



Development of the innovative credit-based degree program "Bachelor IT business management" and derivation of findings for the stabilization of organizational learning processes of universities

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Abstract

Digitalization in combination with the shortage of skilled workers is a significant challenge that has to be faced. Especially the IT sector is characterized by agile and complex developments. In this context, academic further training of IT specialists is crucial to meet the requirements of the IT labor market. The University of Applied Science Weserbergland in Hamelin (Germany) (Hochschule Weserbergland) developed different IT study programs within the research project "Open IT" against the background of the described developments. The study programs "Bachelor of Business Informatics" and "Master IT Business Management" are designed for IT specialists and IT experts with initial and advanced training. These study programs are the first of its kind for the IT sector in Germany due to the recognition of previous professional qualifications. The study programs and their development process are described in this paper. The Deutero concept in terms of organizational learning is the theoretical basis for this article. Single-loop learning and double-loop learning are applied to the research project. © 2017 IJCI & the Authors. Published by *International Journal of Curriculum and Instruction (IJCI)*. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (CC BY-NC-ND) (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Keywords: IT sector, academic education, study program, Bachelor, Master, Deutero, Single-loop learning, double-loop learning

1. Introduction

In view of the continuing digitalization of all areas and the continuing shortage of skilled workers in this field, the academic further training of IT specialists is one of the major future topics for politics and society. The University of Applied Sciences Weserbergland (Hochschule Weserbergland; HSW) is positioning itself in this highly agile segment with a novel offering (Städler, von Zobeltitz, & Linke, 2018). The rapid change in the requirements of the private sector - as well as the rapid progress of technical developments - require special teaching and learning management, which is characterized by constant adaptation and correction to rapidly changing conditions. In this context, the university always analyses the experience gained in order to incorporate this into the (further) development of study programs and thus ensure the high attractiveness of its educational offerings.

The questions for the university, which arose in the research project Open IT in the context of the federal-state competition "Advancement through Education: Open Universities", funded by the Federal Ministry of Education and Research under the funding codes 16OH21005 (1st funding phase) and 16OH22005 (2nd funding phase) in the development and testing of new types of degree programs, are therefore:

- How can experiences from the research project be consolidated?
- How can the evaluation at the university be improved and made more efficient to optimize the teaching offer?

2. The research project Open IT

The HSW is a state-approved private university of applied sciences, accredited by the Science Council and run by the non-profit association Trägerverein Hochschule Weserbergland e. V. in Hamelin, Lower-Saxony, Germany. At the HSW there are currently about 500 students. Most of them (approx. 450) complete three-year dual courses of study, which are implemented with partner companies, primarily from the private sector. The HSW offers dual study courses in the following areas (Hochschule Weserbergland, n.d.):

-Business administration (Bachelor of Arts - specializations: Energy Management, Financial Services, Healthcare, Industry and Services)

-Business Information Technology (Bachelor of Science - specializations: Application Development, IT Consulting, System Integration, Cyber Security)

-Industrial Engineering and Management (Bachelor of Engineering - specializations: Energy Technology, Glass Technology, Production Engineering)

In addition to the dual study programs, HSW offers accredited part-time study programs. The part-time study programs include:

-Master of Business Administration (MBA)

-Bachelor of IT Business Management (B.Sc.)

Within the framework of the federal-state initiative "Advancement through Education: Open Universities", the HSW and its project partner, the Institute of Sociology at Darmstadt University of Technology (TUD), are developing and testing special in-service credit transfer courses in the project "Open IT Bachelor and Open IT Master - from IT practitioner to 'Bachelor of Business Informatics' and from Operative

Professional to 'Master IT Business Management'" for IT specialists and IT experts with initial and advanced training. The training was received at the German Chamber of Commerce (IHK). This form of credit transfer study programs, in which the recognition of previous professional qualifications is considered in the study program, is the first of its kind for the IT sector in Germany. The "Bachelor IT Business Management" is the first course of study that has successfully emerged from the research project.

The main objective of the research project is to take into account the professional competencies of the participants in such a way that "no unnecessary - because known - topics are repeated 'once again' during the course of study and that a substantial reduction in the duration of study can be achieved without impairing the ability to work analytically and scientifically" (Städler & von Zobeltitz, 2018, p. 1).

The research project pursues the following objectives:

- Increasing the permeability and acceptance of vocational education and training programs by recognizing training and vocational skills in a higher education context
- Development of target group-oriented learning and teaching offers
- Transfer from the project into practice and competition.

2.1. The Open IT credit transfer programs

The portfolio developed in the research project includes two bachelor's degree courses and one master's degree course in the field of study. The part-time bachelor programs (B.Sc.) are designed for two years ("IT Business Management") or three years ("Business Information Technology"). The Master's program (M.Sc.) in the field of "IT Business Management" should lead to a degree in a maximum of another 1.5 years. Both bachelor's degree programs started as certificate programs in the winter semester 2016/17 at the HSW with 20 participants each. In the summer semester of 2018, the certificate course "IT Business Management" was successfully completed with thirteen participants. In the winter semester 2018/19, the master program "IT Business Management" started with 14 participants. This also includes people who did not previously participate in the "IT Business Management" certificate program at Bachelor's level, but have a Bachelor's degree from another institution. The participants of the certificate program at master level should complete the program by the end of the project. After successful accreditation of the study program, participants of the certificate study programs will get their certificates credited to the study program and will then receive their respective degrees.

The level of the two study programs differs in their goal orientation:

“In the bachelor's program, students will acquire the skills usual for business information systems specialists, which they may still lack against the background of their previous educational career. In particular, a focus is placed on the development of analytical and scientific skills. The Master's graduates are to be prepared for management positions in the information and communication technology sector (ICT sector) or management in SMEs (note of the authors: small and medium-sized enterprises) from the ICT sector. (Städler, von Zobeltitz, & Linke, 2018, p. 3). ”

A necessary criterion for participation in the courses is professional experience, including formal vocational training and/or further training: For the three-year "Bachelor of Business Informatics", prospective students with initial IT training must be able to demonstrate one year of work experience. For the two-year "IT Business Management" Bachelor's degree, prospective students must be able to show proof of both an initial IT education and further IT education to become an "Operative Professional" and at least three years of relevant IT professional experience (von Zobeltitz, & Linke, 2018, p. 63).

2.1.1. Credit Transfer Program "Bachelor of Business Informatics"

The credit course leading to the "Bachelor of Science in Business Informatics" is aimed at people with an initial IHK training as IT specialists with a specialization in application development or system integration, as well as IT business management assistants, IT systems management assistants, and IT systems electronics engineers.

The credit modules listed in Figure 1 are individual yet standardized course contents which in part show the coherence between the various training occupations. In detail, various modules for the various IT training occupations can be credited via an appropriate level assessment of the non-university qualification and learning objectives within the framework of the European Qualifications Framework (EQF) (Seger, & Städler, 2018). The project also offers the possibility of individual crediting options.

Figure 1: Structure of the credit transfer course "Bachelor Business Informatics" (von Zobeltitz, & Linke, 2019)

IT Specialist in System Integration
IT Specialist in Application Development
Information Technology Officer
IT Systems Management Assistant
IT Systems Electronics Engineer



180 ECTS Bachelor Business Informatics		
Credit Modules	Introduction phase	Study phase
41 ECTS	24 ECTS	115 ECTS
Blanket crediting option	Individual crediting option	
-	1 semester	5 semester

Different crediting potentials were found for the various IHK IT training occupations. Table 1 shows the respective (basic) modules of the "Bachelor of Business Informatics" and their creditability from the various training occupations.

Table 1: Flat-rate crediting of "Bachelor of Business Informatics" (Städler, von Zobeltitz, & Linke, 2018, p. 8)

Module	IT specialist - system integration	IT specialist - application development	Management Assistant in Information Technology	IT Systems Management Assistant	IT system electronics engineer	ECTS each module
Network technology	X	X	X	X	X	4
Hardware and system architectures	X		X	X		3
Operating systems	X	X	X	X		5
Basics Macroeconomics	X	X	X	X	X	3
Rhetoric and presentation	X	X	X	X	X	5
Basics of project management	X	X	X	X	X	3
Basics of programming	X	X	X	X		6
Internship in Computer Science	X	X	X	X	X	8

Module	IT specialist - system integration	IT specialist - application development	Management Assistant in Information Technology	IT Systems Management Assistant	IT system electronics engineer	ECTS each module
Basics of computer science	X	X	X	X	X	4
Databases	X	X	X	X		6
Work experience					X	8
IT system electronics	X	X	X	X	X	6
Total "ECTS crediting"	53	50	53	53	41	61

Figure 2 shows the further course of studies and the first year of study for the occupations IT Specialist, Application Development or System Integration, Information Technology Officer, IT Systems Management Assistant, and IT Systems Electronics Technician. Except for the first semester, the three years of study are the same for all participants. In the first semester, non-accreditable study contents are taught specifically for the respective occupational group. The crediting of IHK IT initial training courses described in this chapter forms the basis for the crediting course "Bachelor of Business Informatics".

Figure 2: Course contents "Bachelor Business Informatics" (Hochschule Weserbergland, 2019a)

Study Contents Bachelor Business Informatics						
1 st Academic Year			2 nd Academic Year		3 rd Academic Year	
1 st sem. A-Entwickler	1 st sem. SI/IK/SE/SK	2 nd sem.	3 rd sem.	4 th sem.	5 th sem.	6 th sem.
Introduction to Business Informatics *8	Introduction to Business Informatics *8	Wirtschaftsmathematik/Statistik *8	Strategic corporate management *8	IT services / IT projects *8	Project studies *8	Elective course Inf. II *8
Hardware and system architecture *3	Operating systems *5		Private Business Law *8	Private Business Law *8		Methodics *5
Network technology *4	Basics of programming *6		Soziale Kompetenz *8	Cost and Performance Accounting *8	Elective course Mgmt II *8	Elective course Inf. I *8
Mathematical basics *4	Databases *6		English *8			
Mathematical basics *4						
Introduction phase			Main studies			

2.1.2. Credited Bachelor and Master "IT Business Management" courses

The research project developed, among other things, credit transfer study programs that are aimed at participants who, in addition to their initial IT training, also have advanced IT training - the so-called Operative Professional (IT master craftsman certificate). The Operative Professional is offered by the IHK in four specializations. In the research project, the specialization areas "IT Business Manager", "IT Business Consultant" and "IT Systems Manager" were considered. The fourth specialization, "IT Marketing Manager", was not considered because this degree is currently no longer in demand on the market.

For the admission to the Operative Professional, primarily an IHK IT initial training is necessary. However, further training can also be completed by persons who have completed other trainings and have several years of professional experience in the field of IT. In this case, the professional status is used for admission. The same also applies to the developed range of courses of study, in which in exceptional cases persons who have not completed their training in the field of IT will also be admitted (Linke, Blanke, & Salzbrunn, 2018). The structures of the study programs in the area of "IT Business Management" are shown in Figure 3.

Figure 3: Establishment of credit transfer courses Bachelor and Master "IT Business Management" (von Zobeltitz, & Linke, 2019)

IT Specialist in System Integration	
IT Specialist in Application Development	
Information Technology Officer	
IT Systems Management Assistant	
IT Systems Electronics Engineer	
+	
IT Business Manager	
IT Business Consultant	
IT-Systems Manager	
↓	
180 ECTS Bachelor IT Business Management	
Credit Modules	Study phase
89 ECTS	91 ECTS
Blanket crediting option	Individual crediting option
-	4 semester
↓	
120 ECTS Master IT Business Management	
Credit Modules	Study phase
36 ECTS	84 ECTS
Flat-rate option of crediting academic achievement during the Bachelor's program	Individual crediting option
-	3 semester

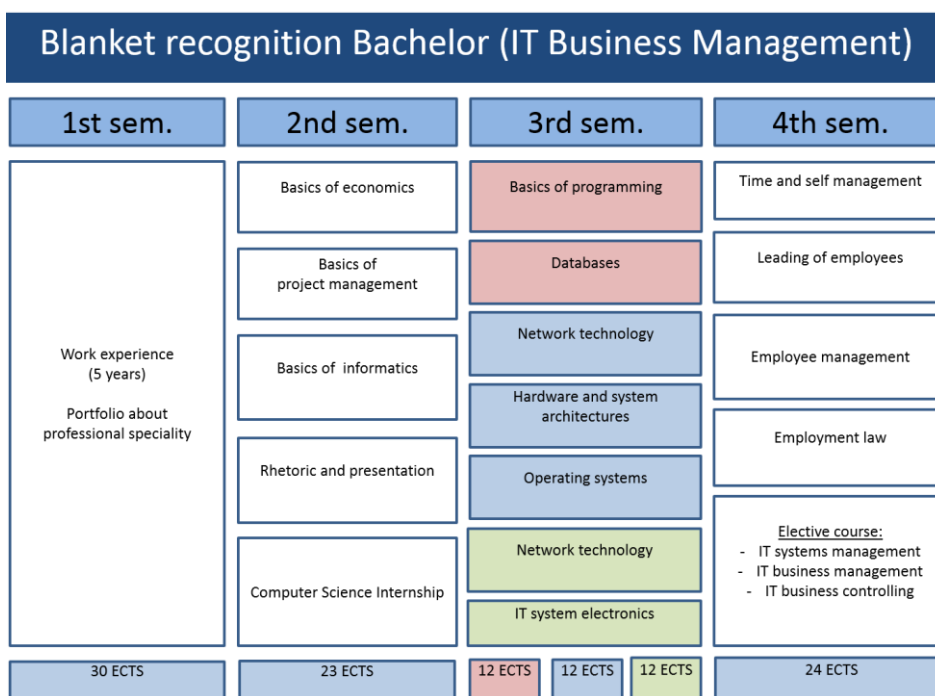
The special feature of the Master's program is the recognition of professional achievements from active professional activity during the participants' Bachelor's phase (36 ECTS - flat-rate crediting option: study achievements during the Bachelor's program). To this end, participants must prepare reports on "Berufsintegration und Praxis" (BuP) (Zobeltitz, Blochberger, & Städler, 2019). The focus of these reports is geared to the participants' respective working environment and includes a reflection of their current work and project activities in the context of the knowledge acquired during their studies. The requirement levels, which differ by semester, are shown in Table 2:

Table 2: Requirements on the BuP (von Zobeltitz, Blochberger, & Städler, 2019)

semester	phase	EQR level requirement	Extent of the reflection work
1.	Bachelor	5	8 pages
2.		5	8 pages
3.		6	10 pages
4.		6	10 pages
5.	Master	7	15 pages
6.		7	15 pages
7.		not applicable, no BuP	-/-

The crediting options for the two-year Bachelor's program are based on the crediting options of the three-year Bachelor's program ("Business Information Technology") as well as on the training content of the Operative Professional. The specializations of the advanced training form the specialization of the Bachelor's program.

Figure 4: Course contents "Bachelor IT Business Management" (Städler, von Zobeltitz, & Linke 2018, p. 9)



The contents of the remaining two years of study include not only the teaching of scientific fundamentals and analytical skills but also primarily business management skills since the field of computer science has already been covered to a large extent by the vocational training.

Figure 5: Course contents "Bachelor IT Business Management" (Hochschule Weserbergland, 2018a)

1 st Academic Year		2 nd Academic Year	
1 st sem.	2 nd sem.	3 rd sem.	4 th sem.
Self Management *6	Business Mathematics / Statistics *8	Research Methods I *5	IT Law *6
Basics of Scientific Work *4	Private Business Law *8	Challenges and General Conditions of the Management *8	Bachelor Thesis and Colloquium *14
Introduction to Business Informatics *8	Scientific Work *4	Information Security *8	
Accounting *4	English *4	Cost and Financial Management *4	
22 ECTS	24 ECTS	25 ECTS	

In May 2019, the Central Evaluation and Accreditation Agency Hanover (ZEvA) accredited the study program presented here for five years without any restrictions. Based on the bachelor's degree program "IT Business Management", a master's degree with a focus on IT business management is currently being tested within the research project. This project considers the study contents from the fields of business administration and IT in equal measure.

Figure 6: Course contents "Bachelor IT Business Management" (Hochschule Weserbergland, 2018b)

Study Contents Master IT Business Management			
Study achievements are to be achieved during the Bachelor's program	3 rd Academic Year		4 th Academic Year
	5 th sem.	6 th sem.	7 th sem.
Vocational Integration and Practice I *9	Process and Change Management *6	Cyber Security *6	Master Thesis and Colloquium *24
Vocational Integration and Practice II *9	IT Project Mangement *6	IT Requirements Engineering *6	
Vocational Integration and Practice III *9	Digitilization *6	Elective Course *6	
Vocational Integration and Practice IV *9	Research Methods II *6		
	21 ECTS	21 ECTS	
	Vocational Integration and Practice V *9	Vocational Integration and Practice VI *9	
36 ECTS			24 ECTS

2.2 The legal design of credit transfer programs

2.3 The recognition of non-university competences and the recognition of higher education competences has been subject to a great dynamic, especially in recent years, also and especially from a legal perspective. The subject areas move in an extremely complex field of legislation and regulations. Among others, the Lisbon Convention, a regulation of the European Union, the national higher education framework law, and the Lower Saxony state higher education law play a corresponding role (Städler, Blochberger, & Seger, 2018). Not all regulations are always clear or coordinated with each other. In addition, the resolution of the conference of culture ministers (Kultusministerkonferenz; KMK) of June 26th, 2002 set out the following:

“ 1. Knowledge and skills acquired outside of higher education may be credited to a university course of study within the framework of a grading system - possibly also on a flat-rate basis - if

1.1 the conditions applicable to access to higher education are guaranteed - if necessary also by means of the possibilities of access to higher education for particularly qualified professionals;

1.2 they are equivalent in content and level to the part of the course of study to be replaced;

1.3 in accordance with the principles of the new quality assurance system in higher education, the qualitative and content-related criteria for the replacement of academic achievements with knowledge and skills acquired outside higher education are reviewed in the accreditation process.

2. Knowledge and skills acquired outside higher education cannot replace more than 50 % of higher education studies.” (Kultusministerkonferenz, 2002, p. 2)

This quotation shows that flat-rate crediting is possible if certain conditions are met. It should also be emphasized that equivalence is necessary and that a maximum of 50% of the studies can be credited based on professional competence.

In the practical implementation of the legal framework for the design of study programs, the challenge is to establish comparability between the different types of previous training and practical experience on the one hand and the purely academic training in the Bachelor's and Master's programs on the other (Seger, Beuthel, & Schmiede, 2009).

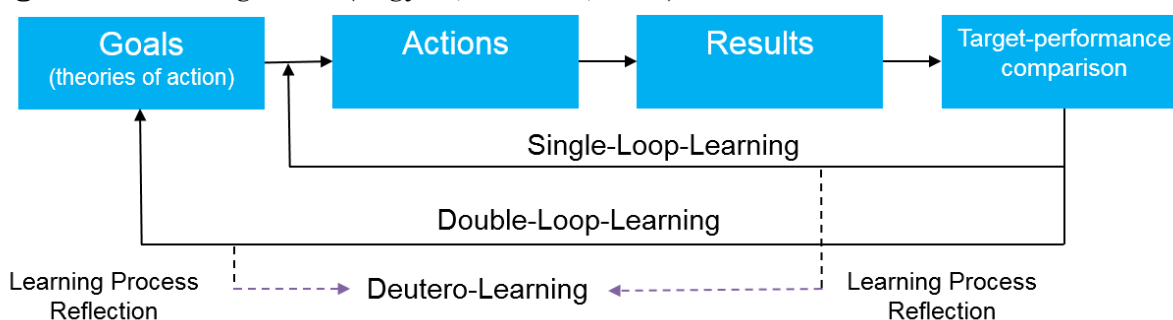
In the context of lifelong learning, "double learning" should be avoided, so existing, equivalent knowledge and skills from previous education or training are used (Linke et al. 2017, p. 36ff.).

3. The Deutero concept as the basis for research support

One objective of this paper is to reflect on how experiences from the research project can be consolidated and made available for the organization 'university' as well as for a transfer to the general research community. The control of collective learning poses a far greater challenge than the control of individual learning. The review is based on two theories of action. The Espoused Theory ("represented theory") describes the explanatory or justifying foundations of collective action. Theory-in-use ("action leading theory"), on the other hand, describes those patterns of action that are tacitly underlying action. The theory that guides action cannot be taken for granted but must first be identified or constructed as such. This action often also reflects the social or communicative structure of the organization or groups. It is not uncommon for implicit action-leading theories in organizations to deviate from the theories represented in an organization. For example, organizational plans, target formulations, or job descriptions may not correspond to the actual, current activities. Organizational learning takes place when, for example, observing problematic situations, surprising incongruities between expected and actual action patterns, or a discrepancy between expectations and results are detected. This leads to a new understanding of organizational assumptions or activities (Argyris, & Schön, 1978, p. 11).

In order to support this through the research project Open IT, surveys, and measures are designed to achieve different levels of organizational learning:

Figure 7: Learning levels (Argyris, & Schön, 2006)



3.1. Practical implementation of accompanying research

3.1.1. Single-Loop-Learning

Single-loop learning (also known as "one-loop learning") is a target-performance comparison of action results and expectations. As a result of a single feedback loop, individuals correct their actions if a mismatch between action results and expectations is identified. Thus, only the result is tested, and the underlying action-leading theory remains unchanged. A practical example is quality control, in which defective products are identified (Argyris, & Schön, 2006: 34 ff). The correction and management of identified errors are based on existing problem-solving practices or routines gained in the past. The values and norms remain unchanged (Berthoin Antal, & Krebsbach-Gnath, 2001; Nerdinger, 2014; Argyris, & Schön, 2006, p. 34 ff).

Within the framework of the research project "Open IT", this form of learning is considered through (quantitative) course evaluations and (qualitative) feedback interviews. The aim of these measures is, as foreseen in the literature, quality control within the developed modules. Course evaluations are a common instrument used at universities, in which both students and teachers anonymously evaluate the framework and content of each module. Possible points of criticism can thus be identified and remedied on a course-related basis. The feedback meetings take place once a semester as a semester progress review. In an open discussion, the students have the opportunity to tell the head of the course about their experiences. This is intended to facilitate a more intensive exchange, whereby the head of the course of studies is then also empowered to implement possible changes. Thus, the single-loop learning concept includes both a qualitative and a quantitative perspective.

3.1.2. Double-Loop-Learning

While the objectives of the organization or research project are not questioned at the first level, this is precisely what double-loop learning aims at by reflecting and checking basic variables. Thus, the learning process of double-loop learning changes the frame of reference for single-loop learning activities, and with it a possible change in values (Argyris, & Schön, 2006, p. 36 ff; Friedmann et al., 2001). The aim is to restructure old standards as well as to establish new standards and thus to change the patterns of action that are tacitly underlying the action, i.e. "theories-in-use". Future action should, therefore, be based on new "target values" (Schreyögg, & Koch, 2015, p. 302 ff).

In the "Open IT" research project, this is done, among other things, by means of a longitudinal analysis (Städler et al., 2018) with holistic questions: Which contents are goal-oriented? Does the evaluation of modules and content change with a longer time interval? The aim of this longitudinal analysis is to question the course concept itself and

identify possible errors in the design and module sequence. Among other things, it should be determined whether "the right content" is being taught, and not only whether the planned content is taught properly within the modules. Both, qualitative and quantitative instruments will be used.

A second measure within the framework of double-loop learning is the targeted scientific monitoring by a project advisory board consisting of experts from practice and science. The research concept, the developed contents as well as the evaluation results are presented to the advisory board at regular intervals in order to discuss possible implications for the design of the study program. As with the single-loop learning concept, double-loop learning ensures that both a qualitative and a quantitative perspective (within the framework of the longitudinal analysis) is ensured.

3.1.3. Deutero-Learning

Deutero-Learning is described by Argyris and Schön (2006) as second-order learning. Learning should, therefore, take place in a learning system in which the existing organizational processes of error and investigation can be redefined and changed. Deutero-Learning does not form a "third loop" alongside single and double-loop learning but rather represents a meta-level of these two. It is thus a kind of "learning of learning" (Argyris, & Schön, 2006, p.44 ff.; Schreyögg, & Koch, 2015, p. 302ff; Brown, 2006). Thus, the learning process itself should be reflected upon so that insights from this reflection can be incorporated into the change of single and double-loop learning processes and transferred to other areas of the organization.

The research project "Open IT" serves as a source of inspiration for the university. For example, within the framework of quality management (single loop) and the development of new courses of study (double loop), interdisciplinary teams were staffed with members of the research project to transfer findings from the research project to the university and thus support an organizational learning process. In addition, the progress and findings of the project were discussed several times during the regular coordination meetings between the professors of the department responsible for the project. In particular, there was a considerable need for clarification regarding the concepts of "similarity" versus "equivalence" with regard to competences acquired at work versus those acquired at university.

At the same time, the research results as well as the survey design were continuously published and discussed with both scientists and practitioners and adapted based on these reflections. This was intended to initiate a discussion at the meta-level as to whether the concrete conception of credit-based degree programs is fundamentally sensible and what requirements are placed on the content and organizational design. These findings have in turn been incorporated into the revision of the "Bachelor IT

Business Management" course of study that emerged from the research project, as well as into the conception of further study formats at the university.

3.2. Selected empirical results

3.2.1. Single-Loop-Learning

On the one hand, the evaluations and semester reviews identified gaps in knowledge on the part of the students during the course of study, which led to a redesign of study modules. For example, the module "Accounting" was additionally integrated in order to provide basic knowledge for the later module "Cost and Financial Management". On the other hand, the desire for more in-depth knowledge, especially of management skills, was considered by extending the module "Challenges and framework conditions of management". It was also possible to identify subjects that tended to be rather unsuitable for this format. For example, a part-time project study program was evaluated as less meaningful than in other study formats, since the students' extensive practical work had already provided them with knowledge in dealing with projects and the project organization proved to be hardly feasible due to the different employers and the students' different types of work. At the same time, learning methods such as homework and presentations were identified as particularly practice-oriented for this target group, while (fictional) case studies and exams were judged to be rather unsuitable for professional practice. Based on the evaluations, it was, therefore, possible, as envisaged in the model, to correct and overcome identified mistakes concerning the study program concept.

3.2.2 Double-Loop-Learning

As described above, one of the objectives was to identify whether the modules were judged to be effective in terms of content. This has to be denied regarding the practical benefit for the daily work after the survey for some subjects (such as scientific work, modules with a legal focus). At the same time, however, the modules were certified to support the ability to think abstractly and analytically. The assumption that students assess the practical significance of modules differently over time than directly after the end of the module could not be confirmed. Neither a positive nor a negative tendency could be identified here. A further aim of the reflection on the program concept was also to identify possible conceptual errors regarding the setting of priorities and the order of modules. Finally, the findings led to new in-depth subjects in the pilot course of study "Bachelor of Business Informatics" (Städler et al., 2018), new types of supervision, e.g. the promotion of peer group learning via social networks (von Zobeltitz et al., 2018) as well as a revised introductory phase to further improve the start of studies and the compatibility of career, studies and family (Bönick et al., 2018). This new entry concept also considered the fact that the level of stress caused by studying was assessed as very

high in all modules. Students should now be sensitized to the special challenges of multiple stress, both before the start of their studies and right at the beginning.

3.2.2. Deutero-Learning

Regarding the "meta-analysis", two approaches can be highlighted. On the one hand, in practice at HSW, knowledge gained through the interlocking of interdisciplinary project teams with staff from the "Open IT" research project was transferred to the revision of the curriculum of the university's dual study program. Both content-related and conceptual experience could thus be implemented in the sense of organizational learning in the organization. At the same time, the findings can also be used for the future conception of part-time study programs ("the example of project studies shows that something that is successful in the dual study program is not necessarily transferable to part-time students"). In addition to these practical implications, new research questions were raised in the meta-reflection of the research project. Thus, especially against the background of the reflection of the double-loop findings, the question arises to what extent students are actually able to assess the long-term benefits of modules for professional practice. The question also arose as to whether companies and students have different expectations of a part-time course of study than is usually the case in universities. The third complex of topics was the question of whether the survey of "relevant lecture content for the professional future" among companies and students identified requirements that will be needed in the future rather than topics that are currently considered particularly relevant. This leads to the question of the extent to which requirements for "future work" can be operationalized at all in a university degree program.

Last but not least, there were and are also critical voices regarding the comparability of a "regular" academic study program and an academic study program based on the recognition of prior learning in the professorial community as to whether the latter could be "serious" concerning the academic claim. During the project, a regular exchange of information within the professorship made it possible to clarify the difference between "similar" and "equivalent" competences and, despite this difference, to bring about broad acceptance for the new study format. In particular, a look at the bachelor's theses of the test subjects convinced the professors that the analytical competence and the linguistic competence of the test subjects are in no way inferior to those of traditional students.

4. Conclusion

Scientifically sound credits for IT practitioners, whether based on initial training or at master craftsman level, not only respond to the market's strong demand for skilled workers, but also offer social potential by fulfilling the promise of "advancement through education", not least through the integration of non-linear CVs (Städler, & Seger, 2018).

With reference to the question asked at the beginning:

- How can the evaluation at the university be improved and made more efficient in order to optimize the teaching offer?

is to be stated: In order to meet the requirements of the growing and rapidly changing market, of students, balancing between professional, private and university interests and of the "volatile" learning material, adapted teaching and learning management is advisable, which can react promptly and flexibly to the permanently changing requirements of an IT-related, part-time study program. Regular feedback and analysis are an inherent part of this new segment. In the opinion of the authors, the development and implementation of these analysis processes are closely linked to the success of such types of study programs. Each feedback should be carefully evaluated in terms of the extent to which the feedback provider can assess the feedback situation in a comprehensible and reliable manner.

With reference to the question asked at the beginning:

- How can experiences from the research project be consolidated?

the following aspect should be emphasized: A differentiation of competence levels was essential in the definition of "credit modules". An analysis of the initial and continuing vocational training relevant to the course of study revealed that in some subject areas the target group had already acquired basic competences, but not always to the desired depth. At this point, universities are called upon to take an unbiased look at their existing, traditional study programs. In order to obtain an academic degree, be it a Bachelor's or Master's, every student will necessarily have to go through a development process. This means that, as a rule, the modules at the beginning of the course of study do not have the academic standard of the modules of higher semesters. To give an example: Hardly any student will be able to write a bachelor thesis at the beginning of a bachelor's program. It is precisely the aim of a course of study to develop a student to reach a defined level of competence at the end of the course of study. Naturally, this level is not yet available to students in most fields of knowledge at the beginning of their studies. It is therefore appropriate to define credit modules whose competence level is below that of a Bachelor's degree. Two questions are helpful here: Is the professionally proven competence essential and appropriate for the course of studies to be developed? Then a potential credit transfer module can be developed. And: Is the professionally proven competence enough to complete the course of study? - If not, an additional acquisition of competence must be made possible within the framework of the course of studies.

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