Research Article

Svenja Hammer*, Lisa Berkel-Otto

Differing Teaching Formats: Pre-Service Teachers' Professional Competency Development in Linguistically Responsive Teaching

https://doi.org/10.1515/edu-2019-0018
received January 28, 2019; accepted December 3, 2019.

Abstract: Teaching multilingual learners in content classrooms is still a challenge for most teachers due to the fact that teacher education is still lacking consistent concepts in this area. Hence, opportunities to learn in teacher education programs need to be examined with regard to content, structure and format. This study deals with the question whether the competencies needed to teach multilingual learners are actually learnable through opportunities to learn in university classes. Three different class formats were examined: 100% online via an e-learning platform, 100% face-to-face, and a blended learning version (50% online, 50% face-to-face). The learning outcome was measured in a pre-post-design on the basis of the level of competency concerning teaching multilingual learners (*DaZKom)*. First results indicate that the competencies to teach multilingual learners increase through the opportunities to learn we offered. Furthermore, the study shows that all three class formats resulted in an increase in competency. The study reaches the conclusion that further opportunities to learn are needed for teachers to be adequately prepared to facilitate multilingual learners in content classrooms.

Keywords: Linguistically Responsive Teaching, Multilingual Learners, Teacher Education, Competency Assessment, e-Learning, Blended Learning.

***Corresponding author: Svenja Hammer,** Ruhr-Universität Bochum, Fakultät für Philologie, Institut für Germanistik, Arbeitsbereich Sprachbildung und Mehrsprachigkeit, Universitätsstr. 150, 44801 Bochum; Leuphana Universität Lüneburg, Fakultät Bildung, Institut für Bildungswissenschaft, Universitätsallee 1, 21335 Lüneburg, Germany, E-mail: svenja.hammer@rub.de
Lisa Berkel-Otto, Ruhr-Universität Bochum, Fakultät für Philologie, Institut für Germanistik, Arbeitsbereich Sprachbildung und Mehrsprachigkeit, Universitätsstr. 150, 44801 Bochum, Germany

1 Introduction

Around 10% of all German 15-year-old students speak another language at home, other than the language of instruction in school (OECD, 2010). Analyses of the 2015 Programme for International Student Assessment (PISA) data show much lower outcomes in competence development of students who speak another language at home, compared to those who do not. On average they were one year behind in terms of their reading comprehension skills than their dominant language speaking peers (Reiss et al., 2016). In Germany[1], a number of federal state governments released letters of intent and implementation laws for teacher education that declare the importance for language support in the educational system and the obligation for every pre-service teacher to be taught in this respect (e.g., Schulministerium NRW – *Ministry for education of North Rhine-Westphalia*, 2015; Baumann & Becker-Mrotzek, 2014). In these states, pre-service teachers of all subjects get opportunities to learn about linguistically responsive teaching. But also, teachers and pre-service teachers in the other federal states realized the need to gain knowledge about how to work with multilingual students, but either do not feel responsible or well prepared for the task (Becker-Mrotzek et al., 2012; Banilower et al., 2013). This has led to a call for innovative and effective opportunities to learn, that highlight that language learning and content learning of each subject can no longer be considered separately from each other. Hence, every subject teacher needs to be a language teacher (e.g., Gogolin et al., 2010).

In states like Lower Saxony, teacher training universities are trying to integrate an inclusive model with varying efforts and resources (Goschler & Montanari, 2016). The financial and personnel restrictions that lead to a lack of course offers are unsatisfactory for pre-

1 In Germany the federal states are responsible for educational matters and therefore rule on teacher education.

service teachers' needs and wishes. Furthermore, there are only few findings so far that indicate the effectiveness of opportunities to learn regarding the increase of pre-service teachers' competencies (Döll et al., 2016; Ehmke & Hammer, 2018). Against this backdrop, we developed a study[2] that introduced and compared alternative forms of teaching formats; an e-learning class, a blended learning class (= half online and half face-to-face) and a traditional face-to-face class (direct teacher – student interaction). Our overall aims were to determine whether the pre-service teachers' competency regarding multilingual learners increases over 14 weeks, and which course format provides the highest increase in competency. We applied the *DaZKom* test instrument to measure the learning outcome, with a total of 162 pre-service teachers as a pre-post measure. We aim to contribute to the existing research gap by asking how opportunities to learn need to be structured in order to adequately prepare teachers to work with multilingual students in the content classroom.

2 Theoretical Framework

Teaching in a linguistically responsive manner has been a major topic in teacher education in Germany for the past 10 years now. Nevertheless, there are only a few theoretical frameworks on teacher competencies regarding the content teaching of multilingual learners, and so far, none of these were adapted to a German-specific context. Lucas and Villegas (2011) outline a framework for linguistically and culturally responsive teaching, and recommend standards for teacher education to support culturally and linguistically diverse students and their specific needs. The framework takes the following topics into account: learning about bilingual students' language backgrounds, experiences, and proficiencies; identifying the language demands of classroom tasks; applying key principles of second language learners; and scaffolding instruction to promote bilingual students' learning. Bunch's (2013) literature review presents various approaches to what pedagogical language (knowledge about the target language and about language acquisition) might entail, and how teacher preparation and development initiatives might go about fostering it. Both agree on the fact that teachers have to handle these requirements to support multilingual learners effectively.

There are several competencies concerning the field of linguistically responsive teaching that are new to content teachers and need to be learned first. For the German context of teacher preparation, the project *Professional competencies of prospective teachers (secondary schools) for German as a Second Language* (Professionelle Kompetenzen angehender LehrerInnen (Sek I) im Bereich Deutsch als Zweitsprache, *DaZKom*) developed a model that builds on Lucas' and Villegas' (2011) framework and is based on an analysis of 60 German university curricula in the field of German as Second Language and Second Language Acquisition (Köker et al., 2015; Ehmke et al. 2018). Köker et al. (2015) discerned three main dimensions for pre-service teachers' competency regarding multilingual learners:

1. Subject-specific Registers, which includes knowledge of lexical and grammatical structures as well as of semiotic systems, and the ability to recognize these in texts and students' oral and written productions.
2. Multilingualism, which includes knowledge of the processes of second language acquisition and migration, and the ability to recognize these processes.
3. Didactics/Teaching Methods, which includes formative assessment of students' competencies and challenges, as well as language facilitation in the mainstream classroom.

Recognizing these competencies as relevant for content teachers to adequately facilitate multilingual students and the fact that even if teachers accept this new task, does not mean that they are automatically able to implement it into their classes. Therefore, the question arises, how teachers need to be prepared. In order to develop suitable opportunities to learn for (pre-) service teachers, measurement tools are necessary to evaluate the impact of the opportunities to learn. There are several projects and frameworks focused on the question, which will be explored below.

2.1 Measuring competencies in the field of linguistically responsive teaching

Measuring competencies in higher education is a topic widely discussed. As a general model of competency development, Blömeke et al. (2015) proposed to regard competency as a continuum where disposition (comprising cognition and affect-motivation), situation-specific skills, and performance entail and relate to one another. Empirical research so far focuses on the dispositional components of this continuum (e.g., Blömeke & Zlatkin-

2 Funded by the Mercator Institute for Language Facilitation and German a Second Language as part of the project *Umbrüche Gestalten. Sprachförderung und -bildung als integraler Bestandteile innovativer Lehrerbildung in Niedersachsen* (Project number 606).

Troitschanskaia, 2013). Only recently, projects have started that work on the remaining components by establishing measurement tools that include performance related stimuli (Pant et al., 2016, e.g., *DaZKom-Video*).

Measurement tools that enable measurement of the cognitive facet of competency in the field of linguistically responsive teaching still do not exist for the English speaking context but have been theoretically and empirically investigated by Köker et al. (2015) for the school context (from age 6), and Tracy et al. (2014) for early education specialists (up to age 6) in Germany (Thoma et al., 2014).

The German project *DaZKom* determined pre-service teachers' competencies with the help of an assessment instrument based on the three afore-mentioned dimensions *Subject-specific Registers*, *Multilingualism*, and *Didactics/ Teaching Methods* (for development and validation see Hammer & Ehmke, 2018; Hammer et al., 2015).

Furthermore, a standard-setting was conducted in which necessary levels of competencies were set by a group of experts of the field (Gültekin-Karakoç et al., 2016). The standard-setting resulted in three levels: (1) under minimum standard, (2) minimum standard, and (3) norm standard. Level (1) *under minimum standard* describes a person that has an unspecified approach to teaching in a linguistically responsive manner, level (2) *minimum standard* characterizes people that are sensitized for linguistically responsive teaching, and level (3) *norm standard* depicts people that are informed about linguistically responsive teaching. The sample included pre-service teachers (n=1383) from all subject areas that spread over the three levels as follows: 91.3% of pre-service teachers are under the minimum standard and therefore only show unspecific approaches to teaching in a linguistically responsive manner; 7.2% of pre-service teachers are sensitized for teaching in a linguistically responsive manner, and only 1.5% of pre-service teachers are informed about teaching in a linguistically responsive manner. This distribution indicates that teachers are so far not prepared to teach multilingual students adequately and raises the question of how they need to be better prepared. This leads to the following section, which discusses different formats of opportunities to learn.

2.2 Learning formats of opportunities to learn

Learning takes place individually very differently (Akkoyunlu & Soylu, 2008; Entwistle, 2012). Therefore, students should be able to learn and be taught as appropriate to their individual learning needs as possible. Though, by individual learning needs we do not mean learning styles since there is a lack of evidence towards learning styles (Clark & Mayer, 2016). However, so far university programs in Germany are not structured to adapt to the individual learning needs of their students, even though more recently different formats of learning have been discussed due to the efforts of digitalization in education (e.g., Buschle & König, 2018).

Studies on the topic use the terms *e-learning*, *blended-learning*, *online learning*, *virtual learning*, *multimedia learning* etc. often synonymously with varying underlying course concepts. Commonly, the concept of e-learning "is formally defined as electronically mediated asynchronous and synchronous communication for the purpose of constructing and confirming knowledge." (Garrison, 2011, p. 2) It includes all forms of learning in which digital media is used for distributing and presenting learning materials, including communication between learners (Issing & Klimsa, 2011; Kopp & Mandl, 2009). The advantages of using digital media are especially seen in the simplification of access to education for different target groups, the facilitation of individualization of learning and the improvement of learning performance (Palloff & Pratt, 2007; Rohs, 2017; Lehmann & Schorer, 2016). For this study, we use the term *e-learning* for an asynchronous online delivery mode for content (Garrison, 2011; Okaz, 2015) with the advantage of supporting differentiation through technology by enabling students to engage with the content at their own pace, whenever and wherever they want. In addition, we use the term *blended learning* to refer to content delivery that is "the thoughtful fusion of face-to-face and online learning experiences" (Garrison & Vaughan, 2008, p. 5) with peer contact and social interaction including immediate responses (Okaz, 2015; Wu et al. 2008). Finally, we understand face-to-face learning as a synchronous learning activity where the students and the teacher are in the same space at the same time.

Moreover, studies have shown that students want to connect to an instructor and want to have a sense of classroom community, which might not be achieved through an online learning setting (Vonderwell, 2003). According to prior studies investigating the impact of different teaching formats, López-Pérez et al. (2011) found that blended learning approaches reduce the dropout rates and raise exam pass rates and have positive effects on student performance (Garrison & Kanuka, 2004). The advantages of blended learning were shown by the University of Tennessee's Physician's Executive MBA (PEMBA) program that indicates that an overall

10% increase in learning outcome can be achieved by implementing blended learning programs instead of face-to-face classes (Dean et al., 2001).

A meta-analysis of the effectiveness of e-learning- and blended-learning-courses also emphasises the advantages of blended-learning formats (Means et al., 2013). The authors show that the acquisition of knowledge for people with different ages is better promoted through e-learning than face-to-face teaching. They could also show that there are differences in performance between blended-learning classes and face-to-face classes but not between e-learning classes and face-to-face classes. Carr (2010) and Fishman et al. (2013) suggest that online approaches and face-to-face classes can be at least equally effective.

In summary, the majority of studies we looked at highlight the advantages of using blended learning approaches compared to using e-learning concepts or face-to-face ideas.

3 Research Questions

The research questions of this study were the following:

(1) Does pre-service teachers' competency regarding multilingual learners increase over 14 weeks of training, and how do the different seminar formats impact the gain in competency?

Due to other seminar evaluations in which the *DaZKom* test was conducted we expect that giving opportunities to learn in the field of teaching multilingual learners has in general an effect on the increase of competency (Darsow, Wagner & Paetsch, 2017; Böttger et al., in press). Based on the results mentioned in section 2.2, we furthermore assume that blended-learning is more effective than e-learning classes and face-to-face classes.

(2) On which level do pre-service teachers' competencies rate, how do they develop throughout the course, and how do the different seminar formats vary?

Other seminar evaluations with the *DaZKom* test showed that opportunities to learn result in higher competency levels. We assume the same result for this study. In particular we expect the participants of the blended learning course to perform best.

(3) Does pre-service teachers' competency regarding multilingual learners increase over 14 weeks of training in terms of the three dimensions (*Subject-specific Registers*, *Multilingualism*, *Didactics/Teaching Methods*).

With regard to this question, we assume that the students show the highest learning increase in the dimensions *Subject-specific Registers* and *Didactics/Teaching Methods*. The course focuses most on these two dimensions, so it can be expected that the learning increase in the dimension *Multilingualism* is not as high.

4 Method

4.1 Research Context

This is an explorative quantitative, correlational study that investigates five university courses throughout one semester at the University of Lüneburg, a city in Lower Saxony in Northern Germany. We chose to use a pre-post-design with the same measures at the beginning and the end of the semester in order to be able to make statements about the development of the pre-service teachers' competencies. The measurement instrument was chosen based on its robustness concerning the validated test score interpretation as well as the statistical test properties (Hammer et al. 2015; Hammer et al., 2018; Ehmke & Hammer, 2018). Furthermore, the test was already successfully used to measure development in other contexts and therefore serves as a tool that makes replication possible (Böttger et al. in press; Paetsch et al. 2019).

The optional course called 'Language Acquisition and Language Learning' is situated within the teacher education program with a limited number of participation spots. It is part of a three-course certificate that runs over two semesters, and is the first course that all certificate-participants have to take. We designed three different kinds of teaching formats with the same content and the same amount of workload for the participants. The first course format was a face-to-face format that included 14 weeks of face-to-face meetings every week. The second course format was an e-learning course that included only a few face-to-face meetings in which the testing took place. The third course format was a blended learning course that included face-to-face classes as well as e-learning classes. Those two class types alternated from week to week with the exception of the testing sessions.

The content for the course was chosen based on recent literature (e.g., Lucas & Villegas, 2011; Leisen, 2013) and the aforementioned *DaZKom* model. The main content areas of the course under examination in this study were *linguistic basics*, *language acquisition*, *social and academic language*, *formative assessment*, *scaffolding* and *home languages*. Each of the five areas was taught with both theoretical and practice-oriented learning goals. The course followed a repetitive, two-part learning cycle, where one week's work established the theoretical

basis for the ideas under examination and the next week focused on practical applications. The learning objectives of the courses were to sensitize the pre-service teachers for working in heterogeneous and multilingual classrooms and their specific requirements – an interdisciplinary introduction to the field of teaching and managing students with different language skills and cultural backgrounds. Figure 1 shows the course structure with the content areas taught. The course took 14 weeks in total with every class lasting 90 minutes. Topics three through seven in figure 1 took two weeks to work on.

The e-learning sessions were completed on the platform developed by the US-American project *eCALLMS* (e-Learning Communities for Academic Language Learning in Mathematics and Science – Viesca, Hamilton & Davidson, 2017) which has been transferred to the German context. The content and structure were subdivided into five units and each unit consisted of three phases: *Explore*, *Make It Work* and *Share*. During the *Explore* phase participants reviewed materials such as videos, research literature or online links independently. During the *Make It Work* phase (Figure 2), each participant was asked to apply the theoretical principles from the *Explore* phase. For instance, for the topic *Research on First and Second Language Acquisition* the participants were asked to interview a multilingual learner and collect information about his or her experience with learning and acquiring another language (Otto & Hammer, 2017). In the *Share* phase (Figure 3), the participants were requested to upload their results and share it with the other participants. Furthermore, students were to comment and discuss the results of their work online. The online discussion helped them to further understand the topic by sharing their experience and asking questions. This cycle of learning where meaning is constructed in a social context through communication and negotiation and where teaching and learning is contextualized in the social interaction enables meaningful learning (Tharp, Estrada, Dalton, & Yamauchi, 2000).

Students in the e-learning course completed the course in the aforementioned manner with the lecturer as a supporter in the background if needed. The communicative aspect of learning was accounted for through the online-peer-discussion and the optional support offered by the lecturer. Students in the face-to-face class worked on the materials of the *Explore* phase in week one. In week two, the students worked on the *Make It Work* task and handed in their results on paper. The blended learning class met face-to-face for the *Explore* phase and worked on the *Make It Work* task in the second week on the online platform, as well as shared the results on the platform.

1. Introduction
2. 1st data collection – pre-testing with DaZKom-test
3. German as First, Second, or Foreign Language; Basics of Linguistics
4. Research on First and Second Language Acquisition
5. Academic vs. Social Language; Orality vs. Textuality
6. Assessment of Language Proficiency (Profile Analysis by Grießhaber)
7. Scaffolding; Use of Home Languages in the Classroom
8. 2nd data collection – post-testing with DaZKom-test
9. Course evaluation

Figure 1: Course Structure and Content.

To achieve comparability between the three formats, different mechanisms were used:

1. All documents were commented by the lecturer (e.g., presentations were uploaded to the online platform for the e-learning class).
2. The *Make It Work* results had to be uploaded to the online platform or handed in on paper (e.g., transcript and answers of the interview with a multilingual learner (Otto & Hammer, 2017)).
3. Every student in the e-learning and blended learning classes had to comment on at least two fellow students' comments in the *Share* section.
4. Office-hours were provided for all students to clarify uncertainties, feedback etc.
5. All content was delivered by the same lecturers in all three formats.

4.2 Sample

Data were collected in five university courses at the German University of Lüneburg. Overall 162 pre-service teachers of all subjects participated in the 14 week courses. They consented in being part of this study at the beginning of the course. 84% were female and 93% had German as their first language. In mean, the participants were 23.6 years old. 33 (20.4%) participants took part in the e-learning course, 35 (21.6%) participants took part in the face-to-face course, and 94 (58%) participants took part in the blended learning course. The participants were randomly assigned to the different formats. 65% of the participants studied German as a subject, and 30% studied Mathematics.

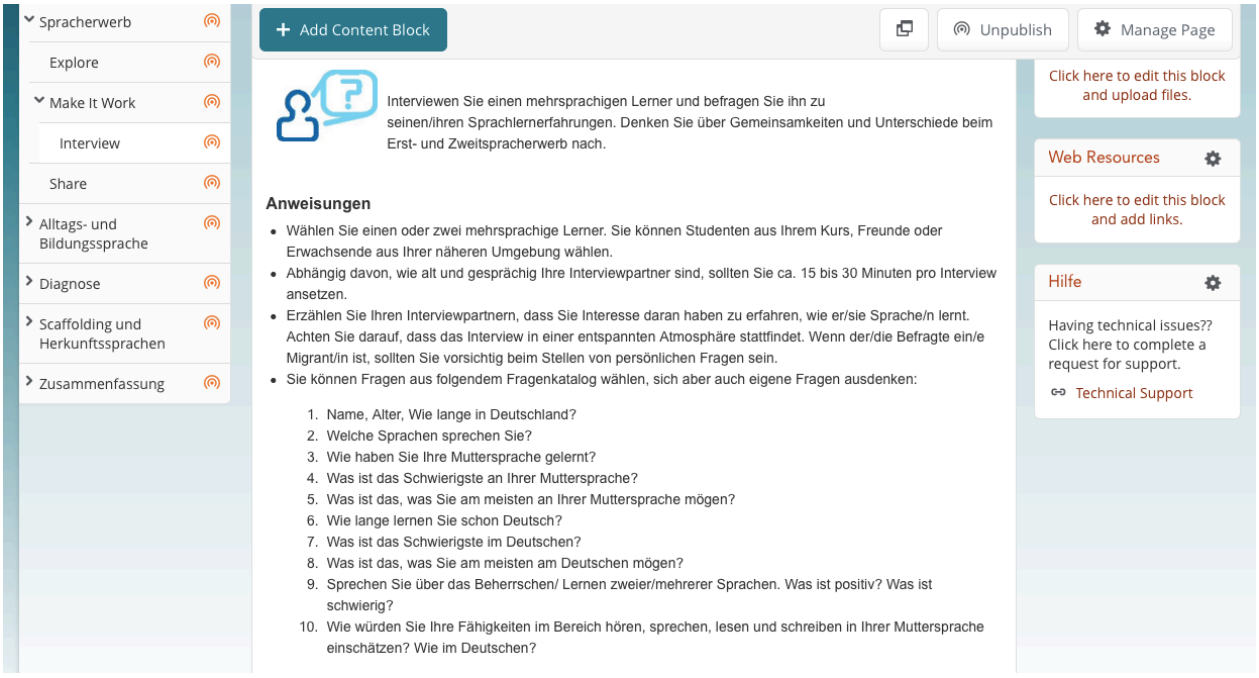

Figure 2: *eCALLMS* platform – Make It Work-Phase.

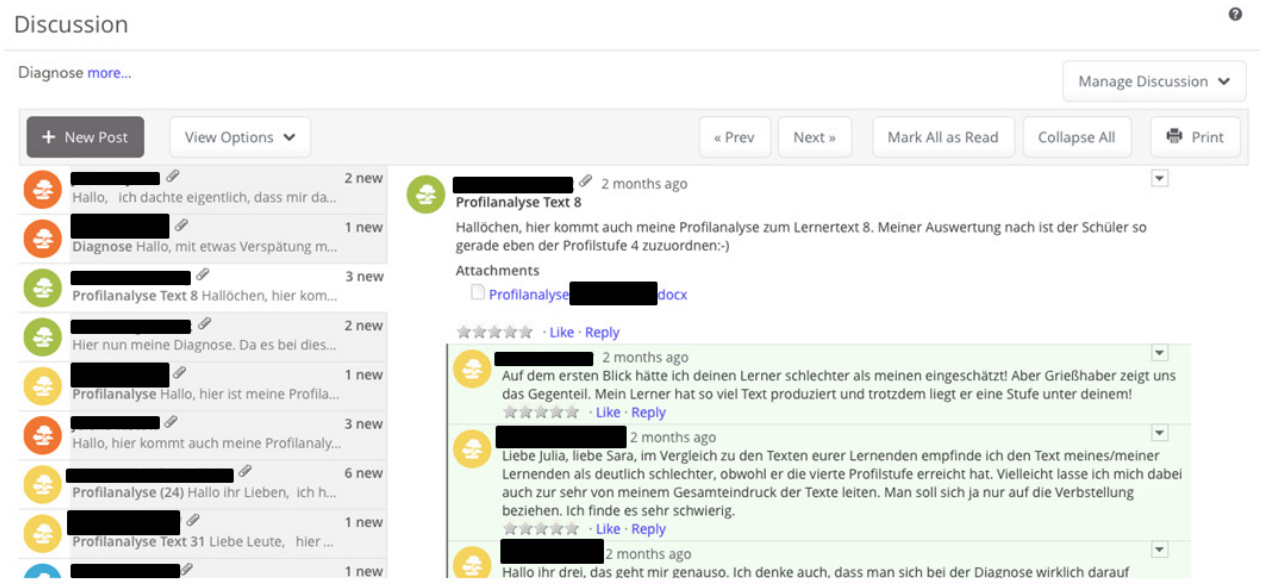

Figure 3: eCALLMS platform – Share-Phase.

4.3 Measures

4.3.1 *DaZKom* test

Based on the *DaZKom* model for pre-service teachers' competency regarding multilingual learners (Köker et al., 2015), a paper and pencil test was developed that includes a total of 68 items (32 selected responses, 14 closed-constructed responses, 22 open-constructed responses). The items are distributed among the three dimensions as follows: 31 items from *Subject-specific Registers*; 17 items from *Multilingualism*; and 20 items from *Didactics/ Teaching Methods*. The test has an overall EAP/PV reliability of $\alpha = 0.78$. Each item unit is headed by an authentic stimulus which was chosen from one of the four types of stimulus material (word problems, case studies,

classroom interactions and written student productions) considered both suitable for a paper and pencil test as well as conforming to situations in the teaching profession (Ehmke & Hammer, 2018). Figure 4 is an example of the stimulus material included in an item unit:

> Peter wants to buy sweets at the school kiosk during break. He buys 10 pieces of candy for 20 cents each. His friend Max cannot resist and also buys 5 treats for 50 cents each. Who spends more money – Peter or Max?
> *Question: How could you modify the word problem in order to present a more precise problem? Name one possibility.*

Figure 4: Stimulus Material from the *DaZKom* test. (Carlson et al., 2018, p. 277).

4.4 Design and Procedure

The participants were randomly assigned to the three different courses and were tested at the beginning and at the end of the course with the above mentioned paper and pencil *DaZKom* test. The test was conducted in a standardized situation by the lecturers during a course session. The *DaZKom* test took 60 minutes, the testing time for the questionnaire on student characteristics and learning opportunities took another 15 minutes. The course evaluation in the last session lasted 15 minutes and was complemented by a following open discussion.

4.5 Data analysis methods

The test was scaled on the basis of the Rasch model (Rost, 2004) through the program *ConQuest* (Adams et al., 2012). Missing values were recoded as wrong answers. The item parameters from the norm sample of the *DaZKom* project (Gültekin-Karakoç et al., 2016; Gültekin-Karakoç, 2018) were imported to determine the person ability presented by Weighted Likelihood Estimates (WLE). In order to measure the growth of competency the effect size *Cohen's d* was calculated and a test on the significant change in mean values was conducted (Cohen, 1988).

5 Results

5.1 Pre-service teachers' competency growth regarding multilingual learners

Using the *DaZKom* test as a measure to make statements about the potential degree of changeability of pre-service teachers' competencies regarding linguistically responsive teaching, we found that in all formats growth occurs to a certain degree. Table 1 shows the means in participants' ability and the standard deviation for the first and the second time of measurement. The means for the first time of measurement between the three groups do not differ in a statistically significant way. Using mean comparisons between the first time of measurement and the second time of measurement, the results indicate that the overall growth in competency over the total sample is significant and shows a medium effect (d = 0.49) according to Cohen (1988). Subdivided into the different formats, both the face-to-face course (d = 0.80) and the e-learning course (d = 0.72) show statistically significant growth as well as a high effect size. Even though the blended learning course only shows a small effect (d = 0.33) the growth in competency is statistically significant.

5.2 Level of competency reached through intervention

As an additional indicator of competency growth we examined the level of competency compared to the reference group from the standard-setting of the *DaZKom* project with 1383 pre-service teachers. The results in table 2 show growth throughout the three course formats which is higher than the distribution in the reference group (standard-setting). At the first time of measurement, only 3.7% of the total sample of pre-service teachers reached the minimum standard, whereas at the second time of measurement 11.1% of the total sample reached it. Notable is the increase in the e-learning course. Starting with 0% on the minimum standard, they reached 18.2% after the course. 97.1% of the face-to-face-group started with a competency under the minimum standard. After the course 11.4% of this group are sensitized for teaching in a linguistically responsive manner. Already 5.3% of the blended learning course started with a competency on level 2 the minimum standard.

Table 1: Competency growth between two times of measurement in different course formats.

	t1		t2			
	M	SD	M	SD	d	P
Total sample (N=162)	-0.070	0.577	0.211	0.550	0.49	< .001
Blended learning (N= 94)	-0.036	0.600	0.159	0.581	0.33	< .001
Face-to-face (N=35)	-0.115	0.470	0.216	0.449	0.80	< .001
E-learning (N=33)	-0.119	0.622	0.351	0.546	0.72	< .001

Note: M = mean WLE; SD = standard deviation; d = effect size

Table 2: Levels of competency in linguistically responsive teaching in %.

Levels	standard-setting (n=1383)	t1 (n=162)				t2 (n=162)			
		total	e-learning	f2f	blended	total	e-learning	f2f	blended
Norm standard "informed about linguistically responsive teaching"	1.5	0.6	0	0	1.1	0	0	0	0
Minimum standard "sensitized for linguistically responsive teaching"	7.2	3.7	0	2.9	5.3	11.1	18.2	11.4	8.5
Under minimum standard "unspecific approach on linguistically responsive teaching"	91.3	95.7	100	97.1	93.6	88.9	81.8	88.6	91.5

Table 3: Competency growth between two times of measurement for dimensions.

Score	t1		t2			
	MW	SD	MW	SD	d	p
Total	-0.070	0.577	0.211	0.550	0.49	< .001
Subject-specific Registers	-0.053	0.758	0.264	0.715	0.43	< .001
Didactics/ Teaching Methods	-0.314	1.101	0.416	0.849	0.74	< .001
Multilingualism	0.020	0.646	-0.117	0.601	-0.22	< .001

Note: M = mean WLE; SD = standard deviation; d = effect size

5.3 Pre-service teachers' competency in terms of the three dimensions

Pre-service teachers' competency regarding multilingual learners comprises three dimensions: *Subject-specific Registers*, *Multilingualism*, *Didactics/Teaching Methods*. Due to the small sample size per course format we only conducted analyses on three dimensions for the total sample. Table 3 shows the overall scores (total) as well as the scores for the three dimensions. For the competency growth of the dimension *Subject-specific Registers* a small effect (d = 0.43, Cohen, 1988) can be shown. For the dimension *Didactics/Teaching Methods* a medium effect is indicated (d = 0.74). Whereas for the dimension *Multilingualism* a small negative effect (d = -0.22) is observable.

6 Summary and Discussion

In this study, we aimed to contribute to the understanding whether and how pre-service teachers develop their

professional knowledge over the course of an innovative teacher education course that combines theoretical input, practical application and peer discussions. Changes in professional knowledge over the course of 14 weeks in three different instructional formats were focused: 1) face-to-face – every week; 2) e-learning – online platform and 3) blended learning – alternated weekly between face-to-face and e-learning.

The results indicate that all three course formats increased the pre-service teachers' competencies statistically significantly and can thus be regarded suitable in order to professionalize student teachers for teaching in linguistically heterogeneous classrooms. Contrary to our expectation that participants of the blended learning course would score the highest, those students who started with less knowledge benefited the most from the course concept alternating theory and practice. Since the students in the blended learning courses start with the highest competency score compared to the other courses, and since the content of our courses focused on the basics of teaching multilingual learners, the results seem plausible.

Looking at the competency levels one can discern based on other seminar evaluations with the *DaZKom* test that all three formats result in an increase (Darsow, Wagner & Paetsch, 2017; Böttger et al., in press; Otto et al., accepted). Similar to the competency growth, the results show an unexpected outcome since the blended learning course shows the lowest competency increase. The interpretation for this result is equal with the one for the competency growth, where the low-performers benefit the most from an introductory course. The results also show that there is still a lot of potential for growth for pre-service teachers to become *informed about teaching in a linguistically responsive manner* as described on the norm level. Keeping in mind that the results are based on one 14-week course with its objective to sensitize the pre-service teachers to the topic, the outcomes are satisfactory. Looking at the (mandatory) offers for teaching multilingual learners in Germany that mostly consist of only two courses, our results show that one course of a certificate-program or a mandatory module does not provide enough opportunities to learn in order to achieve the norm standard or at least the minimum standard set in the *DaZKom* project. We therefore still face the problem that teachers in Germany are not well-prepared but only sensitized to their work in multilingual classrooms even after participating in a course like the one presented. From a standpoint of facilitating multilingual students' learning as much as possible, the structural conditions in teacher education programs need to be revised, even though we recognize the restrictions that programs face in regard to focusing on certain topics.

In terms of the three dimensions *Subject-specific Registers*, *Multilingualism* and *Didactics/Teaching Methods* we could show for the whole sample that the participants' competency grew in the dimensions *Subject-specific Registers* and *Didactics/Teaching Methods* statistically significantly. This confirms our initial third hypothesis that pre-service teachers' competency regarding multilingual learners increases over 14 weeks of training in terms of the three dimensions.

Our study contributes to the current discourse that the alternation between theoretical input, practical implementation and peer discussion seems to be an adequate and appreciated[3] method to teach pre-service teachers about linguistically responsive teaching. Especially the practical orientation, which is always called for shows higher satisfaction within (pre-service) teachers (Wenzl, Wernet & Kollmer, 2017 for pre-service teachers; Lipowsky, 2010 for in-service teachers), and was found true for our study shown by a course evaluation questionnaire concerning the overall satisfaction and the self-perceived learning increase throughout the course. We acknowledge that the possibilities to communicate were varying for the different groups. But since we were investigating groups of learners with differing learning needs and characters, we assume that having social interactions via an online platform or physical presence does not make a difference for their learning outcome (Tharp et al., 2000). Studies on this topic also demonstrate that "social presence affects the learner's interactions and perception of the instructor but has no effect on perceived learning, satisfaction, engagement, or the quality of their final course product" (Wise et al., 2004, p. 2). From the literature we know that blended learning concepts show positive effects on student's performance (López-Pérez et al., 2011; Garrison & Kanuka, 2004; Dean et al., 2001). These results are highlighted by indicating that performance differences only occur between blended learning classes and face-to-face classes but not between e-learning classes and face-to-face classes (Means et al., 2013). Other studies claim that e-learning approaches and face-to-face courses are at least equally effective (Carr, 2010; Fishman et al., 2013).

Our results indicate that neither the face-to-face format nor the e-learning format nor the blended learning format can be understood as optimum for a one-size-fits-all approach. Our study rather points to the idea that the advantages of the different formats should be considered

3 Often listed as an open answer in the course evaluation questionnaire.

equally relevant for different learning needs. Since the individual learning needs were not accounted for in this study but the results anyhow show competency growth throughout the formats, it can be expected that the growth will even be higher when people are learning within their preferred learning format. For future studies it is necessary to evaluate the students' learning needs in advance to optimally serve their learning experience and to see if that corresponds with the competency growth. Future studies should also ask for more differentiated opportunities to learn like e.g., extramural opportunities to learn. Beyond that, replication studies should be conducted at other universities (e.g., at universities with mandatory modules or those with less CP) to gain further understanding about which number of opportunities to learn is needed for students to reach the necessary norm-standard-level. Moreover, the question needs to be answered whether or how the input-implementation-discussion approach used in this study differs in the results compared to other approaches.

In comparison to the blended learning format (as described above) it would be interesting to use a flipped- or inverted-classroom concept (*Explore* = e-learning, *Make it work* and *Share* = face-to-face) to examine if the social arrangement (e-learning vs. face-to-face) or the working method (individual vs. cooperative learning) is the decisive factor. It would also be interesting to measure the pre-service teachers' competency of teaching multilingual learners after at least another course and also after facultative additional courses in this field. Furthermore, the questions arise how pre-service teachers use the opportunities to learn, how they learn concerning the topic, and how they transfer their knowledge into practice.

References

Adams, R., Wu, M., & Wilson, M. (2012). ACER ConQuest. Australian Council for Educational Research (ACER) [Computer Software].

Akkoyunlu, B., & Yilmaz Soylu, M. (2008). A Study of Student's Perceptions in a Blended Learning Environment Based on Different Learning Styles. *Journal of Educational Technology & Society, 11*(1), 183-193.

Banilower, E. R., Smith, P. S., Weiss, I. R., Malzahn, K. A., Campbell, K. M., & Weis, A. M. (2013). Report of the 2012 National Survey of Science and Mathematics Education. *Horizon Research, Inc. (NJ1)*.

Baumann, B., & Becker-Mrotzek, M. (2014). *Sprachförderung und Deutsch als Zweitsprache an deutschen Schulen: Was leistet die Lehrerbildung?* Köln: Mercator-Institut für Sprachförderung und Deutsch als Zweitsprache.

Becker-Mrotzek, M., Hentschel, B., Hippmann, K., & Linnemann, M. (2012). Sprachförderung in deutschen Schulen – die Sicht der Lehrerinnen und Lehrer. *Ergebnisse einer Umfrage unter Lehrerinnen und Lehrern. Köln: Universität zu Köln. URL: http://www. stiftung-mercator.de/fileadmin/user_upload/DAZ/Lehrerumfrage_Langfassung_final_30_05_12. pdf.*

Blömeke, S., & Zlatkin-Troitschanskaia, O. (Eds.) (2013). *The German funding initiative "Modeling and Measuring Competencies in Higher Education": 23 research projects on engineering, economics and social sciences, education and generic skills of higher education students.* (KoKoHs Working Papers, 3). Berlin & Mainz: Humboldt University & Johannes Gutenberg University.

Blömeke, S., Gustafsson, J. E., & Shavelson, R. J. (2015). Beyond dichotomies. Competence Viewed as a Continuum. *Zeitschrift für Psychologie, 223*(1), 3-13.

Böttger, L., Groh, O., Otto, L., Fischer, N., Hammer, S., Jung, U., & Niederhaus, C. (in press). Kompetenzzuwachs und veränderte Unterrichtspraxis. Erste Ergebnisse aus der Evaluation eines DaZ-Weiterbildungsstudiums für Lehrkräfte an beruflichen Schulen. *AG BFN-Tagungsband: Berufliche Integration durch Sprache*.

Bunch, G. C. (2013). Pedagogical language knowledge: Preparing mainstream teachers for English learners in the new standards era. *Review of Research in Education, 37*(1), 298-341.

Buschle, C., & König, A. (2018). E-Learning und Blended-Learning-Angebote: Möglichkeiten beruflicher Weiterbildung für Kita-Fachkräfte. *MedienPädagogik: Zeitschrift für Theorie und Praxis der Medienbildung, 30,* 50-72.

Carlson, S. A., Köker, A., Rosenbrock-Agyei, S., Ohm, U., Koch-Priewe, B., Hammer, S., Fischer, N., & Ehmke, T. (2018). DaZKom – A Structure Model of Preservice Teachers' Competency for Teaching German as a Second Language Learners in the Mainstream Classroom (GSL-competency). In T. Ehmke, S. Hammer, A. Köker, U. Ohm, & B. Koch-Priewe (Eds.): *Professionelle Kompetenzen angehender Lehrkräfte im Bereich Deutsch als Zweitsprache*. (pp. 261-284) Münster: Waxmann.

Clark, R. C., & Mayer, R. E. (2016). *e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning*. 4th ed. Hoboken, New Jersey: John Wiley & Sons.

Carr, V. B. (2010). The viability of online education for professional development. *AASA Journal of Scholarship & Practice, 7*(3), 6-16.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2. ed.). Hillsdale, NJ: Erlbaum.

Darsow, A., Wagner, F. S., & Paetsch, J. (2016). Konzept für die empirische Untersuchung der Berliner DaZ-Module. In M. Becker-Mrotzek, P. Rosenberg, C. Schroeder, & A. Witte (Eds.), *Deutsch als Zweitsprache in der Lehrerbildung, Sprachliche Bildung* (Vol. 2, pp. 27-36). Münster: Waxmann.

Dean, P., Stahl, M., Sylwester, D., & Peat J. (2001). Effectiveness of combined delivery modalities for distance learning and resident learning. *Quarterly Review of Distance Education*, 247-254.

Döll, M., Haegi-Mead, S., & Settinieri, J. (2016). Ob ich mich auf eine sprachlich heterogene Klasse vorbereitet fühle? – Etwas!. In M. Becker- Mrotzek, P. Rosenberg, C. Schroeder, & A. Witte (Eds.), *Deutsch als Zweitsprache in der Lehrerbildung, Sprachliche Bildung* (Vol. 2, pp. 203-215). Münster: Waxmann.

Ehmke, T., Hammer, S., Köker, A., Ohm, U., & Koch-Priewe, B. (2018) (Eds.). *Professionelle Kompetenzen angehender Lehrkräfte im Bereich Deutsch als Zweitsprache*. Münster: Waxmann.

Ehmke, T. & Hammer, S. (2018). Skalierung und dimensionale Struktur des DaZKom-Testinstruments. In T. Ehmke, S. Hammer, A. Köker, U. Ohm, & B. Koch-Priewe (Eds.): *Professionelle Kompetenzen angehender Lehrkräfte im Bereich Deutsch als Zweitsprache*. (pp. 129-148). Münster: Waxmann.

Entwistle, N. (2012). *Styles of Learning and Teaching. An Integrated Outline of Educational Psychology for Students, Teachers, and Lecturers*. New York, NY: Routledge.

Fishman, B., Konstantopoulos, S., Kubitskey, B., Vath, R., Johnson, H., & Edelson, D. (2013). Comparing the impact of online and face-to-face professional development in the context of curriculum implementation. *Journal of Teacher Education, 64*(5), 426-438.

Garrison, D. R., & Vaughan, N. D. (2008). *Blended Learning in Higher Education: Framework, Principles, and Guidelines*. Hoboken, New Jersey: John Wiley & Sons.

Garrison, D. R., (2011). *E-Learning in the 21st Century. A Framework for Research and Practice*. 2nd ed. New York, NY: Routledge.

Gogolin, I., Lange, I., Hawighorst, B., Bainski, C., Heintze, A., Rutten, S., & Saalmann, W. (2010). *Durchgängige Sprachbildung. Eine Handreichung. FörMig Material*, *2*. Münster: Waxmann.

Goschler, J., & Montanari, E. (2016). Deutsch als Zweitsprache in der Lehramtsausbildung: ein integratives Modell. In M. Becker-Mrotzek, P. Rosenberg, C. Schroeder, & A. Witte (Eds.), *Deutsch als Zweitsprache in der Lehrerbildung, Sprachliche Bildung* (Vol. 2, pp. 27-36). Münster: Waxmann.

Gültekin-Karakoç, N., Köker, A., Hirsch, D., Ehmke, T., Hammer, S., Koch-Priewe, B., & Ohm, U. (2016). Bestimmung von Standards und Stufen der Kompetenz angehender Lehrerinnen und Lehrer aller Fächer im Bereich Deutsch als Zweitsprache (DaZ). *Die Deutsche Schule*, *13*, Supplement, 132-148.

Gültekin-Karakoç, N. (2018). Sicherung der Inhaltsvalidität und Festlegung von Kompetenzstufen durch Expertenbefragungen. In T. Ehmke, S. Hammer, A. Köker, U. Ohm, & B. Koch-Priewe (Eds.): *Professionelle Kompetenzen angehender Lehrkräfte im Bereich Deutsch als Zweitsprache*. (pp. 109-128) Münster: Waxmann.

Hammer, S., Carlson, S. A., Ehmke, T., Koch-Priewe, B., Köker, A., Ohm, U., Rosenbrock, S., & Schulze, N. (2015). Kompetenz von Lehramtsstudierenden in Deutsch als Zweitsprache: Validierung des GSL-Testinstruments. In S. Blömeke, & O. Zlatkin-Troitschanskaia (Eds.), Kompetenzen von Studierenden. *Zeitschrift für Pädagogik, 61,* Supplement, 32-54.

Hammer, S., & Ehmke, T. (2018). Ergebnisse einer Validierungsstudie zum DaZKom-Testinstrument. In T. Ehmke, S. Hammer, A. Köker, U. Ohm, & B. Koch-Priewe (Eds.), *Professionelle Kompetenzen angehender Lehrkräfte im Bereich Deutsch als Zweitsprache*. (pp. 185-200) Münster: Waxmann.

Issing, L. J., & Klimsa, P. (2011). Einführung. In Issing, L. J. Issing, & P. Klimsa (Eds.), *Online-Lernen. Handbuch für Wissenschaft und Praxis.* (2. ed, pp. 13-16). München: Oldenbourg Verlag.

Köker, A., Rosenbrock-Agyei, S., Ohm, U., Carlson, S. A., Ehmke, T., Hammer, S., Koch-Priewe, B., & Schulze, N. (2015). DaZKom – Ein Modell von Lehrerkompetenz im Bereich Deutsch als Zweitsprache. In B. Koch-Priewe, A. Köker, J. Seifried, & E. Wuttke (Eds.), *Kompetenzerwerb an Hochschulen: Modellierung und Messung. Zur Professionalisierung angehender Lehrerinnen und Lehrer sowie frühpädagogischer Fachkräfte* (pp. 177-205). Bad Heilbrunn: Klinkhardt.

Kopp, B., & Mandl, H. (2009). Gestaltung medialer Lernumgebungen. In M. Henninger, & H. Mandl (Eds.), *Handbuch Medien-und Bildungsmanagement*, (pp. 55-72). Weinheim und Basel: Beltz Verlag.

Lehmann, R., & Schorer, A. (2016). E-Learning für erwachsene Menschen mit Lernschwierigkeiten – Potenziale für mehr Teilhabe. *Der pädagogische Blick*. 01/2016, 26-39.

Leisen, J. (2013). *Handbuch Sprachförderung im Fach. Sprachsensibler Fachunterricht in der Praxis.* Klett Sprachen.

Lipowsky, F. (2010): Lernen im Beruf. In F. H. Müller, A. Eichenberger, M. Lüders, & J. Mayr (Eds): *Lehrerinnen und Lehrer lernen. Konzepte und Befunde zur Lehrerfortbildung* (pp. 51-72). Münster: Waxmann.

Lucas, T., & Villegas, A. M. (2011). A framework for preparing linguistically responsive teachers. In T. Lucas (Ed.), *Teacher preparation for linguistically diverse classrooms: A resource for teacher educators* (pp. 55-72). New York, NY: Routledge.

Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record*, *115*(3), 1-47.

OECD. (2010). *PISA 2009. Was Schülerinnen und Schüler wissen und können. Schülerleistungen in Lesekompetenz, Mathematik und Naturwissenschaften.* Paris: OECD.

Okaz, A. A. (2015). Integrating Blended Learning in Higher Education. *Procedia - Social and Behavioral Sciences, 186*, 600-603.

Otto, L., & Hammer, S. (2017). Interview mit mehrsprachigen Lerner*innen. In A. Eberhardt, & C. Niederhaus (Eds.), *Das DaZ-Modul in der Lehrerausbildung* (pp. 37-71). Stuttgart: Klett.

Paetsch, J., Darsow, A., Wagner, F. S., Hammer, S., & Ehmke, T. (2019). Prädiktoren des Kompetenzzuwachses im Bereich Deutsch als Zweitsprache bei Lehramtsstudierenden. *Unterrichtswissenschaft*, *47*(1), 51-77.

Palloff, R. M., & Pratt, K. (2007). *Building Online Learning Communities: Effective Strategies for the Virtual Classroom*. Hoboken, New Jersey: John Wiley & Sons.

Pant, H. A., Zlatkin-Troitschanskaia, O., Lautenbach, C., Toepper, M., & Molerov, D. (Eds.) (2016). *Modeling and Measuring Competencies in Higher Education – Validation and Methodological Innovations (KoKoHs) – Overview of the Research Projects* (KoKoHs Working Papers, 11). Berlin & Mainz: Humboldt University & Johannes Gutenberg University.

Reiss, K., Sälzer, C., Schiepe-Tiska, A., Klieme, E., & Köller, O. (2016). PISA 2015. *Eine Studie zwischen Kontinuität und Innovation.* Münster: Waxmann.

Rohs, M. (2017). Erwachsenenbildung in der digitalisierten Gesellschaft. *Lernen und Bildung Erwachsener, 3*, 203-242.

Rost, J. (2004). Psychometrische Modelle zur Überprüfung von Bildungsstandards anhand von Kompetenzmodellen. *Zeitschrift für Pädagogik, 50*(5), 662-678.

Schulministerium NRW (2015). Gesetz über die Ausbildung für Lehrämter an öffentlichen Schulen (Lehrerausbildungsgesetz – LABG). Retrieved June 1, 2015 from: https://www.schulministerium.nrw.de/docs/Recht/LAusbildung/LABG/LABGNeu.pdf

Singh, H. (2003). Building Effective Blended Learning. *Programs Issue of Educational Technology, 43*(6), 51-54.

Tharp, R. G., Estrada, P., Dalton, S. S., & Yamauchi, L. A. (2000). *Teaching transformed: Achieving excellence, fairness, inclusion, and harmony*. Boulder, CO: Westview Press.

Thoma, D., Tracy, R., Michel, M., & Ofner, D. (2012). *Schlussbericht des Vorhabens SprachKoPF, „Sprachliche Kompetenzen Pädagogischer Fachkräfte“.* Berlin: Bundesministerium für Bildung und Forschung.

Tracy, R., Thoma, D., Michel, M., & Ofner, D. (2014). SprachKoPF: Sprachliche Kompetenzen pädagogischer Fachkräfte. *Bildungsforschung, 40*, 285-287.

Viesca, K. M., Hamilton, B., & Davidson, A. O. (2017). Supporting linguistically responsive teachers. E-learning communities for academic learning in mathematics and science (eCALLMS). In C. P. Proctor, A. Boardman & E. H. Hiebert (Eds.), *Flexible approaches in era of new standards* (pp. 158-171). EBSCO Publishing.

Vonderwell, S. (2003). An examination of asynchronous communication experiences and perspectives of students in an online course: A case study. *Internet and Higher Education, 6*, 77-90.

Wenzl, T., Wernet, A., & Kollmer, I. (2017). *Praxisparolen: Dekonstruktionen zum Praxiswunsch von Lehramtsstudierenden, 15*. Wiesbaden: Springer-Verlag.

Wise, A., Chang, J., Duffy, T., & del Valle, R. (2004). The Effects of Teacher Social Presence on Student Satisfaction, Engagement, and Learning. *Educational Computing Research, 31*(3), 247-271.

Wu, J. H., Tennyson, R. D., Hsia, T. L., & Liao, Y. W. (2008). Analysis of e-learning innovation and core capability using a hypercube model. *Computers in Human Behavior, 24*, 1851-1866.