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The Reflective Companion

A self and peer-assessment tool to
analyse reflexivity in portfolios

For more than ten years, the Centre for Teaching and Learning in Higher Education (ZHE) at the Zurich University of Teacher Education (PH Zurich) has been teaching and awarding Certificates of Advanced Studies (CAS) in *Hochschuldidaktik* (a postgraduate course on teaching and learning in higher education). One of the team's interests was to examine the level of reflection in the teaching practice of participants as demonstrated in the portfolios and projects submitted for certification. To do this, the team conducted a Scholarship of Teaching and Learning (SoTL) study and developed a tool to assess reflexivity in written texts. This article presents first a theoretical background on reflexivity in academic writing in continuous training programmes in higher education, followed by a look at the context and objectives of the study as well as the development and testing of the model. We then introduce the Reflective Companion, a tool for evaluating reflexivity in portfolios and projects. We conclude with a discussion of how the use of the Reflective Companion in our CAS programmes has facilitated self-assessment of reflective skills and increased awareness of how teachers can address reflexivity in written texts with their students.

The primary mission of the Centre for Teaching and Learning in Higher Education (ZHE) at the Zurich University of Teacher Education (PH Zurich) is to provide academic development in university didactics through training courses and counselling to individual faculty and teams, to support faculties and study programme curriculum design and development processes, and to carry out research on current topics in higher education. The Centre offers various training programmes, including a one-and-a-half-year, 10 ECTS postgraduate course on teaching and learning in higher education (CAS Higher Education Didactics course, *CAS Hochschuldidaktik* in German). The programme focusses on developing academic and especially pedagogic basic and contemporary competencies to enhance teaching and learning processes at universities, covering topics such as course planning, active learning methods, assessment formats and feedback, coaching, and observation and demonstration of teaching. Participants complete their training by submitting a portfolio or Scholarship of Teaching and Learning (SoTL)¹ project. After years of certifying, the Centre undertook an analysis of the portfolios and SoTL projects from a SoTL perspective and worked together to improve how the quality of participants' reflection in particular is assessed. The following goals were central:

- to gain a better understanding of the concept of reflective practice,
- to develop a model for analysing and assessing reflectivity in written texts,
- to study the reflective practice of course participants with the overarching goal of better supporting them in this reflective process,
- to develop an online tool to assess reflectivity that could be used by both teachers and participants as a self- and peer assessment tool.

In this contribution, we provide a systematic insight into the findings from this project (what we learned from the analysis of the portfolios and projects). We also present the design process, development, and evaluation of the Reflective Companion tool.

1 Scholarship of Teaching and Learning (SoTL) involves higher education institutions supporting lecturers in developing a systematic approach to inquiry regarding their teaching. Huber defines SoTL as “the scientific engagement of university teachers in the subject areas with their own teaching and/or the learning of students in their own institutional environment through investigations and systematic reflections”. Huber, 2014, p. 21. Studies show that SoTL has a positive impact on student-centred approaches to teaching (cf. Kreber et al., 2000), and is tied to improvements in student learning (cf. Trigwell, 2013).

Reflection in higher education didactics: reviewing the literature of a multifaceted concept

For decades, teachers and researchers have advocated for the recognition of reflection as an important component of learning processes. The current body of evidence on reflection is based on the significant contributions of Dewey, Schön, and Kolb.² Reflection, or the skill of reflecting on practice experiences, is seen as essential in building and developing professional competencies.³ If the ability of students to reflect is considered important in teacher education and needs to be explicitly promoted, then it is necessary to clarify the meaning of the term so as to better understand its phases and main components. Undertaking the following literature review has helped us build our own theoretical model for analysing portfolios and projects.

What is reflection?

While there is no universally accepted definition of reflection in the literature, and a wide range of theoretical approaches and practical applications,⁴ there is agreement that reflection represents a (higher) form of thinking. As Moon notes:

Reflection is a form of mental processing—like a form of thinking—that we may use to fulfil a purpose or to achieve some anticipated outcome, or we may simply ‘be reflective’ when an outcome may be unexpected. Reflection is applied to relatively complicated, ill-structured ideas for which there is not an obvious solution and is largely based on the further processing of knowledge and understanding that we already possess.⁵

This definition bears some expansion when reflection is applied in formal education, because in a formal context, reflection usually involves both processes of reflection and the representation of reflection. Moreover, it usually takes place under constraints and conditions that influence the learner’s reflective processes and responses. Moon further observes that:

2 Dewey, 1993; Schön, 1983; Kolb, 1984.

3 Mezirow, 1997; Schön, 1983; McAlpine & Weston, 2000.

4 Korthagen, 2001, p. 266.

5 Moon, 2007, p. 192.

Reflection/reflective learning or reflective writing in an academic context is likely to include a deliberate and stated purpose for reflection, with an outcome stated in terms of learning, action, or clarification. It may be preceded by a description of the purpose and/or object of the reflection. The process and outcome of the reflective work will most likely be in representative (e.g., written) form, seen and evaluated by others. All these factors may influence its nature and quality.⁶

Definitions also differ in terms of which aspects of learning are emphasized (e.g., cognitive, emotional, meaningful, motivational, social, cultural, or political), the extent to which the process of reflection is controlled and described, and the extent to which change and development are taken into account.⁷ Examining the changes and developments in teaching resulting from the process of reflection holds particular importance for us.

Phases in the reflective process

Reflectivity refers to an individual's awareness of how their behaviour affects the (learning) process, and how awareness of one's own thoughts, feelings, and perceptions can be categorized as an ability to reflect. Beyond reflection as a deep understanding and comprehension of a phenomenon, critical reflection goes a step further. It requires individuals to separate their reflections from their immediate experiences. Mezirow notes that critical questioning is a "systematic" act, while Lucas asserts that developing reflective processes involves systematic inquiry to improve and deepen one's understanding of practice.⁸ The word "systematic" indicates a methodical process that takes time, and the outcome can be improved if critical reflection occurs in a safe space with another person or persons.

Reflection is often linked to action and described as a process. In developing the ability to reflect, a reflection cycle is referred to when several steps or phases of reflection are distinguished, expressing a temporal sequence. The following process elements appear in many cycles of reflection: "description of experience", "(spontaneous) interpretation", "analysis", "conclusions", and "application". Depending on the author, these process elements are embed-

6 Ibid.

7 Fook et al., 2006, p. 19.

8 Mezirow, 1997; Lucas, 1991.

ded in a different number of reflection phases (usually between three and seven). This variation is evident in the following examples of reflection cycles:

- Six steps of reflection according to Dewey: (1) Having an experience, (2) spontaneously interpreting the experience, (3) Naming the problems or questions arising from the experience, (4) Developing possible explanations, (5) Formulating hypotheses about the explanations, and (6) Examining or testing the selected hypotheses.⁹
- Kolb's Learning Cycle with the four phases (1) Concrete experience, (2) Observations and reflections, (3) Formation of abstract concepts and generalisations, and (4) Testing the new concepts.¹⁰
- Gibbs' Reflective Cycle: (1) Description, (2) Feelings, (3) Evaluation, (4) Analysis, (5) Conclusion, and (6) Action plan.¹¹
- Korthagen's ALACT model: (1) Action, (2) Looking back on the action, (3) Awareness of essential aspects, (4) Creating alternative methods of action, and (5) Trial.¹²

In our work at the Centre, we found the various reflection cycles proposed by different authors to be useful in understanding the distinct stages of participants' reflective experience during the programme and as they developed their portfolios. In teaching, we also recognized that reflection involves more than just "rational analysis"¹³, and it should also be connected to other components such as attitudes, emotions, needs, or desires. Reflecting is therefore not just a mental exercise in which one deals with the "outside world", it is also about making oneself or one's own "inner world" the object of reflection. Meaning is constructed through reflection, and this construction depends on how one understands oneself as an individual and as a teacher.¹⁴

9 Rodgers, 2002.

10 Kolb, 1984.

11 Gibbs, 1988.

12 Korthagen, 2001.

13 Boud et al., 1985; Gibbs, 1988; Korthagen & Vasalos, 2005.

14 Toom et al., 2014.

Components of reflection

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In addition to understanding reflective thinking as a systematic critical process and acknowledging its stages of development, we address the components of reflection. The following authors have helped us understand the components and types of reflection:

- Mezirow, as well as Kreber and Cranton, distinguished three components of reflection: “content reflection” (which helps to understand the subject matter); “process reflection” (which can be used to validate one’s own actions); and “premise reflection” (which obliges one to examine one’s own way of teaching by justifying the chosen approaches or considering alternatives to them).¹⁵
- To further differentiate, Van Manen popularized the concept of “technical reflection” (judging the efficiency of the means to achieve certain goals); “practical reflection” (examining goals and their actual results); and “critical reflection” (which involves evaluating personal actions and placing them in socio-historical and political-cultural contexts).¹⁶

The above-mentioned authors agree that reflective practice is a systematic attitude towards the analysis and evaluation of teachers’ own practice, which helps to develop new strategies for optimizing their teaching. All approaches also share the goal of sharpening the concept of reflection in order to make new insights and options visible.

The act of writing allows individuals to expand and refine their original inner reflections, thereby further developing their subjective theories. The process of writing supports the development of thought and can lead to deeper self-knowledge.¹⁷ Through reflective writing, personal thoughts are documented and can potentially be made available to others. Fund, Court, and Kramarski distinguish between the following different types of written reflection by teachers: descriptive texts, personal texts, linking texts, and critical texts with argumentative content.¹⁸

15 Mezirow, 1997; Kreber & Cranton, 2000.

16 Van Manen, 1992.

17 Moon, 2004.

18 Fund et al., 2002.

Portfolios and research projects in particular are well-suited to assessing reflectivity in academic development, as these formats allow reflections to be articulated and result in coherent and meaningful planning of future activities.¹⁹ The model developed by Larsson, Olsson, and Anderberg enumerates components of reflection that align with the primary elements in our portfolio structure: “what” (subject matter); “why” (teaching-learning philosophy); “how” (teaching and learning methods); “impact” on student learning; and “linking” theory to practice.²⁰

Following the previous arguments, Table 1 provides a summary of the authors who have influenced our model:

LITERATURE	KEY FEATURES OF REFLECTION
Mezirow (1991), Kreber and Cranton (2000)	1. Components of reflection • Content • Process • Premise
Van Manen (1991)	2. Types of reflection • Technical reflection • Practical reflection • Critical reflection • Meta-reflection
Fund, Court & Kramarski (2002)	3. Reflection through writing • Descriptive texts • Personal texts • Linking texts • Critical texts
Larsson et al. (2015)	4. Reflection through portfolio writing • What? (subject matter) • Why? (teaching philosophy) • How? (teaching and learning methods) • Effects on students' learning • Linkage theory-practice

TAB. 1: Central theoretical foundations of the ZHE model

19 Wyss & Ammann, 2015.

20 Larsson et al., 2011.

Context and objectives of our study

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In the context of continuing education in university didactics for lecturers at universities of applied sciences, we are particularly interested in promoting reflective competencies through appropriate didactic settings. The concept of

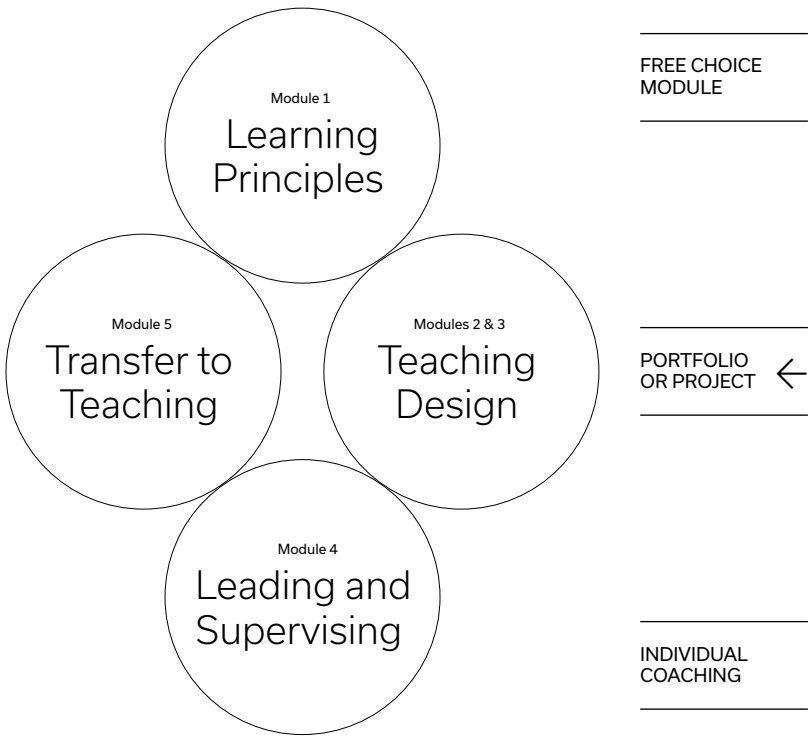


FIG. 1: Structure of the CAS Higher Education Didactics course. Visualization by the authors

“reflective practice”, understood as a systemic stance for the assessment and development of teaching practice,²¹ is a central guiding idea.

The didactic concept of the one-year CAS Higher Education Didactics course (10 ECTS) provides for the creation of a reflective-oriented²² or research-oriented portfolio (also known as a SoTL project)²³ as an integrative proof of achievement. This assignment has a particularly important function in the structure of the programme (1.5 ECTS) and is developed throughout the course (Fig. 1).

The reflective-oriented portfolio focusses on one’s own teaching-learning philosophy and its development in the form of practical tasks and systematic and reflective evidence. In addition, artifacts (e.g. central theories, models, and instruments of university didactics) from the different modules are to be collected and consciously connected. Awareness of the development of one’s own previous teaching and learning experiences and beliefs throughout the course, as well as the consequences of one’s own teaching competencies and interventions in students’ learning, complete the portfolio.

As an alternative to the reflective-oriented portfolio, participants can choose to develop a teaching project following the SoTL idea,²⁴ also called “the research-oriented portfolio”. Here, the focus is on the connection of higher-education didactic perspectives and concepts with a challenging situation in the personal teaching context. It also requires the formulation of one or more research questions and development of research design including, for example, analysis of an intervention, data analysis, and final conclusions or reflection on experiences gained.

Participants are introduced to the task at different moments and levels during the CAS. The first module provides an overview; the second module offers a more thorough presentation of the options and key assessment criteria.

Instructors for the modules provide substantive written, video or oral feedback based on transparent criteria at the end of each module, whilst programme leaders provide guidance and follow the individual development of participants’ certificate work (portfolio or project): participants write a structured one-page document (disposition) with the main ideas for their certificate work, discuss it with partners and receive feedback from peers and

21 Schön, 1983.

22 Bachmann, 2018.

23 Boyer, 1990.

24 Ibid.; Huber, 2011.

instructors. They also have individual meetings and tutoring on a voluntary basis. Certificate work is submitted at the end of the CAS.

Although dialogic, constructive, and multi-perspective feedback for learning and assessment purposes has been a feature of the programme since its inception, the focus was more on the content of the core elements of the course and less on their reflective practice and reflectivity skills. The fact that some portfolios and projects were more descriptive than reflective led us to search for tools and strategies to improve these skills. We concluded that building a tool, for example in form of a rubric to support participants in developing their reflective skills, would be of great benefit. This study therefore focussed on the following research questions:

- How does reflectivity become visible in written texts?
- How can the quality of reflective processes be systematically assessed?
- What factors influence the quality of reflectivity in written texts?

DISCIPLINE/ SUBJECT	TEACHING PHILOSOPHY	DEVELOPMENTAL GOALS, DESIGN, AND IMPLEMENTATION OF THE CORE INTERVENTION
What is being taught?	Why and how is it taught?	What is being examined? How is it examined? • <u>Reflexive-oriented portfolio</u>: "How is the intervention designed and taught?" • <u>Research-oriented project (a SoTL Project)</u>: "What is explored (research question) and how is it developed (research method)?"

TAB. 2: The content dimensions of the ZHE model for analysis in reflective-oriented portfolios and research-oriented portfolios (projects)

Implementing a model
for assessing reflectivity in texts

The review of the various concepts described in the second part of this contribution forms the basis of the ZHE model for assessing reflectivity in texts. Turning these concepts and ideas into a model,²⁵ and later into a tool, involved intense and valuable debates as a team. We continue in the following with a presentation of the model, followed by an introduction to the tool.

The model for assessing reflectivity in written texts

Our work had as a starting point the development of two different rubrics, one for assessing portfolios and one for projects. These first rubrics referred to the quality of the main components of these assignments, but they did not specifically address the reflectivity competence.²⁶ A thorough examination of the categories and concepts was needed to build a more robust theoretical model. The model was built and underwent several transformations and adjustments until it was ready to be tested.

EFFECTS ON THE TEACHING AND LEARNING	CONNECTION THEORY & PRACTICE	SELF-ASSESSMENT OF WHAT IS LEARNED
What has resulted?	What are our theoretical references?	What is learned?

25 This model was explained in detail in Feixas et al., 2020, and is briefly described in the following.

26 Cf. Feixas et al., 2017.

In terms of content, the model focusses on five dimensions following the main competencies that CAS participants need to develop and our assignment guidelines, also based on Larsson, Olsson, and Anderberg's classification for portfolios: the "what", "why", and "how" of the teaching intervention, the "effects" and "linkage to theory",²⁷ to which we added a sixth dimension: a final self-reflection of what is learnt (Table 2). For the research-oriented portfolios, the research question and methodological approach were more relevant. For both text formats, reflective and research-oriented portfolios, there is a particular interest in the effects of teaching on learning and the connection between theory and practice.

Following Van Manen's different levels of reflection and the types of reflection described by Kreber and Cranton,²⁸ we classified the texts according to their reflectivity. Those authors distinguish between lower and higher levels of reflective quality. Lower quality is associated with more narrative or descriptive formulations, a focus on one's own actions, and sometimes limited questioning. In contrast, the highest level of reflectivity is characterized by abstraction, a critical distance to one's own actions, and the linking of different perspectives.

We did not envision the model as hierarchical in function or intend to set up a structure where description would be seen as negative; on the contrary, it is important to note that a precise description can be an important basis for deeper reflection. In any case, the aim of such assignments is to enrich participants' teaching practice with reflective and critical or meta-reflective accounts.

After many revisions by the team at different phases of the study, we arrived at a model that distinguishes between three levels of reflection (Table 3).

27 Larsson et al., 2011.

28 Van Manen, 1992; Kreber & Cranton, 2000.

PRE-REFLECTIVE, DESCRIPTIVE	REFLECTIVE	TRANSFORMATIVE, CRITICAL-REFLECTIVE
On the pre-reflective/ descriptive level a text shows:	On the reflective level a text demonstrates:	On the meta-reflective level a text demonstrates:
• Understanding of concepts without reflecting upon its significance in personal or practical situations (Kember, 1999). • Understanding or comprehension without relation to other situations (according to Bloom's taxonomy) (Bachmann, 2018) • The use of existing knowledge, without attempting to appraise that knowledge, so learning remains within pre-existing meaning schemes and perspectives. • It's considered a superficial critical level of reflection. • A descriptive account is a superficial analysis of data.	• A critique on assumptions about content or processes; raises questions; does not take for granted a situation. • An exploration of one's own experiences in order to lead to new understandings and appreciations. • Questioning one's own way of thinking and trying to think of a better way. • Thinking, reflecting and re-appraising the experience over one's own activities and considering alternative ways of doing it to improve next performance. • Examining possibilities before reaching a conclusion. • A thorough and systematic analysis of data, resulting in a justified judgement.	• A critical review of pre-suppositions. • A reflective thinking through which someone can transform his/her mindset. • An awareness of one's own mindset, perceptions, thoughts, feelings or actions (Mezirow, 1991, p. 108). • A deeper understanding of the nature of learning, e.g. how knowledge is acquired, how understanding is formed (Van Manen, 1991). • Possibilities to extrapolate experience/method/ intervention to a wider practice. • A change in the way of looking at oneself as a result of the course, for example in having discovered faults in previous beliefs.

TAB. 3: Description of the three reflection levels of the ZHE model

Testing the model and the first tool in the context of a postgraduate course in higher education

To test the model, we conducted a pilot study in which we assessed the reflective quality of a set of eight portfolios and projects.²⁹ Each portfolio and project was reviewed by two team members. The idea was to select excerpts of descriptive, reflective, and meta-reflective accounts and compare them to find common agreement on defining the different levels of reflection. We went through this process three times until we all agreed on the qualities of each assignment. We also conducted in-depth interviews with the owners of the assessments to complement the analysis. The aim was to see if their

29 Feixas et al., 2020.

understanding of a reflective practice somehow matched their way of reflecting in the portfolios. The sample was intentionally selected to include participants with diverse backgrounds in terms of gender, age, discipline, teaching experience, and CAS. We also asked them about their motivations for taking part in the CAS. The assignments and the transcribed and coded interviews were analysed for content. These different levels are illustrated by the following examples.

Some descriptive text passages are characterized by a superficial level of reflection, as they do not show an understanding of theoretical knowledge or develop simple relations between variables, as is clear from the following excerpt on teaching methodology (“how”):

You can't follow a speaker for long. I was not aware of that at all until now. It has a very big impact on my teaching, which is now much more fragmented and contains many more exercises and activities.

Although the quote shows insight gained from the course, it lacks the next step of systematic and critical questioning based on the insight gained. Mostly descriptive text passages, however, transition smoothly into the reflective stage, as the following excerpt on teaching philosophy shows:

My teaching-learning philosophy has developed over the years of my work [...]. It is a dynamic construct based on a mixture of experience, acquired theory and ongoing reflection.

Written examples are also interesting, pointing to an essential personal insight and drawing a connection between the “why” and the “how” of teaching:

Before the CAS, my teaching strategy was mainly based on frontal teaching. I was convinced that I had to demonstrate the material to the students and then they should practise. [...] The material learned in the CAS on brain research and psychology of learning has opened my view to the fact that frontal teaching is no longer up-to-date. I have come to the conclusion that individual learning traces are used and deepened through the activation of prior knowledge. The focus of activity should be on the students. The CAS introduced me to a wide range of ways to activate prior knowledge. I have already started to apply this knowledge regularly at the beginning of my lessons. As learning takes time, I support the consolidation phase.

The same person continued to reflect in the interview:

So here, too, I certainly let them [the students] do what they want and don't have the feeling that I have to have a solution. I just let them make mistakes so that they can learn from them later.

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Meta-reflection represents a further step in the depth of reflection, as the following interview excerpts show:

Actually, it's a topic that comes up again and again: How do you get the message across, or what you want to get across? Well, we work in the field of *[laughs]* communication here, and yet I find it difficult sometimes. Our school system is shaped by what I would call the direction of right versus wrong, but in teaching we encourage students to think for themselves; we expect that they ask questions on their own and that these categories of 'right and wrong' are somehow broken down.

Because I realised that what I really keep for a lifetime is what I have acquired myself: nobody can know everything, and you are also allowed to learn from the students. [...] And it is precisely this aspect of mediation, of translating teaching back into research and research into teaching. Or when I'm doing research, I'm already thinking along those lines, thinking: how can I think about or write this in a language that I can use later on, also for mediation purposes?

Here we see the participant taking a critical distance from their own actions and placing their insights in a broader context.

In summary, from this initial study, it can be concluded that although portfolios provide an insight into participants' reflective processes, individual contexts and backgrounds can also significantly influence the depth of reflection. The motivation for giving a course is also an influencing factor that should not be underestimated; the willingness to engage in a reflective process further depends on individual possibilities, for example the resources available to carry out this work. In addition, experience also plays a role in how reflection shows up in texts, for example if someone is mainly involved in professional practice or in research.

The model has shown us that reflectivity remains a difficult construct to measure. An initial instrument developed helped to capture the qualitative notions of reflection in texts, although additional fine-tuning was needed. After conducting a pilot study of the model, a follow-up project was undertaken to create a rubric and evaluate its quality for the final implementation.

Resulting rubric for assessing reflectivity in portfolios: the Reflective Companion

The definitive rubric is called the Reflective Companion and is designed to assess both research-oriented and reflective-oriented portfolios. In the following section we describe it and present the analysis of the first pilot test.

Description of the Reflective Companion

The Reflective Companion is organized around the main dimensions or guidelines of the portfolio or project and around the three different levels of reflectivity (from pre-reflective/descriptive and reflective to transformative/critical-reflective). The main dimensions are:

1. Subject matter (presentation of “what is taught” or the course content)
2. Teaching philosophy (presentation of “why it is taught” or beliefs about teaching and learning in higher education)
3. The core pedagogical intervention
 - Reflection-oriented portfolio: (presentation of the set of interventions being planned, implemented and assessed or “how it is taught”)
 - Research-oriented portfolio: (related to the presentation of “how it is explored” or a research question and method being planned, implemented and analysed)
4. Effects on teaching and learning (related to the presentation of the “analysis of the impact on the teachers’ teaching and students’ learning”)
5. Link to theory (related to the presentation of the “linkage between theory and practice”)

A general table explains the three levels of reflective thinking (Table 4).

In the context of the LeLa project, we examined various digital tools to create our Reflective Companion, that is to facilitate accessibility to the dimensions, criteria and items, to make the answering process easier and to visualise the results in an aesthetic and effective way. Yet, after a thorough examination of free-of-charge tools and determining the pros and cons for each, we came to the conclusion that using the Microsoft App Excel would be the best choice to work with our model, because it is accessible to everyone who has Windows installed, does not require a log-in process or giving personal data to a software company, is inexpensive, and makes it easy for users to answer and

show the results immediately. The Microsoft Excel format also allows users to add notes to the file that are relevant for the final portfolio.

We provide an insight into the final version in the Appendix (Fig. 2 & 3). This version will soon be released under a Creative Commons license. The Reflective Companion has four parts or sheets:

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- The Rubric *per se*: this sheet contains the rubric with its dimensions, criteria, and descriptors. At the end of each dimension and subdimension is a “Reflectivity level” cell with three drop-down levels (descriptive/pre-reflective, reflective, or transformative/critical-reflective) where participants can summarize the level of reflectivity for that (sub)dimension.
- The Summary: provides a general description of the dimension and subdimensions and shows a summary of participants’ assessment.
- A Network diagram: a visualisation of the summary in the form of a network diagram.

Using the Reflective Companion, one is reminded of the reflective component and encounters new ideas that can lead to changes or improvements in the portfolio. In this respect, the rubric can be used as a self-assessment tool or for peer assessment purposes. This provides an important basis for systematically supporting the participants in their reflective processes, for example, through self-assessment before final submission of the portfolio (passed/failed) or during the course in the context of peer feedback processes.

Levels of reflective thinking in portfolios

1. Teaching Biography

- Reflects the main teaching and learning activities for the past years in higher education.

**PRE-REFLECTIVE/
DESCRIPTIVE**

Presents teaching duties by listing the most important courses, modules, lectures, seminars, workshops, design of evaluation activities or other relevant teaching activities conducted.

REFLECTIVE

Presents teaching duties by describing and explaining the most important courses, modules, lectures, seminars, workshops, design of evaluation activities or other relevant teaching activities conducted.

**TRANSFORMATIVE/
CRITICAL-REFLECTIVE**

Presents teaching duties by explaining and critically reflecting the most important courses, modules, lectures, seminars, workshops, design of evaluation activities or other relevant teaching activities conducted.

2. Teaching Philosophy

- Understanding of teaching and learning in higher education, including, for example, one’s personal motivations for teaching, role/s as a teacher, the role of the students, methods that are believed work best, role of feedback, and the interaction, communication and relationship between the teacher and the students.
- Making associations and critically building from previous experiences with teaching.

**PRE-REFLECTIVE/
DESCRIPTIVE**

Articulates a teaching philosophy by describing the conceptions about teaching and learning in higher education, the useful teaching methods, and the characteristics of the relationship with the students, etc., and relates it to one or various experiences of teaching.

REFLECTIVE

Articulates a teaching philosophy by justifying the conceptions about teaching and learning in higher education, the useful teaching methods, and the characteristics of the relationship with the students, etc., and relates it meaningfully to one or various experiences of teaching.

**TRANSFORMATIVE/
CRITICAL-REFLECTIVE**

Articulates a teaching philosophy by justifying and challenging critically the conceptions about teaching and learning in higher education, the useful teaching methods, and the characteristics of the relationship with the students, etc., and relates it critically to one or various experiences of teaching.

3. Developmental Teaching Goals and Design and Implementation of the core Intervention/s

- 3.1. Goals: Developmental teaching goals that the teacher has set up to achieve and the extent to which they have been achieved during the training programme
- 3.2. Topics: Selection of focused and manageable higher education topics for the intervention/s
- 3.3. Implementation of the core intervention: Methodological design and implementation vary according to the type of intervention project chosen (for ex. various small teaching innovations in the classroom, the design and testing of a curricular resource or a SoTL project)
- 3.4. Results and effects: Analysis of the results of the intervention/s and its effects on teaching and learning
- 3.5. Links to the theory: Links are made to the university didactics (general and disciplinary specific) theory
- 3.6. Limitations for further development: Discussion of limitations of the intervention's design and implementation and the extent to which the goals have been achieved
- 3.7. Conclusions from the core intervention: Specification of conclusions on the findings and demonstration

PRE-REFLECTIVE/ DESCRIPTIVE

Formulates the developmental teaching goals by listing them and articulates how they have been developed by describing the intervention showing the extent to which the proposed goals have been achieved.

REFLECTIVE

Formulates the developmental teaching goals by justifying why they have been chosen and articulates how they have been developed by explaining didactically the intervention showing the extent to which the proposed goals have been achieved.

TRANSFORMATIVE/ CRITICAL-REFLECTIVE

Formulates the developmental teaching goals by justifying why they have been chosen and articulates how they have been developed by explaining didactically and critically reflecting the intervention showing the extent to which they have been achieved.

Levels of reflective thinking in portfolios

4. Final reflections and self-assessment of learning

Demonstration of a developing sense of self as a learner, building on prior experiences to respond to new and challenging context.

PRE-REFLECTIVE/ DESCRIPTIVE	REFLECTIVE	TRANSFORMATIVE/ CRITICAL-REFLECTIVE
Provides final thoughts by describing main learning gains as a result of the work done in the training programme.	Provides final thoughts by examining the main learning gains as a result of the work done in the training programme and demonstrating a developing sense of self as a learner.	Provides final thoughts by justifying and critically reflecting the main learning gains as a result of the work done in the training programme and demonstrating a developing sense of self as a learner, capacity of building on prior experiences and of transferring to respond to new and challenging context.

TAB. 4: General overview of the three levels of reflective thinking in portfolios

Testing the rubric

We tested the rubric in one CAS (academic year 2021–2022), with 18 participants who worked on their reflective- or research-oriented portfolios electronically (e-portfolio). They were introduced to the idea of the Reflective Companion during Module 3 (Assessment and Evaluation Module) about six months into the CAS, when they were given comprehensive information about the levels and components of reflection. They received the Reflective Companion rubric one month before submitting their portfolios. The idea of providing the rubric at that particular moment was deliberate and based on the evidence that it should be handed in when the writing process has started or is quite advanced, firstly because if a rubric is provided at the beginning of a task, it can interfere the original ideas and development of creativity,³⁰ but also

30 Panadero & Jonsson, 2013.

because the process of writing a portfolio involves many changes to the various parts and the final version is usually very different from the initial one.

We carried out an evaluation of the Reflective Companion once the portfolio was submitted. The evaluation took the form of an open-ended questionnaire with the aim of obtaining feedback on the e-portfolio and on the effectiveness of the rubric in improving reflectivity. There were two questions referring specifically to the rubric, one pertaining to perception of its usefulness in improving reflectivity, the other having to do with future recommendations. Participants completed the questionnaire on the final day of course, on the same day as their portfolio presentations and the awarding of certificates (n=16). Of the 16 participants present, 12 answered the questionnaire on-site and 4 did not, having openly acknowledged that they did not find time to implement the rubric as thoroughly as they would have liked. With regard to the first questions, the participants assessed the tool very positively because:

- they could identify the different depths of reflection very clearly,
- the categories were very well described,
- they appreciated the effort taken to reduce the concept to its essentials, and
- the implementation in Microsoft Excel was useful and practical.

However, other participants found that differences between the depths of reflection in some of the items were not always clear-cut; some sentences were not really understandable, or they could not determine the exact difference between reflective and meta-reflective levels. One participant asked, for example, "What is the difference between comprehensive understanding and deep understanding?" It was also mentioned that they felt that meta-reflection was the goal to strive for in all dimensions and that this seemed too ambitious. Finally, respondents noted that the formulation of the goal of the Reflective Companion should be made more precise. With this feedback in hand, the real focus of our work is to address the challenges described before the rubric is released in its final form for public use: we have written an introduction to the use of the Reflective Companion with information about the dimensions, the various levels of reflection, and how to use the tool.

When asked about possible implementations of the rubric, respondents mentioned that it would be very helpful in the context of a peer-review experience before submission of the portfolio, in addition to the self-assessment.

Finally, they added that the Reflective Companion not only helped them to improve their reflective practice, but will also assist them in the assess-

ment of their own students' work. The concepts and levels described in the Reflective Companion are also well-suited to assessing research projects of any kind, including bachelor's or master's theses, or any other extensive essay or written assignment.

Conclusions

In this article we offered main insights into the findings of a SoTL project aimed at examining reflectivity in teaching portfolios and projects. We also presented the design, development, and evaluation of the Reflective Companion tool. The SoTL study provided us with a better understanding of the concept of reflective practice. We now have at hand a model that can be used to analyse and assess reflectivity in written texts or to support reflective processes in our teachers. We have also shown how the Reflective Companion can be used as a self- and peer assessment tool to help CAS participants identify the level of reflectivity in their writing and to offer guidance on how to improve reflective practice and skills.

In the development of such models, there tends to be a conflict of objectives between reducing complexity for the purpose of incorporating the model into everyday life and demonstrating sufficient theoretical grounding. There has also been debate about whether a model primarily aims at efficient use by university teachers in everyday teaching, or whether it is a scientific analysis for research purposes.

This SoTL study was not only an opportunity for members of the Centre to learn about the conceptualisation and assessment of reflectivity, but we also experienced working together on a major project and saw how it helped consolidate our culture of collaborative working. Taking a "scholarly approach" to higher education didactics is not without its challenges. The dual role of academic developers as trainers supporting lecturers in developing their reflective practice in teaching and as researchers contributing to the development of the scholarship requires time, resources, capacity, competences, etc. Through our project we have created time and space to reflect on our own practice. Our experience shows that we have benefited as a team. However, reflective practice requires an adapted strategy to support our endeavours in our specific contexts. We believe that openness and the search for appropriate approaches are central to this.

Overall, SoTL studies and higher education research complement each other in academic development. We deal with specialised and scientific literature daily. At the same time, we find that project-oriented formats are preferable to traditional formats due to the extensive prior knowledge our participants bring to the table. This also opens up new ways of thinking about research in collaboration with researchers and non-researchers, with team members and participants.

Our goal is to continue to use the rubric in our forthcoming courses, to share it with other interested researchers and practitioners, and to use this knowledge as basis for further discussion about SoTL practices and the role of research in academic development.

References

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ARGYRIS, C. & SCHÖN, D. (1974). *Theory in Practice. Increasing Professional Effectiveness*. San Francisco: Jossey-Bass.

BACHMANN, H. (2018). *Kompetenzorientierte Hochschullehre: Die Notwendigkeit von Kohärenz zwischen Lernzielen, Prüfungsformen und Lehr-Lern-Methoden*. Bern: Hep Verlag.

BADLEY, G. (2001). Towards a pragmatic scholarship of academic development. *Quality Assurance in Education*, 9(3), 162–170.
DOI: <https://www.doi.org/10.1108/09684880110399167>.

BARNETT, R. (1997). *Higher Education: A Critical Business*. Buckingham: Society for Research into Higher Education and Open University Press.

BOS, W., LANKES, E.-M., PLASSMEIER, N. & SCHWIPPERT, K. (EDS.) (2004). *Heterogenität. Eine Herausforderung an die empirische Bildungsforschung*. Münster: Waxmann.

BOUD, D., KEOGH, R. & WALKER, D. (EDS.) (1985). *Reflection: Turning Experience into Learning*. London: Kogan Page.
DOI: <https://doi.org/10.4324/9781315059051>.

BOYER, E. L. (1990). *Scholarship Reconsidered. Priorities of the Professoriate*. San Francisco: Jossey-Bass.

BROOKFIELD, S. D. (1987). *Developing Critical Thinkers: Challenging Adults to Explore Alternative Ways of Thinking*. San Francisco: Jossey-Bass.

DEWEY, J. (1933). *How We Think. A Restatement of the Relation of Reflective Thinking to the Educative Process*. Massachusetts: D.C. Heath & Co.

FEIXAS, M., ENGFER, D. & ZELLWEGER. (2017). Evidenzbasierte Unterrichtsentwicklung. Ein Raster zur Entwicklung von Small-scale-Lehrprojekten in der Aus- und Weiterbildung. *Education Permanente*, 3, 55.

FEIXAS, M., ENGFER, D., ZELLWEGER, F., ZIMMERMANN, T. & FLEPP, G. (2020). Degrees of reflection in academic development: Construction and application of a tool to assess critical reflection in portfolios and projects. *Profesorado. Revista de Currículum y Formación de Profesorado*, 24(2), 98–119. DOI: <https://doi.org/10.30827/profesorado.v24i2.15227>.

FOOK, J., WHITE, S. & GARDNER, F. (2006). Critical reflection: a review of contemporary literature and understandings. In S. White, J. Fook & F. Gardner (eds.), *Critical Reflection in Health and Welfare* (pp. 3–20). Maidenhead: Open University Press.

FUND, Z. COURT, D., & KRAMARSKI, B. (2002). Construction and application of an evaluative tool to assess reflection in teacher-training courses. *Assessment & Evaluation in Higher Education*, 27(6), 485–499. DOI: <https://www.doi.org/10.1080/0260293022000020264>.

GEERTSEMA, J. (2016). Academic development, SoTL and educational research. *International Journal for Academic Development*, 21(2), 122–134. DOI: <https://www.doi.org/10.1080/1360144X.2016.1175144>.

GIBBS, G. (1988). *Learning by Doing: A Guide to Teaching and Learning Methods*. Oxford: Further Education Unit.

GORDON, G. (2012). It is time to strengthen the conceptual focus of SoTL. *International Journal for Academic Development*, 17(2), 177–180. DOI: <https://www.doi.org/10.1080/1360144X.2012.668750>.

GROEBEN, N., WAHL, D., SCHLEE, J. & SCHEELE, B. (1988). *Forschungsprogramm Subjektive Theorien. Eine Einführung in die Psychologie des reflexiven Subjekts*. Tübingen: Francke.

HUBER, L. (2011). Scholarship of Teaching and Learning. Forschung zum (eigenen) Lehren. In B. Berendt, H.-P. Voss & J. Wildt (eds.), *Neues Handbuch Hochschullehre* (J1.11). Berlin: Raabe.

HUBER, L. (2014). Scholarship of Teaching and Learning: Konzept, Geschichte, Formen, Entwicklungsaufgaben. In L. Huber, A. Pilniok, R. Sethe, B. Szczyrba & M. Vogel (eds.), *Forschendes Lehren im eigenen Fach. Scholarship of Teaching and Learning in Beispielen* (pp. 19–36). Bielefeld: Bertelsmann.

KEMBER, D., LEUNG, D. Y. P. & KWAN, K. P. (2002). Does the use of student feedback questionnaires improve the overall quality of teaching? *Assessment & Evaluation in Higher Education*, 27(5), 411–425.

DOI: <https://www.doi.org/10.1080/026029302200009294>.

KNAUF, H. (2016). Heterogenität – ein umfassendes Projekt für Hochschulen und Hochschulentwicklung. In: Brahm, T., Jenert, T., Euler, D (eds.), *Pädagogische Hochschulentwicklung*. Wiesbaden: Springer.

KOLB, D. A. (1984). *Experiential Learning. Experience as the Source of Learning and Development*. New Jersey: Prentice-Hall.

KORTHAGEN, F. A. J. (2001). Changing our view of educational change. *Teaching & Teacher Education*, 17(2), 263–269.

KORTHAGEN, F. A. J. & VASALOS, A. (2005). Levels in reflection: core reflection as a means to enhance professional growth. *Teachers and Teaching*, 11 (1), 47–71. DOI: <https://www.doi.org/10.1080/1354060042000337093>.

KREBER, C. & CRANTON, P. A. (2000). Exploring the scholarship of teaching. *The Journal of Higher Education*, 71(4), 476–496.
DOI: <https://www.doi.org/10.2307/2649149>.

LARSSON, M., OLSSON, T. & ANDERBERG, E. (2011). *Researching the Change in the Scholarship of Teaching and Learning through Portfolios and Conference Contributions: An Institutional Reflection*. Paper presented at the International Society for the Scholarship of Teaching and Learning (ISSOTL).

LITTLE, D. (2014). Reflections on the State of the Scholarship of Educational Development. *To Improve the Academy*, 33(1), 1–13.
DOI: <https://www.doi.org/10.1002/tia2.20005>.

LUCAS, P. (1991). Reflection, New Practices, and the Need for Flexibility in Supervising Student Teachers. *Journal of Further and Higher Education*, 15(2), 84–93. DOI: <https://www.doi.org/10.1080/0309877910150209>.

MCALPINE, L. & WESTON, C. (2000). Reflection: issues related to improving professors' teaching and students' learning. *Instructional Science*, 28, 363–385. DOI: <https://doi.org/10.1023/A:1026583208230>.

MEZIROW, J. (1997). Transformative Learning: Theory to Practice. *New Directions for Adult and Continuing Education*, 74, 5–12.

MOON, J. (2007). *A Handbook of Reflective and Experiential Learning. Theory and Practice*. London: Routledge.
DOI: <https://doi.org/10.4324/9780203416150>.

MYATT, P., GANNAWAY, D., CHIA, I., FRASER, K., & MCDONALD, J. (2018). Reflecting on institutional support for SoTL engagement: developing a conceptual framework. *International Journal for Academic Development*, 23(2), 147–160. DOI: <https://www.doi.org/10.1080/1360144X.2017.1346511>.

PANADERO, E., & JONSSON, A. (2013). The use of scoring rubrics for formative assessment purposes revisited: A review. *Educational Research Review*, 9, 129–144. DOI: <https://doi.org/10.1016/j.edurev.2013.01.002>.

PATEL, F. (2014). Promoting a culture of scholarship among educational developers: exploring institutional opportunities. *International Journal for Academic Development*, 19(3), 242–254. DOI: <https://www.doi.org/10.1080/1360144X.2013.805693>.

RODGERS, C. (2002). Defining Reflection: Another Look at John Dewey and Reflective Thinking. *Teachers College Record*, 104(4), 842–866. DOI: <https://doi.org/10.1111/1467-9620.00181>.

SCHÖN, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*. London: Temple Smith.

SPINATH, B. & SEIFRIED, E. (2018). Was brauchen wir, um solide empirische Erkenntnisse über gute Hochschullehre zu erhalten? *Zeitschrift für Hochschulentwicklung*, 13, 153–169.

DOI: <https://www.doi.org/10.3217/zfhe-13-01/08>.

SUGRUE, C., ENGLUND, T., SOLBREKKE, T. D. & FOSSLAND, T. (2018).

Trends in the practices of academic developers: trajectories of higher education? *Studies in Higher Education*, 43(12), 2336–2353.

DOI: <https://doi.org/10.1080/03075079.2017.1326026>.

TOOM, A., HUSU, J. & PATRIKAINEN, S. (2014). Student teachers' patterns of reflection in the context of teaching practice.

European Journal of Teacher Education, 38(3), 320–340.

DOI: <https://doi.org/10.1080/02619768.2014.943731>.

TRIGWELL, K. (2013). Evidence of the impact of Scholarship of

Teaching and Learning purposes. *Teaching & Learning Inquiry*, 1(1), 95–105.

DOI: <https://www.doi.org/10.2979/teachlearninqu.1.1.95>.

VAN MANEN, M. (1992). Reflectivity and the pedagogical moment:

the normativity of pedagogical thinking and acting. *Journal of Curriculum Studies*, 23(6), 507–536.

DOI: <https://www.doi.org/10.1080/0022027910230602>.

WYSS, C., & AMMANN, D. (2015). Rundum reflektieren. Von der praktischen Erfahrung zum planvollen Handeln. In M. Honegger, D. Ammann & T.

Hermann (eds.), *Schreiben und Reflektieren. Denkspuren zwischen Lernweg und Leerlauf* (pp. 23–34). Bern: Hep.

Appendix

ZHE-Modell zur Beurteilung der Reflexivität in Portfolios			Reflexionsstufe
deskriptiv-präreflexiv	reflexiv	transformativ-kritisch reflexiv	
1. Lehr-Biographie (Lehrfähigkeit in den letzten Jahren)			
Du nennst und beschreibst deine wichtigsten Lehrfähigkeiten (Module, Seminare, Kurse etc.) der letzten Jahre im Hochschulbereich.	Du beschreibst deine wichtigsten Lehrfähigkeiten (Module, Seminare, Kurse etc.) der letzten Jahre und erklärst die Veränderungen und Entwicklungen bei bzw. dem Inhalt, den Methoden sowie bei den Rollen und Verantwortlichkeiten.	Du beschreibst deine wichtigsten Lehrfähigkeiten (Module, Seminare, Kurse etc.) der letzten Jahre und erklärst die Veränderungen und Entwicklungen bei bzw. dem Inhalt, den Methoden sowie bei den Rollen und Verantwortlichkeiten. Du zeigst auch Zusammenhänge und Kohärenz in deinen Lehrfähigkeiten auf.	deskriptiv-präreflexiv reflexiv transformativ-kritisch reflexiv
2. Lehr-Lern-Philosophie (Persönliche Verständnis von Lehren und Lernen in der Hochschulbildung)			
Du beschreibst deinen Lehr-Lern-Ansatz oder Lehr-Lernverständnis betreffend "gute Lehre" und die Art des Lernens (z.B. Verständnis von Lehren und Lernen, Rolle als Dozent:in, Interaktion mit den Studierenden, usw.), ohne Verbindung zu deinen früheren Erfahrungen als Dozent:in oder Student:in.	Du legst die Entwicklung deines Lehr-Lern-Ansatzes dar, in dem du auf eigene Überzeugungen oder Ideen betreffend "gute Lehre" und die Art des Lernens eingehst und machst Verbindungen zu deinen früheren Erfahrungen als Dozent:in oder Student:in. D.h. du vergleichst Standpunkte, stellst Diskrepanzen zwischen früheren und aktuellen Erfahrungen dar um zu zeigen, dass sich dein Verständnis von Ideen über das Lehren und Lernen verändert hat.	Bei der Reflexion deiner Lehr-Lern-Philosophie berücksichtigst du mehrere Erfahrungen und zeigst die zentralen Unterrichtsprinzipien und -strukturen auf, die hinter deinen Überzeugungen und Werte stehen. Du stellst etablierte Normen in Frage , zeigst radikale Veränderungen sowie die Neugestaltung von Lehr- und Lernpraktiken in Betracht .	diese Dimension am besten zutrifft
Du nennst Werte und Überzeugungen in Bezug auf das Lehren und Lernen in der Hochschulbildung, wobei diese nicht persönlich sind, sondern sich auf Konzepte und Theorien in den Modulen beschränken.	Du erläuterst persönliche Werte und Überzeugungen in Bezug auf das Lehren und Lernen in der Hochschulbildung und nimmt dabei auch Bezug auf die in den Modulen erläuterten Konzepte und Theorien.	Bei der Reflexion deiner Lehr-Lern-Philosophie berücksichtigst du persönliche und theoretische Perspektiven und nimmt dabei auch Bezug auf die in den Modulen erläuterten Konzepte und Theorien. Du zeigst die zentralen Unterrichtsprinzipien und -strukturen auf, die hinter deinen Überzeugungen und Werte stehen, in deiner Lehr-Lern-Philosophie ist zudem ein Lernmuster und konsistentes pädagogisches Wissen identifizierbar.	
Du erwähnst vereinzelt Feedback-Quellen oder Vorbilder (Studierende, Peers, Expert:innen oder Familie etc.) , die dich bei der Entwicklung deiner Lehrfähigkeit unterstützen.	Du erläuterst die Rolle der Feedback-Quellen oder Vorbilder , um die Entwicklung deiner Lehre zu unterstützen. D.h. du vergleichst Standpunkte, stellst Diskrepanzen zwischen deinen Ideen und die von anderen her, analysierst den Kontext um zu zeigen, dass sich dein Verständnis von Ideen über das Lehren und Lernen verändert hat.	Du begründest die Rolle der Feedback-Quellen oder Vorbilder und machst eine breite Analyse der kontextuellen Faktoren in dem du darlegst, wie sie die Lehre deines Faches beeinflusst und weiterentwickelt haben.	
Du führst vereinzelt Beispiele für die Anwendung der Lehr-Lern-Philosophie an.	Du führst einige Beispiele für die Anwendung der Lehr-Lern-Philosophie an.	Du führst einige ausführliche Beispiele für die Anwendung der Lehr-Lern-Philosophie an. Das heißt du nimmst Bezug auf didaktische und kontextuelle Faktoren , die deine Lehre beeinflussen und reflektierst die Auswirkungen auf das Lernen der Studierenden.	reflexiv
3. Entwicklungsziele, Konzeption und Durchführung der Intervention/en			
3.1 Entwicklungsziele			
Du nennst und beschreibst die eigenen Entwicklungsziele , die du dir gesetzt hast und während des Lehrgangs erreichen möchtest.	Du erläuterst die eigenen Entwicklungsziele , die du dir gesetzt hast, sowie die Art und Weise , wie du sie während des Lehrgangs erreichen möchtest (Hypothesen/Fragen die du anhand deiner Intervention überprüfen/klären möchtest).	Du erläuterst die eigenen Entwicklungsziele , die du dir gesetzt hast, sowie die Art und Weise , wie du sie während des Lehrgangs erreichen möchtest und begründest, warum diese wichtig sind . Das heißt, du zeigst systematisch und präzise auf, welche Hypothesen/Fragen du mit der/den Intervention/en überprüfen/klären möchtest und setzt diese in einen größeren Kontext (Beweggründe, Zusammenhänge).	transformativ-kritisch reflexiv

FIG. 2: Screenshot of the ZHE model in Microsoft Excel (rubric)

Zusammenfassung	
1. Lehr-Biographie	
Spiegelt die wichtigsten Lehr- und Lernaktivitäten der letzten Jahre in der Hochschulbildung wieder.	deskriptiv-präreflexiv
2. Lehr-Lern-Philosophie	
Verständnis des Lehrens und Lernens in der Hochschulbildung, einschließlich z.B. der Motivation für das Lehren, der Rolle(n) als Lehrende(r), der Rolle der Studierenden, bevorzugten Methoden, der Rolle des Feedbacks und der Interaktion, Kommunikation und Beziehung zwischen Lehrenden und Studierenden.	reflexiv
Assoziationen herstellen und kritisch auf frühere Lehrerfahrungen aufbauen.	
3. Entwicklungsziele, Konzeption und Durchführung der Kernintervention	
3.1 Entwicklungsziele	
Die von der/vom Dozierenden gesetzten Entwicklungsziele	transformativ-kritisch reflexiv

FIG. 3: Screenshot of the ZHE model in Microsoft Excel (summary)

Figures and tables

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FIG. 1: Structure of the CAS Higher Education Didactics course.
Visualization by the authors

FIG. 2: Screenshot of the ZHE model in Microsoft Excel (rubric).
Visualization by the authors

FIG. 3: Screenshot of the ZHE model in Microsoft Excel (summary).
Visualization by the authors

TAB. 1: Central theoretical foundations of the ZHE model. Overview by the authors

TAB. 2: The content dimensions of the ZHE model for analysis in reflective portfolios and research-oriented portfolios (projects). Overview by the authors

TAB. 3: Description of the three reflection levels of the ZHE model.
Overview by the authors

TAB. 4: General overview of the three levels of reflective thinking in portfolios. Overview by the authors

