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Teachers' Experiences and Role in the Design Process of Online Degree Programmes in Higher Education

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Abstract

Background. The study was conducted in a higher education (HE) organisation where online degree programmes (ODP) were a new type of education. An initial model for the holistic design of ODPs was created in Cycle 1 of the design-based research process from an organisational viewpoint to establish the basic infrastructure and support.

Objectives. This study examines the first ODP teachers' experiences in the HE organisation to create design principles for the holistic design of ODPs.

Methods. This study presents the results of Cycle 2 of the design-based research process. Focus group interview and thematic analysis were used to gain the teachers' experiences of the initial model. The results were compared with the elements from the initial model to create design principles.

Findings. The teachers' positive and negative experiences include the importance of management support, collegial collaboration, and different teaching environments. Design

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principles based on the experiences are presented in three layers: organisational, pedagogical, and online degree programme.

Conclusions. The design principles may be of interest to managers, coordinators and educators in HE organisations that aim to design and implement online degree programmes as a new type of education. The study also offers insights into the support needs of new ODP teachers.

Keywords: Online Degree Programme, Teachers' experiences, Design-based research, Higher Education.

Introduction

The digitalisation of education has been accelerated by the recent pandemic and there is an increasing trend to expand degree education from traditional to online modes (OECD, 2021). This has also created a need for further research in e-learning and online degrees in higher education (HE) (Ghanem, 2020). HE organisations are finding new non-traditional, online and flexible teaching and learning methods to meet the demands of the future learners (Naidu, 2019). In Finland, HE organisations are developing a learning ecosystem and national learner data portal in Digivision 2030, a national program that aims to make Finland as a model country for flexible learning and a global pioneer in higher education (Digivision2030). Online degree programmes (ODP) create possibilities for lifelong learning in national collaboration to support the sustainable development goals of the future (Joshi, 2022).

University education has been provided online for decades, and examples can be found especially in the field of distance education (Peters, 2001) and virtual universities (d'Antoni, 2006). Various frameworks are available for evaluating online degree programmes (Benson, 2003; Rovai & Downey, 2010; Shelton, 2011; Chipere, 2017). It is important for HE organisations to create online degrees that are purposefully and pedagogically conceptualised and constructed (Ragusa & Crampton, 2017). However, much of the research has focused on instructional design and less so on holistic design (Kumar, 2014). Also, more research is needed in different geographical and cultural environments on the barriers faced by those teachers who are new to online teaching (Kellen & Kumar, 2021).

In Finland, parts of the HE curriculum are offered online in varying degrees (Murtonen et al., 2020). Some HE organisations have only recently started to develop entire degree programmes online. In 2016, there were eight Bachelor level ODPs offered through the general application system in Finland, which were all provided by universities of applied sciences (Joshi, 2021). The purpose of this study is to focus on the design of online degree programmes in those HE organisations that have not implemented ODPs before. The empirical case presents a HE organisation in Finland where ODPs are a new type of education. The data represents the viewpoint of those teachers who are teaching in the first

ODPs in the organisation and have no prior experience of ODPs.

In Finland, the universities of applied sciences (UAS, former polytechnics) are career-oriented institutions that aim to improve working and economic life, encourage internationalisation and answer the growing needs that digitalisation poses on learning and teaching in the constantly changing world (ARENE, 2018). They provide higher education level education where students can obtain Bachelor and Master level degrees in applied sciences (Ministry of Education and Culture, 2014). The studies in the applied higher education sector have a practical orientation (Downing, 2017), which makes it important to consider how the practically oriented learning and teaching can be implemented in ODPs by means of technology and pedagogy.

The empirical case is a university of applied sciences (UAS) in Finland where a strategic decision was made to start offering Bachelor level degree education online in 2017 as a new type of educational service. Due to this, there was a need to investigate how to create a model for designing ODPs in the applied higher education sector where the teaching traditionally has focused on hands-on, campus-based activities. Moreover, since the HE organisation follows a specific pedagogical strategy called innovation pedagogy (Kettunen et al., 2013), it was important to integrate the pedagogical approach into the first ODPs. The pedagogical strategy of the organisation defines the basic requirements and cornerstones that are implemented in all the degree programmes, with the aim to create a good life for students in a sustainable future (Konst & Kairisto-Mertanen, 2020).

The initial model and design principles for the holistic design of ODPs were created in Cycle 1 of the design-based research (DBR) process (Joshi, 2021). The three-tiered model contains design principles on organisational, pedagogical and online degree programme level. Several different stakeholders took part in the design process, including degree programme teams, ODP coordinators, managers, and technical and pedagogical staff. The purpose of Cycle 2, presented in this paper, is to collect data from the first ODP teachers in the HE organisation to gain an understanding of how they experienced the initial model. The ODP teachers were selected because they represent the practitioners of the intended pedagogy in the first ODPs and their experiences can inform how the model should be further developed. The empirical data is used to create design principles that will complement the initial principles for the holistic design of ODPs.

The results of this study may be useful to those HE organisations where ODPs have not been implemented previously and are developed as a new type of degree education. Managers may also find the results useful to gain a better understanding of the teachers' support needs in their new role as ODP teachers.

The following section discusses previous research in terms of pedagogy in the holistic design of online degree programmes and teachers' role in the design process. This is followed by a description of the research design. The teachers' experiences and their role in

the design and implementation of the ODPs are presented in the results section. Finally, the design principles for the holistic design of ODPs based on the teachers' experiences are presented.

Previous research

Online and distance education has become as commonplace in HE as traditional on-site, campus-based education (Xiao, 2018). An online programme is such where all education and support services are provided fully online (Sener, 2015). Online degree programmes that have been developed with a focus on pedagogy can ensure the implementation of pedagogical strategy in the design and implementation of the degree. Pedagogy is one of the critical success factors for online programmes (Rovai & Downey, 2010) and HE pedagogy needs special focus when implemented online (Green et al., 2010). Many HE organisations have a pedagogical strategy that is based on a commonly agreed approach (Penttilä, 2016). This study presents the case of a HE organisation where ODPs are implemented with the pedagogical strategy of the organisation for the first time.

HE organisations need to reconsider teaching and learning methods and experiences to create new open, flexible and technology-enhanced learning (Naidu, 2019). Frameworks and models for technology-enhanced learning designs vary in terms of pedagogy, among other features (Bower, 2018). When using technology in education, ethical considerations in building a framework for strategy should be considered (Jefferies et al., 2007; Govers, 2014). Offering pedagogical training for new teachers can support the development of a more supportive pedagogical culture in the HE organisation (Murtonen & Vilppu, 2020), thus investigating new ODP teachers' experiences can have an organisation-wide impact. This study examines the teachers' experiences of the initial model that was created from an organisational viewpoint and used as the framework for constructing the first ODPs.

The change from traditional campus-based degree teaching to fully online degree teaching for the first time can be significant. Shared design and organisation-wide practices in ODPs are needed, as they are important in ensuring the fidelity to the agreed approach (Paniagua & Istance, 2018). Whole-of-institution approach in the design includes collaboration and co-design between various stakeholders (Kek & Hujser, 2017) and teachers' experiences should be taken into account in the design of the degree (Badia et al., 2019). Academic staff should be actively engaged in the change process of a new university-wide approach (Honkimäki et al., 2021) and the development process (Baran et al., 2011). Teachers' involvement in the design process can have an impact on the implementation of the design (Kali, 2015), so their views as practitioners can be considered relevant to the development of the ODPs.

To design learning, teachers need subject-specific and pedagogical competence, but also research and design competence (Kirschner, 2015). Also, teachers need support in implementing new approaches and new designs (Chie et al., 2018). Integrating technology

into teacher design teams can only work if both team and institutional level conditions are observed (Tondeur, 2018). Teachers must be offered adequate continuing professional development and support (Naidu, 2019) in the pedagogical use of technology for sustained online teaching and development of teachers' agency in digital contexts (Damşa et al., 2021). As new teachers in the ODP, teachers are placed in a situation where they need to learn various new pedagogical, technical and design competence. Therefore, finding out their support needs is relevant to their professional development and the further design of the ODPs.

There is evidence of how teachers' work identity is formed or supported by their professional development (Murtonen & Vilppu, 2020). Teacher reflections can be used as part of their professional development (Philipsen et al., 2019). There are many functions for teachers' competence and role in online teaching (Martin et al., 2021). The teachers need to be supported in their new role as ODP teachers so that they can provide quality education to ensure students can proceed with their studies as planned (Cober, 2015). Teachers may face challenges when combining the new ODP teacher identity to their previous professional identity when implementing ODP as a new type of education.

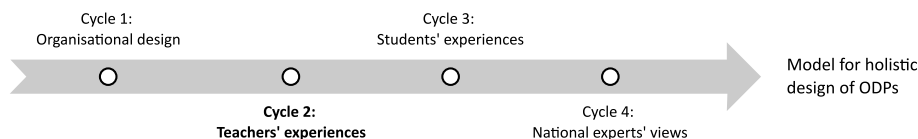
It is important to understand what barriers teachers new to online teaching may face (Kellen & Kumar, 2021). Teachers may differ in their approaches and perceptions of their own development needs (Tynjälä, 2017), and they may not be able to evaluate how to utilise technologies in accordance with their own teaching style (Syvänen et al., 2016). Reunanen and Taatila (2021) found correlations between teachers' felt justice and student satisfaction, indicating that teachers may transfer their satisfaction and emotions to the teaching they offer, thus their experiences of the design are important. Investigating the teachers' negative and positive experiences of the ODP design may prevent the transmission of possible negative feelings to the students in the implemented ODP education.

Research design

This is a qualitative design-based research (DBR) study, which is part of a wider DBR process to create a model for holistic design of ODPs (Figure 1). The DBR process consists of four cycles completed during the years 2017-2021 and focuses on how to organise the basis for and implementation of an ODP that is offered in a HE organisation where ODPs have not been implemented before and are thus a new type of educational service.

Figure 1

Cycle 2 of the design-based research process

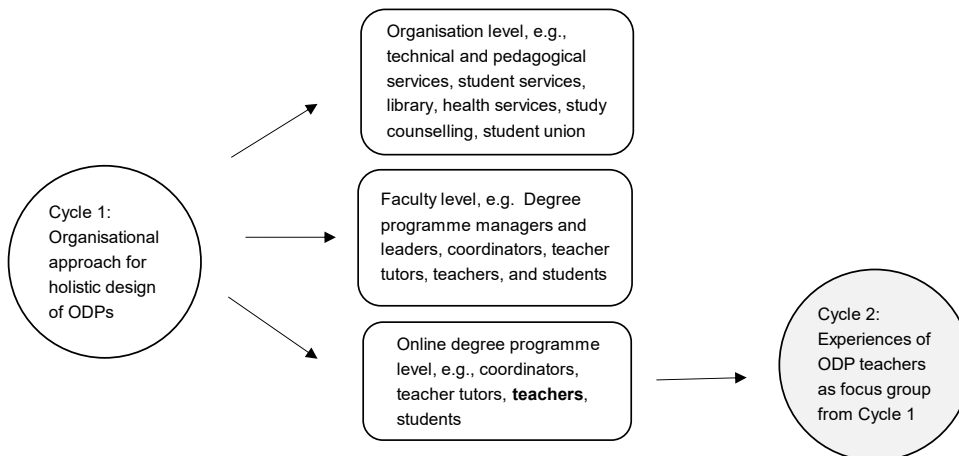


Cycle 1 of the DBR process approached the design from an organisational and pedagogical viewpoint to establish the basic infrastructure and conditions for ODPs to be offered in a digitally competent HE organisation as a new type of degree education. The initial model created as a result of Cycle 1 comprises three levels: organisational, pedagogical and online degree programme, where each level contains several design principles to be included in the holistic design of ODPs (Joshi, 2021). Cycle 2 presented in this paper continues the DBR process by investigating the experiences of the first ODP teachers in the HE organisation. Later studies develop the model further by examining the experiences of the ODP students in an international and multicultural context (Cycle 3), and by investigating ODP elements in the design of ODPs for national cross-studies and integration of sustainable development (Cycle 4).

According to DBR, the researcher is an active part of the research process and the development work is done in a local context to develop pedagogical processes (Collins et al., 2004). DBR can be used to address real-life situations and contexts together with practitioners (Wang & Hannafin, 2005). In this study, practitioners are teachers, whose experiences and role in the real-life context of the online degree programmes are examined (Figure 2).

Figure 2

Stakeholders in Cycles 1 and 2 of the DBR process.



The focus of Cycle 2 is how the ODP teachers experienced the initial holistic design model at the beginning of the implementation phase in an organisation where online degree programmes have not been implemented before. The main research questions to be answered in this study with this empirical data are:

1. How do the ODP teachers experience the elements of the initial model created in Cycle 1? (Phase 1)
2. How can their experiences be used to develop the model further? (Phase 2)

Alghamdi and Li (2013) suggest that design-based research can be used to bridge the gap between theoretical studies and practical solutions within educational research. DBR is considered suitable for the purposes of this study, as it uses theoretical studies combined with empirical data to create a practical solution, i.e. a model for creating ODPs in the practically-oriented HE organisation where ODPs are a new type of degree education (Cycle 1). Also, it is further developed based on practitioners' experiences, i.e., ODP teachers (Cycle 2, Phase 1). The DBR research takes place at a local level, meaning that the participants in the process are also taking part in the design process, which makes the ODP teachers an important informant for further development of the model.

Plomp (2007, 15) defines design research as something that is used “to design and develop an intervention as a solution to a complex educational problem as well as to advance our knowledge about the characteristics of these interventions and the processes to design and develop them” and uses the term ‘development study’ to describe a type of study where the goal is to develop a research-based intervention as a solution to a complex problem and create design principles as the outcomes of the study (Cycle 2, Phase 2). The DBR Cycle 2 consisted of two phases (Table 1).

Table 1*Methods and focus of data collection in DBR Cycle 2*

DBR Cycle 2	Method	Data
Phase 1	Focus group interview	Experiences of ODP teachers categorised in three dimensions to reveal positive or negative experiences or new suggestions placed in the elements of ODP design from Cycle 1
Phase 2	Comparison	Comparing the interview results with the design principles from DBR Cycle 1 to add new design principles to further develop the model

The data in Phase 1 was collected using the focus group interview method where “a small group of people engage in a collective discussion of a topic” and where the researcher moderates the discussion using a set of questions and a stimulus to provide a starting point for the discussion (Edwards & Holland, 2013, 37). The purpose of the focus group interview in this study was to “collect feedback on results or for assessment in an evaluation design” (Edwards & Holland, 2013, 38). The data was collected in two separate data collection sessions in the autumn of 2017, i.e., one month after the online degree programme implementations had started, thus enabling teachers to reflect on the design process that took place before the implementation. The two data collection sessions were held in a different language, Finnish and English, as some of the participating staff was English-speaking.

The interviews were conducted by the authors of this paper, where the main author was responsible for the pedagogical design of all new ODPs in addition to operational management of one of the ODPs in question. The second author represented the Higher Education Research Group and Future Learning Design team, the latter being responsible for e.g., the development of teaching and learning related processes, the implementation of the pedagogical strategy and in-service training of teachers. The participants were informed of these roles at the beginning of the discussion.

The interview group was formed to represent the three Bachelor level ODPs that were under construction in the HE organisation in 2017. More specifically, the discussions were held with those ODP teachers who were involved in the design phase of the three ODPs of different study fields that each had a different profile: The International Business degree programme had 49 students in the first cohort, with 11 teachers and instruction in English, whereas Media Production and Social Services degree programmes had 20 students in the first online cohort, with five teachers in each, and instruction in Finnish. The estimated graduation time was 3.5 years for the International Business and Social Services programmes, whereas it was only two years for the Media Production, as their students' basic studies were accredited based on prior competence at the beginning of their degree studies.

The interviewees were invited to the discussion via email and informed that the purpose of the interview was to develop the design and implementation of ODPs in the organisation. They were also informed that the interview followed a structured format where both groups would be asked the same questions in the same order (Edwards & Holland, 2013), but in a different language. The interviews were recorded with the informed consent of the respondents to be transcribed for analysis. In total, nine teacher tutors and head teachers took part in the focus group discussion. In the HE organisation in question, teacher tutors are responsible for tutoring and guiding a specific year group of students, which in this study referred to the first cohort of the respective ODPs. Head teachers are responsible for the content of a specific curriculum or module of the programme, and in this case the head teachers were responsible for the first academic semester of implementation of the new ODPs.

The teacher tutors and the head teachers were invited as they were involved in the design of the programme with the coordinators of the programme. The coordinators were not invited to the discussion as it was considered they were responsible for the design of their respective online degree programmes and their views may be more influenced by the design phase instead of the experiential data that could be gathered from the teachers. Most of the participating teachers had some experience of teaching online or blended courses, but none of them had any experience of teaching in an ODP and therefore taking part in the design of an ODP was new to all of them.

The atmosphere in the interviews was open and the participants were willing to share their views. The interviewers proceeded question by question and everyone was given a chance to share their views on each of the questions. Further clarification and additional questions were presented in those parts where the participants wanted additional information to provide their answers.

The interviewers showed the initial holistic design model at the beginning of the interview as a stimulus and explained that the structure of the interview would follow ten questions based on the model. As an example, the interviewees were asked how the design had supported their professional development as an ODP teacher, how the strategy of the HE organisation had supported creating the ODPs, and what had been their role in it as ODP teachers. Other questions concerned continuing professional development, the use of pedagogical frameworks, collaboration, the development of learning environments and support from management.

The total length of the interview recordings was 2:08:39 minutes. The audio recordings of the interviews were first transcribed verbatim by each of the interviewers so that one interviewer transcribed the English interview and the other did the Finnish interview. The transcripts were then uploaded onto a shared network folder maintained by the Future Learning Design team for the authors' collaborative process of thematic content analysis. The transcribed material was altogether 31 pages (14,767 words).

The interviewers then coded the data on the digital transcripts. The purpose of coding is to pattern, classify, and reorganise the collected and transcribed data into categories to analyse it further (Saldana, 2011, 95). The transcribed data was coded using in vivo coding where the code is based in the actual verbatim language used by the interviewees and seems to be significant or stand out (Saldana, 2011, 99). The unit of analysis varied between a word, a sentence and a longer passage.

Three dimensions were used as categories for the coding to reflect the experience of the teachers: negative, positive and new suggestion. The negative and positive experience was considered as something that the person felt and expressed as having experienced regarding that question. The new suggestion was considered as something that the person had not experienced but suggested being included or considered in future iterations of the design. The frequencies of the coded data were then placed in themes that represented the elements of the initial design for reflective analysis.

After completing the individual analysis, the interviewers discussed the thoughts and coding sets in one data session. Then, in Phase 2, the results were compared with the elements of the initial holistic design model for ODPs created in DBR Cycle 1. New design principles were formulated to reflect the teachers' experiences to be included in the model.

The following section presents the data and results, followed by an analysis with quotes for each theme to represent the experiences. Finally, the new design principles based on the results are presented.

Results

Table 2 below shows the overall experience of the interviewees in the three categories of experiences when compared with the elements of the initial ODP model created in Cycle 1 of the DBR process.

Table 2

The frequency of the teachers' experiences according to the elements of the initial ODP model

Elements of online degree programme design from DBR Cycle 1	Experienced positively	Experienced negatively	New suggestion
1. Investigating HE and institutional strategies for pedagogical choices	7	15	6
2. Completing a quality framework self-assessment for implementation of online degree	0	0	0
3. Developing a curriculum for online degree education	10	1	0

Elements of online degree programme design from DBR Cycle 1	Experienced positively	Experienced negatively	New suggestion
4. Offering continuing professional development for online degree teachers	9	13	12
5. Collaborating with internal partners for consistency of standards	9	10	17
6. Creating materials for marketing and communication of pedagogical choices	0	1	0
7. Creating course and degree design templates for consistent implementation	9	4	1
8. Setting up online and on-site teaching and learning environments	5	14	4
9. Arranging continuous support for staff and students for implemented online degree education	4	1	8
10. Creating a community and a sense of belonging for online degree staff and students	4	1	1
Total	57	60	50

The positively experienced elements of the initial design model with the three highest frequencies were 1) Developing a curriculum for online degree education (n=10); 2) Offering continuing professional development for online degree teachers (n=9); Collaborating with internal partners for consistency of standards(n=9); Creating course and degree design templates for consistent implementation(n=9); and 3) Investigating HE and institutional strategies for pedagogical choices (n=7).

The negatively experienced elements with the three highest frequencies were 1) Investigating HE and institutional strategies for pedagogical choices (n=15); 2) Setting up online and on-site teaching and learning environments (n=14); and 3) Offering continuing professional development for online degree teachers (n=13).

The new suggestions with the three highest frequencies were 1) Collaborating with internal partners for consistency of standards (n=17); 2) Offering continuing professional development for online degree teachers (n=12); and 3) Arranging continuous support for staff and students for implemented online degree education (n=8).

RQ1: How do the online degree teachers experience the elements of the design?

Element 1, Institutional strategies, was the most negatively experienced. The negative experiences relating to institutional strategy were mostly related to lack of resources, lack of time, lack of infrastructure and lack of understanding or support from management. Comments included being “short of time” and “how much resources do we have”. Suggestions made included creating suitable infrastructure, increasing awareness of online teaching and including research elements into resourcing of teaching.

Surprisingly, the use of quality framework, element 2, did not receive any comments or

suggestions.

Element 3, Curriculum development, was the most positively experienced element and received comments about the practical and concrete support it offered for designing online teaching, one comment being “the pedagogical curriculum model has really helped structure all the necessary parts that one has to design”.

Negative experiences relating to element 4, Professional training, were mostly related to lack of technical training, but there were some mentions of lack of pedagogical training as well, including other pedagogical approaches than relating to online pedagogy. More than one teacher said they felt “overwhelmed with technology”. However, it can be seen as a positive aspect that professional development also received the most suggestions for new ideas, such as “getting more hands-on guidance” or “getting videos about how to use the online teaching studio”.

Element 5, Collaborating with internal partners, received the highest number of new suggestions, relating to sharing of experiences, co-creating and co-teaching. For example, some suggestions made by the teachers were “sharing our experiences to learn from each other”. One interviewee stated that “exchanging ideas along the way” would be important and another one suggested “exchanging experiences purely online”. The negative aspects of internal collaboration concerned lack of information sharing, too much hierarchy and too much time spent on this aspect. One teacher mentioned “the process is separate from my own reality...and the model needs to be test-driven first” and another one stated “there were too many hierarchical levels to the online degree design process”.

Element 6, Marketing materials, received only one comment relating to marketing not having been successful in communicating to students about the study methods and pedagogical approaches.

Element 7, Course templates, was seen positive because of easing the workload, offering students a standardised approach on courses and saving time in planning and design phase of teaching. A good example of this was one teacher’s comment that “the templates make it more unified, easier for the students... and that it saves time”.

In terms of Element 8, Online and onsite environments, the comments revolved mostly around the lack of access to onsite teaching environments, the usability of online environments on campus and off campus, as well as technical solutions and equipment provided. One teacher commented that they “were supposed to have received more training for teaching online” and other comments included “lacking access to all environments”.

The teachers expressed in their answers that Element 9, Continuous support, is important in technical, pedagogical and collegial aspects and seemed to be lacking at the moment. For example, one teacher mentioned it would be important to have “IT support for the first

Teachers' Experiences and Role in the Design Process of Online Degree Programmes in Higher Education sessions...or in the background”.

Element 10, Creating a community, was experienced mostly positively. One teacher mentioned how being part of designing a new type of degree felt like being part of something important. Collegial support was seen as important as well, with one teacher saying, “it helps if you are together with others outside of your comfort zone with somebody else”. There were some mixed experiences about the success in creating a community for students in the ODP.

RQ2: How can their experiences be used to develop the ODP design further?

In Phase 2, the empirical data was compared with the design principles from DBR Cycle 1 to create new design principles to complement the initial model. Those experiences or suggestions that had already been included in the initial design principles were left out, and those that had not yet been included were formulated into the new principles. The design principles are divided into three layers (organisational, pedagogical, online degree programme) according to the initial three-tiered model created in DBR Cycle 1 (Joshi, 2021). Based on the ODP teachers' experiences, the design principles for the holistic design of new ODPs in HE organisations are as follows:

Organisational layer

- Include organisational community, management support and future predictions and redesign the ODP based on those
- Enable internal collaboration not only to create consistency but to create a link between the online and onsite degree communities
- Enable internal collaboration amongst the ODP staff in different ODPs
- Make collaborative activities as well as co-creation and co-design central in the design process of a new ODP
- Offer managerial support in implementing ODP as a new type of education
- Allow discussions between various stakeholders of the organisation during the ODP design process
- Create a sense of community and belonging for the ODP to the entire organisation
- Give ODP teachers opportunities to link their online teaching role to the onsite role

Pedagogical layer

- Offer possibilities for collegial support and sharing of experiences and solutions in terms of professional training, mentoring and collaborative design in the ODP
- Give support for both the pedagogy and technology in the various environments of the ODP, extending from campus to home and from online to onsite
- Inform future students of the pedagogical solutions in the online environments of the ODP through marketing of the ODP

Online degree programme layer

- Facilitate the need to belong to both online and onsite degree community of the entire organisation for both students and staff
- Support their need to collaborate and be supported in the ODP and as part of the organisation.
- Support their needs of the ODP education and community in international and intercultural contexts
- Include online degree teaching staff and students as active participants in the co-design of an ODP

The teachers' experiences revealed important points about their positive and negative experiences as well as their new suggestions. These will be used to further develop the holistic ODP design model in future DBR cycles. The following sections discuss the results, followed by the limitations and possibilities for further research.

Discussion

This qualitative design-based research (DBR) study presents the case of a HE organisation in the field of applied sciences in Finland where ODPs were implemented for the first time. The study investigated the experiences that the first online ODP teachers in the organisation had of the holistic design of ODPs. Their experiences will be used to develop the model further in the local context.

According to Xiao (2018), online and distance education have become an equally integral part of higher education as traditional campus-based has been. It was important for the HE organisation to create a model for the first ODPs as a new type of education. The model could support the implementation of the organisation's pedagogical strategy online, as suggested by Green et al. (2010), since frameworks and models for technology-enhanced learning designs vary in terms of pedagogy (Bower, 2018).

Honkimäki et al. (2021) recommend involving academic staff in the change process of a new university-wide reform. Badia et al. (2019) state that it is important to include teachers' experiences in the design of the degree. The change from traditional campus-based degree teaching to fully online degree teaching for the first time was significant for the entire HE organisation presented in this study, and the same experience was reflected in the teachers' answers. Teachers seemed to be willing to participate in the design process and were willing to share their positive and negative suggestions as well as make new suggestions to facilitate the change process.

The first ODP teachers were also representing the change in the teacher's role. The teachers did not have previous experience of teaching in an ODP, although some of them had experience of online teaching. It is interesting to reflect how their teaching identity may have to be adjusted in ODP teaching contexts, as they may not have previous

experience of teaching in a fully online experience, which may in turn become a source of technostress, as indicated by Syvänen et al. (2016). Teachers experienced institutional strategies negatively, referring to lack of time, infrastructure and support. This supports earlier findings of barriers experienced by online teachers, where faculty support is needed to manage the workload and policies in transferring to online teaching (Kellen & Kumar, 2020) and training is essential in supporting novice teachers (Murtonen & Vilppu, 2020).

It was important to gain their views to understand their support needs better. This showed clearly in the results, since out of all suggestions the teachers made, the highest frequencies of suggestions were related to support and training. For example, they made several new suggestions regarding collaboration with internal partners, and this may point to the findings by Murtonen and Vilppu (2020) that teachers want collegial support but there may not be enough of it. Tondeur (2018) highlights that integrating technology into teacher design teams can only work if both team and institutional level conditions are observed. This study supports their findings, as it can be concluded that teachers seem to experience organisational, managerial and collegial support important in implementing the ODP education in the whole-of-institution design model. This may also reflect the specific need in the field of applied higher education to consider how to implement the practically oriented teaching and learning online.

The teachers' need for collaboration was highlighted in many aspects, but a surprising result was their desire for closer collaboration between online and onsite community for both teachers and students. According to Damsa et al. (2021), teachers need support in the development of teacher's agency in digital contexts. The surprising result of creating a closer bond between online and onsite teaching community may reflect the need to extend their established campus-based onsite teacher's professional identity to that of the online role, as none of the participants had any prior experience of ODP teaching. Enabling collaboration between online and onsite community needs more research in future iterations of the design.

Professional development is identified important in previous research (Naidu, 2019; Murtonen & Vilppu, 2020), and the results of this study confirm that participating in the development of a new type of education creates new needs but also possibilities for professional development. It is possible that teachers find participation in the design of an online degree programme as an interesting new opportunity where they can learn about and develop technology-based teaching solutions instead of focusing only on the content and subject expertise. This encourages organisations, managers and coordinators to involve their teachers in the design process of new online degree programmes.

Konst and Scheinin (2018) state that in today's world, work is not a constant or stable part of teacher's life, and teachers must adapt and adjust quickly to changing demands of their work. This may be reflected in the interesting notion the teachers made about extending the working environment from campus and online to off-campus and home-based work.

The teachers expressed the need for support in changing work environments, which was also stated important by Cober (2015) and Chie et al. (2018).

Organisations should ensure that the teachers feel they are heard, so that they transfer their positive feelings to students, as Reunanen and Taatila (2021) suggest there may be a correlation between the two. In this study, the teachers' experiences were examined to find out their negative and positive experiences of the ODP design model to develop it further and to avoid possible negative feelings to be transmitted to the students in the implemented ODP education. This is an important factor for the HE organisation where standardised quality education should be offered through shared design and practices, as suggested by Paniagua and Istance (2018). Moreover, the online degree students are likely to benefit from well-designed integration of the pedagogical approach in the implemented ODP studies if the teachers' feelings are heard already in the design stage.

The teachers' role as active participants in the design of ODPs as a new mode of degree education can add value to the design process. Their experiences as practitioners of pedagogy can help develop organisation-wide implementation already in the design phase and ensure the consistency, collaboration and involvement at whole-of-institution level, as emphasised by Kek and Hujser (2017). In addition, internal support services may gain a clearer understanding about the intentions of the degree programme teaching and the type of support that is needed. It is important for the organisation to understand what kind of support the teachers and students need in the new type of education where there is no previous experience of constructing, implementing or providing ODP education.

Limitations

This study has some limitations. Firstly, it represents the experiences of only those teachers that took part in the initial stages of the design and implementation of the first ODPs in the described HE organisation. The data was collected through focus group interviews, and although the number of interviewees was relatively small, due to small total number staff in the ODPs at the time of data collection, it represents the target group well. However, it can be seen as strength that the interviews were held in multidisciplinary groups, which enabled a wide reflection of views which was not limited to a specific degree programme or study field.

As the HE organisation had no prior experience in the design and implementation of ODPs, the view presented is limited to previous literature and empirical data from the local context. The study could have been strengthened by investigating the views of those HE organisations where ODPs have been offered for a long time and experiences are wide. However, this study may be useful for other organisations that are starting to construct ODPs for the first time.

Another limitation is that due to the early phase of implementation of the ODPs in

question, the view of the participants may have been limited in terms of their understanding about ODP design and implementation process of online degree education that is offered fully online. It is possible that their views may therefore reflect experiences of online teaching in general, however, these views may still be applicable to the context of ODPs as well.

Finally, one limitation is that the researchers were actively involved in the ODP design process and therefore it may be considered a risk that their subjective experiences influence the research. However, as one of the key ideas of a design-based research process is the close connection between researchers and the context of the research, this can be seen as a possibility for deeper interpretation of the results.

Further research

In a DBR process, the researchers are active participants in the research process and find new ways how the design can be applied in new contexts (Collins et al., 2004). One objective of DBR is to communicate research and its implications for a wider audience. This study offers possibilities for many new research topics that can expand our understanding about how to design and support online degree programme implementations in higher education, and some of them will be explored in the future cycles of this DBR study and tested in the local context of the HE organisation.

One interesting aspect that was raised in this study was to consider the international and intercultural aspects of online degree education. Also, students' viewpoint should be included in the design. The following cycle of this DRB study will therefore focus on international and intercultural aspects of ODPs and presents the view of ODP students.

Further research is needed in policy, administrative structures and pedagogical solutions. Future visions for online degrees and shared practices across universities on a national level need to be addressed and more research is needed on common solutions, frameworks and models that can be used for ensuring quality of teaching and learning on a wider national and international scale. The fourth cycle of this DBR study will focus on online degree studies offered as national cross-studies.

More research is needed to see how to better incorporate online and onsite teaching staff and students through collaboration activities. A valuable topic may also be to investigate how online degree teachers experience their work identity, and what are the possible changes in the teacher's identity when working fully online.

It may also be worth exploring how the design principles created for ODP may be relevant in the design of blended degree programmes where online education forms a major part of the studies. The results could also be compared with those HE organisations where ODPs have been offered for a long time to investigate how the needs of organisations and teachers may change as more experience in offering ODPs is gained.

Conclusion

The results of this study contribute to the previous research of online degree programme (ODP) design, especially in the field of applied higher education where it was important to consider how to implement the practically oriented teaching and learning through technology and pedagogy. In addition, the study adds to previous research on the use of design-based research in the holistic design of ODPs. The design principles were created based on the theoretical information and empirical data that were placed in the context of the initial holistic model for ODP design. The design principles can be used when designing and developing ODPs as a new type of educational service in other HE organisations.

The results presented in this paper are especially relevant now, as the research was done prior to the COVID-19 pandemic when online degree programmes were not offered widely, and experiences of online education were limited in places. Following the pandemic, many higher education (HE) organisations are planning to or have already implemented online and hybrid modes in degree education (OECD, 2021). Those HE organisations that do not have previous experience of constructing ODPs may find the design principles useful in the change process to the new type of education, especially if they are interested to create university-wide practices for the design of ODPs. The results may also give them a better understanding about the teachers' needs and experiences in their new role as ODP teachers.

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