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Academics´ experiences of participating in a microcredentials development experiment

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ABSTRACT

CONTEXT

Digital microcredentials are an emerging tool to provide students with flexible access to learning materials. There is a lack of consensus regarding the definition of microcredentials and their role in engineering education; as a result, universities are exploring microcredentials in their own way. Aalborg university´s engineering students have historically all been full time on campus; this paper reports reflections on the development of its first digital microcredentials by academic staff.

PURPOSE OR GOAL

This paper explores the motivation, practices, and challenges faced by academic staff involved in the development of microcredentials. Using interview data, the study answers two research questions: *How can a traditionally face-to-face university best support the implementation of microcredentials based on the experiences from the microcredential experiment? How do the academics who partook in the experiment envision the future of microcredentials based on their experiences developing them?*

APPROACH OR METHODOLOGY/METHODS

To address the research question, this paper employs a qualitative research methodology. The study employs semi-structured interviews with seven members of academic staff who developed five different microcredentials. The interview data was transcribed and analysed using an inductive, thematic network analysis in NVivo, allowing for identification of key themes.

OUTCOMES

The interviews reveals that the participants believe in the importance of microcredentials as a supplement to existing courses. The participants drew on prior experiences when developing microcredentials, resulting in a strong reliance on video-based formats. Moreover, the participants express a desire for guidelines that still would let them maintain their autonomy.

CONCLUSIONS/RECOMMENDATIONS/SUMMARY

Consistent with current literature, the participants expressed a need for a well-defined understanding of microcredentials before the university embarks on the creation of new microcredentials. They also called for an institutional framework which could serve as support for the participants without constraining the individual freedom over the microcredentials design.

KEYWORDS

Microcredentials, digital transformation, curriculum development

Digitalising the on campus experience

Aalborg University has traditionally adhered to an on-campus educational model, emphasising face-to-face activities to provide students with a synchronous on-campus experience. This approach has been highly appreciated by students who value the nature of in-person education.

The university has been considering options for the digitalisation of its teaching model for some time. The emergence of the COVID-19 pandemic accelerated this transition, necessitating an abrupt transition to emergency remote instruction, and leading to a broader discussion about the role of digital learning tools in shaping the future of education. These developments have prompted organisational leaders and academic staff at Aalborg University to engage in discussions regarding new approaches to facilitate learning in an increasingly digital space.

Among the strategies proposed at the university, to adapt to the changing landscape is the implementation of microcredentials as a supplement to existing courses (Lindsay et al. 2023). Microcredentials have gained recognition at an organisational level for their potential to enhance student learning outcomes and facilitate lifelong learning, extending the potential of other digital learning approaches (such as MOOCs) by formalising learning outcomes with some kind of credential. This viewpoint aligns with Oliver (2019), a pioneer in the field, who defined microcredentials as:

> *A microcredential is a certification of assessed learning that is additional, alternate, complementary to or a formal component of a formal qualification.*

Oliver's definition allows for many types of microcredential implementations, which can be utilised both as standalone components and as supplements to traditional courses. A defining characteristic for both usages is the need for certification to recognise the learning associated with the course. The flexibility in the use of microcredentials poses challenges in defining the term and implementing microcredentials within the traditional, standardised practices that shape the on-campus academic development (Lindsay et al. 2022).

Academics face clear challenges when transitioning from face-to-face teaching to implementing digital microcredentials. This change requires them to rethink learning and student involvement, which can be a significant adjustment depending on their prior experience with online education. To support this transition, Aalborg University introduced workshops like "Microcredentials in a Million Ways" to inspire academics regarding the implementation of digital learning tools. Nevertheless, these workshops refrained from providing a precise definition of microcredentials, allowing academics to develop their own understanding of what they are and can be.

In the second half of 2022, Aalborg University implemented a microcredential experiment, supporting the development of around 30 microcredentials across the Engineering faculty. The purpose of this paper is to examine and report on the experiences and perceptions of academics who developed microcredentials as a part of this experiment. As there are multiple ways to facilitate microcredentials, the outcome of this paper will serve to gain a better understanding of how institutions can support academic personnels developing microcredentials and how these efforts are influenced by academics' visions of the future of digital microcredentials. This leads to the following research question:

> *RQ1: How can a traditionally face-to-face university best support the implementation of microcredentials based on the experiences from the microcredential experiment?*

> *RQ2: How do the academics who partook in the experiment envision the future of microcredentials based on their experiences developing them?*

This paper will provide a description of the experiment and an account of the methodology employed for data collection. The main findings from the interviews will be presented and analysed, forming the basis for a presentation of how to best support academic staff in developing microcredentials at an historically on-campus university.

The microcredential experiment

In 2022, the engineering and science faculty at Aalborg university launched its microcredential experiment, providing financial support to academic staff who wished to develop microcredentials. The project was deliberately facilitated as an experiment, granting participants substantial freedom in shaping their courses, with the only requirement being that the microcredential must be digital. The main objective of the experiment was to create and acknowledge alternative and flexible digital learning opportunities for students and supplementing traditional face-to-face teaching.

The participants in this experiment were discipline experts in the fields of engineering and technology studies, with experience in both teaching and researching in their respective fields. They developed microcredentials on various topics, including lab safety, emotional leadership, energy consumption in buildings, basic physics, and encryption. Academics had to apply to participate in the experiment, and they each received funding for approximately 50 hours of work to develop the digital microcredential courses.

As part of the digitalisation agenda, academics were invited to attend three workshops aimed at introducing approaches to develop digital microcredentials. The purpose of these workshops was to support the participants, allowing them to explore ways of structuring digital microcredentials before implementing institutional guidelines. In addition to the workshops, academics received invaluable support from the education designers at the university's Center for Digitally Supported Learning (CDUL). The primary focus of CDUL's work is to aid academic staff looking to enhance their proficiency in the realm of digital learning and teaching. They lent their expertise in various aspects of the process, such as aiding in the creation of storyboards, facilitating the filming process, and managing the distribution of microcredentials through institutional platforms.

During the experiment there were ongoing discussions regarding the accreditation of microcredentials at Aalborg University. Organisational strategies such as digital badges, diplomas, or accreditation have been discussed as part of the experiment, but no finalised strategy has been implemented.

Although the knowledge gained from the microcredential experiment provides valuable insights for other institutions planning on implementing microcredentials, the transferability of these experiences must be approached with an understanding of the specific educational system, institutional culture, and geographical and political factors unique to the Danish context. For example, the Danish geographical proximity between students and campuses does not provide the same incentives to transition from face-to-face lectures to online microcredentials as in other contexts, such as Australian regional engineering schools. Additionally, the development of new courses in Denmark is influenced by political factors due to the country's welfare state, which limit the freedom and flexibility of the individual universities.

By the scheduled end of the experiment, the initiative had resulted in the creation of 28 microcredentials at different stages of completion. To better understand how to best support the development of microcredentials at an organisational level going forward, we interviewed academics who successful finished their microcredentials within the given time. The study reported in this paper was approved by the Aalborg University Human Research Ethics Committee, case number 2023-505-00024. In the following section, the interview and analysis methodology will be described.

Gaining insight into the experiences of developing microcredentials

This paper utilises a qualitative research methodology to explore the experiences of academics who participated in the microcredentials experiment. The study involved conducting five semi-structured interviews, each lasting approximately one hour (Kvale, 2007). Seven academics were selected as participants based on their successful completion of their microcredentials within the experiment timeframe. It is recognised that this is a biased sample as it focuses on academics who were successful in the development of microcredentials. These interviewees possessed the necessary confidence to make decisions without a clear framework. Therefore, moving forward it's crucial to capture the experiences of academic staff with diverse backgrounds in facilitating digital learning or facing distinct challenges in microcredential development.

Prior to the interviews, the participants were informed about the purpose of the study, and their consent was obtained. To ensure consistency and comprehensive coverage of the research question, an interview guide (Kvale, 2007) was developed based on the findings from the report of the overall digitalisation experiment AAU Micro. To gain a understand how the interviewees planed the development of their microcredential and understood the future of micro credentials at Aalborg university, the interview builds upon the following themes:

1. Introducing the participant and their microcredential.
2. Collaboration with other participants who took part in the experiment and usage of institutional, digital support structures.
3. The participant’s views of the future of microcredentials at the university.

Two of the interviews were conducted online due to geographical constraints. With the participants' consent, all interviews were recorded using a recorder, and the Microsoft Teams transcription tool was employed. The transcripts were carefully reviewed to ensure accuracy.

For data analysis, NVivo software was utilised, employing a thematic network analysis approach (Attride-Stirling, 2001). The data were analysed using an inductive approach utilising data familiarisation, initial coding, and organisation of themes, to ensure the relevance of emerging factors in the interviews. This analysis identified five key themes.

Academics believe in microcredentials but they don’t volunteer to develop them

The participants emphasised that regular students could benefit from asynchronous learning materials, enabling them to have greater control over their own learning by accessing the material whenever they needed to fulfill specific learning needs. The interviewees highlighted the importance of greater flexibility and accessibility in learning through digital microcredentials as a significant factor that motivated their participation in the experiment. One participant explained,

> *So that's one of the largest advantages for me is that they, the students can see when they like in the at the speed they like and resee it when they feel the need to.*

Furthermore, the use of microcredentials to make research-based knowledge accessible beyond the organisation was seen as a crucial incentive for developing these courses. The interviewees also pointed out that microcredentials facilitated knowledge dissemination across traditional academic departments, which further motivated their involvement in the experiment. One interviewee reflected on the changing role of the university in this context, stating:

> *(…) I like the idea that everything we do at a university should be publicly available all the time. I mean, all the funding I get is public money, so it is the broad society that fund my research.*

In contrast, the financial support associated with the experiment was not a determining factor for the participants when deciding to take part in the experiment. All participants reported not receiving the financial support directly and instead viewing it as part of the broader departmental budget. This underscores the importance of institutional support as a basis for their participation.

All interviewees mentioned being approached by their department leaders, who encouraged them to participate in the experiment. One participant expressed,

> *I had no idea what was going on because sometimes there's so many initiatives (…) but then our deputy head of department for teaching he came and said ohh you see and this, they are making these microcredentials. I think that would be a very good idea for your (…) safety course.*

In this context, the motive to participate was not directly tied to the microcredential experiment itself but rather aimed at gaining support from department leaders for future projects.

The incentive of academic staff to participate in the development of microcredentials can be attributed to two main factors. There was a desire to utilise microcredentials to expand upon the learning experiences associated with traditional face-to-face teaching. The solicitation and support from department and study leaders played a crucial role in incentivising academic staff to engage in the experiment. This highlights the importance of both pedagogical considerations and organisational support in motivating academic staff to develop microcredentials.

Prior experience with online learning influences engagement with digital support

The interviews revealed a significant disparity in the extent to which participants utilised the digital support structures provided by the experiment organisers. Three interviewees reported actively participating in the workshops and collaborating with CDUL during the filming process. It is worth noting that these three participants mentioned having limited experience in facilitating digital teaching or working with digital video tools, unlike the other interviewees who explicitly mentioned their prior experience facilitating digital learning.

The three participants did not utilise the support structures from the beginning when planning their courses, and expressed an initial struggle to understand what resources were available and how to access them. As a participant later acknowledged, the support structures were not fully in place at the beginning of the experiment, leading to confusion amongst academic staff.

On the other hand, when these interviewees made use of the available digital support structures expressed great satisfaction with the final product, including the videos and the collaborative process behind them. One participant highlighted the positive impact of the implemented support on the participants who chose to utilise them:

> *I mean, for one thing, they filmed me. So, I went there, and (…), I had prepared slides and talk and things like that. (…) But I think they were really kind of nice people and very helpful.*

Four of the interviews involved participants who had significant prior experience developing digital learning materials. This group did not utilise the available support and instead independently developed the material, leveraging experiences from existing online resources such as online courses, filmed lectures, and familiar video editing programs. The microcredentials they created primary took the form of online video materials. Though these participants didn't utilise the support system, they all valued knowing that such a support system was available.

In contrast to the first group, these participants did not place a high value on their individual visual presence. None wished to show their faces in the microcredentials, arguing that the learning outcomes were more important than their online presence. They explicitly opposed including their faces in the material. In addition, they also chose not to utilise the available video support.

The platform matters

All participants expressed a desire for guidelines and support regarding the platforms that formed the basis for the microcredentials. The primary learning support platform used by the organisation as a whole is Moodle, while Eduflow had been specifically acquired to explore opportunities for digital learning. The platform theme in participants' responses had two dimensions. Firstly, there was confusion among participants regarding which platform to prioritise during the development

of the microcredentials. Secondly, there were difficulties in getting the platforms to support the individual courses and ensure accessibility. Challenges included uploading video materials, creating quizzes, and issuing certificates. One participant described this dilemma, saying,

> *There (Moodle) you can have slightly better questions than Eduflow, but not still not in the vicinity of Moodle. Not near as good as what Moodle can do, but (…) then in Moodle it's apparently extremely complicated to design a flow of videos with the quizzes and that then also (…) hands out certificates.*

Additionally, Moodle requires student access, limiting access to the material to already enrolled students. While participants acknowledged that CDUL was working on a solution, it was identified as an important problem to resolve before developing further microcredentials.

During the interviews, a potential solution to this problem was discussed, suggesting the uploading of courses to social media platforms such as YouTube or LinkedIn. Participants had mixed reactions to this idea. Some viewed it positively, as it would help ensure that research-based knowledge is available beyond the confines of the university, thereby strengthening the possibility of lifelong learning. Others perceived it as detrimental to the university's credibility as a knowledge provider. Consequently, this aspect of microcredentials requires further exploration and organisational-level discussions.

All interviewees highlighted the need for a systematic approach to the distribution and feedback of microcredentials. Multiple academics expressed a desire to have an overview of where, when, and by whom the material is being used. The lack of such an overview negatively impacted their willingness to develop more microcredentials. One interviewee stated,

> *I think it is unfair to make such a work and so many hours and so many money (…) And it is still in the what is called…. Skuffen (the drawer).*

The wish for a systematic overview of material usage is also tied to questions of ownership and rights to use the material. As outlined in the final report of the digitalisation project (2022), individual developers retain the rights to the material, while Aalborg university has the right to use it. Developers are not remunerated for the use of the material and have the right to withdraw it if they leave. Rights to video material can be withdrawn at any time. The participants' lack of insight into this information highlights the need for improved communication and dissemination of such.

Institutional support structures are vital for effectively supporting the development of microcredentials at a traditional face-to-face university. All the interviewees emphasised the need for such support, which includes recognition and support from department leaders, as well as accessible assistance throughout the development process. This support can involve guidance in decision-making regarding the structure of microcredentials, assistance with choosing appropriate digital tools, and support with filming and editing. The participants highlight the importance of making contact information for the support structure easily accessible and providing information about existing support structures, such as through dedicated websites.

Academics wants both templates and autonomy

As discussed in previous sections, the lack of clear guidelines in the microcredential experiment influenced how participants approached the creation of their microcredentials. While some participants acknowledged that this approach allowed for greater creativity, a recurring theme was the desire for clearer guidelines moving forward. The lack of guidelines was directly identified as a hindrance by one participant, who emphasised the need for a clear framework, stating,

> *I have and I think everybody had that that there was sort of like, OK, we need to do microcredentials, OK, what is it? We don't know. How? What platform should we know? Work try something right? So so we couldn't get any answers.*

To address this issue, the academics suggested the development of clear guidelines and templates, creating a structured framework for what a microcredential should be, how it should be

developed, and which platforms should be used for delivery. However, none of the interviewees desired a template that would limit their individual freedom over their courses. On the contrary, they saw it as a potential deterrent to the development of microcredentials among the academic staff. This sentiment was underscored by one participant, who stated,

> *You have to do it this way and only this way. Then we go back, say you can do it yourself, can't you? And we have that autonomy to choose what we think is right.*

This argument highlights the importance of preserving individual autonomy when creating an institutional framework for the future development of microcredentials.

One aspect that was glossed over in most of the interviews was the question of quality assurance. One participant argued for the need of a quality assurance system, after critiquing the theoretical level of one of the courses – but they were the only participant to actually mention quality assurance at all. This underscores the fact that most participants did not consider the need for institutional guidelines regarding the aesthetic and academic standards of digital materials in the future.

The microcredentials experiment was deliberately framed as an experiment, granting participants full autonomy in developing their microcredentials. While some participants appreciated the freedom to structure their microcredentials and choose digital tools, all the interviews underscored the need for institutional guidelines and templates. This need encompasses various aspects of microcredentials, including the framework, digital tools, and platform for delivery. However, it was also evident that while academics desire support and guidelines, the participants expressed that it should not infringe upon their individual autonomy, as this could diminish their motivation to develop microcredentials. As argued by one interviewee during discussions on future guidelines, a template should be seen as an "offer" that can be used, modified, or disregarded. Striking a balance between accessible guidelines and preserving individual freedom is essential in supporting academics in developing microcredentials effectively.

An understanding of Microcredentials is important – even if it’s not a shared one

The lack of a clear definition of microcredentials amongst the academics is evident in the interviews. At the beginning of each interview, participants were asked to define the term "microcredential". The answers revealed that the academics understood microcredentials as a digital learning tool aimed at facilitating individual student learning. This understanding influenced how the academic staff chose to structure their microcredentials. Four out of the five microcredentials developed by participants in this study heavily relied on video materials. These participants pointed to their prior experiences facilitating learning during the COVID-19 pandemic as inspiration for their courses. Therefore, it can be argued that when moving forward with the development of microcredentials, it is important to consider how the definition of ”microcredential“ influences the final structure of the digital courses.

There is a notable disparity between the interviewees' understanding of microcredentials and Olivers (2019) understanding of microcredentials, regarding the accreditation of learning achieved through microcredentials. None of the participants placed any value on the accreditation aspect of microcredentials. One participant even defined microcredentials as “*Activities we would like the students to take part in or have access to (…) without giving them credits.*”

Several factors have contributed to this perspective. Firstly, the question of accreditation was presented as an organisational decision within the microcredential experiment, not under the control of individual developers. Secondly, the participants' previous experience with digital learning, which was not formally accredited, influenced their perception that accreditation was not a crucial factor for microcredentials. Lastly, Danish universities traditionally offer larger courses (ranging from 5 to 15 ECTS), and the political framework surrounding accreditation makes it time-consuming to accredit new formal courses.

The future of microcredentials is believed to be bright

A prevalent theme among the participants is their belief that microcredentials will serve as a vital supplement to the predominantly face-to-face teaching methods currently used at Aalborg university. This belief is rooted in the potential benefits for regular students, lifelong learners, and the dissemination of research-based knowledge to a broader audience.

The consideration of a broader spectrum of knowledge recipients emerges as an important factor when planning the future of microcredentials at an organisational level. This theme influences decisions regarding the selection of templates, choice of platforms for delivering microcredentials, and the accreditation of learning outcomes. Moreover, this theme also raises ideological questions for some interviewees, such as how to make engineering knowledge more accessible in the 21st century. One example illustrating this ideological incentive is expressed as follows,

> *(…) I mean now, we did this in in Danish, but we could do things in English and then it could be distributed worldwide. And I thought that would be even greater. I mean we got universities in countries that are poor. They would never be able to afford, paying for attending courses here.*

In this context, microcredentials are seen as a means to share knowledge and benefit developing countries. Additionally, three interviewees highlight the potential of microcredentials to facilitate interdisciplinary learning across different faculties, thereby strengthening the role of interdisciplinarity engineering education.

The successful implementation of microcredentials at Aalborg university requires staff members to embrace the notion that the digital transformation will bring about positive change. The belief in microcredentials as a valuable supplement to traditional teaching, their potential for lifelong learning and knowledge dissemination, and their role in promoting accessibility and interdisciplinarity all contribute to shaping the support of microcredentials at the institution. The participants also recognised, in line with recent political incentives and research, that microcredentials have the potential to challenge traditional university structures by granting flexible access to learning across time and space.

Conclusion

To facilitate the successful implementation of digital microcredentials in a traditional on-campus organisation, several key factors must be considered. While the initial experiment granted full autonomy to the participants, it is recommended to establish clear guidelines and a well-defined definition of microcredentials from the start. This approach would have helped academics, especially those with less confidence, to understand what is expected of them and would have strengthen their engagement. Also, while it is crucial to emphasise the pedagogical advantages it is necessary to secure a strong support from department leaders, since they play the largest role getting academics to participate in the digital transformation.

In addition, the value of digital support structures cannot be understated. Although not all the participants required nor desired such support, all the interviewees emphasised the value of its availability. It is essential that this support is presented as an optional resource rather than a mandatory requirement to ensure the best possible implementation of microcredentials. Even if the support is not utilised by the academics, it cannot be removed, since that existence is of value in the development process. Not all academics participated in the available workshops, and some chose not to utilise the digital support systems nor organisational-purchased platforms when developing their courses. Nevertheless, all interviewees recognised the necessity of these support structures for the successful implementation of microcredentials within the organisation.

This duality is also prevalent regarding the role of templates and guidelines. The academics recognised the need for guidelines and templates to streamline the development process and ensure a standardised implementation of microcredentials across the organisation. Yet, these guidelines should be designed with individual autonomy in mind, allowing room for creativity and

personalisation without undermining the academics' motivation. While a project with clearer guidelines from the start would undermine the incentives for these interviewees, it would enhance accessibility for academics with less confidence in developing digital learning tools.

Organisational decisions and support for the development of microcredentials are equally important for the platforms used to deliver them. The participants expressed confusion regarding platform selection, and some mentioned receiving assistance in this regard. However, none of the academics indicated a clear preference for a specific platform, underscoring the need for organisational guidelines to aid in decision-making.

The implementation of microcredentials in a face-to-face university should involve providing academics with a clear definition of microcredentials from the outset. The freedom provided in this experiment meant that the microcredentials produced relied heavily upon participants' prior experiences in digital teaching, leading to a strong emphasis on video materials rather than on course accreditation. In the future, careful consideration should be given to how a chosen definition will influence the implementation of microcredentials within a specific university context.

In conclusion, the experiment not only demonstrated effective support for the development of microcredentials but also highlighted the importance of striking a balance between providing guidelines and support structures while respecting the autonomy of academics. Additionally, the experiment revealed significant support among traditionally face-to-face teaching academics for the implementation of microcredentials. By emphasising the pedagogical advantages and securing backing from department leaders, the implementation can be expanded to a wider group, thereby solidifying the role of digital learning tools in a historically on-campus university. This expansion is not only expected to have positive effects on the individual organisation but also on the broader world by making learning accessible beyond the confines of the university walls. Overall, the outcomes of this study demonstrate the feasibility and potential positive impact of implementing microcredentials within an on-campus university.

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