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Enhancing Collaboration and Digital Teaching Competencies in Higher Education: The KoKoN Project

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Zusammenfassung

Die Notwendigkeit einer schnellen Umstellung vom klassischen Präsenzunterricht auf digitale und virtuelle Lernformate während der Corona-Pandemie stellte selbst erfahrene Hochschullehrende vor Herausforderungen. Wenn Lehrende nach geeigneten Methoden für ihre Lehrszenarien und die damit verbundene Lehrkooperation suchen, nutzen sie in erster Linie den Austausch mit Kolleg:innen oder die naheliegende (Google-)Suche im Internet. KoKoN zielt darauf ab, über die Digitale Vernetzungsinfrastruktur für die Bildung (DVIB) einen einfachen und sicheren Zugang zu qualitativ hochwertigen und didaktisch aufbereiteten Lehr- und Lernmethoden zu ermöglichen, wobei die kooperative Nutzung und

Weiterentwicklung didaktischer Methoden mit der Reflexion von erfahrungsrelevanten Best-Practice-Informationen für alle Nutzer:innen im Vordergrund steht. Der Beitrag beschreibt anhand eines Nutzungsszenarios die zentralen Komponenten dieses Projekts.

Stichwörter: e-learning; Digitale Lehre; digitale Kollaboration; Kompetenzen

Abstract

The need for a rapid shift from classical face-to-face learning to digital and virtual learning formats during the Corona pandemic posed challenges even for experienced higher education teachers. When teachers are looking for suitable methods for their teaching scenarios and the associated teaching cooperation, they primarily use discussions with colleagues or the obvious (Google) search on the Internet. KoKoN aims to provide easy and secure access to high-quality and didactically prepared teaching and learning methods via the Digitale Vernetzungsinfrastruktur für die Bildung (DVIB) with focus on cooperative use and further development of didactic methods with reflection of experience-relevant best-practice information for all users. The paper describes the key components of this project by means of a usage scenario.

Keywords: e-learning; digital teaching; e-collaboration; competencies

1 Introduction

The importance of digital teaching in higher education has steadily increased in recent years (Gentile et al., 2022). Not least because of the COVID-19 pandemic the experiences of higher education teachers with digital teaching during the pandemic have also increasingly become the object of study in higher education research (Marinoni, van't Land & Jensen, 2020; Arndt, Ludwig & Knudsen, 2020). Particularly at the onset of the pandemic, tried-and-true methodological-didactic concepts and proven teaching practices were often jettisoned in favor of emergency remote teaching (Hodges, Moore, Lockee, Trust & Bond, 2020). Thus, while teaching could be maintained, the full didactic potential of digital media could not be harnessed for teaching in the process. Higher education teachers are now faced with the task of dealing more systematically with the possibilities of digital teaching. The development of digital teaching competencies is a key to the successful implementation of digital educational formats in higher education teachers (Eichhorn, Tillmann & Drachsler, 2021). Of equally crucial importance as individual competence building are collaborations between teachers in the conception and design of higher education teaching (Schleifenbaum & Walther, 2015). Collaborative conceptualization of teaching as well as discussion and reflection on teaching actions can provide valuable ideas for improving teaching.

The development of the *Digitale Vernetzungsinfrastruktur für die Bildung (DVIB)* offers the opportunity to increase the exchange and cooperation between higher education teachers in the teaching context. A brief overview of the summarized connections between DVIB and KoKoN is given in this practice paper.

2 Addressing the needs of university teachers via the DVIB

The goal of the project “KoKoN2 – Kompetente Kollaboration im Netzwerk” [1] is to provide higher education teachers with easy and secure access to high-quality and didactically prepared teaching and learning methods via the DVIB and thus to contribute to building up competence in the use of didactic methods and digital tools for digital teaching. Within the learning offer of KoKoN a *methodological toolbox* and a *competence profile* are intended to enable higher education teachers to ease access to *collaborations* – within their own institution or beyond the boundaries of their own university.

This is made possible via the DVIB, which is intended to bring together many different applications in the context of education and make them permanently available. In this way, the offerings provided via KoKoN gain broad visibility among higher education teachers. KoKoN builds on this basis and provides opportunities for them to network and collaborate.

With its focus on didactic methods for digital teaching and its exchange and matching functions, KoKoN offers a fundamental and pioneering online service. It thus forms a content-related and functional supplement to existing online offerings for support in the area of digital and hybrid teaching, such as e-teaching.org, The importance of supporting teachers with regard to didactic methods in digital teaching was made clear by a KoKoN survey, as explained below.

3 Investigation of the target group's needs

To more precisely assess the needs of the target group regarding the learning offer to be developed a quantitative online survey and interviews were conducted among higher education teachers.

Online Survey: The survey was conducted at TU Dresden and AKAD University Stuttgart. Out of more than 1000 contacted teachers of both institutions, the survey yielded a response from 217 participants, most of whom were active in teaching on a full-time or freelance basis and had been active in teaching for more than ten years. The aim of the survey was to investigate how higher education teachers prepare their lessons didactically, which media or sources they use for preparation, whether they already cooperate regarding digital teaching and what support they additionally need. Three central results emerged from the study:

1. The survey showed that the intensification of digital teaching (due to the COVID-19 pandemic) will not remain a transitional phenomenon, but that after two years of experience with digital teaching formats, teachers no longer want a return to pure face-to-face teaching. Instead, they are predominantly in favor of mixed forms of hybrid face-to-face and digital formats (49.3%).
2. Although most respondents (49.8 %) have already been active in higher education teaching for more than ten years, the need for methodological information for digital courses is high: Only 18.5 % of respondents felt well versed in the methodological-didactic preparation of their digital courses, while 81.5 % would like further information on the selection and use of digital methods.

3. Cooperation between higher education teachers is already of central importance for the selection and use of suitable methods. Around 83 % of all respondents already use forms of cooperation of varying intensity, and would like to increase this in the future, but need additional support in this respect. 68.5% of the respondents wanted information about potential cooperation partners.

Interviews: To understand the context of the current work tasks and how higher education teachers prepare their courses, including the framework conditions of this process, both on the technical and organizational side, five remote interviews were conducted with higher education teachers from LMU München and AKAD Hochschule Stuttgart. The current opportunities for exchange and cooperation were inquired about, as well as sources of inspiration and desires for didactic methods. The need for exchange about digital teaching was largely confirmed. Higher education teachers with less experience indicate that they currently exchange ideas with more experienced colleagues as well as with those of similar professional experience mostly from the same university. Several respondents expressed a desire for inspiration and ideas for activating students and strengthening social presence in the online setting.

4 Methodological knowledge, competence building and collaboration – the three key components of KoKoN

The KoKoN2 project intertwines three key components, which are briefly described below. The interplay of the three components is then illustrated using a concrete example.

4.1 The methodological toolbox

When designing a systematization of methods, two essential aspects must be considered. On the one hand, higher education teachers must have a well-structured overview and sufficient information about didactic methods when planning digital courses. On the other hand, the retrieval of methods should be as efficient and effective as possible, even without prior didactic knowledge. Accordingly, a methodological toolbox should meet certain requirements.

These requirements were adopted and expanded in advance in the existing methodological toolboxes the KoKoN toolbox will rely on (for example the toolbox MobiDics of LMU München) (Meyer et al., 2014 [2]. There is a large number of method systematizations, but none of them has finally established. It is therefore interesting to examine existing systems for teaching methods with regard to the established requirements. For this purpose, various existing method systems in school and university contexts were considered (cf. Adl-Amini 1993, Berendt et al. 2006, Baumgartner 2011, Einsiedler 1981, Flechsig in Baumgartner 2011, Gage/Berliner 1986, Jaschinsky 2008, Meyer 2002, Siebert 2008, Waldherr/Walter 2009, Winkel 1982, Winteler 2011).

None of the considered systematizations met all criteria. This is probably due to the difficulty of reconciling abstraction, which goes hand in hand with systematization, and the greatest possible concreteness to meet the needs of higher education teachers. It is precisely this discrepancy that the methodological toolbox to be developed aims to overcome.

KoKoN aims to offers a methodological toolbox with a great variety of didactic methods to choose from. It is based on the didactic concept of "Constructive Alignment" (Biggs & Tang, 2011), which places the orientation of teaching on the examination of the learners. The aim is to align the *learning objectives*, *the learning activity* (didactic methods) and the *examination of the course* to design the teaching holistically. The chosen categories of the method systematization within the toolbox therefore consist of the learning objectives “AVIVA” [3] (Städeli et al., 2010; Städeli et al., 2021), combined with different social forms and the differentiation of learning activities. Learning objectives do not stand on their own but build on each other within the framework of a teaching unit. The category of learning objectives is combined with different social forms (Saalfrank, 2011). A distinction is made between individual work, partner work, interactive plenary, plenary among themselves and frontal plenary. Changing the social form in a course has a stimulating and motivating effect on the learners, as attention can be held longer. Learning activities can be understood as the degree of learner activation that influences the quality of learning. Chi (2009) offers a taxonomy of learning activities “ICAP” [4] and classifies them in relation to cognitive processes in learners (Sailer & Figas, 2018).

4.2 The teaching competence profile

To be able to recommend suitable didactic methods for digital teaching to the higher education teachers and to match suitable cooperation partners, teachers have the possibility to create a teaching competence profile. The core of the profile is the digital teaching competencies, which are self-assessed by the teachers with the help of a validated instrument. The profile is based on the "Frankfurt Model of Digital Competencies of Higher Education Teachers" (Eichhorn, Müller & Tillmann, 2017) and focuses on the three competence dimensions "IT Competence", "Digital Teaching" and "Communication & Collaboration", which are particularly relevant for matching teaching collaborations. In addition to digital competencies, the teaching competencies profile also maps other characteristics relevant for the recommendation mechanism, e.g., teaching experience, preferences and teaching attitudes, technology acceptance, or regional location.

The methods described in the methodological toolbox are also provided with a requirement or competence profile. This shows which competencies are required for the use of a particular method (e.g. collaborate digitally in combination with knowledge of appropriate tools), but also which competencies can be particularly promoted by this method.

4.3 The matching process and collaboration

Based on the teaching competencies profile, collaboration mechanisms are supposed to promote the initiation of collaborations among teachers, as well as support the co-creation of learning and teaching methods in the methodological toolbox.

Based on our assumption that most of the interested teachers are forwarded by DVIB to KoKoN with the intention of adjusting their learn settings with a new set of digital methods we are assuming that the motivation for collaboration will be mostly waked by KoKoN. Based on our survey 81% of teachers are interested in collaboration but lack an environment to do so. Our offer provides the initial motivational state and the opportunity to initiate a collaboration process by higher education teachers.

To initiate collaboration and to motivate teachers to collaborate, it is also planned to use social cooperation mechanisms based on theoretical approaches like the Shared-Mental-Modell (Busch, Lorenz, 2010) or Yield-Shift-Theory (Briggs, Reinig, de Vreede, 2008.). These social coordination mechanisms ensure that cooperation partners have a common relationship goal and can derive their own benefits from the cooperation and can be implemented digitally with the help of self-assessment questions, which help to optimise the matching process on a social level. In the current work phase, different forms of questions are being tested to obtain information about individual goals, teaching preferences and other topics relevant to cooperation with as few questions as possible. In addition to this, teachers can also be motivated to participate in a collaboration by making activities, such as the optimisation of didactic methods in the methodological toolbox, of individual actors visible to others and naming them as authors in jointly developed or optimised works (Robra-Bissantz, Siemon, 2018).

Teachers receive recommendations for methods that are particularly suitable for them, as well as recommendations for cooperation partners to carry out the recommended methods based on their applied profile. Through this form of cooperation, methods can be implemented collaboratively, and digital teaching competencies can be built up. The matching process analyzes teaching preferences, experiences and concrete search entries of the teachers on the platform in addition to the specified competencies. The more information the teachers provide, the higher the chance of finding suitable cooperation partners on the platform.

5 The functioning of KoKoN on the example of two selected didactic methods

To illustrate how KoKoN works, a short application scenario (see Fig. 1) is explained below from the perspective of the typical and fictitious user Renate and using the example of two methods from KoKoN's toolbox.

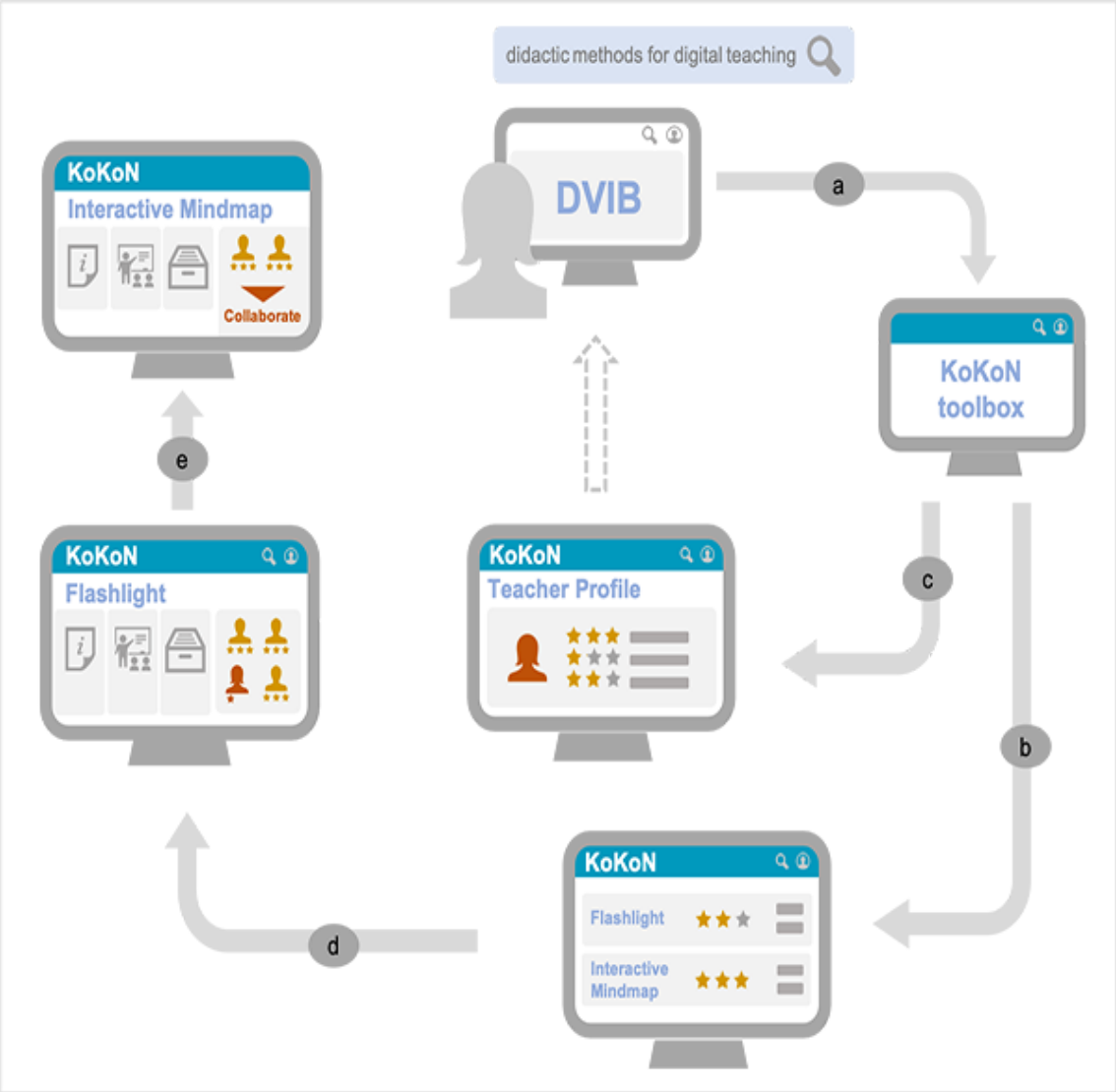

Figure 1: Schematic use case scenario of KoKoN

For more than 10 years, Renate has been a higher education teacher and conducts many seminars and workshops in presence. However, her students are demanding more and more digital classes. Therefore, she needs to familiarize herself with didactic methods for digital teaching and the different demands on her as a lecturer (Schwinger, Markgraf & Blumentritt, 2022). She has good digital skills and wants to run a digital workshop of one hour. To get started, she is looking for a method with which she can actively involve students right at the beginning and then work with them on a problem.

Renate gains access to a variety of didactic methods in the KoKoN methodological toolbox via NIDE (see Fig. 1 a). Using the various filter options within the KoKoN toolbox, she can search specifically for methods for the beginning or for groups. She receives a variety of methods descriptions, including the following two:

- **Flashlight:** If possible, all learners should make a short statement on a question, which is not assessed. This gives everyone the opportunity to communicate their contribution. Questions can be anything that can be answered in a few sentences, such as experiences, ideas or feedback from the learners. (Antosch-Bardohn et al., 2019)
- **Interactive Mindmap:** The lecturer writes a term in the middle of the board, the learners name the corresponding words by shouting, which are added in a mind-map-like manner. In this way, learners are introduced to a topic, asked about their previous knowledge, connected to it, interact with each other and at the same time practice associative thinking. Towards the end of the method, the teacher can enrich the Mind-Map with further content (Antosch-Bardohn et al., 2019) (see Fig. 1 b).

However, Renate is not yet able to assess which of the two suggested methods fits her current digital skills. She therefore decides to use the opportunity to fill in her individual competence profile. For example, she indicates how familiar she is with methods, how she assesses her use of digital tools and to what extent she already collaborates with others digitally (see Fig. 1 c).

By completing the competence profile, she is provided with additional information in the list of suggested methods, which indicates the fit of a method to her own competences. On the one hand, this changes the order of the method results, but on the other hand, she also receives further information about the application of the method, the associated requirements and the degree of fit with her current competence profile. In the first step, she is recommended the method “Flashlight”.

After she has successfully used this method, she gives feedback and wants to be included in the co-creation pool / cooperation pool. She also fills out her profile on these points. At the same time, the information on the methods used expands her competence profile (see Fig. 1 d).

For the upcoming workshop, she wants to use another, more sophisticated method and therefore decides on the Interactive Mindmap. There is no one in her own circle of colleagues who has used the method so far. However, she can access best practices from colleagues at other universities via the platform and gets opportunities to initiate cooperations. Through KoKoN, she comes across teachers who have already used the method several times in their own teaching and can benefit from their experience (see Fig. 1 e)

6 Prospects and further development of KoKoN in the context of the DVIB

Based on the exemplary usage scenario described in this paper and in line with recent discourse (Apaolaza et al., 2021), the KoKoN project will further address answering to the following research questions: Which characteristics of teachers should a digital recommendation system cover? How can such a system be used to strengthen the collaboration of higher education teachers and how does it contribute to the development of digital methodological competences?

The DVIB offers the technical and structural possibilities to improve the exchange between higher education teachers as well as their cooperation. KoKoN wants to enable participants with DVIB accounts to access and interact with the methodological toolbox via a secure and simple SSO (Single Sign-on) connection. Furthermore, teachers should use their competence profile to find methods and cooperation partners and to get in contact with them. This developing matching mechanism is also based on additional variables, e.g. usage behavior which could be made measurable via badges.

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[2] The applicable requirements for a good method systematization are (cf. Meyer et al., 2014): Good overview of methods; reduce the complexity that actually exists; contain meaningful and few classifying dimensions that can be grasped without a great deal of prior knowledge.

[3] AVIVA is an acronym and translates into English as ARIPE. The letter A stands for "align", R for "reactivate prior knowledge", I for "inform", the P for "process" and E for "evaluate", which stand for phases or learning objectives that are to be fulfilled in a course.

[4] The ICAP describes the accompanying learning quality of the learner and stands for the acronym for "interactive", "constructive", "active" and "passive".