ePortfolio as a tool for reflection and self-reflection

Peter Slepcevic-Zach and Michaela Stock
Department of Business Education and Development, University of Graz, Graz, Austria

ABSTRACT
The request and promotion of reflection begins with an analysis of one’s own understanding of education and learning as well as the connection of reflection and self-reflection and the competence development of students. A self-reflective attitude should be promoted early on by encouraging students to understand (reflection), to evaluate (evaluation), and, if necessary, to adapt (regulation) their own learning behavior. To encourage reflection, self-reflection, and competence development, the use of an ePortfolio can provide a valuable contribution. However, the implementation process of an ePortfolio for pre-service teachers remains a debated method. This research paper investigates the impact and sustainability of an ePortfolio-implementation regarding students’ competence development and reflection skills in a Master’s Program for Business Education and Development (BED). The survey was conducted between October 2011 and June 2014 (n = 811) and consists of six sequential questionnaires. The students assessed the positive impact on their (self-)reflection. When being asked about their most distinctive competences, students’ responses emphasize their previous ePortfolio-sessions, thus indicating a positive impact of the ePortfolio on students’ self-perceived competences.

1. Introduction

1.1. Reflection and self-reflection as a basis of competence development

‘To be able to learn is a condition of survival for the human species’ (Gudjons, 2003, p. 213; translated from German by the author). In this paper education is understood as a reflective process, following the pedagogical tradition that education always is: ‘I am constantly learning’. Thus, education is not seen in today’s popular transitive understanding, in the sense of: ‘I am getting educated’. This approach to education does not follow excessive notions of feasibility, but education is understood rather as something that ‘people do by and for themselves: one educates oneself. Others can merely train us, only one can educate oneself. We go through an education with the objective to be able to do something. Though, if we get educated, we are working to become something, we strive to be a certain way in this world’ (Bieri, 2005; jacket text, translated from German by the author). In this sense, Klafki’s definition
of education from 1985 appears to be consistent: Education is seen as personal development to self-determination, ability to contribute as well as for solidarity (Klafki, 1985). To advance the development of education is a central task of university structures, which face the challenge to not only promote particularly critical thinking and reflective as well as argumentative skills, but furthermore to impart knowledge (Pellert, 1999). A solely professional education therefore falls short. Furthermore, the increasing demands of peoples’ living and working world and the growing need for autonomy in the work environment call for holistic thinking and acting personalities, who need to have the knowledge and skills it takes to deal with constantly new and unexpected situations (Dubs, 2006). Therefore, diverse competences are needed which promise to help people manage and surpass specific situations and issues (Knoll, 2006).

Being able as a learner to cope with constantly new and unexpected situations necessitates the ability to act. In this context, the concept of capacity to act – in some cases also referred to as competence of action – has developed as one of the main communication formulas in the (vocational) education (Bloemen & Schlömer, 2012). The concept of performance should be considered in this context as well:

Competence is the asset invested and performance is what the individual and institutional actor under given (changing) conditions thereof makes. The term thereby has a double meaning of process and outcome. Performance as a process describes the double balance of direct action results (performance) and repercussion on the competence of action (capacity). (Schreyögg & Conrad, 2006, p. 10, translated from German by the author)

In this paper, competence is identified according to Peterßen (2009) as professional, methodological, social, and self-competence, which together lead to capacity of action or competence of action. Reflection and self-reflection are now closely linked to learning and thus to the growth of one’s own capacity of action. Furthermore, they are a necessary condition for evaluation and regulation in terms of taking over individual responsibility for thinking and action processes (Dilger, 2007).

Reflection and self-reflection form the central basis for competence development as a task of the university (Schön, 1983). Although there is no broad consensus over a general definition for reflection (Dilger, 2007; Lynch, 2000), reflection is considered to be an important part of a person’s skill set (Lynch, 2000). For the ePortfolio and the study presented in this paper, we will use Korthagen’s definition of reflection which he defines as the ‘mental process of structuring or restructuring an experience, a problem or preexisting knowledge or existing recognition’ (1999, p. 193). The definition of self-reflection here follows the understanding by Hilzensauer (2008), whereby self-reflection is understood as an ability to relate to one’s own strengths and weaknesses, at the same time being able to act critically and, on this basis, to recognize one’s own learning difficulties or possibilities. Self-reflection in this sense is always a question of the ability and willingness for personal insight; for example, while questioning what effect a particular event, thought, or process has on oneself.

1.2. Development of reflection and self-reflection by portfolios

In many areas, so-called portfolios are used as tools for competence development. The portfolio method is considered especially significant in the area of self-reflective learning. Here, the method plays a crucial role in the development of professionalism through reflection and self-reflection (Riebenbauer & Stock, 2013). Portfolios are employed in different fields
of application, such as higher education, high schools, preparing for job interviews, or in human resource development.

The portfolio-concept in (continuing) education was first discussed in the 1970s in the US, and due to criticism of the quality of the US school system, further gained momentum in the early 1980s. In the early 1990s, as the portfolio already represented one of three top trends of curricular education in the US, the portfolio concept was conveyed to the German-speaking countries. From a broader perspective, however, the cornerstone of the portfolio concept could have already been placed in the German debate about the educational reform because certain approaches, such as documentation, reflection, and representation of one’s own learning behavior, constituted major issues in the 1980s (Häcker, 2009a). A portfolio is defined as ‘a purposeful collection of student work that exhibits the student’s efforts, progress, and achievements in one or more areas’ (Paulson, Paulson, & Meyer, 1991, p. 60).

Within the scope of the portfolio-work, not only the result (product) is important, but also the process that led to this development (Kerr, 2007). Portfolios broaden the view from a single product to a process and therefore identify a high-quality process or help build knowledge of process quality (Häcker, 2009b). In this regard, the portfolio-work is a metacognitive exploration of learning situations. Learners deal with contents while observing their learning process and try to give it a meaning (Behrens, 1997). Portfolio-work thus is not an end in itself but represents a method or an approach to implement the theoretical objectives of self-organized learning. Externally controlled objectives without input from the author are usually not as successful as self-organized learning (Hornung-Prähauser, Geser, Hilzensauer, & Schaffert, 2007).

A classification of portfolio types appears extremely complex due to the large number of versions, and a coherent categorization cannot be identified (Häcker, 2005, 2009c). Subsequently the classification by Baumgartner (2009) is used, by which portfolios can be divided into the following three types:

- Reflection portfolio
- Development portfolio
- Presentation portfolio

The focus of this paper lies on reflection and development portfolios, since the ePortfolio – as implemented in the Master’s Program of Business Education and Development (BED) at the University of Graz – represents a combination of both portfolio types (Stock & Slepcevic-Zach, 2013). The electronic implementation of portfolios is called ‘ePortfolios’, ‘electronic portfolios’, or ‘digital portfolios’. These terms are used interchangeably (Hornung-Prähauser et al., 2007) and represent digital realizations of paper-based portfolios, which are implemented as electronic folders (Bauer & Baumgartner, 2012). The possibility of digital implementation extends the features and capabilities of the portfolio immensely as the paths of visualization, data storage, and generation can be expanded (Hilzensauer & Hornung-Prähauser, 2006).

The creation of a portfolio (in particular a reflection portfolio) represents a great challenge for learners. It is therefore important that learners are supported throughout the creation process. This support can be given through different approaches; for example, a good theoretical introduction to the portfolio concept, or the opportunity to exchange with other learners. A coach for learners can provide costly but promising support. Coaching is a personal and process-oriented format of consultation, which – based on individual resources,
objectives, and the specific situation of the coach – aims at fostering performances. A coaching-process opens a larger breadth of alternative actions and supports the development of individual solutions or approaches (Wiemer, 2012; or from the practical perspective Nowotny, 2005). Coaching processes always aim for individuals or, more precisely, for the self as a central organization and control instance (Burchardt, 2009). Coaching therefore aims to support students in their learning behavior and their competence development, especially through externally guided support for reflection and self-reflection (Haberleitner, Deistler, & Ungvari, 2007).

1.3. Reflection and self-reflection with an ePortfolio in the Master’s Program Business Education and Development

Today the use of portfolios in higher education is prevalent; they are used not only as a tool to focus on students’ competence development but also as a preferred didactic approach in higher education (cf. Egloffstein & Frötschl, 2011; Menhard, Scholz, & Bruder, 2012; Stratmann, Preussler, & Kerres, 2009). In terms of portfolio-work in a teaching-learning context, different factors should be considered if portfolio-work is to be successful, according to studies by Breault (2004). The following inhibiting factors (cf. in detail Stock & Winkelbauer, 2012) may be mentioned:

- Lack of curricular anchoring of portfolio-work.
- Use of portfolio-work is not clear for learners.
- Goals of portfolio-work are not clear for learners.

To counteract these inhibiting factors, portfolio-work is anchored in the curriculum of the Master’s Program of BED at the University of Graz. The program comprises five semesters (150 European Credit Transfer System) and follows a Bachelor’s degree in Economics, a comparable Bachelor’s program, or an equivalent qualification. For the first time – and also new to the different Master’s Programs of BED in Austria – the curriculum anchored portfolio-work within the entire course of study (Stock, Riebenbauer, & Neuboeck, 2015).

For students in the Master’s Program BED a special form of portfolio was developed: the so-called ‘electronic competence development portfolio’ (ePortfolio). It represents a combination of reflection and development portfolio, which has been specifically developed and expanded for the use in the Master’s Program (Stock & Slepcevic-Zach, 2013). With this type of ePortfolio, students should be provided with a sustainable methodical as well as technical instrument – structurally anchored within the curriculum – which sharpens reflection and self-reflection considering their own learning behavior and competence development. In the spirit of ‘collect – select – reflect – connect’, as a basis of the ePortfolio-work, students are encouraged and challenged to critically engage with their own learning behavior and development processes, and their motivation to work continually on their own ePortfolios is supported. In accordance with these objectives, the structured ePortfolio-work encourages the students throughout their entire course of studies and requires them to reflect on their own learning behavior, their own learning processes and products, as well as make their competence development transparent and promote their motivation to engage in sustainable reflective practice beyond their studies (Stock & Koeppel, 2012).

It is furthermore explicitly noted that the ePortfolio is not a measurement of competence. Teachers have no access to individual ePortfolios, and although ePortfolio-work is
compulsory for students it is not graded; that is, ePortfolio-work is not subject to performance assessment under any circumstances. The task of the coach is to accompany and support the students in ePortfolio-work and to ensure that students work on their portfolios seriously and coherently. The ePortfolio-initiative is implemented within the entire course of study in the new curriculum with three independent courses: Electronic Competence Development Portfolio I, II and III (ePortfolio I, II and III). All courses are held by an external coach. The competence model in accordance with Peterßen is used as a basis for the focus in the Master’s Program BED. The ePortfolio-work in the first semester focuses on self-perception and the reflection of individual competences (social and personal skills), in the third semester, the emphasis is placed on the reflection of professional and methodological competences. In the fifth semester, finally, the reflection of a comprehensive, holistic development of competence of action takes center stage. The work on and with the ePortfolio is accompanied by a coach and split into periods of university attendance and intensive homework.

The first ePortfolio unit represents the most extensive unit and creates the basis for the ePortfolio-work. It comprises a seven-hour attendance phase and the preparation of the personal competence portfolio at home. The attendance period is divided into a theoretical introduction to aspects of ePortfolio-work, the competence development of students, and a group reflection phase. One year after completion of the first ePortfolio unit, the second ePortfolio-work is intended for the students. In the second phase, the attendance period is limited to three and a half hours. A prerequisite for participating in the second unit is a previously compiled ePortfolio from the first phase. The third and final ePortfolio unit takes place at the end of the studies; that is, according to the model curriculum, in the fifth semester. This final ePortfolio unit should assist students in the further planning of their professional and private futures. The workshop lasts three hours and focuses on group reflection and individual work. The coach accompanies the reflection process and helps the students with their ePortfolios, having read the first draft of the students’ ePortfolios and having urged to improve them. To make sure that the students reflect their competences, the coach asks them various specific questions; for example: ‘Why do you believe that this particular situation helped you to evolve your professional competences?’

With the introduction of the ePortfolio at the department of Business Education and Development at the University of Graz, a companion research project aiming to study both the process and the effectiveness of the use of ePortfolios began. The design of the companion research was subject to continuous review, whereas the results presented here are based on surveys that have been conducted since the winter semester 2011/12. The objectives of ePortfolio-work can be summarized as in the following points (Stock & Koeppel, 2012; Stock & Slepcevic-Zach, 2013):

- Development and further advancement as well as promotion of reflection and self-reflection
- Comprehensive examination of one’s own competence development
- Holistic promotion of individual development and advancement
- Promoting capacity to act
- Structured textualization of one’s own reflection and self-reflection

The results presented in this paper help answer the question whether these objectives could or can be achieved. The following aspects are more precisely surveyed in the study (Stock, 2010):
Evaluation of the infrastructure and the structural implementation of the ePortfolio
• Evaluation of the process of the ePortfolio-initiative and its sustainability
• Evaluation of the results of the ePortfolio, based on:
  ○ Attitude of students toward ePortfolio-work and toward the process of reflection and self-reflection
  ○ Development of reflection and self-reflection
  ○ Multipliers
  ○ Use for job application

The companion research serves the purpose of checking the set goals of the ePortfolio-initiative in the Master’s Program BED. In this regard, an appropriate research design that covers and reflects the extensive aspects at the best rate was developed.

2. Methods

Prior to the final implementation of the ePortfolio companion research (2011–2014), a preliminary study lasting five semesters was launched in 2009. It was assumed that students would recognize the benefits of ePortfolio-work. However, it turned out that this was not the case, which resulted in negative feedback in the questionnaire. In order to receive more feedback, focus group discussions with students, who were recently in the ePortfolio-initiative, were approved (Stock & Koeppel, 2012). The following four key perceptions were recorded:

• Students understood the need for compulsory reflection in the course of studies and supported the unconditional retention.
• Students were often unclear about how to reflect. It is a rather complex problem, because both technical problems of reflecting (problems of attribution of competence) occurred and the duty to textualize was not understood. It was suggested that simple contemplation would be enough or given text modules would simplify reflection.
• Students were mostly unclear about the general objective and the personal benefits of ePortfolio-work and they mixed up the concepts of ePortfolio with those of the presentation portfolio. They argued that an ePortfolio was too personal to use for job applications, as it would reveal too much private information for recruiters.
• Students also lacked confidence in the project participants as well as in the technology used. The core of the problem was the unusual focus on personal information in an academic setting since the ePortfolio-work includes addressing personal aspects. The second critical aspect was a questioning of reliability and security of the software.

Based on these results the ePortfolio-initiative was revised and the study design of the companion research (last from 2011 till 2014), shown in Figure 1, was developed.

2.1. Sample

The study was conducted as a panel survey of all students in the Master’s Program of BED. In total 811 questionnaires, including the summer semester 2014, have been evaluated. The exact distribution of the six collection points (t1 to t6) can be found in Table 1.

Students with a date of birth up to 1979 are referred to as mature students in this study – compared to students with a year of birth after 1980. The students of the Master’s Program BED, similar to most studies of Social Sciences at the University of Graz, are predominantly female.
2.2. Questionnaire

The questionnaire directly asks students about acquired competences, but the survey is also carried out by means of open questions. To allow selectivity and structure, two clusters were formed in the evaluation between the four areas of competence: a technical and methodological expertise cluster, and a social and personal competence cluster. With this type of structure, incorrect allocations can largely be excluded (Stock & Koeppel, 2012). Many previous attempts of utilizing ePortfolios for educational purposes focused on the ‘assessment’ of the achievements documented within the portfolio (Barrett, 2005; Lopez-Fernandez & Rodriguez-Illera, 2009; Mason, Pegler, & Weller, 2004). In contrast, the ePortfolio as implemented at the University of Graz specifically does not aim at ‘assessing’ students’ competences. All students’ portfolios remain private and are only visible to an external coach (Stock & Koeppel, 2012). The two final questionnaires (t5 and t6) cover the capacity for action. Since it can be seen as a combination of technical, methodological, social, and personal competence, the last course (ePortfolio III) focuses on the capacity for action precisely.

2.3. Process

Students are surveyed anonymously at six time points with a questionnaire. The survey times t1, t3 and t5 always took place at the beginning of the semester, whereas t2, t4 and t6 took place at the end of the semester. Completing each questionnaire takes about 20 min and is carried out as part of the course. The statistical software SPSS has been used to process the data.
2.4. Limitations

Twofold limitations originate from the research design and sample: The research of this paper does not represent a formal assessment of students’ competences but merely their self-perceptions of their own competences collected via the questionnaires of the accompanying study (see also Stock & Winkelbauer, 2012). According to Weinert (2002), objective, valid, and reliable ‘assessments’ of competences are beyond the scope of reflection portfolios. Regarded in this light, even the possibility of analyzing individual student portfolios would not allow a more reliable assessment. A second limitation originates from the research design as a full sample survey: Sample sizes vary across the investigation period due to dropouts, thus limiting the possibility of tracking every individual development from the first to the fifth semester.

3. Results

The results always refer to surveying students of the Master’s Program of BED at the University of Graz. When students are mentioned in the following text, we are only referring to this particular group. Presented data generally follow the three semesters or the six reference points in time. The analysis by gender or age (persons born before or after 1980) is only presented if there are relevant differences in the results. The results are shown according to the areas of learning behavior and competences, evaluation of the process, as well as questions to the ePortfolio-use during and after the course of study.

3.1. Learning behavior and competences

At all six survey times (t1 to t6) the students were asked for their evaluation of the importance of self-reflective learning behavior during their studies.

Table 2 shows that self-reflective learning gains importance among the students over the course of the six survey points, in particular during an individual semester (i.e. from t1 to t2, t3 to t4 and from t5 to t6). Generally, students also appreciate self-reflective learning behavior at the very beginning of their studies or believe that it is fairly important. Usually female students tend to estimate the capacity for reflection and self-reflection as more important than male students, although this cannot be shown for all survey periods and the differences are rather small. The largest difference can be traced to t2: 47.6% of female students and 19.6% of male students rate self-reflective learning as very important.

Students were further asked to assess how many competences they assume to know themselves to have (Figures 2 to 4). This question was also asked at all six survey times. Here the questionnaires explicitly address the self-perception of the students’ individual competences.

Table 2. Importance of self-reflective learning.

|                      | t1     | t2     | t3     | t4     | t5     | t6     |
|----------------------|--------|--------|--------|--------|--------|--------|
| very important       | 34.9%  | 41.9%  | 38.9%  | 42.7%  | 34.2%  | 46.1%  |
| rather important     | 56.6%  | 52.3%  | 54.1%  | 53.3%  | 55.7%  | 48.7%  |
| rather irrelevant    | 3.2%   | 5.8%   | 6.4%   | 3.3%   | 8.9%   | 5.3%   |
| irrelevant           | 1.1%   | 0.0%   | 0.6%   | 0.7%   | 1.3%   | 0.0%   |
| does not know        | 4.2%   | 0.0%   | 0.0%   | 0.0%   | 0.0%   | 0.0%   |
In the first survey time (see Figure 2), results differ mostly between the two groups before and after completing the ePortfolio. The set of students who think they only know a few of their competences decreases rapidly. In the second survey time (see Figure 3), a significant rightward shift of the curve can be detected, even though the students already know more of their competences than before the ePortfolio-initiative. In the third survey time (see Figure 4), there are no more differences between the perceived competences before and after the ePortfolio-initiative.

The majority of students also indicate that they have discovered for themselves previously unknown competences with the help of the ePortfolio. At t2 these were 59.7%, at t4 58.4%, and at t6 still 54.7%. There are no differences between female and male students, but certainly between students of different age groups. Mature students indicate more often that they have not discovered any new competences, though this result needs to be interpreted cautiously due to the small number of cases. There is no connection to the evaluation of the importance of self-reflective learning.

After each of the three ePortfolio courses (t2, t4 and t6), the students were asked in an open question what they considered to be the most important thing they could learn from ePortfolio-work in the past semester. Students indicated that they were more aware of their competences, had a better idea about themselves, and could describe themselves better. Some students even indicated that during this semester they learned that they were capable of more than they thought. They also mentioned that they were able to engage in deeper reflection and self-reflection. In addition to the recognition of existing competences, the students said that they could now better formulate competences and were therefore more able to use them, for example, in form of better self-presentations.

When analyzing the number of self-perceived individual competences, male students indicate at almost all times that they are aware of more of their competences. When it comes to the age of students, there is indeed a tendency that mature students indicate they know more competences, but this is not obvious at all times nor are there significant differences between younger and mature students (due to the rather small number of mature students).

Another question asked at all six survey times targets how often students reflect on their competences (see Figure 5). The reflection, of course, did not have to be in connection with the ePortfolio or the university context.

Figure 2. Evaluation of self-perception of individual competences t1 to t2.
The results of Figure 5 show that students report reflecting more often on their competences because of the ePortfolio-initiative – also outside of the course time. This effect can be observed mainly in the first semester.

A very strong connection arises between the frequency of reflection and self-reflection and the evaluation of the importance of self-reflective learning, as shown in Table 3.

One question in the survey targeted the triggering moments encouraging students to reflect on their individual competences – besides being a course obligation. This question was of particular interest for the researchers of this study and was only asked in the first questionnaires (t1, t3, t5). Figure 6 shows the results for the three survey dates. Multiple answers were possible.

3.2. Evaluation of the process

Although the students’ learning behavior and their competence development were the focus of the companion research, it was also of interest how students perceived the ePortfolio-initiative. Here it was significant to identify specific points that can be improved in subsequent semesters or that require a conceptual revision. At the end of each semester,
students were asked to evaluate the implementation of the project. The students were able to rate different aspects using a scale corresponding to the Austrian school grading system (1 = excellent; 5 = very poor). The mean values are shown in Table 4. The ‘Point of time’ refers

![Figure 5. Frequency of reflection about one's own competences.](image)

![Figure 6. Triggering moments to reflect own competences.](image)

| Collection point | Correlation |
|------------------|-------------|
| t1               | .075        |
| t2               | .337*       |
| t3               | .406**      |
| t4               | .341*       |
| t5               | .507**      |
| t6               | .317**      |

Note: *p < .05; **p < .01.
to the date that was chosen during the semester for the organization of the workshop and the subsequent elaboration.

In total the students consistently rated the overall project with an average between 1.83 and 2.03. The software was rated worse in t4 and t6 than in t2, due to a revised software package being used only since the winter semester 2010/11. The high level of satisfaction with the support and feedback from the coach must be highlighted.

Students were asked at the end of each of the three years (t2, t4 and t6) whether there was something they really liked in the implementation of the ePortfolio. The proportion of those who responded to this question with yes drops from the first to the third survey time slightly from 59.6% (t2) to 58.3% (t4) and to 56.6% (t6). Mentioned as especially well-liked elements of the implementation of the ePortfolio were engagement with oneself or one’s own competences, the support and feedback from the coach, the provision of a platform, specific methods such as group discussion and interview, special competences which students became aware of, as well as the use of the ePortfolio for job applications. To the question whether there had been any problems with the implementation of the ePortfolio, 17.3% of the first-year students answered with yes. After the second year, the proportion of students who recognized problems dropped to 9.9% and only slightly increased after the third year again to 13.2%. On one hand, indicated problem areas were organizational difficulties, such as poor communication regarding the tasks to be performed, or too short a time period and technical problems in the operation of the software. On the other hand, there were also issues such as the challenge to write about oneself and one’s own competences. In addition, the students indicated that it was sometimes difficult to separate the various competence areas from one another and, thus, be able to assign the competences.

The evaluation of the ePortfolio depends highly on the students’ attitude of their own self-reflective learning. If students assess this as ‘important’ or ‘rather important’, the results are significantly better in the majority of the surveyed criteria. The entire project, for example, results in a correlation between 0.310 ** and 0.352** (see Table 5).

Even if the expenditure of time is seen as critical, at the end of their studies the students are ‘very satisfied’ or ‘satisfied’ with the ePortfolio they created. There were no differences in gender and the age of the students found. Only about 5% of the students were ‘not very satisfied’ or ‘not satisfied’ at all with the result.

Especially toward the end of their studies, students are interested in the search for employment or, more generally, in the professional direction they want to pursue. In the final questionnaire (t6), the students were asked whether they perceived the ePortfolio-initiative as a

---

**Table 4.** Evaluation results (mean values).

|                           | t2  | t4  | t6  |
|---------------------------|-----|-----|-----|
| **Point of time**         | 2.03| 1.86| 1.81|
| Facilities/Rooms          | 1.65| 1.80| 1.91|
| Software                  | 1.99| 2.29| 2.44|
| Time period               | 2.41| 2.47| 2.62|
| Information/Introduction  | 1.55| 1.80| 1.68|
| Groupwork                 | 1.92| 1.96| 1.95|
| Creation process          | 1.99| 2.15| 2.09|
| Support/Feedback          | 1.53| 1.85| 1.59|
| Overall project           | 1.83| 2.03| 1.95|

Note: Mean values (1 = excellent; 5 = very poor).
guide for their own professional orientation. Of the students, 64.5% claim the ePortfolio is supporting their career orientation.

### 3.3. ePortfolio during the course of studies and after graduation

The integration of the ePortfolio-initiative in the curriculum of the Master’s Program BED is a special feature in the study landscape of Austria. For this reason, it was of interest whether or not the students consider the use of the ePortfolio during their studies as useful. Almost all students consider the ePortfolio-use during the course of studies as ‘very useful’ or ‘useful’. Only about 10% think this does not make sense. These estimations vary only slightly over the three survey time periods. Female students tend to see the instrument slightly more positively than their male counterparts. But there were no differences in the question of value between younger and mature students. There is an expectable relation: students, for whom self-reflective learning is important, will most likely evaluate the usefulness of the ePortfolio-initiative higher in the Master’s Program BED.

It is quite positive to view the ePortfolio as useful for their studies, but the students have also consciously opted for a course of study in which such an ePortfolio is a compulsory task. Therefore, the question whether students would recommend the ePortfolio-work (a smaller version of the ePortfolio can be done by all students of the University of Graz in a specific workshop) to fellow students was of particular interest for the authors. In this regard it is also shown that the students have a basically positive attitude towards this instrument. The three survey times (t2, t4 and t6) result in an approval rate (‘yes’ or ‘likely yes’) between 71.6% and 82.5%.

The students are not required to produce a presentation portfolio in the ePortfolio-initiative but they have the possibility to transform their ePortfolio into a presentation portfolio or to get further support from the coach about the necessary procedure. After the initial engagement with the ePortfolio (t2), less than half (44.7%) of the students want to create such a presentation portfolio. The motivation to create one decreases further at the next two survey times (t4 and t6) to 27.5% and 26.3% and it is also evident that only a small proportion of students (6.6%) actually created a presentation portfolio. Subsequently, the question arises whether the students would enclose their ePortfolio in a job application. Only about one third of the students (32.4%) could imagine enclosing a presentation portfolio in a job application, although the ePortfolio generally seems to be seen positively for the application process. Students were asked at the beginning of the second and third ePortfolio course (t3 and t5) whether they had applied for a job or an internship since the

---

**Table 5. Connection evaluation results and evaluation of self-reflective learning.**

|                          | t2      | t4      | t6      |
|--------------------------|---------|---------|---------|
| **Point of time**        | .194*   | .097    | .328**  |
| **Facilities/Rooms**     | .002    | .116    | .097    |
| **Software**             | .191*   | .195*   | .22     |
| **Time Period**          | .178*   | .364**  | .322**  |
| **Information/Introduction** | .155  | .277**  | .225    |
| **Group work**           | .131    | .253**  | .268*   |
| **Creation process**     | .308**  | .265**  | .422**  |
| **Support/Feedback**     | .261**  | .195*   | .295**  |
| **Overall project**      | .312**  | .352**  | .310**  |

Note: *p < .05; **p < .01.
previous ePortfolio unit. At the beginning of the second year, (t3) 58.5%, and at the beginning of the third year, (t5) 49.5% of the students had applied for a job or internship since the last appointment. Additionally, those who had applied were asked whether the ePortfolio had helped them in the application process; at both times about 56% indicated it had.

In the last survey time (t6) students were asked whether they are planning to further develop their ePortfolio autonomously. The intentions of the students can be seen very positively, as at least more than half (55.4%) strive for further developing their ePortfolios. There is no relation to the gender of the students but there is to the age. Mature students tend to ‘not’ or ‘likely not’ further develop their ePortfolios. As the number of cases are low, no robust connection can be shown. A strong correlation is found for the question of the importance of self-reflective learning. This strongly correlates (0.331**) with the intention to continue the ePortfolio. Students were also asked in t6 whether they would use an ePortfolio in their possible occupations as teachers. Nearly two-thirds (61.3%) of the students expressed the wish to use the ePortfolio in their possible future teaching activities with their students. For this question there is no relation between age and gender, but there is a very strong correlation (0.495**) with the evaluation of the importance of self-reflective learning.

4. Discussion

It becomes apparent that the emphasis on the ePortfolio-courses has an impact on students’ self-perceptions. Regarding the triggering events of the reflection process, external factors dominate after the first semester, enabling the provision of specific triggering events (e.g. job applications for virtual enterprises or internships). Although a large share of graduates used the ePortfolio for job application purposes, sustainability of the ePortfolio might be improved via discussing suggestions for the future use of the ePortfolio in the last ePortfolio-session.

The results show that the evaluation of the importance of self-reflective learning is a very important factor for the positive implementation of an ePortfolio-initiative. If it would be possible to provide students with an approach that clearly highlights the importance of self-reflective learning, the implementation of this instrument would not only be easier but its effectiveness would be evaluated even more positively. Work on this certainly represents a long-term process and must also represent an important goal both for teachers of these courses as well as those outside of these courses. The investigation also shows some differences between male and female students. The female students indicate to be more open toward reflection and self-reflection, or generally prefer to reflect, whereas male students indicate to be more convinced about knowing a lot of their competences already. It is also obvious that mature students seem to have some difficulties with this instrument. They are usually more critical than their younger colleagues and could not recognize the benefits of the ePortfolio-initiative as easily. Nevertheless, a majority of students (93.4%) perceive the ePortfolio-work as meaningful support in their studies and evaluate the ePortfolio itself or the entire ePortfolio-initiative positively.

The goals that were set for the companion research could be largely achieved. The evaluation of the infrastructure and the structural implementation of the ePortfolio was significant for the smooth continuation of the ePortfolio-initiative within the Master’s Program BED. This also applies to the general process of the ePortfolio-initiative. The evaluation of the sustainability of the ePortfolio could be started and would have to be continued with
the data of a planned graduate’s survey, since these are necessary for the sustainability over a longer period of time. In regard to the students, their attitude towards the ePortfolio and the topics of reflection and self-reflection were generally well surveyed. Also the benefit for a job application and the work involved for a presentation portfolio could be analyzed in more detail. The development of the ability and willingness to reflect and self-reflect can only be assumed by other factors, but the first positive signs can be seen in this paper. It turned out that it is possible for the students to be more aware of their competences, and students also reported back that the ePortfolio helped them with their own reflection and self-reflection. Thus, it can be presumed that the structured implementation of the ePortfolio enabled an improvement of the ability to reflect and self-reflect. Since the implementation is compulsory, and yet there are no data of a graduate’s survey, it is difficult to say whether the willingness to reflect and self-reflect has increased accordingly. However, the research has shown that students further work on their ePortfolio, even outside of their course obligations; for example, for use in job applications. Even though developing the ePortfolio further involves a relatively high workload, it is not an obstacle. It is important that students realize that the ePortfolio brings a far broader benefit than just on the course of studies. The fact that students recognize the potential of the method is demonstrated as nearly two-thirds of them indicated that they can imagine using the ePortfolio as part of their future teaching activities. The objectives of the ePortfolio-initiative can therefore be largely considered as achieved.

The results of the companion research demonstrate that engagement with oneself and the resulting reflection and self-reflection are associated with effort and are not always a simple matter. This process is rather assessed very positively by the students and it turns out that they are well aware of the goals and benefits. The present findings in this paper demonstrate that the ePortfolio-initiative as part of the Master’s Program BED has been successfully introduced and implemented.

**Conflict of interest**

The authors declare that they have no conflict in interest.

**Notes on contributors**

*Peter Slepcevic-Zach* Assistant Professor at the Department for Business Education and Development, PhD in Social and Economic Sciences, experience in the field of quality assurance and quality development in education and training institutions (for example administration and execution of the Feasibility Study VET-LSA Business Administration Austria), expertise in the following fields: communication and collaboration with national and international stakeholders, e- and distance-Learning-concepts, quality development and organizational development.

*Michaela Stock* Head of the Department for Business Education and Development; quality expert, researcher in the area of VET for 15 years, main research: quality management in the area of Business Education and VET, corporate education and organizational learning, multidimensional forms of teaching and learning – organization simulation for learning purposes – training firm as action-oriented method, competence orientated learning in VET, business lab, foundation and development of enterprises, entrepreneurship Education.
References

Barrett, H. C. (2005). Researching electronic portfolios and learner engagement. White Paper. Retrieved from http://www.electronicportfolios.org/reflect/whitepaper.pdf

Bauer, R., & Baumgartner, P. (2012). Schaufenster des Lernens [Shop window of learning]. Münster: Waxmann.

Baumgartner, P. (2009). Developing a taxonomy for electronic portfolios. In P. Baumgartner, S. Zachner, & R. Bauer (Eds.), The potential of e-portfolios in higher education (pp. 13–44). Innsbruck: Studienverlag.

Behrens, M. (1997). Das Portfolio zwischen formativer und summativer Bewertung [The portfolio between format and summative valuation]. Beiträge zur Lehrerbildung, 15(2), 176–184.

Bieri, P. (2005). Wie wäre es gebildet zu sein? [How about being educated?] Grünwald: Komplett-Media.

Bloemen, A., & Schlömer, T. (2012). Berufliche Handlungskompetenz [Capacity to act]. In M. Paechter, M. Stock, S. Schmölzer-Eibinger, P. Slepcevic-Zach, & W. Weirer (Eds.), Handbuch kompetenzorientierter Unterricht (pp. 120–134). Weinheim: Beltz.

Breault, R. A. (2004). Dissonant themes in preservice portfolio development. Teaching and Teaching Education, 20(8), 847–859.

Burchardt, E. (2009). Coaching und Selbstentwicklung [Coaching and self-development]. Organisationsberatung, Supervision, Coaching, 16, 385–398.

Dilger, B. (2007). Der selbstreflektierende Lerner [The self-reflective learner]. Wirtschaftspädagogisches Forum, Band 33. Paderborn: Eus.

Dubs, R. (2006). Entwicklung von Schlüsselqualifikationen in der Berufsschule [Development of key qualifications in the vocational school]. In R. Arnold & A. Lipsmeier (Eds.), Handbuch der Berufsbildung (pp. 191–203). Wiesbaden: VS Verlag.

Egloffstein, M., & Frötschl, C. (2011). Leistungsdarstellung im e-Portfolio-Assessment [Performance presentation in e-portfolio assessment]. Zeitschrift für E-Learning, 6(3), 51–62.

Fernandez, K., Slepcevic-Zach, P., & Goessler, T. (2015). Aufbau und Ergebnisse der Begleitforschung zum eKEP [Design and results of the companion research]. In P. Slepcevic-Zach, E. Riebenbauer, K. Fernandez, & M. Stock (Eds.), eKEP – ein Instrument zur Reflexion und Selbstreflexion (pp. 67–96). Graz: Leykam.

Gudjons, H. (2003). Pädagogisches Grundwissen [Educational basic knowledge]. Bad Heilbrunn: Klinkhardt.

Haberleitner, E., Deistler, E., & Ungvari, R. (2007). Führen. Fördern. Coachen [Leading, developing, coaching]. Heidelberg: Redline Wirtschaft.

Häcker, T. (2005). Mit der Portfoliometheode den Unterricht verändern [Change the lessens with portfolio]. Pädagogik, 57, 13–18.

Häcker, T. (2009a). Wurzeln der Portfolioarbeit [Roots of portfolio work]. In I. Brunner, T. Häcker, & F. Winter (Eds.), Das Handbuch Portfolioarbeit (pp. 27–32). Seelze-Velber: Klett-Kallmeyer.

Häcker, T. (2009b). Ein Medium des Wandels in der Lernkultur [Ein Medium des Wandels in der Lernkultur]. In I. Brunner, T. Häcker, & F. Winter (Eds.), Das Handbuch Portfolioarbeit (pp. 15–18). Seelze-Velber: Klett-Kallmeyer.

Häcker, T. (2009c). Vielfalt der Portfoliobegriffe [Variety of portfolios]. In I. Brunner, T. Häcker, & F. Winter (Eds.), Das Handbuch Portfolioarbeit (pp. 33–39). Seelze-Velber: Klett-Kallmeyer.

Hilzensauer, W. (2008). Theoretische Zugänge und Methoden zur Reflexion des Lernens [Theoretical approaches and methods for reflecting learning]. Bildungsforschung, 5(2), 1–18.

Hilzensauer, W., & Hornung-Prähauser, V. (2006). E-Portfolios. Methode und Werkzeug für kompetenzbasiertes Lernen. Retrieved from http://ewiesion.com/mahara/artefact/file/download.php?file=3356&view=400

Hornung-Prähauser, V., Geser, G., Hilzensauer, W., & Schaffert, S. (2007). Didaktische organisatorische und technologische Grundlagen von E-Portfolios. Retrieved from http://www.fnm-austria.at/fileadmin/user_upload/documents/Abgeschlossene_Projekte/fnm-austria_ePortfolio_Studie_SRFG.pdf
Kerr, R. (2007). Portfoliomappe Selbstdisziplin [Portfolio self-discipline]. Mühlheim: Verlag an der Ruhr.

Knoll, J. (2006). … dass eine Bewegung entsteht […] a movement arises. QUEM-report, 67, 135–148.

Korthagen, F. A. J. (1999). Linking reflection and technical competence: The logbook as an instrument in teacher education. European Journal of Teacher Education, 22(2/3), 191–207.

Lopez-Fernandez, O., & Rodriguez-Illera, J. L. (2009). Investigating university students’ adaptation to a digital learner course portfolio. Computers & Education, 52(3), 608–616.

Lynch, M. (2000). Against reflexivity as an academic virtue and source of privileged knowledge. Theory, Culture & Society, 17(3), 26–54.

Mason, R., Pegler, C., & Weller, M. (2004). E-portfolios: An assessment tool for online courses. British Journal of Educational Technology, 35(6), 717–727.

Menhard, I., Scholz, N., & Bruder, R. (2012). Kompetenz kompetenzorientiert lehren? [Teaching competence-oriented]. Zeitschrift für Hochschulentwicklung, 7, 50–59.

Nowotny, V. (2005). Praxiswissen Coaching [Practice coaching]. Berlin: VDM.

Paulson, F. L., Paulson, P. R., & Meyer, C. A. (1991). What Makes a Portfolio a Portfolio? Eight thoughtful guidelines will help educators encourage self-directed learning. Educational Leadership, 48(5), 60–63.

Pellert, A. (1999). Die Universität als Organisation [The university as an organization]. Wien: Böhlau.

Peterßen, W. H. (2009). Kleines Methoden-Lexikon [Small method dictionary]. München: Oldenbourg Schulbuchverlag.

Riebenbauer, E., & Stock, M. (2013). (Selbst-)Reflexion im Schulpraktikum [(Self-)reflection in teaching-practice-phase]. In M. Stock, P. Slepcevic-Zach & G. Tafner (Eds.), Wirtschaftspädagogik. Ein Lehrbuch (pp. 659–669). Graz: Uni-Press.

Schön, D. A. (1983). The reflective practitioner. How professionals think in action. New York: Basic Books.

Schreyögg, G., & Conrad, P. (2006). Management von Kompetenz [Competence management]. Wiesbaden: Gabler.

Stock, M. (2010). Kompetenzorientierung: EPortfolio-Begleitung im neuen Masterstudium Wirtschaftspädagogik [Emphasis of competence: ePortfolio in the new Master’s Program of Business Education and Development]. wissenplus, 10/11(5), 12–15.

Stock, M., & Koeppel, T. (2012). ePortfolio-Begleitung im Masterstudium Wirtschaftspädagogik [ePortfolio in the master’s program of business education and development]. wissenplus, 11/12(5), 10–14.

Stock, M., Riebenbauer, E., & Neuboexck, K. (2015). eKEP im Masterstudium Wirtschaftspädagogik an der Karl-Franzens-Universität Graz [eKEP in the Master’s Program of Business Education and Development at the University of Graz]. In P. Slepcevic-Zach, E. Riebenbauer, K. Fernandez, & M. Stock (Eds.), eKEP – ein Instrument zur Reflexion und Selbstreflexion (pp. 39–66). Graz: Leykam.

Stock, M., & Slepcevic-Zach, P. (2013). eKEP – Elektronisches Kompetenzentwicklungsportfolio [eKEP – electronic competency development portfolio]. In M. Stock, P. Slepcevic-Zach, & G. Tafner (Eds.), Wirtschaftspädagogik. Ein Lehrbuch (pp. 647–657). Graz: Uni-Press.

Stock, M., & Winkelbauer, A. (2012). ePortfolio-implementation in the Master’s Program of business education and development. International Journal of Business Education, 152, 48–55.

Stratmann, J., Preussler, A., & Kerres, M. (2009). Lernerfolg und Kompetenz [Learning success and competence]. Zeitschrift für Hochschulentwicklung, 4, 90–103.

Weinert, F. E. (2002). Konzepte der Kompetenz [Definition and selection of competencies]. Paris: OECD.

Wiemer, M. (2012). Begleitung anspruchsvoller Bildungsweg [Accompanying challenging educational paths]. Organisationsberatung. Supervision. Coaching, 19, 49–57.