students. *Urban Education, 43*(2), 240–261. doi: 10.1177/0042085907312346

Resnick, M. (2012). Still a badge skeptic. http://hastac.org/blogs/mres/2012/02/27/still-badge-skeptic

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 138*(2), 353–387.

Richardson, S., & Radloff, A. (2014). Allies in learning: Critical insights into the importance of staff–student interactions in university education. *Teaching in Higher Education, 19*(6), 603–615. doi: 10.1080/13562517.2014.901960

Roberts, L. D., Howell, J. A., & Seaman, K. (2017). Give me a customizable dashboard: Personalized learning analytics dashboards in higher education. *Technology, Knowledge and Learning*.

Robinson, S., Pope, D., & Holyoak, L. (2013). Can we meet their expectations? Experiences and perceptions of feedback in first year undergraduate students. *Assessment & Evaluation in Higher Education, 38*(3), 260–272. doi: 10.1080/02602938.2011.629291

Romero, C., Ventura, S., Espejo, P. G., & Hervás, C. (2008). *Data Mining Algorithms to Classify Students*. Paper presented at the The 1st International Conference on Educational Data Mining, Montréal, Québec, Canada.

Rost, J. (2004). *Lehrbuch Testtheorie – Testkonstruktion*. Bern: Verlag Hans Huber.

Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet und Higher Education, 6*, 1–16.

Sarcletti, A., & Müller, S. (2011). Zum Stand der Studienabbruchforschung. Theoretische Perspektiven, zentrale Ergebnisse und methodische

Anforderungen an künftige Studien. *Zeitschrift für Bildungsforschung, 1*(3), 235–248. doi: 10.1007/s35834-011-0020-2

Scharfe, S. (2010). Neue Informationen mit alten Daten: Studienverlaufsbezogene Auswertungen durch Verknüpfung von Erhebungen der amtlichen Hochschulstatistik. In M. Baethge, J. Brunke, K. Dedering, H. Döbert, M. Fest, H.-W. Freitag, B. Fritzsch, K. Fuchs-Rechlin, C. Kerst, S. Kühne, S. Scharfe, B. Skripski, M. Wieck & A. Wolter (Eds.), *Indikatorenentwicklung für den nationalen Bildungsbericht 'Bildung in Deutschland'. Grundlagen, Ergebnisse, Perspektiven* (pp. 133–156). Bonn/Berlin: BMBF.

Scheffel, M., Drachsler, H., & Specht, M. (2015). Developing an evaluation framework of quality indicators for learning analytics *LAK '15 Proceedings of the 5th International Conference on Learning Analytics and Knowledge* (pp. 16–20). New York: ACM

Scheffel, M., Drachsler, H., Stoyanov, S., & Specht, M. (2014). Quality indicators for learning analytics. *Educational Technology & Society, 17*(4), 117–132.

Schmied, V., & Hänze, M. (2015). The effectiveness of study skills courses: Do they increase general study competences? *Zeitschrift für Hochschulentwicklung, 10*(4), 176–187.

Schröder-Gronostay, M. (1999). Studienabbruch - Zusammenfassung des Forschungsstandes. In M. Schröder-Gronostay & H. D. Daniel (Eds.), *Studienerfolg und Studienabbruch. Beiträge aus Forschung und Praxis* (pp. 209–240). Neuwied, Kriftel, Berlin: Luchterhand Verlag.

Schuetze, H. G., & Slowey, M. (2002). Participation and exclusion: A comparative analysis of non-traditional students and lifelong learners in higher education. *Higher Education*(44), 309–327.

Schulmeister, R. (2010). Students, internet, eLearning and web 2.0. In M. Ebner & M. Schiefner (Eds.), *Looking Toward the Future of Technology-Enhanced Education: Ubiquitous Learning and Digital Native*. Hershey, PA: IGI Global.

Schumacher, C., & Ifenthaler, D. (2017). Features students really expect from learning analytics. *Computers in Human Behavior*.

Schuster, B., Försterling, F., & Weiner, B. (1989). Perceiving the causes of success and failure. A cross-cultural examination of attributional concepts. *Journal of Cross-Cultural Psychology, 20*(2), 191–213.

Schwandt, T. A., & Gates, E. F. (2011). Case Study Methodology. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE Handbook of qualitative research*. Los Angeles, CA: Sage.

Sclater, N., & Bailey, P. (2015). *Code of practice for learning analytics.* Retrieved from https://http://www.jisc.ac.uk/sites/default/files/jd0040_code_of_practice_for_learning_analytics_190515_v1.pdf

Sclater, N., Peasgood, A., & Mullan, J. (2016). *Learning analytics in higher education. A review of UK and international practice. Full report.* Retrieved from https://http://www.jisc.ac.uk/sites/default/files/learning-analytics-in-he-v3.pdf

Scott, G., Shah, M., Grebennikov, L., & Singh, H. (2008). Improving student retention: A university of Western Sydney case study. *Journal of Institutional Research, 14*(1), 9–23.

Scutter, S., Palmer, E., Luzeckyj, A., Burke da Silva, K., & Brinkworth, R. (2011). What do commencing undergraduate students expect from first year

university? *The International Journal of the First Year in Higher Education, 2*(1), 8–20. doi: 10.5204/intjfyhe.v2i1.54

Selwyn, N. (2009). The digital native - myth and reality. *Aslib Proceedins: New Information Perspectives, 61*(4), 364–379. doi: 10.1108/00012530910973776

Shehata, S., & Arnold, K. E. (2015). Measuring student success using predictive engine *LAK '15 Proceedings of the 5th International Conference on Learning Analytics and Knowledge*. New York: ACM

Siemens, G. (2012). Learning analytics: Envisioning a research discipline and a domain of practice *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 4–8). New York: ACM

Siemens, G. (2013). Learning Analytics: The emergence of a discipline. *American Behavioral Scientist, 57*(10), 1380–1400.

Siemens, G., Dawson, S., & Lynch, G. (2013). *Improving the quality and productivity of the higher education sector. Policy and strategy for systems-level*

deployment of learning analytics. Retrieved from http://solaresearch.org/Policy_Strategy_Analytics.pdf

Siemens, G., Gašević, D., Haythornthwaite, C., Dawson, S., Buckingham Shum, S., Ferguson, R., . . . Baker, R. S. J. d. (2011). *Open learning analytics: An integrated & modularized platform. Proposal to design, implement and evaluate an open platform to integrate heterogeneous learning analytics techniques.* Retrieved from http://solaresearch.org/OpenLearningAnalytics.pdf

Slade, S., & Galpin, F. (2012). Learning analytics and higher education: Ethical perspectives *LAK '12 Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 16–17). New York: ACM

Slade, S., & Prinsloo, P. (2013). Learning Analytics: Ethical Issues and Dilemmas. *American Behavioral Scientist, 57*(10), 1509–1528.

Smith, J. S., & Wertlieb, E. C. (2005). Do first-year college students' expectations align with their first-year experiences? *NASPA Journal, 42*(2), 153–174.

Söhnlein, D., Weber, B., & Weber, E. (2013). Qualifikationsspezifische Arbeitslosenquote. Nürnberg: Institut für Arbeitsmarkt- und Berufsforschung.

Stinebrickner, R., & Stinebrickner, T. (2008). The effect of credit constraints on the college dropout decision: A direct approach using a new panel study. *American Economic Review, 98*(5), 2163–2184.

Su, F., & Wood, M. (2012). What makes a good university lecturer? Students' perceptions of teaching excellence. *Journal of Applied Research in Higher Education, 4*(2), 142–155.

Sullivan, F. M. (2013). New and alternative assessments, digital badges, and civics: An overview of emerging themes and promising directions (CIRCLE working paper no. 77): The center for information & research on civic learning & engagement.

Surgenor, P. W. G. (2013). Measuring up: Comparing first year students' and tutors' expectations of assessment. *Assessment & Evaluation in Higher Education, 38*(3), 288–302. doi: 10.1080/02602938.2011.630976

Tanes, Z., Arnold, K. E., Selzer King, A., & Remnet, M. A. (2011). Using signals for appropriate feedback: Perceptions and practices. *Computers & Education, 57*(4), 2414–2422.

Taylor, J. A., & Bedford, T. (2004). Staff perceptions of factors related to non-completion in higher education. *Studies in Higher Education, 29*(3), 375–394.

Thomas, L. (2002). Student retention in higher education: The role of institutional habitus. *Journal of Education Policy, 17*(4), 423–442. doi: 10.1080/02680930210140257

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125. doi: 10.3102/00346543045001089

Tinto, V. (1993). *Leaving college. Rethinking the causes and cures of student attrition*. Chicago; London: The University of Chicago Press.

Tinto, V. (2012). *Completing college. Rethinking institutional action*. Chicago; London: The University of Chicago Press.

Tolstrup Holmegaard, H., Møller Madsen, L., & Ulriksen, L. (2017). Why should European higher education care about the retention of non-traditional students? *European Educational Research Journal, 16*(1), 3–11. doi: 10.1177/1474904116683688

Tran, C., Schenke, K., & Hickey, D. T. (2014). Design principles for motivating learning with digital badges: Consideration of contextual factors of recognition and assessment *ICLS 2014 Proceedings*.

Trautwein, C., & Bosse, E. (2017). The first year in higher education—critical requirements from the student perspective. *Higher Education, 73*(3), 371–387.

Tremblay, K., Lalancette, D., & Roseveare, D. (2012). Assessment of higher education learning outcomes. Feasibility study report. Design and implementation (Vol. 1): OECD.

Turner, N., Wuetherick, B., & Healey, M. (2008). International perspectives on student awareness, experiences and perceptions of research: Implications for academic developers in implementing research-based teaching and learning. *International Journal for Academic Development, 13*(3), 199–211.

Ulriksen, L., Madsen, L. M., & Holmegaard, H. T. (2010). What do we know about explanations for drop out/opt out among young people from STM higher education programmes? *Studies in science education, 46*(2), 209–244. doi: 10.1080/03057267.2010.504549

Umbach, P. D., & Wawrzynski, M. R. (2005). Faculty do matter: The role of college faculty in student learning and engagement. *Research in Higher Education, 46*(2), 153–184.

Van Bragt, C. A. C., Bakx, A. W. E. A., Bergen, T. C. M., & Croon, M. A. (2011). Looking for students' personal characteristics predicting study outcome. *Higher Education, 61*(1), 59–75. doi: 10.1007/s10734-010-9325-7

Van der Meer, J., Jansen, E., & Torenbeek, M. (2010). It's almost a mindset that teachers need to change: First-year students need to be inducted into time management. *Studies in Higher Education, 35*(7), 777–791. doi: 10.1080/03075070903383211

Verbert, K., Duval, E., Klerkx, J., Govaerts, S., & Santos, J. S. (2013). Learning analytics dashboard applications. *American Behavioral Scientist, 57*(10), 1500–1509.

Voorhees, R. A. (2001). Competency-based learning models: A necessary future. *New Directions for Institutional Research, 2001*(110), 5–13.

Voss, R., Gruber, T., & Szmigin, I. (2007). Service quality in higher education: The role of student expectations. *Journal of Business Research 60*(9), 949–959.

Warner, R. N., & Picard, M. Y. (2013). ALL Academics Facilitating Articulated Learning for English as an Additional Language Students. *Issues in Educational Research, 23*(1), 83–96

Waters, D. (2003). Supporting first-year students in the bachelor of arts: An investigation of academic staff attitudes. *Arts and Humanities in Higher Education, 2*(3), 293–312. doi: 10.1177/14740222030023006

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*(4), 548–573.

Weiner, B. (1986). *An atrributional theory of motivation and emotion*. New York: Springer.

Weinert, F. E. (2001a). Concept of competence: A conceptual clarification. In D. S. Rychen & L. H. Salganik (Eds.), *Defining and Selecting Key Competencies* (pp. 45–65). Seattle (et. al.): Hofgrefe & Huber Publishers.

Weinert, F. E. (2001b). Vergleichende Leistungsmessung in Schulen - eine umstrittene Selbstverständlichkeit. In F. E. Weinert (Ed.), *Leistungsmessungen in Schulen* (pp. 17-31). Weinheim und Basel: Beltz Verlag.

Weinert, F. E. (2001c). Vergleichende Leistungsmessung in Schulen – eine umstrittene Selbstverständlichkeit. In F. E. Weinert (Ed.), *Leistungsmessungen in Schulen* (pp. 17–31). Weinheim und Basel: Beltz Verlag.

Weinstein, C. E., & Palmer, D. R. (1990). LASSI-HS user's manual. Clearwater, Florida: H&H Publishing Company.

Weinstein, C. E., & Underwood, V. L. (1985). Learning strategies: The how of learning. In J. W. Segal, S. F. Chipman & R. Glaser (Eds.), *Thinking and learning skills: Relating instruction to research* (Vol. 1, pp. 241– 258). London: Lawrence erlbaum Associates, Pub.

Weissberg, N. C., Owen, D. R., Jenkins, A. H., & Harburg, E. (2003). The incremental variance problem: Enhancing the predictability of academic success in an urbal, commuter institution. *Genetic, Social, and General Psychology Monographs, 129*(2), 153–180.

West, D., & Lockley, A. (2016). Implementing digital badges: The importance of institutional context. In D. Ifenthaler, N. Bellin-Mularski & D.-K. Mah (Eds.), *Foundation of digital badges and micro-credentials: Demonstrating and recognizing knowledge and competencies* (pp. 467–482). New York: Springer.

Wilcox, P., Winn, S., & Fyvie-Gauld, M. (2005). ‘It was nothing to do with the university, it was just the people’: The role of social support in the first‐year experience of higher education. *Studies in Higher Education, 30*(6), 707–722. doi: 10.1080/03075070500340036

Willcoxson, L., Cotter, J., & Joy, S. (2011). Beyond the first-year experience: The impact on attrition of student experiences throughout undergraduate degree studies in six diverse universities. *Studies in Higher Education, 36*(3), 331–352.

Willis, J. E., Campbell, J. P., & Pistilli, M. D. (2013). Ethics, big data, and analytics: A model for application. Retrieved May 17, 2016, from http://er.educause.edu/articles/2014/4/~/link.aspx?_id=B0FD05F11CF14C49B6284C43DE06ECA5&_z=z

Willis, J. E., Quick, J., & Hickey, D. T. (2015). Digital badges and ethics: The uses of individual learning data in social contexts. In D. T. Hickey, J. Jovanovic, S. Lonn & J. E. Willis (Eds.), *Proceedings of the Open Badges in Education (OBIE 2015) Workshop*. Poughkeepsie, New York, USA: ceur-ws.

Wingate, U. (2006). Doing away with "study skills". *Teaching in Higher Education, 11*(4), 457–469. doi: 10.1080/13562510600874268

Wolff, A., Zdrahal, Z., Herrmannova, D., Kuzilek, J., & Hlosta, M. (2014). Developing predictive models for early detection of at-risk students on distance learning modules *Machine Learning and Learning Analytics Workshop at The 4th International Conference on Learning Analytics and Knowledge (LAK14)*. Indianapolis, Indiana, USA.

Wolff, A., Zdrahal, Z., Nikolov, A., & Pantucek, M. (2013). Improving retention: Predicting at-risk students by analysing clicking behaviour in a virtual learning environment *LAK '13 Proceedings of the 3rd International Conference on Learning Analytics and Knowledge* (pp. 145–149). New York: ACM

Wright, C. V., & O'Shea, K. (2014). Digital Badges and Outcomes-Based Learning. Retrieved May, 24, 2016, from http://www.educause.edu/events/educause-connect-baltimore/2014/digital-badges-and-outcomes-based-learning

Wu, M., Whiteley, D., & Sass, M. (2015). From girl scout to grown up: Emerging applications of digital badges in higher education. *The Online Journal of Distance Education and e-Learning, 3*(2), 48–52.

Wyatt, L. G. (2011). Nontraditional Student Engagement: Increasing Adult Student Success and Retention. *The Journal of Continuing Higher Education, 59*(1), 10–20. doi: 10.1080/07377363.2011.544977

Yorke, M. (2000). Smoothing the transition into higher education: What can be learned from student non-completion? *Australasian Association for Institutional Research Journal, 9*(1).

Yorke, M., & Longden, B. (2008). The first-year experience of higher education in the UK. York: The Higher Education Academy.

Zaitseva, E., Clifford, E., Nixon, S., Deja, E., & Murphy, A. (2011). Communication as performance: A cross-disciplinary approach to staff-student partnership. In S. Little (Ed.), *Staff-student partnerships in higher education* (pp. 123–137). London, New York: Continuum.

Zlatkin-Troitschanskaia, O., Pant, H. A., Kuhn, C., Toepper, M., & Lautenbach, C. (2016). Assessment practices in higher education & results of the German research program modeling and measuring competencies in higher education (KoKoHs). *Research & Practice in Assessment, 11*, 46–54.

Zlatkin-Troitschanskaia, O., Shavelson, R. J., & Kuhna, C. (2015). The international state of research on measurement of competency in higher education. *Studies in Higher Education, 40*(3), 393–411. doi: 10.1080/03075079.2015.1004241

Appendix

Questionnaire (Paper 1)

Befragung zu Kompetenzerwartungen und Selbsteinschätzung von Studienanfängern

Sehr geehrte Studierende, sehr geehrter Studierender,
Sie sind Studienanfänger im ersten oder zweiten Semester an der Universität Potsdam?
Dann unterstützen Sie die Optimierung der Studieneingangsphase! Um aussagekräftige Ergebnisse zu erhalten, ist jede Meinung wichtig. Ihre Angaben können maßgebeblich dazu beitragen, Erkenntnisse über die herausfordernden ersten zwei Semester an der Universität zu erlangen, um beispielsweise Studienabbrüche zu reduzieren.

(1) Was sind die Themen? Teil 1: Welche Kompetenzerwartungen und Unterstützungswünsche haben Sie während der ersten zwei Semester an der Universität Potsdam? Teil 2: Wie schätzen Sie Ihre Fähigkeiten in verschiedenen akademischen Bereichen ein? Teil 3: Angaben zu Ihrer Person.

(2) Wie lange dauert die Befragung? Für die Beantwortung der Fragen benötigen Sie ca. 15 Minuten Zeit.

(3) Wer führt die Befragung durch? Im Rahmen meiner Promotion im Fachbereich „Angewandte Lehr- und Lernforschung“ des Department Erziehungswissenschaft führe ich, Dana-Kristin Mah, diese Befragung durch. Bei Rückfragen stehe ich Ihnen gerne per E-Mail (dana-kristin.mah@uni-potsdam.de) zur Verfügung.

Alle Teilnehmer haben nach der erfolgreichen Beendigung des Fragebogens die Chance, einen von fünf iTunes-Geschenkgutscheinen im Wert von jeweils 25 Euro zu gewinnen. Die Passwörter (bitte nachfolgend angeben) der Gewinner werden im Januar 2015 auf der Homepage des Fachbereichs "Angewandte Lehr- und Lernforschung" veröffentlicht.
Sie können den Fragebogen bis zum 19. Dezember 2014 online beantworten.
Die Teilnahme an der Befragung ist selbstverständlich freiwillig. Alle erhobenen Angaben werden streng vertraulich behandelt und die Vorschriften des Datenschutzes eingehalten.

Vielen Dank für Ihr Mitwirken!
Mit freundlichen Grüßen Dana-Kristin Mah

Bitte geben Sie Ihr 6-stelliges Passwort an
Dieses dient der längsschnittlichen Auswertung der Fragebögen (also einem Vorher-Nachher - Vergleich) zukünftiger Studien. Außerdem wird es benötigt, um unter allen Teilnehmern die fünf Gewinner der iTunes-Geschenkgutscheine zu ermitteln.

Ihr Passwort erstellen Sie bitte folgendermaßen:

1. Die ersten beiden Buchstaben des Vornamens Ihrer Mutter (z.B. Anna → AN)
2. Die ersten beiden Zahlen Ihres eigenen Geburtstages (z.B. 08.10.1979 → 08)
3. Der Monat indem Ihre Mutter geboren wurde (z.B. 28.02.1951 → 02)
Ihr Passwort wäre folglich: AN0802 1.

Teil 1: Erwartungen
Inwiefern erwarten Sie in Ihren ersten zwei Semestern an der Universität Potsdam, dass folgende Aussagen zutreffen?
1 = trifft voll und ganz zu, 2 = trifft überwiegend zu, 3 = trifft eher zu, 4 = trifft eher nicht zu, 5 = trifft überwiegend nicht zu, 6 = trifft überhaupt nicht zu
Bitte kreuzen Sie jeweils ein Kästchen an! Markieren Sie nur ein Oval pro Zeile.

1.1: Ich werde kontinuierlich studienrelevante Lektüre für meine Lehrveranstaltungen lesen.
1.2: Ich werde die meiste Zeit selbstständig arbeiten.
1.3: Ich werde meine Zeit gut organisieren, um die bevorstehenden studienbezogenen Aufgaben und Leistungsanforderungen bewältigen zu können.
1.4: Die Dozenten erklären mir jede Woche, welche studienbezogenen Aufgaben ich erfüllen muss.
1.5: Die Dozenten erklären mir, wie ich Kursnotizen anfertige.
1.6: Die Dozenten erklären mir, wie gute Gruppenarbeit funktioniert.
1.7: Die Dozenten erklären mir, wie ich erforderliche Informationen zur Bearbeitung von studienbezogenen Aufgaben recherchieren und auswählen kann.
1.8: Ich werde universitäre Onlinesysteme nutzen (z.B. E-Mail, Moodle für Kursinformationen und -materialien, studienbezogene Aufgaben, Diskussionsforen, PULS für Kursanmeldungen etc.)
1.9: Ich werde auf wissenschaftlichen Internetseiten für studienrelevante Themen recherchieren (z.B. Google Scholar).
1.10: Die Dozenten erklären mir, wie ich die universitären Onlinesysteme bedienen kann (z.B. Moodle, PULS, Bibliothek etc.) .
1.11: Die Dozenten vermitteln mir Methoden, mit denen ich meinen Lernprozess reflektieren kann (z.B. in einem Journal, Blog, e-Portfolio).
1.12: Ich werde versuchen, meine theoretisch erworbenen Kenntnisse mit meinen eigenen Erfahrungen zu verknüpfen.
1.13: Ich werde Feedback zu meinen eingereichten studienbezogenen Aufgaben erhalten, um mich weiterentwickeln zu können.
1.14: Ich werde an Forschungsprojekten mitarbeiten.
1.15: Ich werde selbstständig viele Forschungsprojekte durchführen.
1.16: Ich werde mich häufig mit wissenschaftlichen Fragestellungen auseinandersetzen (z.B. in den Lehrveranstaltungen,
1.17: Die Dozenten erklären mir das forschungsmethodische Vorgehen, um wissenschaftlich arbeiten zu können.
1.18: Die Dozenten werden mir erklären, wie ich wissenschaftliche Arbeiten verfasse (z.B. Hausarbeiten).

Teil 2: Selbsteinschätzung
Wie schätzen sie sich selber ein?
1 = sehr gut, 2 = gut, 3 = befriedigend, 4 = ausreichend, 5 = verbesserungswürdig, 6 = stark verbesserungswürdig
Bitte kreuzen Sie jeweils ein Kästchen an! Markieren Sie nur ein Oval pro Zeile.

2.1: Ich kann die Zeit, die ich fürs Lernen benötige, planen und organisieren.
2.2: Ich kann studienbezogene Aufgaben fristgerecht absolvieren.
2.3: Ich kann selbstständig arbeiten.
2.4: Ich kann meine studienbezogenen Aufgaben organisieren.
2.5: Ich kann meine freie Zeit während des Studienalltags nutzen, um studienbezogene Aufgaben zu bearbeiten.
2.6: Ich kann zu studienrelevanten Texten Notizen anfertigen.
2.7: Ich kann mit anderen Personen in einer Gruppe zusammenarbeiten.
2.8: Ich kann die wesentlichen Aussagen in Texten identifizieren.
2.9: Ich kann Microsoft Office oder ähnliche Programme anwenden (Textverarbeitung, Tabellenkalkulation, Präsentationssoftware).
2.10: Ich kann Informationen zu studienrelevanten Themen mit Hilfe einer Suchmaschine recherchieren (z.B. Google).
2.11: Ich kann auf wissenschaftlichen Internetseiten für studienrelevante Themen recherchieren (z.B. Google Scholar, E-Journals der Universitätsbibliothek).
2.12: Ich kann meine ideale Lernatmosphäre beschreiben (Ort, Zeit etc.).
2.13: Ich kann meine Projekte und studienbezogene Aufgaben absolvieren, ohne daran erinnert zu werden.
2.14: Ich kenne meine Stärken und Schwächen in Bezug auf mein Lernen.
2.15: Ich kann meine eigenen Lernresultate beurteilen.
2.16: Ich kann selbständig wissenschaftliche Arbeiten verfassen (z.B. Hausarbeiten).
2.17: Ich kann eine wissenschaftliche Fragestellung entwickeln.
2.18: Ich kann zur Bearbeitung wissenschaftlicher Fragestellungen recherchieren.
2.19: Ich kann ein wissenschaftliches Forschungsdesign entwickeln.
2.20: Ich kann Forschungsergebnisse interpretieren.
2.21: Ich kann Forschungsergebnisse mündlich kommunizieren.

Teil 3: Angaben zur Person
3.1: Welchen Studiengang studieren Sie an der Universität Potsdam?
3.2: Welcher Fakultät ist Ihr Studiengang zugehörig? *Wählen Sie alle zutreffenden Antworten aus*. Juristische Fakultät, Philosophische Fakultät, Humanwissenschaftliche Fakultät, Wirtschafts- und Sozialwissenschaftliche Fakultät, Mathematisch-Naturwissenschaftliche Fakultät
3.3: Wie hoch ist die Anzahl Ihrer Hochschulsemester? 1, 2, 3, 4, mehr als 4
3.4: Wie viele Lehrveranstaltungen besuchen Sie im aktuellen Wintersemester 2014/15? (Bitte Ziffern eintragen, z.B. 06)
3.5: Wie viele verschiedene Vorlesungen haben Sie insgesamt bereits an der Universität Potsdam besucht? (ohne das aktuelle Wintersemester 2014/15) (Bitte Ziffern eintragen, z.B. 06)
3.6: Wie viele verschiedene Seminare haben Sie insgesamt bereits an der Universität Potsdam besucht? (ohne das aktuelle Wintersemester 2014/15) (Bitte Ziffern eintragen, z.B. 06)
3.7 : Wie viele verschiedene Übungen haben Sie insgesamt bereits an der Universität Potsdam besucht? (ohne das aktuelle Wintersemester 2014/15) (Bitte Ziffern eintragen, z.B. 06)
3.8: Wann erwarben Sie die Hochschulreife bzw. die Hochschulzugangsberechtigung? (Jahr und Monat in Ziffern, z.B. 201406)
3.9: In welchem Bundesland erwarben Sie Ihre Hochschulreife bzw. Hochschulzugangsberechtigung? *Markieren Sie nur ein Oval.* Baden-Württemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-

Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein, Thüringen, Im Ausland
3.10: Bitte geben Sie den Schultyp bei Erwerb der Hochschulreife bzw. den Weg zum Erwerb der Hochschulzugangsberechtigung an. *Markieren Sie nur ein Oval.* Gymnasium/Gesamtschule/Freie Waldorfschule, Abendgymnasium/Kolleg (nicht Berufskolleg), Fachgymnasium, Gymnasiale Oberstufe einer Berufsfachschule bzw. im Oberstufenzentrum, Berufsoberschule, Fachoberschule, Durch Fachhochschulstudium Aufstiegsfortbildung (z. B. Meister, Techniker, Fachwirtin), Eignungsfeststellungsverfahren, Sonder-/Aufnahmeprüfung, Auf einem anderen Weg
3.11: Welche Art von Hochschulreife haben Sie erworben? *Markieren Sie nur ein Oval.* Allgemeine Hochschulreife (Abitur), Fachgebundene Hochschulreife, Fachhochschulreife, Andere Hochschulreife, Keine Hochschulreife
3.12 : Welche Durchschnittsnote hatten Sie in dem Zeugnis, mit dem Sie Ihre Studienberechtigung erworben haben? Bitte Punktzahl ggf. in Note umrechnen. Bei ausländischer Studienberechtigung geben Sie bitte die anerkannte Note an oder rechnen Sie die Note um. (Bitte Ziffern eintragen, z.B. 2,3).
3.13: Haben Sie vor Ihrem Studium – vor, mit oder nach Erwerb der Hochschulreife – bereits eine Berufsausbildung begonnen? *Markieren Sie nur ein Oval.* Ja, Nein
3.14: Was haben Sie zwischen Erwerb der Studienberechtigung und Studienaufnahme getan? *Wählen Sie alle zutreffenden Antworten aus.* Berufsausbildung, Praktikum/ Volontariat, Auslandsaufenthalt (auch Au-Pair-Tätigkeit), Berufstätigkeit/ Jobben Freiwillige soziale/ ökologische Tätigkeit, Familien-/ Haushaltstätigkeiten, Krankheit, Ferien/Reise/Erholung, Sonstiges:
3.15: Was ist die wichtigste Finanzierungsquelle in Ihrem Studium? *Markieren Sie nur ein Oval.* Unterstützung durch die Eltern und/ oder andere Verwandte, Unterstützung durch den (Ehe-)Partner/ die (Ehe-)Partnerin, Ausbildungsförderung nach dem BAföG, Eigener Verdienst aus Tätigkeiten während der Vorlesungszeit und/ oder der vorlesungsfreien Zeit, Kredit (z. B. Bildungskredit von der KfW Bankengruppe; Kredit zur Studienfinanzierung von einer Bank/ Sparkasse oder von Privatpersonen), Stipendium, Eigene Mittel, die vor dem Studium erworben/ angespart wurden, Andere Finanzierungsquelle
3.16 : Sind Sie gewöhnlich während des Semesters und/ oder der vorlesungsfreien Zeit erwerbstätig? *Markieren Sie nur ein Oval.* Ja, während des Semesters, Ja, während der vorlesungsfreien Zeit, Ja, während des Semesters und der vorlesungsfreien Zeit, Nein
3.17: Wo und wie wohnen Sie während der Vorlesungszeit überwiegend? *Markieren Sie nur ein Oval.* Eltern (Verwandte), Wohngemeinschaft (nicht im Studentenwohnheim), Studentenwohnheim, In einer Wohnung (allein/ mit Partner/ mit Kind)
3.18: Wann ist Ihr Geburtsjahr und -monat? (Bitte Ziffern eintragen, z.B. 199405)
3.19: Haben Sie Geschwister? *Markieren Sie nur ein Oval.* Nein, Ja, 1, Ja, 2, Ja, 3, Ja, mehr als 3
3.20: Welche Sprache wird in Ihrem Elternhaus normalerweise gesprochen? *Markieren Sie nur ein Oval.* Deutsch, Deutsch, sowie eine andere Sprache, Nicht Deutsch
3.21: Welches ist der höchste Schulabschluss Ihres Vaters? *Markieren Sie nur ein Oval.* Abitur, Fachhochschulreife, Realschulabschluss/ 10. Klasse, Volks-/Hauptschulabschluss/ 8. Klasse, Kein Abschluss/ unter 8. Klasse Abschluss, nicht bekannt

3.22: Welches ist der höchste Schulabschluss Ihrer Mutter? *Markieren Sie nur ein Oval.* Abitur, Fachhochschulreife, Realschulabschluss/ 10. Klasse, Volks-/Hauptschulabschluss/ 8. Klasse, Kein Abschluss/ unter 8. Klasse Abschluss, nicht bekannt
3.23: Welches ist der höchste berufliche Abschluss Ihres Vaters? *Markieren Sie nur ein Oval.* Universitätsabschluss (einschl. Technische, Pädagogische, kirchliche Hochschule, Gesamt-, Kunst- oder Musikhochschule), Fachhochschulabschluss o. Ä. (auch Fachschulabschluss in der DDR) Meisterprüfung, Technikerschulabschluss Lehre oder gleichwertige Berufsausbildung, Kein beruflicher Abschluss, Beruflicher Abschluss nicht bekannt
3.24: Welches ist der höchste berufliche Abschluss Ihrer Mutter? *Markieren Sie nur ein Oval.* Universitätsabschluss (einschl. Technische, Pädagogische, kirchliche Hochschule, Gesamt-, Kunst- oder Musikhochschule), Fachhochschulabschluss o. Ä. (auch Fachschulabschluss in der DDR) Meisterprüfung, Technikerschulabschluss Lehre oder gleichwertige Berufsausbildung, Kein beruflicher Abschluss, Beruflicher Abschluss nicht bekannt
3.25: Welcher Berufsgruppe gehört Ihrem Vater an bzw. welcher hat er zuletzt angehört? *Markieren Sie nur ein Oval.* Selbstständige, Angestellte, Beamte, Arbeiter, Nie erwerbstätig gewesen / Hausmann, Sonstiges:
3.26: Welcher Berufsgruppe gehört Ihrer Mutter an bzw. welcher hat er zuletzt angehört? *Markieren Sie nur ein Oval.* Selbstständige, Angestellte, Beamte, Arbeiter, Nie erwerbstätig gewesen / Hausfrau, Sonstiges:

Hinweise und Anregungen
Hinweise und Anregungen können Sie gerne hier vermerken:

Vielen Dank für Ihre Teilnahme!

Sie haben die Chance, einen von fünf iTunes-Geschenkgutscheinen im Wert von jeweils 25 Euro zu gewinnen. Die Passwörter der Gewinner werden im Januar 2015 auf der Homepage des Fachbereichs "Angewandte Lehr- und Lernforschung" (http://www.uni-potsdam.de/allf/) veröffentlicht. Bitte kontaktieren Sie mich per E-Mail (dana-kristin.mah@uni-potsdam.de), sofern Sie zu den Gewinnern gehören.

Bei Rückfragen stehe ich Ihnen gerne per E-Mail (dana-kristin.mah@uni-potsdam.de) zur Verfügung.
Mit freundlichen Grüßen Dana-Kristin Mah

Questionnaire (Paper 2)

Befragung Studienanfänger

Liebe Studierende,
Bitte geben Sie auf dieser Seite Ihre Projektgruppennummer ein und bestätigen Sie mit "weiter". Im Anschluss übergeben Sie das iPad den Probanden und lassen den Fragebogen ohne Beeinflussung vollständig ausfüllen.
Für Fragen bezüglich der Untersuchung und zum Fragebogen wenden Sie sich an Professor Dr. Dirk Ifenthaler (ifenthaler@bwl.uni-mannheim.de) oder Dana-Kristin Mah (dana-kristin.mah@uni- potsdam.de).

1. Projektgruppennummer
2. Bestätigung der Projektgruppennummer

Sehr geehrte Studierende, sehr geehrter Studierender, Sie sind Studienanfänger im ersten oder zweiten Semester an der Universität Mannheim?
Dann unterstützen Sie die Optimierung der Studieneingangsphase! Um aussagekräftige Ergebnisse zu erhalten, ist jede Meinung wichtig. Ihre Angaben können maßgebeblich dazu beitragen, Erkenntnisse über die herausfordernden ersten zwei Semester an der Universität zu erlangen, um beispielsweise Studienabbrüche zu reduzieren.

Wie lange dauert die Befragung? Der folgende Fragebogen besteht aus drei Teilen. Für die Beantwortung der Fragen benötigen Sie ca. 15 Minuten Zeit.
Wer führt die Befragung durch? Die Befragung wird im Rahmen der Promotion von Dana-Kristin Mah an der Universität Potsdam, Fachbereich „Angewandte Lehr- und Lernforschung" des Department Erziehungswissenschaft durchgeführt. Bei Rückfragen können Sie sich gerne per E-Mail an Dana-Kristin Mah wenden (dana-kristin.mah@uni-potsdam.de).

Die Teilnahme an der Befragung ist selbstverständlich freiwillig. Alle erhobenen Angaben werden streng vertraulich behandelt und die Vorschriften des Datenschutzes eingehalten.

Vielen Dank für Ihr Mitwirken!
Mit freundlichen Grüßen Dana-Kristin Mah

Bitte geben Sie Ihr 6-stelliges Passwort an

Das Passwort dient der längsschnittlichen Auswertung der Fragebögen (also einem Vorher- Nachher-Vergleich) zukünftiger Studien.
Ihr Passwort erstellen Sie bitte folgendermaßen:
1. Die ersten beiden Buchstaben des Vornamens Ihrer Mutter (z.B. Anna → AN)
2. Die ersten beiden Zahlen Ihres eigenen Geburtstages (z.B. 08.10.1979 → 08)
3. Der Monat indem Ihre Mutter geboren wurde (z.B. 28.02.1951 → 02)
Ihr Passwort wäre folglich: AN0802

Teil (1)
Inwiefern vermuten Sie, dass Folgendes von Ihnen in Ihren ersten zwei Semestern an der Universität erwartet wird?
1= Trifft überhaupt nicht zu, 2= Trifft überwiegend nicht zu, 3 = Teils/ teils,
4 = Trifft überwiegend zu, 5 = Trifft voll und ganz zu
Bitte kreuzen Sie jeweils ein Kästchen an! Markieren Sie nur ein Oval pro Zeile.

1.1: Ich werde kontinuierlich studienrelevante Lektüre für meine Lehrveranstaltungen lesen.
1.2: Ich werde die meiste Zeit selbstständig arbeiten. 1.3: Ich werde meine Zeit gut organisieren, um die bevorstehenden studienrelevanten Aufgaben und Leistungsanforderungen bewältigen zu können.
1.4: Ich werde die Bearbeitung diverser studienrelevanter Aufgaben nach ihrer Wichtigkeit ordnen.
1.5: Ich werde selbstständig meine studienrelevanten Aufgaben organisieren.
1.6: Ich werde mir einen Zeitplan erstellen, um den Umfang studienrelevanter Aufgaben zeitlich organisieren zu können.
1.7: Ich werde aus wissenschaftlichen Texten die Hauptaspekte herausfiltern.
1.8: Ich werde Lesetechniken anwenden (z.B. Markierungen, Zusammenfassungen, etc.).
1.9: Ich werde in Lehrveranstaltungen Notizen anfertigen.
1.10: Ich werde studienrelevante Texte mit meinen eigenen Worten zusammenfassen, um das Gelesene besser zu verstehen.
1.11: Ich werden verschiedene Lerntechniken anwenden (z.B. Visualisierungen, Wiederholungsstrategien, Karteikarten, etc.).
1.12: Ich werde mir selbst Fragen zu meinen Lerninhalten stellen, um mein Verständnis zu überprüfen.
1.13: Ich werde beim Lesen studienrelevanter Texte entscheiden, welche Informationen für mein Erkenntnisinteresse wichtig sind und welche weniger bedeutsam.
1.14: Ich werde universitäre Onlinesysteme nutzen (z.B. Lernplattformen und Studienorganisation).
1.15: Ich werde auf wissenschaftlichen Internetseiten für studienrelevante Themen recherchieren (z.B. Google Scholar).
1.16: Ich werde Informationen zu studienrelevanten Themen mit Hilfe von Suchmaschinen recherchieren (z.B. Google).
1.17: Ich werde das Internet zur Bearbeitung studienrelevanter Aufgaben benutzen.
1.18: Ich werde Microsoft Office oder ähnliche Programme anwenden (z.B. Textverarbeitung, Tabellenkalkulation, Präsentationsoftware).
1.19: Ich werde E-Mails im universitären Kontext versenden (z.B. zur Kommunikation mit Kommilitonen, Dozenten).
1.20: Ich werde mit Hilfe digitaler Medien (z.B. universitäre Onlinesysteme) mit Kommilitonen online zusammenarbeiten.
1.21: Ich werde meine theoretisch erworbenen Kenntnisse mit meinen eigenen Erfahrungen verknüpfen.
1.22: Ich werde meinen Lernprozess reflektieren (z.B. in einem Journal, Blog, e-Portfolio).
1.23: Ich werde mich mit meinen Studieninhalten kritisch auseinandersetzen.
1.24: Ich werde meine eigenen Lernresultate bewerten, um mich weiterzuentwickeln.
1.25: Ich werde mich mit meinen Stärken in Bezug auf mein Lernen auseinandersetzen.

1.26: Ich werde mich mit meinen Schwächen in Bezug auf mein Lernen auseinandersetzen.
1.27: Ich werde mich damit auseinandersetzen, welches für mich die ideale Lernatmosphäre ist (z.B. Ort, Zeit).
1.28: Ich werde an Forschungsprojekten mitarbeiten.
1.29: Ich werde selbstständig viele Forschungsprojekte durchführen.
1.30: Ich werde mich häufig mit wissenschaftlichen Fragestellungen auseinandersetzen (z.B. in den Lehrveranstaltungen, Lehrveranstaltungsliteratur).
1.31: Ich werde zur Bearbeitung wissenschaftlicher Fragestellungen recherchieren.
1.32: Ich werde Literaturrecherchen durchführen.
1.33: Ich werde zusätzlich zur vorgegebenen Grundlagenliteratur weitere Fachliteratur recherchieren.
1.34: Ich werde Forschungsergebnisse mündlich kommunizieren (z.B. als Vortrag).

Teil (2) Inwiefern erwarten Sie in Ihren ersten zwei Semestern an der Universität folgende Unterstützungsleistung von Ihren Dozenten?
1= Trifft überhaupt nicht zu, 2= Trifft überwiegend nicht zu, 3 = Teils/ teils,
4 = Trifft überwiegend zu, 5 = Trifft voll und ganz zu
Bitte kreuzen Sie jeweils ein Kästchen an! *Markieren Sie nur ein Oval pro Zeile.*

2.1: Die Dozenten erklären mir jede Woche, welche Arbeitsaufgaben ich erfüllen muss.
2.2: Die Dozenten machen regelmäßig auf die Abgabefristen studienrelevanter Aufgaben aufmerksam.
2.3: Die Dozenten erklären mir, wie ich ein Semester zeitlich am besten organisieren kann.
2.4: Die Dozenten erklären mir, wie ich einen Zeitplan erstelle.
2.5: Die Dozenten erklären mir, wie ich die Bearbeitung studienrelevanter Aufgaben nach ihrer Wichtigkeit ordne.
2.6: Die Dozenten erklären mir, wie ich termingerecht arbeite.
2.7: Die Dozenten erklären mir, wie ich Kursnotizen anfertige.
2.8: Die Dozenten erklären mir, wie gute Gruppenarbeit funktioniert.
2.9: Die Dozenten erklären mir, wie ich erforderliche Informationen zur Bearbeitung von studienrelevanten Arbeitsaufgaben recherchiere.
2.10: Die Dozenten erklären mir, wie ich erforderliche Informationen zur Bearbeitung von studienrelevanten Arbeitsaufgaben auswähle.
2.11: Die Dozenten erklären mir, wie ich die Hauptaspekte aus studienrelevanten Texten herausfiltere.
2.12: Die Dozenten erklären mir, wie ich mir große Informationsmengen einpräge.
2.13: Die Dozenten bieten mir Unterstützungsleistungen an, wenn ich Studieninhalte nicht verstehe.
2.14: Die Dozenten erklären mir, wie ich universitäre Onlinesysteme bediene (z.B. Lernplattformen und Studienorganisation).
2.15: Die Dozenten erklären mir, wie ich Microsoft Office oder ähnliche Programme anwende (z.B. Textverarbeitung, Tabellenkalkulation, Präsentationsoftware).
2.16: Die Dozenten erklären mir, wie ich Informationen zu studienrelevanten Themen mit Suchmaschinen recherchiere (z.B. Google).
2.17: Die Dozenten erklären mir, wie ich das Internet zur Bearbeitung studienrelevanter Aufgaben benutze.
2.18: Die Dozenten erklären mir, wie ich auf wissenschaftlichen Internetseiten für

studienrelevante Themen recherchiere (z.B. Google Scholar, E- Journals der Universitätsbibliothek).
2.19: Die Dozenten stellen studienrelevante Arbeitsmaterialien auf universitären Onlinesystemen zur Verfügung.
2.20: Die Dozenten vermitteln mir Methoden, mit denen ich meinen Lernprozess reflektieren kann (z.B. in einem Journal, Blog, e- Portfolio).
2.21: Die Dozenten geben mir Feedback zu meinen Lernresultaten, so dass ich mich weiterentwickeln kann.
2.22: Die Dozenten vermitteln mir Methoden, um meine Stärken zu bewerten.
2.23: Die Dozenten vermitteln mir Methoden, um meine Schwächen zu bewerten.
2.24: Die Dozenten erklären mir, wie ich mich kritisch mit Studieninhalten auseinandersetze.
2.25: Die Dozenten erklären mir, wie ich die ideale Lernatmosphäre für mich gestalte (z.B. Ort, Zeit).
2.26: Die Dozenten erklären mir das forschungsmethodische Vorgehen, um wissenschaftlich zu arbeiten.
2.27: Die Dozenten erklären mir, wie ich wissenschaftliche Berichte verfasse (z.B. Hausarbeiten).
2.28: Die Dozenten erklären mir, wie ich eine Literaturrecherche durchführe.
2.29: Die Dozenten erklären mir, wie ich ein wissenschaftliches Forschungsdesign entwickle.
2.30: Die Dozenten stehen mir zur Verfügung, um meinen Forschungsprozess zu besprechen.
2.31: Die Dozenten erklären mir, wie ich wissenschaftlich zitiere.
2.32: Die Dozenten erklären mir, wie ich Forschungsergebnisse interpretiere.
2.33: Die Dozenten erklären mir, wie ich Forschungsergebnisse mündlich kommuniziere.
2:34: In welchen Bereichen wünschen Sie sich Unterstützung von der Universität?

Teil (3)
Angaben zur Person
3.1: Ihr Alter
3.2: Ihr Geschlecht *Wählen Sie alle zutreffenden Antworten aus.* Weiblich, Männlich
3.3: Welchen Studiengang studieren Sie an der Universität Mannheim (z.B. Bachelor Wirtschaftspädagogik)?
3.4: Welcher Fakultät ist Ihr Studiengang zugehörig? *Wählen Sie alle zutreffenden Antworten aus.* Fakultät für Rechtswissenschaft und Volkswirtschaftslehre, Fakultät für Betriebswirtschaftslehre, Fakultät für Sozialwissenschaften, Philosophische Fakultät, Fakultät für Wirtschaftsinformatik und Wirtschaftsmathematik
3.5: Wie hoch ist die Anzahl Ihrer Hochschulsemester? (Hochschulsemester sind Semester, die insgesamt im Hochschulbereich verbracht worden sind) *Markieren Sie nur ein Oval.* 1, 2, 3, 4, mehr als 4
3.6: Wie viele Lehrveranstaltungen besuchen Sie im aktuellen Herbst-/Wintersemester 2015? (Bitte Ziffern eintragen, z.B. 06)
3.7: Wie viele verschiedene Vorlesungen haben Sie insgesamt bereits an der Universität besucht? (Bitte Ziffern eintragen, z.B. 06)
3.8: Wie viele verschiedene Seminare haben Sie insgesamt bereits an der Universität besucht? (Bitte Ziffern eintragen, z.B. 06)
3.9: Wie viele verschiedene Übungen haben Sie insgesamt bereits an der Universität besucht? (Bitte Ziffern eintragen, z.B. 06)

3.10: Wann erwarben Sie die Hochschulreife bzw. die Hochschulzugangsberechtigung? (Jahr und Monat in Ziffern, z.B. 201406)
3.11: In welchem Bundesland erwarben Sie Ihre Hochschulreife bzw. Hochschulzugangsberechtigung? *Markieren Sie nur ein Oval.* Baden-Württemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein, Thüringen, Im Ausland
3.12: Bitte geben Sie den Schultyp bei Erwerb der Hochschulreife bzw. den Weg zum Erwerb der Hochschulzugangsberechtigung an. *Markieren Sie nur ein Oval*.
Gymnasium/Gesamtschule/Freie Waldorfschule, Abendgymnasium/Kolleg (nicht Berufskolleg), Fachgymnasium, Gymnasiale Oberstufe einer Berufsfachschule bzw. im Oberstufenzentrum, Berufsoberschule, Fachoberschule, Durch Fachhochschul-studium Aufstiegsfortbildung (z. B. Meister, Techniker, Fachwirtin), Eignungsfeststellungsverfahren Sonder-/Aufnahmeprüfung, Auf einem anderen Weg

3.13: Welche Art von Hochschulreife haben Sie erworben? *Markieren Sie nur ein Oval.* Allgemeine Hochschulreife (Abitur), Fachgebundene Hochschulreife, Fachhochschulreife, Andere Hochschulreife, Keine Hochschulreife
3.14: Welche Durchschnittsnote hatten Sie in dem Zeugnis, mit dem Sie Ihre Studienberechtigung erworben haben? Bitte Punktzahl ggf. in Note umrechnen. Bei ausländischer Studienberechtigung geben Sie bitte die anerkannte Note an oder rechnen Sie die Note um. (Bitte Ziffern eintragen, z.B. 2,3).
3.15: Haben Sie vor Ihrem Studium – vor, mit oder nach Erwerb der Hochschulreife – bereits eine Berufsausbildung begonnen? *Markieren Sie nur ein Oval.* Nein, Ja
3.16: Was haben Sie zwischen Erwerb der Studienberechtigung und Studium getan? (Mehrfachantworten möglich) *Wählen Sie alle zutreffenden Antworten aus.* Berufsausbildung Praktikum/ Volontariat, Auslandsaufenthalt (auch Au-Pair), Berufstätigkeit/ Jobben, Freiwilliges soziales/ ökologisches Jahr
3.17: Was ist die wichtigste Finanzierungsquelle in Ihrem Studium? *Markieren Sie nur ein Oval.* Unterstützung durch die Eltern und/ oder andere Verwandte, Unterstützung durch den (Ehe-)Partner/ die (Ehe-)Partnerin, Ausbildungsförderung nach dem BAföG, Eigener Verdienst aus Tätigkeiten während der Vorlesungszeit und/ oder der vorlesungsfreien Zeit, Kredit (z. B. Bildungskredit von der KfW Bankengruppe; Kredit zur Studienfinanzierung von einer Bank/ Sparkasse oder von Privatpersonen), Stipendium Eigene Mittel, die vor dem Studium erworben/ angespart wurden, Andere Finanzierungsquelle
3.18: Sind Sie gewöhnlich während des Semesters und/ oder der vorlesungsfreien Zeit erwerbstätig? *Markieren Sie nur ein Oval.* Nein, Ja, während des Semesters, Ja, während der vorlesungsfreien Zeit, Ja, während des Semesters und der vorlesungsfreien Zeit
3.19: Wo und wie wohnen Sie während der Vorlesungszeit überwiegend? *Markieren Sie nur ein Oval.* Eltern (Verwandte), Wohngemeinschaft (nicht im Studentenwohnheim), Studentenwohnheim, In einer Wohnung (allein/ mit Partner/ mit Kind)
3.20: Haben Sie Geschwister? *Markieren Sie nur ein Oval.* Nein, Ja, 1, Ja, 2, Ja, 3, Ja, mehr als 3
3.21: Welche Sprache wird in Ihrem Elternhaus normalerweise gesprochen? *Markieren Sie nur ein Oval.* Deutsch, Deutsch, sowie eine andere Sprache, Nicht Deutsch
3.22: Welches ist der höchste Schulabschluss Ihres Vaters? *Markieren Sie nur ein*

Oval. Abitur, Fachhochschulreife, Realschulabschluss/ 10. Klasse, Volks-/Hauptschulabschluss/ 8. Klasse, Kein Abschluss/ unter 8. Klasse, Abschluss nicht bekannt
3.23: Welches ist der höchste Schulabschluss Ihrer Mutter? *Markieren Sie nur ein Oval.* Abitur, Fachhochschulreife, Realschulabschluss/ 10. Klasse, Volks-/ Hauptschulabschluss/ 8. Klasse, Kein Abschluss/ unter 8. Klasse, Abschluss nicht bekannt
3.24: Welches ist der höchste berufliche Abschluss Ihres Vaters? *Markieren Sie nur ein Oval.* Universitätsabschluss (einschl. Technische, Pädagogische, kirchliche Hochschule, Gesamt-, Kunst- oder Musikhochschule), Fachhochschulabschluss o. Ä. (auch Fachschulabschluss in der DDR) Meisterprüfung, Technikerschulabschluss Lehre oder gleichwertige Berufsausbildung Kein beruflicher Abschluss, Beruflicher Abschluss nicht bekannt
3.25: Welches ist der höchste berufliche Abschluss Ihrer Mutter? *Markieren Sie nur ein Oval.* Universitätsabschluss (einschl. Technische, Pädagogische, kirchliche Hochschule, Gesamt-, Kunst- oder Musikhochschule), Fachhochschulabschluss o. Ä. (auch Fachschulabschluss in der DDR) Meisterprüfung, Technikerschulabschluss Lehre oder gleichwertige Berufsausbildung Kein beruflicher Abschluss, Beruflicher Abschluss nicht bekannt
3.26: Welcher Berufsgruppe gehört Ihrem Vater an bzw. welcher hat er zuletzt angehört? *Markieren Sie nur ein Oval.* Selbstständige, Angestellte, Beamte Arbeiter, Nie erwerbstätig gewesen / Hausmann, Sonstiges:
3.27: Welcher Berufsgruppe gehört Ihrer Mutter an bzw. welcher hat er zuletzt angehört? *Markieren Sie nur ein Oval.* Selbstständige, Angestellte, Beamte, Arbeiter, Nie erwerbstätig gewesen / Hausfrau, Sonstiges:
3.28: Denken Sie derzeit darüber nach, Ihren Studienangang zu wechseln? *Markieren Sie nur ein Oval.* Nie, Selten, Gelegentlich, Häufig, Sehr häufig
3.29: Denken Sie derzeit darüber nach, Ihr Studium abzubrechen? *Markieren Sie nur ein Oval.* Nie, Selten, Gelegentlich, Häufig, Sehr häufig
3.30: Aus welchen Gründen denken Sie derzeit über den Wechsel Ihres Studiengangs bzw. Abbruch Ihres Studiums nach?

Hinweise und Anregungen
Anmerkungen: Möchten Sie uns noch etwas mitteilen?

Vielen Dank für Ihre Teinahme!

Für Fragen bezüglich der Untersuchung und zum Fragebogen wenden Sie sich an Professor Dr. Dirk Ifenthaler (ifenthaler@bwl.uni-mannheim.de) oder Dana-Kristin Mah (dana-kristin.mah@uni- potsdam.de).
Mit freundlichen Grüßen Prof. Dr. Dirk Ifenthaler und Dana-Kristin Mah

Semi-structured interview (Paper 3)

Vielen Dank, dass Sie sich Zeit für dieses Interview nehmen.
Bevor wir mit dem Interview beginnen, würden wir uns kurz vorstellen und Ihnen einige Informationen zum Forschungsprojekt geben.

Vorstellung InterviewerInnen
Ich möchte gar nicht so viel vorwegnehmen, Ihnen aber auch einen Rahmen geben, warum und wofür wir mit Ihnen dieses Interview führen. Unser Projekt beschäftigt sich mit der Erforschung und der Optimierung der Studieneingangsphase an der Universität Potsdam. Unter Studieneingangsphase verstehen wir dabei die ersten beiden Semester, die Studierende an der Universität sind.
Bisher wurden bereits Erwartungen und Vorstellungen von Studierenden mithilfe von Fragebögen erhoben. Nun interessieren wir uns aber auch für die Sicht der Dozenten und was für Erwartungen diese an Studierende in den ersten ein, zwei Semestern haben. Daher wollen wir uns mit Ihnen über Ihre Erwartungen, an die Studierenden, sowie über die Rolle des Dozenten in der Studieneingansphase unterhalten. Uns geht es dabei darum, die Perspektive der Dozenten besser verstehen zu können, um so ein möglichst vollständiges Bild zu bekommen.
Das Interview wird ungefähr eine halbe Stunde dauern.
Wir möchten das Interview gern mit diesem Gerät aufzeichnen [zeigen!]. Wichtig zu wissen: Alles, was Sie sagen, wird bereits bei der Verschriftlichung soweit anonymisiert, dass später keine Rückschlüsse auf Ihre Person möglich sind. Das Interview wird ausschließlich für ein Promotionsprojekt und eine Masterarbeit am Lehrstuhl für Angewandte Lehr- und Lernforschung genutzt. Sämtliche Angaben werden streng vertraulich und unter Berücksichtigung der gesetzlichen Datenschutzbestimmungen behandelt.
Sie können also alles sagen, was Ihnen in den Sinn kommt, es gibt keine richtigen oder falschen Antworten, keine Idee ist erwünscht oder unerwünscht. Wir sind an Ihrer subjektiven Meinung interessiert.
Haben Sie noch Fragen zum Interview?
[Start der Aufnahme!]

Zur Person
Bevor wir mit dem eigentlichen Interview starten: Könnten Sie sich noch kurz Vorstellen.
Was haben Sie studiert?
Seit wann sind Sie an der Uni?
Was ist dabei ihr Tätigkeitsschwerpunkt?
Wie viele Veranstaltungen haben Sie mit Bachelor Erstsemestern?
Geschlecht:
Geburtsjahr:

(A) Offene Fragen - wichtige Kompetenzbereiche
Wie bereits gesagt geht es uns um Ihre Erwartungen, hinsichtlich der fächerübergreifenden Kompetenzen, von Studierenden in den ersten beiden Semestern im Bachelor und wie die Studierenden den akademischen Anforderungen an der Universität gerecht werden.

1. Zunächst ganz allgemein, als wie ‚akademisch Kompetent' würden Sie Studierende in den ersten beiden Semestern in ein paar Sätzen beschreiben?

Vor diesem Hintergrund interessiert uns, welche Kompetenzen Sie von Studierenden erwarten, dass diese sich erfolgreich in das Universitätsleben einfinden können und ihr Studium bewältigen können

2. Welches sind für Sie die drei wichtigsten fächerübergreifenden Kompetenzen oder Kompetenzfelder, die Studienanfänger mitbringen sollten? Beginnen Sie bitte mit der für Sie wichtigsten Kompetenz.
3. Denken Sie, Studienanfänger schätzen diese Felder als genauso wichtig ein?

(B) Erwartungen an Studienanfänger im Abgleich mit den subjektiv beobachteten Kompetenzen

Auch in der Literatur wird betrachtet, was wichtige Kompetenzen in der Studieneingangsphase sind, dabei werden vor allem fünf Kompetenzbereiche als wichtige fächerübergreifende Schlüsselkompetenzen diskutiert. Diese sehen Sie hier in einer Skala dargestellt.

[Netz zeigen und Bereiche kurz erläutern]

Ich würde jetzt gerne in zwei Schritten vorgehen:

Zunächst geht es um ihre Erwartungen an Studienanfänger.

Die Skala geht dabei von „1 - trifft gar nicht zu – diese Kompetenz erwarten Sie überhaupt nicht" bis hin zu „5 – trifft voll zu - diese Kompetenz erwarten Sie auf jeden Fall von Studienanfängern".

Erklären Sie uns dabei bitte auch wie Sie zu Ihrer Einschätzung kommen und welche Überlegungen für Sie dahinter stecken.

1. Bitte markieren Sie ihre Erwartung an die Studienanfänger

   [Stift]

   - →Bei sehr hohen Erwartungen: Warum erwarten Sie in diesem Bereich besonders viel von den Studienanfänger/innen
   - →Bei sehr niedrigen Erwartungen: Glauben Sie diese Kompetenz wird erst im Studium erworben oder hat keine große Bedeutung?
   - Was genau erwarten Sie hier von den Studienanfängern?
2. Wie schätzen Sie Ihre Erwartungen im Vergleich zu anderen Fächern/ Lehrenden ein. Glauben Sie, dass Sie eher viel oder wenig erwarten?

Ich würde Sie nun bitten aufzuzeichnen, wie kompetent Sie ihre Studierenden im Durchschnitt, in der Studieneingangsphase wahrnehmen.

Hier ist nun eine andere Farbe, mit der Sie Punkte setzen können.

Auch wieder von „1 - trifft gar nicht zu - diese Kompetenz können Sie nicht beobachten" bis zu „5 – trifft voll zu – diese Kompetenz ist voll und ganz zu beobachten".

Erklären Sie dabei bitte wieder, wie Sie zu Ihrer Einschätzung kommen und welche Überlegungen für Sie dahinter stehen.

[Stift geben]

3. Bitte markieren Sie, wie kompetent Sie ihre Studierenden wahrnehmen.
   - Können Sie uns erklären, woran Sie Ihre Einschätzung fest machen.
   - Haben Sie dafür Beispiele?
   - …

   →Wenn Diskrepanz zwischen Erwartung und Einschätzung zu beobachten ist nachfragen, inwiefern dies zu erklären ist:
4. Bevor wir das Skalennetz auf Seite legen. Haben Sie noch einen Bereich, von dem Sie sagen, der müsste auf jeden Fall noch mit hinzugenommen werden? Fehlt Ihnen ein Bereich?

(C) Die Rolle der Dozenten

Nun haben wir uns über Ihre Erwartungen und Einschätzungen den Studierenden gegenüber unterhalten. Uns würde nun noch interessieren wie Sie die Rolle der Dozenten an der Universität wahrnehmen.

1. In was für einer Rolle sehen Sie sich als Dozenten, bei der Entwicklung von überfachlichen Kompetenzen, in der Studieneingangsphase?
    - Was beinhaltet diese?
    - Welches Bild steckt dahinter? Fällt Ihnen dafür ein Bild/ eine Metapher/ ein Schlagwort ein?
2. Was denken Sie erwarten Studienanfänger von Dozenten in der Studieneingangsphase, vor allem mit Blick auf die Entwicklung der überfachlichen Kompetenzen.
3. Sprechen Sie über ihre Anforderungen mit Ihren Studierenden, oder diskutiert diese sogar?
    - →Wenn ja: Wie haben die Studierenden auf ihre Anforderungen reagiert?
    - →Wenn nein: Warum nicht?

(D) Ideen zur Optimierung der Studieneingangsphase

Zum Abschluss des Gespräches interessieren wir uns noch für Ihre Einschätzung der Studieneingangsphase und möglicher Optimierungsideen.

1. Sind Sie der Ansicht, dass die Studieneingangsphase reformiert werden sollte?
    - →Wenn ja: Warum? / Inwiefern?
    - →Wenn nein: Warum nicht?
2. Als letzte Frage, mal angenommen Sie bekommen den Auftrag die Studieneingangsphase hinsichtlich der fachübergreifenden Kompetenzen zu verbessern, ohne dabei auf etwaige Kosten achten zu müssen, welche Unterstützungsmaßnahmen würden Sie einführen?

Das war´s. Ganz herzlichen Dank für das Interview.