Reimagining online teacher education: combining self-directed learning with peer feedback for interaction and engagement

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Received 13 July 2023
Revised 26 October 2023
Accepted 5 November 2023

Abstract

Purpose – There has been an unprecedented increase in online learning worldwide, including in teacher education. However, student lurking can be a common issue, leading to a non-interactive learning environment.
Design/methodology/approach – The authors employed a qualitative case study with thematic analysis to examine a novel "self-directed" pre-service teacher online degree module that engaged students in regular peer-feedback, which intended to promote student engagement and interactivity. The research questions were as follows: To what extent did the seminar series represent the principles of self-directed learning and were learning outcomes effective from the process? And, how effective was the use of peer feedback?
Findings – The thematic analysis revealed that student progression and course completion was successful, and it represented some principles of self-directed learning; but (a) it cannot be presumed that pre-service teachers are competent in giving (peer) feedback and (b) pre-service teachers may need specific guidance and training for providing competent feedback.
Originality/value – This paper is highly original in respect of its combination of the self-directed learning framework with use of peer feedback, to engage students in an interactive learning environment. The present paper identifies that peer feedback is a powerful tool in online learning; peer feedback can supplement self- and teacher-assessment; but it should not be assumed that pre-service teachers are competent in providing (peer) feedback – pre-service teachers may need specific training in providing feedback.

Keywords Teacher training, Lifelong learning, Constructivism, Inquiry learning, Distance education, Online learning, 21st century skills, Thinking skills

Paper type Research paper

Introduction

There has been an unprecedented increase in online learning in pre-service teacher education worldwide (Mikeska *et al.*, 2023; Tarchi *et al.*, 2022). Recently, over 91% of face-to-face learning experiences worldwide were affected by the COVID pandemic (UNESCO, 2021). Subsequently, online learning, for many, became (and has become) a necessity rather than an

Journal of Research in Innovative Teaching & Learning
Emerald Publishing Limited
2397-7604
DOI 10.1108/JRIT-07-2023-0086

option (Dhawan, 2020; Martins *et al.*, 2023). It is not surprising therefore that there has been an expanding volume of literature exploring use of digital technologies that enable live online collaboration between learners and educators – such as BlackBoard Collaborate, Teams, Zoom, Moodle, etc. (see Kutz *et al.*, 2023; Neuwirth *et al.*, 2021) – that explore the limitations and opportunities of online and distance educational experiences (e.g., Adedoyin and Soykan, 2023; Neromi *et al.*, 2019; Simonson *et al.*, 2019). A potential advantage of live online collaborative learning platforms is, theoretically, the educational possibility of mirroring face-to-face learning activities in which there is rich interactive dialogue between teacher and learners (Batdı *et al.*, 2023; Nyathi and Sibanda, 2023).

However, research shows quite the contrary: online learning can lead to *reduced* uncontrived dialogue between teacher and learners in comparison to face-to-face experiences (see Nagel *et al.*, 2009). Even, perhaps more strikingly, the term "lurking" has come into the forefront of studies exploring online learning during the COVID pandemic. For instance, Kuhn *et al.* (2021) identify *lurking* as a common problem in online education; this could be an issue when an educator seeks to facilitate a constructivist form of learning – where learning is viewed as an active and personal process of meaning-making (see Hmelo-Silver and Eberbach, 2012; Merriam *et al.*, 2006). In this respect, in practice, facilitating learning when students do not signal their online presence can feel like communicating to a black hole or empty space, where on such an occasion the natural discussion that might be present in a face-to-face classroom may not take place (Kuhn *et al.*, 2021).

At the same time, a clear and salient advantage for educational institutions of online learning is a cost advantage, in terms of the cost of education delivery (Deming *et al.*, 2015). There are other advantages such as flexibility of learning location, remote learning, comfort and accessibility (e.g., Chow and Croxton, 2017; Cojocariu *et al.*, 2014; McBrien *et al.*, 2009; Mukhtar *et al.*, 2020). Part of achieving a costing advantage, it has been known for some time now that there are many instances where educational providers have explored increased student numbers per course (see Deming *et al.*, 2015). However, the disadvantages of increasing student numbers in online courses (student per teacher ratio) are well documented, especially within Massive Open Online Courses; key issues include low student progression and high student drop-out (Rohs and Ganz, 2015), and a clear challenge to provide all learners with timely and detailed teacher feedback. Thus, peer feedback becomes an important supplementary learning tool (Morris and Rohs, 2021). And, arguably, the use of feedback should be practised especially in teacher education, as it is a daily task for teachers in their professional life.

In response to these issues, the present paper provides an evaluation of a novel self-directed online German Higher Education seminar series, for pre-service teachers, in respect of the research questions, in which student lurking was not an option, but rather students were stipulated to be self-directed in terms of progressing through the seminar. The novel seminar series sought to utilise the power of peer feedback to stimulate learner interactivity and engagement, which are further discussed in the following two sections. In sum, the purpose of the present study was to investigate the effectiveness of a self-directed pre-service teacher online degree module in promoting student engagement and interactivity, and to explore the effectiveness of using peer feedback in this regard.

Literature review

Self-directed online learning environments for pre-service teachers

Self-directed learning is especially important for teachers and their teaching practice. Notably, Beach (2017) explained that self-directed learning enables teachers to upskill, improve and adapt their teaching practice over time. In this respect, Beach (2017, p. 61) identified that "When given the opportunity, teachers might self-direct their learning by first

identifying their needs. Then, teachers may decide which professional development approach will best meet their needs". Importantly, being competent in self-directed learning is *fundamental* to meet the demands of the rapidly changing conditions (Boyer *et al.*, 2014; Morris, 2019c). And, for teachers, self-directed learning practice and competence is arguably therefore of primary importance – as teaching conditions are constantly changing.

Notably, digitisation and the current COVID-19 pandemic have been key drivers of heightened change and uncertainty (Morris and Rohs, 2021). As a meta-competence – i.e., a competence that allows the learning of other knowledge or skills – it is held that competent self-directed learning affords persons the *adaptability* necessary to meet the demands of change (see Morris, 2019a; Morris and König, 2021). To highlight the importance of adaptability in conditions of rapid social contextual change, adaptability has been labelled the sine *qua non* of professional expertise (Ward *et al.*, 2018).

Self-directed learning is a learning process in which learners take primary responsibility to control the direction of and choose their learning means and objectives in order to meet their learning goals (Knowles, 1975; Knowles *et al.*, 2020). Self-directed learning competence is defined as "the ability to pursue self-directed learning with success and efficiency: to proficiently direct one's own learning means and objectives in order to meet definable personal goals" (Morris, 2019b, p. 302). Thus, for teachers and their teaching practice, self-directed learning affords teachers the opportunity to upskill through a process of self-identification of learning needs and pursuing professional development activities in order to meet those needs (Beach, 2017).

The process of affording learners' responsibility over the control of directing the planning, undertaking and reviewing aspects of learning aligns with the constructivist learning perspective as it appreciates "the individual" and their differential perspectives, goals, interests and contexts (see Hmelo-Silver and Eberbach, 2012; Merriam *et al.*, 2006). In this regard, an acknowledgement is made that knowledge construction does not occur in a social contextual vacuum (see Baloche and Brody, 2017). Indeed, somewhat paradoxically, the word "self" in self-directed learning does *not* mean that learning occurs in social isolation.

On the contrary, it is well-established that self-directed learning commonly, and perhaps inevitably (Garrison, 1997), represents a collaborative process that is social (see Frey *et al.*, 2019), interactive (see de Witt and Grune, 2012; Le *et al.*, 2018) and sometimes community-based (see Hart and Akhurst, 2017). Scholars have highlighted the point that online learning environments represent a salient opportunity to stage a learning process in which learners are offered responsibility over the *control* of directing their own learning process; learning environments that celebrate learner *choice* (see Arnold and Schön, 2019; Woodford, 2021).

In terms of the self-determination theory of motivation, such educational environments would theoretically lead to a heightened learner intrinsic motivation for learning and progression (Ryan and Deci, 2020). Specifically, Rigby and Ryan (2018) discuss multiple kinds of motivations, which fall on a "spectrum of *motivational quality*" (p. 136; emphasis in original), in which "volitional, high-quality motivation" is "energized directly by . . . needs, values, and interest" (p. 136). And, through self-directed learning, learning outcomes can satisfy the needs, values and interest of learners (Tough, 1971). Furthermore, in respect of teachers and pre-service teachers, Carpenter and Willet (2021) identify the need for further studies to explore how digital spaces could be leveraged in order to be more supportive of facilitating the process of self-directed learning.

Importantly, self-directed online learning environments have the potential to overcome two issues that have been highlighted in the recent literature which might arise with more traditional forms of online learning: the phenomenon of student lurking in teacher-led online spaces, and the difficulty of providing timely and detailed teacher feedback when faced with high student numbers in online learning environments. First, the *lurking* phenomenon, which may be commonplace in teacher-led online spaces (Kuhn *et al.*, 2021), is no longer relevant in

online self-directed learning. Actually, theoretically, lurking cannot even "come into play" in self-directed online learning environments – and therefore we will not elaborate further on this phenomenon – because the teacher is no longer directing the process, but rather the *student takes control* and leads the learning process. In this respect, and given the importance of self-directed learning competence for teachers, the present study evaluates a pre-service teacher university module that was identified by the seminar lecturer, who designed this novel pre-service teacher module, as specifically designed to be less teacher-directed and more student-directed, in respect of:

RQ1. To what extent did the seminar series represent the principles of self-directed learning and were learning outcomes effective from the process?

Second, peer feedback fits within the principles of self-directed learning and can be used as an effective tool to strengthen the quality of education provision (Morris, 2018). Peer feedback is viewed as an additional (to other feedback forms) powerful tool to enhance learner progression whilst maintaining learner control (see Phielix *et al.*, 2010). Given the potential importance of feedback in enhancing learning progression in online environments, we will now discuss the importance of feedback and peer feedback in more detail.

Feedback and peer feedback

Feedback is a process "necessarily about improvement" (Dawson *et al.*, 2019, p. 10) and broadly concerns the practices of teachers and students, and how congruent these practices are within the broader institutional and cultural contexts (e.g., Fernández-Toro and Furnborough, 2018; Bohan *et al.*, 2015; Hattie and Timperley, 2007). It is well established that feedback has significant potential for facilitating and enhancing learning and learner development (see Dawson *et al.*, 2019; Ossenberg *et al.*, 2019; Evans, 2013; Merry *et al.*, 2013; Nicol and Macfarlane-Dick, 2006).

Furthermore, feedback is a complex and multifaceted phenomenon (Pitt and Norton, 2017; Winstone *et al.*, 2017) that is an inherently social process (Jørgensen, 2019; Crawford and Hagyard, 2011; Mutch, 2003). Therefore, it is fundamental to consider the relations around, and of, the practice of feedback giving and receiving. In particular, how institutional structures support feedback activity and how individuals are supported to develop the skills and dispositions facilitative to engage in this practice.

Barriers to engaging with feedback have been highlighted and explored extensively elsewhere, and peer feedback practice has the potential to overcome some of these barriers (i.e., tutor availability per student), whilst it also elevates others (i.e., unconstructive learner inter-group dynamics); the tensions faced are dual-sided in their presentation and how we might manage them. For instance, whilst the tutor might be an intimidating figure for learners to approach to engage in a dialogue about feedback/their learning (Jack, 2016), they hold subject and, likely, pedagogic expertise – they have more experience of feedback giving than the learners. And, the learners may not consider their peers as up to the challenge of reviewing and feeding back on their performance and/or feel uncomfortable in doing so (Xu and Carless, 2017). Yet they are engaged in broadly the same practices and in the same cultural contexts – vocationally so, in regard to pre-service teacher training.

Whether pre-service teachers recognise it or not, they are engaged at the periphery of a community of practice (Wenger, 1998). This should be highlighted and used to help frame *signature* feedback practices, such as peer feedback, and other drivers of dialogue for educators (Quinlan and Pitt, 2021). It has been argued for some time that space for such dialogue in learning is valuable (see Bohm, 1996; Buber, 1958) and yet many problems associated with feedback practices in higher education are arguably a result of "impoverished dialogue" (Nicol, 2010, p. 501). Peer feedback could be one means to reinstate/protect and develop/enhance the quality of learning dialogue otherwise diminishing in higher education,

even accelerated through the rapid necessary adoption of online delivery (Nagel *et al.*, 2009). Whilst some have shown peer feedback activities to improve aspects such as students' critical thinking and writing skills (Cartney, 2010; McConlogue, 2012; Nicol *et al.*, 2014), the effects will depend on how peer feedback is implemented and the training students receive to provide this potentially meaningful and effective feedback (Gielen *et al.*, 2010; Mulder *et al.*, 2014; Nicol *et al.*, 2014).

Skills pertaining to these dimensions can be developed in order to make best use of time and facilitate the best outcomes of peer feedback. The development of learner feedback literacy is an important, if sometimes overlooked, aspect of the feedback process. In this respect, Carless and Boud (2018) offer four interrelated features of feedback literacy which have resonance when planning for peer feedback practice: (a) appreciating feedback (b) making judgements (c) managing affect and (d) taking action. Learners must come to value the reception of feedback; acknowledge that they have an emotional response (whatever that may be) to the feedback – and that this is ok – but then seek to take action; and, in doing so develop their evaluative judgement through exemplar, draft, and peer work critique and response.

Explicit scaffolding for learners in this respect has particular relevance in training for pre-service teachers, where peer feedback has been found to help self-regulation of learning (Chou and Zou, 2020; Garcia and Pons-Segui, 2020). Such self-regulatory processes are an important element of successful self-directed learning (see Saks and Leijen, 2014; for further discussion, see Karlen *et al.*, 2023). For such potential to be realised, those creating and those engaging with feedback - from and by the self or from other sources – must be sufficiently competent at doing so.

The skill of generating and delivering peer feedback, and self-assessment that is part of self-regulation more broadly, is desirable for learners. Without concerted opportunities to develop competency at feedback giving (and receiving), students may lack sufficient skill and confidence at engaging with and delivering feedback (Chou and Zou, 2020; Carless and Boud, 2018; Adachi *et al.*, 2017). In such instances, feedback may go unheard or ignored, missing the opportunity for development and thus wasting the time of both learner and educator (Price *et al.*, 2010; Laurillard, 2002).

In giving and receiving peer feedback the learners fulfil a role of both learner and educator. These roles entail both cognitive and affective dimensions (Winstone *et al.*, 2017; Xu and Carless, 2017; Anderson and Krathwohl, 2001); learners must be able to think constructively about what they are being given whilst also being open to the prospect of criticism (ideally, taken in the spirit of improvement). Although previous studies have shown that students may lack sufficient skill and confidence at engaging with and delivering feedback (Chou and Zou, 2020; Carless and Boud, 2018; Adachi *et al.*, 2017), to the knowledge of the present authors little is known about the competence of pre-service teachers in Germany in this respect. Given pre-service teachers are soon to enter the teaching profession this represents a very important area for study. The second research question of the present study was therefore:

RQ2. How effective was the use of peer feedback?

Method

Context of the study and seminar design

The present study was a qualitative case study (Baxter and Jack, 2008) in which a novel Master's level online seminar course titled "Educational and Vocational Training Institutions," part of pre-service teacher training at a University in Germany, was examined in respect of the research questions outlined above. The seminar course was started and completed on time by all students (N = 23; 7 female and 16 male; *M* age = 23.26; *SD* = 1.60), which was part of their Teacher Training degree study at ISCED Level 7 (UNESCO, 2012). Data collection and analysis for the present study was conducted between

April 2019 and June 2022. One of the authors of the present work was the sole instructor and designer of the university module examined in the present study. At the time of the study, all participants already held a Bachelor of Education degree (ISCED Level 6; UNESCO, 2012) and had completed multiple practical internships at schools. They were still in teacher training at university, because in Germany a Master's degree in education or equivalent is necessary to become a fully qualified teacher.

In this Master's level pre-service teacher online seminar course, all content and tasks were performed on the "OLAT" learning platform (see Ferdinand and Heckmann, 2012) of the Virtual Campus Rhineland-Palatinate. Via the OLAT online platform, the overarching learning objective was for learners to acquire the necessary basic knowledge on five subject areas: (1) Functions and tasks of schools (2) Educational pathways (3) Educational institutions (4) Local education policy and (5) Challenges of inclusive school development; where tasks consisted of individual and group work, including peer feedback tasks (Table 1).

Prior to commencement of the online seminar, students undertook a "kick-off" face-to-face two-hour introduction with the lecturer to provide organisational information. Here, students formed groups of up to three persons. To facilitate students to get to know each other, students were encouraged to create and upload a group portrait within the first week, in which the group members introduce themselves individually. Subsequently, with the concept grounded in self-directed learning theory (according to the seminar designer), the seminar then demanded learner responsibility for making learning progress: task completion was self-paced, the design of which considered the ideals of the Competence Model of Living and Sustainable Learning, which argues for education that is self-directed, self-paced, productive, activating, situational and social (see Arnold, 2015; Arnold and Schön, 2019; Arnold and Schön, 2021).

Each task, which included either a case analysis/study, essay, petition, mind map, visual facilitation, or practice of scientific writing, had a number of points allocated to it, which were made explicit to students beforehand (see Table 2). Each student required a score of 80 points to pass the seminar course, including completing one task from each of the five subject areas

Table 1.
Individual, group and feedback tasks in relation to subject areas; showing number (N) of students engaging with each task

	Subject area 1: Functions and tasks of schools	Subject area 2: Educational pathways	Subject area 3: Educational institutions	Subject area 4: Local education policy	Subject area 5: Challenges of inclusive school development
Individual work 1	Mind-map (N = 23, created by 23 students) or visualisation (N = 0)	Mind-map (N = 23, created by 23 students) or visualisation (N = 0)	Mind-map (N = 23, created by 23 students) or visualisation (N = 0)	Mind-map (N = 23, created by 23 students) or visualisation (N = 0)	Mind-map (N = 23, created by 23 students) or visualisation (N = 0)
Individual work 2		Case analysis (N = 1, created by 1 student)		Case study (N = 4, created by 4 students)	
Individual work 3	Peer feedback (N = 46, created by 18 students)	Peer feedback (N = 69, created by 19 students)	Peer feedback (N = 47, created by 19 students)	Peer feedback (N = 71, created by 19 students)	Peer feedback (N = 52, created by 19 students)
Group work 1		Political Atlas (N = 5, created by 5 students)	Step concept (N = 2, created by 2 students)	Educational map (N = 21, created by 21 students)	Essay (N = 13, created by 13 students)
Group work 2		Storytelling (N = 19, created by 19 students)	Petition (N = 12, created by 12 students)		

Source(s): Authors' own work

Task	Task description	Points
1. Mind map	The students visualised information in a structured and networked manner with the help of the given key questions on literature using a mind map. A critical thesis was formulated on the respective topics, which the fellow students use as a basis for discussion	5
2. Visualisation	The students visualised information in a structured and networked manner with the help of the given key questions on literature by combining images and explanatory text. A critical thesis was formulated on the respective topics, which the fellow students used as a basis for discussion	5
3. Peer feedback	Students were tasked to take a critical stance and explain their point of view. They were asked to assess another learner's contribution in detail based on the four given criteria of language, theoretical relevance, originality and practical relevance; and to use examples from the text to clarify their assessments. They were asked to provide tips for improvement by rounding off their feedback with critical hints for the authors on how they could improve the elaboration	3 (tasks 1,2) or 6 (tasks 4–11)
4. Case analysis	The aim of the group task was to create a case analysis based on a fictitious or real-life situation based on given key questions as well as relevant description and reflection criteria. This included a reflection and analysis of the case regarding the professional behaviour of the teacher as well as an alternative action plan. The final question impulse served the fellow students as a basis for discussion	20
5. Case study	With the help of a selection of key questions and given literature, students developed the topic of school supervision and municipal school sponsorship by processing given cases based on these, justifying their decision regarding the case solution and putting them up for discussion	10
6. Political Atlas	The aim of the group task was to develop a policy Atlas on the different approaches of the school system for all German federal states with the help of the given literature. Likewise, presentation of specific problem questions as well as their possible solutions. A final question served the fellow students as a basis for discussion in the feedback	10
7. Step concept	Based on the step concept, a scientific text with central statements on the diversity of educational institutions in Germany was designed, which explains aspects such as diversity, institutional framework, cooperation, etc. The method of the step concept was used to logically structure the argumentation and the writing process	10
8. Educational map	The students designed a municipal educational map for a selected district of a larger city by identifying all existing educational institutions and presenting them in an overview. Regarding this, they wrote a working paper on the topic of municipal education policy based on relevant questions previously worked out	10
9. Essay	After providing an overview of the challenges of inclusive school development, an essay was written in which, among other things, positive and negative aspects, difficulties, limitations, advantages and needs were discussed. The conception follows the guidelines of scientific writing and was supported by suggestions and questions	25

(*continued*)

Table 2.
Tasks description and points allocation for task completion

Task	Task description	Points
10. Storytelling	The aim was the conception of a short story based on given criteria, which addresses the career-finding phase of a fictional character and the associated problems. Among other things, the value of the options available in the future educational path, the added value for one's own life as well as the significance and the consequences for the future of the fictional character must be clarified	20
11. Petition	Based on a categorisation, the learning group developed a constructive proposal for the education system in the Federal Republic of Germany in the form of an educational petition considering specific criteria for an appropriate control quality and educational policy as well as the naming and justification of expected quality improvements	10

Table 2.

Source(s): Authors' own work

(excluding peer feedback tasks). Students elected task completion by uploading their task outcomes, which were then signed off by the lecturer through awarding points.

It is important to note here that there was some form of gamification (which is known to promote the quality and quantity of learners' performance; see McGonigal, 2011; Sailer and Sailer, 2020; Zainuddin, 2018). In this respect, at the beginning of each week, a points table was published, which offered the opportunity to compare one's own score with that of fellow students – another factor that, theoretically, may drive motivation and performance (see Burguillo, 2010; Landers and Landers, 2014).

The peer feedback process

The formative peer feedback process took place in the OLAT online course forum, in which individual peer feedback was provided on other student's uploaded completed work, using a cooperation script (see Noroozi *et al.*, 2013; Weinberger *et al.*, 2005). The peer feedback of the online seminar presented here requested students to provide detailed feedback on the given criteria of language, theoretical relevance, originality and practical relevance.

After having received at least two feedback for a task, the feedback recipients themselves had to respond to the feedback received in the form of a self-assessment conclusion, in order to complete the feedback process. For uploading a task, only half of the points were awarded; only the full score was credited after the peer feedback and self-assessment steps were completed.

Data collection and analysis

Ethical clearance was granted for this study. All 23 students successfully completed the seminar. In total nine groups were formed ($N = 5$ groups of three, $N = 4$ groups of two). The points achieved through task completion ranged from 82 to 135 ($M = 102.83$; $SD = 16.76$). The number of feedback given by each student ranged from 0 to 20 ($M = 9.26$; $SD = 5.01$). Overall, the students achieved 36 points on average through their feedback ($M = 35.87$; $SD = 18.87$). Measured against the total score achieved, the proportion of feedback ranged from 0.00 to 74.23% ($M = 35.06$; $SD = 18.22$).

Table 1, above, summarises the number of students that completed each task. In summary, the data for the present study included: Mind-maps (N = 115), no Visualisations (N = 0), a Case analysis (N = 1), Case studies (N = 4), Political atlases (N = 5), Step concepts (N = 2), Educational maps (N = 21), Essays (N = 13), Storytelling (N = 19), Petitions (N = 12),

the accompanying Peer-Feedback (N = 285), alongside the numerous documents and information contained within the OLAT learning platform for this module. A thematic analysis was conducted on this data.

Three investigators, who were all not involved in the design of or teaching duties associated with this seminar programme, independently conducted a thematic inductive analysis following six steps outlined by Braun and Clarke (2006) of all the data, in respect of the two research questions. Each investigator independently sought to analyse, qualitatively, the data in order to determine key themes in relation to the research questions. Prior to beginning the data analysis process investigators were involved in one day of formal training concerning the hand coding indicative analysis process. The analysis process was fully inductive in that there were no preconceived ideas about what themes or ideas would be found.

When each investigator had arrived at initial themes, the investigators met for a full day meeting to discuss and arrive at the agreed final themes. This discussion entailed details about each investigator's journey of data analysis, the initial themes they found and explanations of how they arrived at the themes they presented. During this meeting a fourth investigator – the seminar course designer and principal teacher of the seminar – was also present. This enabled a member checking process where the fourth investigator listened to investigators' findings, but also provided some important clarifications as the investigators were approaching final theme arrival, which represent the subheadings of the findings section of the present report (see Table 3). The principal investigator took notes of the discussion held, which is presented in the findings section here, alongside examples of data extracts.

Findings and discussion of themes

Theme 1: quality of peer feedback was poor: feedback was too positive and general rather than specific

A key theme noted by the investigators concerned the poor quality of peer feedback: it was judged that, overall, the pre-service teachers in the present study were not competent in providing (peer) feedback. First, peer feedback given by students tended to be too positive. For example, one pre-service teacher wrote "I like your mind-map very much. The arrows and

Theme	Description of theme	Research question
Theme 1: Quality of peer feedback was poor: Feedback was too positive and general rather than specific	Pre-service teachers provided feedback that was considered too positive and too general	RQ2: How effective was the use of peer feedback?
Theme 2: Learning represented self-directed learning, in part	In terms of the "what" and "how", although there was some learner choice in terms of task selection and timing of completion, the educator set the range of learning topics available and the task possibilities. The learners then selected some of those learning topics and tasks	RQ1: To what extent did the seminar series represent the principles of self-directed learning and were learning outcomes effective from the process?
Theme 3: Students' intrinsic motivation to learn activated	Many students completed more work than was necessary for them to pass the module	

Source(s): Authors' own work

Table 3.
Summary of themes

the different colours you chose create a thread through your work. The thoughts that you had when solving this task also come to the fore" (Peer feedback from TP03 to TP11).

Specifically, "positive" peer feedback was offered to high standard student work, but, concerningly, at the same time, positive peer feedback was also given to student work in incidences where the investigator team deemed the student's work to be relatively weak in terms of academic quality, as judged against the criterion provided by the seminar tutor. An example of such positive peer feedback given to relatively weak work was: "The information content of your mind-map is exactly right, as is your colour coding, which makes it easy to follow the mind-map" (Peer feedback from TP09 to TP21).

Notably, pre-service teachers seemed reluctant to provide critical feedback. It is important to highlight the point that previous studies have indeed identified that certain feedback may represent a missing opportunity for development, and, even, wasting the time of both feedback giver and receiver (Price *et al.*, 2010; Laurillard, 2002).

Moreover, from the investigators' perspective, the mind maps, in particular, were very hard to judge in terms of quality because they often presented facts in isolation (without further elaboration and explanation on what they mean exactly). In such instances, students would still provide positive *general* peer feedback on them; examples of peer feedback comments include "I like the look of your mind-map very much, it is clear and the different coloured branches make it easier for the reader. The structure is also well chosen and appropriate focal points are set. I don't miss anything in the content of your mind-map" (Peer feedback from TP08 to TP16)" and "I like your mind-map. You have worked out and summarised the central elements of the text well. It is noticeable that you have studied the literature intensively, as the mind-map is very detailed. Perhaps you could have summarised a few points to make it clearer. The different colours contribute to understanding" (Peer feedback from TP15 to TP16).

In this respect, although previous studies have highlighted the point, for some time, that space for such dialogue through feedback can be a valuable part of the learning process (see Bohm, 1996; Buber, 1958). It was apparent in the present study, from the investigators' perspective, that there was a social norm in place "to be nice" and for students to provide positive feedback to each other: mostly then the investigators judged that the feedback was not useful for learners in terms of identification of what could be improved. This was particularly concerning given feedback is "necessarily about improvement" (Dawson *et al.*, 2019, p. 10) and, when it is done well, has significant potential for facilitating and enhancing learning and learner development (e.g., Dawson *et al.*, 2019; Ossenberg *et al.*, 2019).

Importantly, the lack of specificity, and disconnection from feedback criteria, in the feedback provided by pre-service teachers to their peers was not considered useful feedback or feedforward by the investigators. For example, one pre-service teacher wrote "In my opinion, your mind-map is very clearly laid out. The different colours of the most important points create a common thread. The sub-points that you have worked out also appeal to me. Basically, I think that the message behind your mind-map can be understood very well, even without knowing the topic" (Peer feedback from TP05 to TP01).

Thus, in the present study it was clear that students did not follow or consider using the set criteria in order to formulate their peer feedback against. Other examples include "I think your mind-map is very well done. Despite the amount of information it offers, it is still very clear and pleasant to look at because of the colours" (Peer feedback from TP19 to TP07), and "I like the fact that your mind-map is so detailed and that you have worked on so many aspects. However, I find it very confusing and overcrowded. Maybe you should have stayed a bit more general or concentrated on one aspect more" (Peer feedback from TP12 to TP08).

Although students were instructed to provide detailed feedback on the given criteria of language, theoretical relevance, originality and practical relevance – it was quite clear that most of the feedback given to other students (even though it was considered a "pass" by the

course educator) was provided *without* consideration of the given criteria. Such feedback was considered "poor quality feedback" by the investigators. On this point we should consider that a lack of learner competence in providing feedback has been noted in other studies such as in Xu and Carless (2017), who indeed identify that learners may not consider their peers as up to the challenge of reviewing and feeding back on their performance and/or feel uncomfortable in doing so.

In sum, the feedback was commonly general, rather than specific, too positive even when the work they examined was poor quality, and in the process generally students did not see the need or importance of criteria (i.e., language, theoretical relevance, originality and practical relevance) to formulate their feedback. The lack of pre-service teacher competence in giving feedback concurs with previous research that highlights the point that without concerted opportunities to develop competency at feedback giving (and receiving), students may lack sufficient skill and confidence at engaging with and delivering feedback (Nicola-Richmond *et al.*, 2023; Chou and Zou, 2020; Carless and Boud, 2018; Adachi *et al.*, 2017).

Perhaps most concerning was that this programme was a master's level pre-service teacher course. In this respect, it was quite clear that targeted opportunities are/were required for these students to develop competency at feedback giving (and receiving). In sum, educators should not assume pre-service teachers held the necessary skill and confidence at engaging with and delivering feedback.

Theme 2: learning represented self-directed learning, in part

There were some elements of self-directed learning during the planning (what; the learning objectives), undertaking (how; the undertaking of learning tasks) and reviewing (whether learning tasks met the stipulated learning objectives) aspects of learning. In terms of the "what" and "how", although there was some learner choice in terms of task selection and timing of completion, the educator set the range of learning topics available and the task possibilities. The learners then selected some of those learning topics and tasks. In terms of self-directed learning theory, this process falls somewhat away from being "self-directed learning" in that rather than the learners assuming "primary responsibility" to control the direction of their learning means (see Knowles, 1975); arguably in the present instance the educator held primary responsibility in terms of determining the available, mandatory, learning topics and tasks.

On the contrary other studies, such as that of Kicken *et al.* (2009), in a context of vocational education and training in the Netherlands, describe a formal learning situation where learners are stipulated to fully choose their learning tasks and means in order to address their learning and career development needs. The key here is that learners in the study from Kicken *et al.* (2009) were stipulated to "fully choose", whereas ultimately in the present study there were some options, but choice was limited; constrained to the learning topics and tasks chosen by the educator. Interestingly the study from Kicken *et al.* (2009) highlighted the point that in their study many students found the process of "learner fully choosing" a difficult task and many of them made insufficient progress. The authors concluded that the students would need more practice of self-directed learning, as many of them were used to teacher-directed learning programmes and had not yet fully fostered the necessary inquiry skills. This was in contrast to the present study where "some learner choice" actually led to very good progression in learning outcomes, as described in more detail in the following section.

At this point it is perhaps useful to point out that Garrison (1997) in particular argued that self-directed learning in a formal education setting – given the presence of an educator and therefore involving a second opinion on what is considered "worthwhile knowledge" – is inevitably a collaborative process between teacher and learner, and perhaps with other learners. Such "collaborative" learning processes might be considered "toward" a

self-directed learning process (see Grow, 1991), in comparison to the self-directed learning processes seen in non-contrived learning settings (see Gibbons *et al.*, 1980; Tough, 1971).

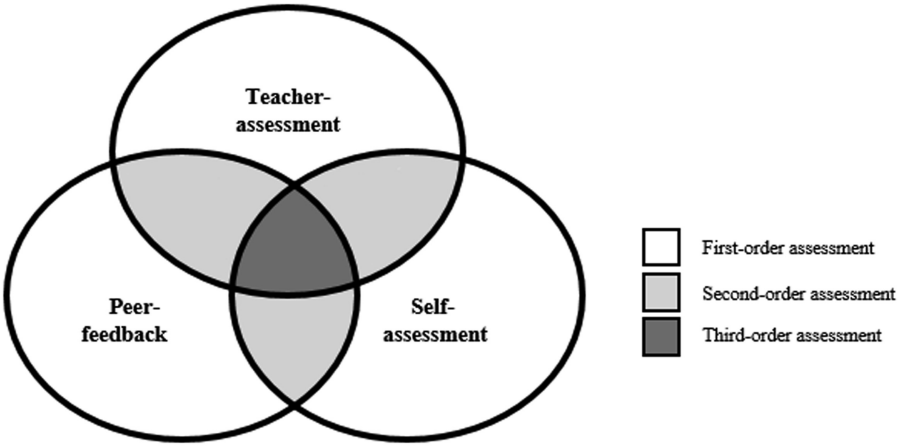
Indeed, however, if the present seminar were to run again, in order to reflect more of a self-directed learning process, the seminar could be potentially set up to trial "both options". i.e., the educator could offer a selection of topics available and the task possibilities, but in addition could offer the possibilities for students to *fully* select a self-determined topic and task. Even at the planning stage the learner could be asked to fill out a "planning form" such as a "learning contract" which states learner determined objectives and means, which could be agreed with the educator at the start of the process (see Knowles, 1975; Rogers, 1969). Theoretically, this could tick the self-directed learning boxes, moving in a stepped-like fashion away from educator control of directing the means and objectives and toward learner control of objectives and means (see Grow, 1991), whilst meeting the demands of the stipulations of the formal educational setting.

Moreover, in the present study it was interesting to report that in the reviewing aspect of learning the educator "took a back-seat", distant role, in terms of providing feedback. Surprisingly, apart from quantitative feedback, in which the educator made the decision whether or not to award points, the students did not receive any qualitative feedback from the seminar teacher. The seminar teacher did not provide feedback in terms of noting why a particular student had passed or failed a particular component of the seminar course. But at the same time, it is important to note that numeric points awarded (and totals) – which reflected the progress of each student – were updated on a regular basis and were made visible to all other students.

In this respect, previous research has highlighted that with online learning courses where there are increasing student numbers, higher student per teacher ratios (exampled within Massive Open Online Courses) presents a clear challenge to provide all learners with timely and detailed teacher feedback: and commonly in such situations low student progression and high student drop-out becomes a reality (Morris and Rohs, 2021; Rohs and Ganz, 2015), but then peer feedback and/or self-assessment become important supplementary learning tools in terms of reviewing learning. Peer feedback is congruent with the ideals of self-directed learning; but, that said, the opportunity for feedback from the educator, as an expert on the topic, seemed wholly missing in the present study.

What we know from previous studies on self-directed learning is that competent self-directed learners often proactively seek feedback from experts in the field. This is exemplified in the seminal study from Gibbons *et al.* (1980) where experts in various fields, who had gained their expertise without a formal education course, commonly sought feedback from other experts in their field to progress in their learning and expertise. Indeed, in addition to the peer feedback (and minor self-assessment) elements of the present seminar course, a revision of the course might include, in addition, students "inviting" the educator for feedback, and a greater emphasis on the importance of regularly undertaking self-assessment. Together, this would provide a triangulation of feedback, potentially strengthening the quality of learning outcomes and progressions, and reflect the ideals of self-directed learning. This concept is summarised in Figure 1 and depicts a summary of the ideas that were identified by the investigators during the present thematic analysis process.

In summary, Figure 1 depicts three levels of feedback. First order feedback concerns one source of feedback: teacher- or self-assessment or peer feedback. Second order feedback concerns combining two of these feedback possibilities. Finally, third order feedback is where teacher-, self-assessment and peer feedback are all used in the learning process; and this third order feedback would be recommended for a revised version of the present seminar series, as we know the positive power of these feedback elements in facilitating and enhancing learning and learner development (see Dawson *et al.*, 2019; Ossenberg *et al.*, 2019; Evans, 2013; Merry *et al.*, 2013; Nicol and Macfarlane-Dick, 2006).



Source(s): Authors own work

Figure 1.
Feedback triad

Theme 3: students' intrinsic motivation to learn activated

In the present study, all students completed the course and collected more than the mandatory 80 points to pass the course. As mentioned before, student lurking can be an issue in online courses. This was already countered with the design of the online seminar, as the students had to actively work on tasks, which was overall very successful and accepted. Interaction was fostered through the peer feedback process outlined above. Interestingly, there was no obvious extrinsic motive for students to collect more than 80 points, as the course was "pass or fail" with no extra marks or credits awarded for additional work completion. However, the mean points achieved in the present study was 102.83 points (SD = 16.76) – well above the 80 points required to pass and represented 29% more work completed on average compared to what was stipulated by the course leader. It should be noted here that one student completed 135 points – which represented 69% more work completed compared to what was stipulated by the course leader. Activation of intrinsic motive to learn here was an important finding of this report.

Self-determination theory of motivation (Ryan and Deci, 2017), theoretically, points out that high quality motivations, which are commonly intrinsic to the person (see Knowles *et al.*, 2020), are those which are personally meaningful; driven by the individual's needs, values and interests (Rigby and Ryan, 2018). In the present study the learning objectives were likely therefore to have been personally meaningful, driven by needs, values and interests.

Moreover, interestingly, the seminal study from Tough (1971) on adult learning showed that adults tend to spend a very different amount of time engaging with self-directed "learning projects". This finding was reflected in the present study, where there was a variety of amount of work completed – in some cases some students completed much more work than was required to pass the course.

Study limitations

It is important to acknowledge that there were limitations of the present study. Concomitantly, it is important to note that there were some salient strengths of the study design. First, the study examined a novel seminar course, which led to key insights that other study designs may not have drawn. Second, the present study employed three investigators, who were all not involved in the design of or teaching duties associated with this seminar programme, and who all independently conducted the thematic inductive analysis process.

We identify this as a strength of the present study design as this design element, in part, eliminated inherent bias that may be more present in a study where a single investigator conducts the data analysis process.

However, the cross-sectional nature of the present study did not allow insight into measurement or observation of the possibility of fostering pre-service teachers' skills or competence for self-directed learning (including competence in providing and giving feedback) over time (see Grow, 1991). A longitudinal study design would, theoretically, allow examination of the impact of experience of such a seminar series upon the fostering of skills and competence for self-directed learning and feedback giving and receiving. Furthermore, personality characteristics of pre-service teachers were not considered in the present study, and it was not possible to examine individual differences in desire or preference towards taking responsibility for self-directed learning and/or feedback giving/receiving (see Kirwan *et al.*, 2014; Slater *et al.*, 2017).

Finally, it is important to highlight the point that the present study arguably represented a single case that is difficult to replicate. Specifically, we do not claim external validity of the findings. That is, differential findings might be drawn in differential study contexts. Therefore, the findings of the present study must be read with this in mind.

Conclusion

The present empirical case study explored a novel master's level online German Higher Education seminar series, for pre-service teachers, in which students were stipulated to be "self-directed" in terms of progressing through the seminar, whilst utilising peer feedback as a supplement to self- and teacher-assessment.

Through the analysis we conclude that the seminar series, in part, reflected the ideals of self-directed learning. Specifically, there were elements of the learning process in which the educator held onto control of directing the learning process, such as the educator determining the range of topics and tasks available, but then the selection of tasks completed and the pacing of tasks completed were determined by the pre-service teacher(s). Nonetheless, aligning with self-determination theory, we found overall that student progression and course completion was very successful, and many students completed more work than was stipulated by the course demands.

A key and important finding of this present study was that pre-service teachers were not competent at providing peer feedback. This study highlights that pre-service teachers may need specific guidance and training in order to gain the necessary skills for providing feedback. This research provides key insights and implications for practice, further research, and policy in pre-service teacher education.

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