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Facilitation of project group formation supported by online tools

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Abstract

This article presents the case of facilitating *project group formation* via blended learning and full online participation. The analysis is based on impressions from the COVID-19 lockdowns. It is assessed whether the online tools and didactic practices were successful. Further, the text presents a coherent three-step model of the process of forming project groups, where the students formulate a research problem. Cases with blended learning and full online participation are contrasted with cases with presence on campus in order to analyse the challenges and benefits of online tools.

The article is based on the theories of *Problem-oriented Project Learning* and *Problem-Based Learning*. The main findings are: 1) clear communication and student involvement are essential, 2) online tools can strengthen academic written communication of the process, and 3) using asynchronous online tools enable students to participate in the process of formulating a research problem in new ways more sensitive to different team roles. Finally, it is discussed that personal presence on-site is of the essence when choices are to be made.

Introduction

This article presents the case of *group formation* via blended learning and full online participation. The hope is that experienced facilitators can draw inspiration from this, and that readers new to this process can use the presented model in their own facilitation. The case study material will focus on how to meet the challenges of changing format from on-site presence to online formats and assess to what degree the new tools and didactic practices were successful. The aim of the article is two-fold. Firstly, to discuss and assess the experiment of changing a process involving a strong tradition of on-site presence into blended learning and fully online formats. Secondly, to offer a three-step format for forming project groups which other teachers can follow or use for inspiration. The article is based on a description of a semi-structured method of facilitating the formation of project groups based on experience and evaluations of eight cases. Facilitation of this kind of process has similarities across disciplines and educational programmes. Accordingly, the findings can be transferred and be of inspiration. However, the facilitator of each session presents a framework for facilitation that can vary according to the particular facilitator and situation. In addition, in the most exemplary version of the method, student involvement can influence the course of each process. In sum, there is no specific 'normal' setup.

Research problem: Facilitating student-centred online group formation: the role of the teacher

This article is devoted to the development of the less analysed *process of facilitating the formation of project groups*. The lockdown of Danish universities and other institutions due to the COVID-19 health crisis highlighted the need for new formats for teaching. The sudden lockdowns of teaching institutions presented us with space

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for reflection and reorientation. Many teachers had to change their teaching significantly, into online and blended formats. In the methodological approaches of Problem-oriented Project Learning (PPL) and Problem-Based Learning (PBL), one of the central notions is student involvement. In both PPL and PBL, students learn via project work, where the topics, definition of problems and research designs are decided upon by the students in groups, guided by supervisors. This normally takes place at the beginning of the semester. When the groups are formed, students meet, present topics to each other, develop and formulate a relevant research problem and are inspired by each other. In addition, they navigate in a social setting where academic aspirations and social relations cross (Hagedorn-Rasmussen, 2018; Mac, 2018). It is a balancing act to be the facilitator of this process (Westerling, 2028). The normal format for this is to meet in person on campus, where the class of students interact verbally. This article will discuss the position of the teacher or *facilitator* of this process, when physical presence is limited or impossible. In line with this, information and communication technologies are commonly used in project work (Heilesen, 2015; Petersen & Sørensen, 2019: 104). The inclusion and use of online tools in PBL settings are discussed internationally (i.e. Verstegen et al., 2016) and in a Danish context (Tølbøll et al, n.d.). However, when the COVID-19 lockdowns started, researchers realised that there was little literature on specific cases where online and blended formats for facilitation of students' choices of topics and members for their project groups were used in relation to the principles of PPL. Today, there is a growing body of literature analysing the lockdowns and the use of online tools (i.e. Lyngdorf et al., 2021). Yet, the specific theme of project group formation supported by online tools still needs to be further described and analysed in order to develop. The aim is to present reflections and an evaluation for future facilitation.

Literature and research question

One of the central aspects of student learning at the Danish reform universities is problem-oriented, interdisciplinary participant-directed project work (Andersen & Heilesen, 2015 p. ix; Bundgaard et al. 2021). Project work in groups of more than two students is at the core of learning at new reform universities in Denmark, and to some degree at other universities around the globe. The literature argues that a distinction between the two methodologies PPL (i.e. Andersen & Heilesen, 2015) and PBL (i.e. Bundgaard et al., 2021) is to what degree the students are involved in the formulation of project topics, and thereby how involved the students are in actually choosing the theme of their project work. Nevertheless, in practice both approaches emphasise the importance of learning via group work and thus the importance of the group formation process. The cases in this article are from a setting where student involvement is used, and where the students themselves were encouraged to present topics and develop a relevant problem for their projects. The project group formation in focus happens at the beginning of the semester, before the start of course work. Accordingly, the main arguments in this article will draw on the PPL and PBL methodological approaches where students have extensive influence on the chosen topics[2]. The method of PBL has a long history in education, is internationally used and recognised, and in a Danish context there is a strong academic milieu developing the method as well (Askehave et al., 2015). In addition, teachers and researchers have developed a specific methodology and theories of PPL since the 1970s (Andersen & Heilesen, 2015; Illeris, 1974, 1981; Olsen & Pedersen, 2003). Theories of PPL describe the pedagogical approach, didactic, benefits and learning outcomes of studying and working in groups (e.g. Petersen & Sørensen, 2019). Considerable attention has been paid to the role of the supervisor and to how students immerse themselves in the task of project-oriented work in groups (Petersen & Sørensen, 2019).

[2] Via his employment at two different reform universities, where one mainly emphasised PBL and the other emphasised PPL, the author has been involved in group formation and supervision of groups within both methodologies. Today, the author is employed at a University College.

However, the existing literature is less concerned with the specific situation where students form groups facilitated by teachers of PPL and PBL. It is recognised that this process is pivotal in order for the students to have a positive experience of project work for the entire semester (Kjeldsen & Andersen, 2015, p. 40).

Accordingly, the research question of this article is: *What can we learn from the unexpected experiment where online participation is partly or fully integrated as the means of communication during the process of describing topics and developing problems for project work and the formation of project groups?*

Methods

This article is based on the facilitation of four cases of entirely face-to-face learning on campus, two cases of blended learning, and two cases of fully online learning. The main evaluation is based on the author's impressions and reflections. However, the evaluations of other facilitators are also taken into consideration. The author has participated in evaluations with other teachers at university level and includes knowledge gained from being a member of a task force that collected knowledge based on facilitation of formation of project groups and disseminated this to other facilitators across departments at the university. However, the analytical reflections and evaluations are based on cases selected and conveyed by the author.

One thing is to plan a course or a specific teaching session and then deliver the lesson. Another thing is to make room for reflection on what was good and what went wrong in the classroom or in the teaching situation (Scholarship of Teaching and Learning, 2013). When we reflect upon our own teaching, a hermeneutical inspiration is involved. It can be argued that one's overall approach to teaching is put to the test via reflection based on the practical act of teaching (i.e. Hiim, & Hippe, 2005, p.23; Løw, 2009). We refer to the whole in order to understand the parts, and vice versa, the parts refer back to the whole. This is also the main principle of the hermeneutic circle (Højberg, 2004). In other words, teaching is planned, performed, assessed and then corrected according to what has happened. Further, what happens between teacher and students will ideally be changed according to new overall understandings of one's own methodology (Boström & Schmidt, 2011). The teacher needs to take into consideration the teaching material, the students' reactions, the atmosphere, and the physical surroundings. In many ways this involves a reflective process based on presence in the classroom. When the COVID-19 crisis hit Denmark, the setting changed; teaching was transferred to online formats or blended-learning, where both online participation and participation on campus blended into one.

Findings: Group formation and student involvement in three steps

The process in question in this article is based on a high degree of student involvement. The process is student-oriented (Bundgaard et al., 2021), yet it is also partly led by the students themselves (Kjeldsen & Andersen, 2015) in a facilitated process (Westerling, 2018). Where Bundgaard et al. differentiate between a *self-organizing model* and a *subject centered model* (Bundgaard et al., 2021), here we present a model which combines the two.

Westerling (2018) describes how two elements are present in the process of project group formation: project formulation and formation of groups. Ideally, in PPL the process should be problem-oriented from the outset. However, when the process includes students with no or less experience with problem-oriented project work, it can be a help to start out with students presenting broader topics in plenum and then move towards formulating a problem in the actual groups. Formulating problems is inspired by the methodology of scientific research as it is the students themselves that drive the process of problem formulation. Formulating a problem demands making reflexive choices. In the process alternative projects and potential choices must be excluded (Andersen, 2019). Depending on the available time and the access to feedback from facilitators or supervisors during the process, the formulation of problems can be integrated to a lesser or larger degree. However, it is not uncommon that the formulation of a relevant problem happens during the later stages of group formation. The

research problem should be stated in the written description that the groups hand in after closing the group. And before they are assigned a supervisor.

To make future processes more comprehensible, this article presents a framework for forming project groups that has been developed and used by the author. The model can be used to facilitate group formation with physical attendance. Similarly, Westerling (2018) describes how such processes can be understood and facilitated. And what to take into consideration. Yet, what is special to the model suggested in this present article, is its adaptive nature and the possibility of replacing or supplementing the different steps with online tools. Thus, the model can also be used in settings with blended learning or settings that are fully online based.

In the article, the word *facilitation* is intended. The main principle is that the students are the ones responsible for the content, while the teacher facilitates the process. The teacher is pivotal and can ask critical questions or questions of clarification. However, it is the students who decide what they would like to question or problematize via their project.

Different specific models are used at different study programs and across institutions. Further, the specific approach to group formation can vary from semester to semester, and it can vary depending on the facilitator. However, from the author's experience, the process can be described in three common steps:

In brief, in *the first step*, students present topics they might be interested in. The topics are written down on a whiteboard in the lecture hall where all participants are present. The facilitator might ask the students to elaborate on the topics. To begin with, there are many diverse topics. These can be clustered into fewer topics, and topics can be related to each other.

During *the second step* the students go into group rooms, where they have a dialogue on one topic at a time. Normally a series of topics are discussed during this session, and the students have to choose between them. After a few rounds of dialogue, the students return to the lecture hall. The facilitator asks about each topic. Here, the groups can suggest a preferred topic or 'close it down' if no one is interested in continuing the dialogue on that specific topic. This process is repeated. At the beginning, new topics can be added or larger groups can break up and become smaller potential groups. Later on, fewer topics and accordingly fewer possible groups are available. The facilitator encourages a dialogue aimed at formulating a research problem according to the idea of problem learning. The groups receive the amount of supervision possible in the given situation.

The third step is to consolidate the groups. This is also sometimes called 'closing the group', as the groups have been 'open' for new members up until then. It is a core principle that the groups are open until the very last moment, as this ensures that no one is left behind without a group.

The model is inspired by the author's experience and reflection on facilitating group formation. The level of experience with problem-oriented project work can vary among the participating students. Some have participated in project group formation before, and some have not. The outset is group formation processes that often take one to three days, depending on the decisions of the teachers/facilitators and based on the students' level. For another case study, see Kjeldsen & Andersen, 2015. For further descriptions of models, variations and cases, read Westerling (2018) and Bundgaard et al. (2021). These referenced texts were an inspiration for the three-step model. The method behind the model differs from ordinary teaching situations at the university or other institutions of higher education in all three axes or corners of the didactic triangle: teacher, student and subject. The didactic triangle is described in different ways. In this presentation, I draw on the version presented by Rosa in his resonance pedagogy (Rosa 2017, 2019). The third corner can be the *subject* or *material*. In this case, the understanding of 'subject matter' goes beyond a differentiation between subject and

material. Material is not to be understood as a selection of specific texts or a product. When students form project groups, they produce the content. The topic is not predefined. The content is the result of dialogues and knowledge-based negotiations between students in groups.

The general theoretical foundation of PPL (Andersen & Heilesen, 2015; Mac & Hagedorn, 2018) and PBL (Bundgaard et al., 2021) supports the following changes of roles in relation to the analysed cases of project group formation at hand. In the following, I present how the presented three-step model relates to a change of the role of the student and of the teacher, and the connection to the material:

First, the role of the teacher is to facilitate the ideas and problem areas described by the students. This differs from a situation where the teacher is the one who has the (final) answer. The outcome of the situation is that the students form project groups based on their own priorities. The students have direct influence on the topic they choose. However, the facilitator must make sure that the topics presented are within the scope and aims of the semester. If so, then the students can have a dialogue on the content. The teacher guides and inspires them in relation to the topics. The aim is to make the students feel confident in their choices[3].

Second, the role of the student is to fully participate and to create content. This differs from a role where students are expected to listen and ask questions.

Third, in this case, the material is to be understood as the issues constructed and negotiated by the students. Material can be introduced during the period of group formation, either by the students themselves or by the facilitator, but then only in direct relation to the topics introduced by the students. This is in contrast to situations where material is selected by a teacher and read beforehand by the students.

Irrespective of whether the process is face-to-face blended, or online, the steps of the abovementioned model are the same. In the following, the online format is presented in full.

Case: Supplementing familiar elements with online tools

When the pandemic limited presence on campus and ultimately closed the campus, it was not an option to cancel the formation of project groups at universities where teaching is based on student-centred project work and problem-orientation. They are a fully integrated part of the education. However, this posed a challenge. How could we ensure that the students were still the ones developing the topics and choosing which other students to work with? In the following, I will describe how we achieved an online format that resembled the 'normal' format as much as possible. The online tools were selected by the facilitators and introduced to the students by the facilitators. The didactic and educational relevance and the intended use of the tools were discussed by the group of facilitators. We used the online platform Microsoft Teams. A team for the class was set up. Instead of a classroom or lecture hall, a general channel accessible to all was used. In addition, students were able to create channels named after the topic they wished to discuss with other students. These were specified in one complete list in Teams. All participants could enter and leave these channels as they pleased. They could choose to turn on the video or not. However, it was suggested that they used video whenever possible. Later on, these channels were used when the students had a dialogue in the potential groups. The online tool *Padlet*, which imitates a whiteboard, was integrated in the visual presentation of the program Microsoft Teams. The students and teacher could write short texts in a format that looked like Post-it notes. The notes can be given different colours, and it is possible to create arrows visually connecting them. This resembles

[3] This is even more important if the method is new to the students involved. Many of the participating students came from other institutions offering bachelor's degrees and were unfamiliar with the specific processes of discussing possible project topics and forming groups.

the normal use of a whiteboard. An additional Padlet was also set up. Here, the groups could be organised at the end of the process, when they were to be consolidated.

The following is based on the aforementioned facilitation of four cases of project group formation entirely face-to-face learning on campus, two cases of blended learning and two cases of fully online learning.

The participating students came from diverse backgrounds and had studied different subjects before they started on the master's course in focus; however, the topics presented during the formation of groups in question were all interdisciplinary. All of the cases analysed in this article are based on topics related to health and society. All the students had bachelor's degrees or professional bachelor's degrees. For most of them it was the first, second or third time they had participated in group formation as students at this university. The main part had chosen to study further or change to the university after receiving their bachelor's degree at other institutions, e.g. University College. A few students had experienced group formation several times before and their experiences and skills were included, as the facilitator asked these students to give detailed feedback on the cases they had experienced in their previous studies or during the previous semesters at their present study. The analysis in this article will mainly be concerned with the cases of blended learning and the cases of fully online facilitation. Knowledge of how to facilitate group formation in face-to-face settings will be the reference or backdrop of the evaluation and description of future changes to this process. The data were drawn from group formation in classes of 25 to 80 students. The overall process does vary according to whether there are 25 or 80 students. Nevertheless, there is direct transferability of the techniques and experiences.

Communication and student involvement as the focal points

Three practical findings based on experiences with blended learning and online teaching should be emphasised:

First, online facilitation shows a need for clear and detailed oral and written communication. Lengthy verbal dialogues or explanations tend to decrease student involvement and concentration. Time spent on answering questions from students in the lecture hall (or via the common video channel) should be minimised. This might seem a banal finding, but it proved to be even more important when online and blended formats were used. Evaluations from the students support this reflection. It is therefore important to remember the following points: i) spend time on planning and communicate the plan to the students, ii) be precise and brief when communicating, and iii) be flexible, but be wary of changing the plan too much.

Second, it is a challenge to strike the right balance between making room for students to pose individual questions and the need for dialogue in smaller groups. We found that video channels set up by the students themselves in Microsoft Teams (or other video-supported solutions) accommodated this. When the students talked to each other or received feedback from the facilitator, the ideal number of participants in the online video meetings was 3-6 students. Facilitating group formation with more than 30 students involved is a challenge, as time is scarce. If possible, there should be room for direct feedback to the smaller groups of students, and the best way to do this is to have more than one facilitator present.

Third, online tools such as Padlet offer a way for students to be more involved and enable them to leave a lasting written record of the dialogues. During the normal face-to-face format the topics proposed by the students are written on a blackboard, a whiteboard, or projected as slides on a screen in the classroom. The teacher/facilitator is the one introducing and facilitating this writing process. This is complemented by notes written on A3 paper and Post-its, when the potential and temporary groups discuss the topics in smaller groups. These are written by the students in groups. In this process, often the development of the topics and the written material become secondary to the dialogues. To mirror this process, we developed ways to present and develop

material online. It was important that the online version was similar to the process the students already knew. The online format presented us with a new opportunity to bring the written material to the foreground. The possibility of writing down topics before the groups were formed enabled the students to do more research beforehand. Further, it allowed them to work on the ideas when they felt inspired in between the sessions planned for project creation at the university. It also made it possible to develop written dialogues, accessible to all participants via the Padlets used online. Further, at the end of the process, the groups had material when they wrote their project description and formulated their research problem. This helped the students as they were then able to present more enhanced and elaborated ideas. In addition, it also helped the person who was to allot project supervisors to the groups, as the descriptions were more detailed. Matching the supervisor's skills and knowledge with the group's aspirations was made easier.

Using a Padlet online provides more time for research on the project topics. The students can add dimensions when they feel inspired instead of at certain allotted time slots during the days when group formation takes place. We saw that the Padlets were being filled with references and links to reports, campaigns, articles, etc. The normal setting with its A3 posters and handwritten Post-its does not offer the same convenience and ease of reference to online material. Further, the online format minimised the time normally spent writing on a whiteboard, as the students had already written text online before they met in the lecture hall. The students also had the opportunity to write directly on the Padlets while group formation was being facilitated online or when we were present in the lecture hall on campus in the blended learning format. In addition, it minimised the time normally spent collecting the physical handwritten descriptions from the groups, which could also be lost or misplaced. Instead, this time can be freed and spent on giving feedback to the groups.

Discussion

My experience was that the description and selection of topics worked out well online. In fact, the topics were treated in greater depth than when students only discussed them in a face-to-face setting on-site.

Many of the dialogues that the students have during group formation are based on the ability to formulate problems and topics in academic language. As the facilitator, I have promoted this. The first realisation is that the online format enhances choices based on academic interest, and decreases the social competition that can occur in this process. This is a strength that can be difficult to promote in a face-to-face setting.

One finding from using online Padlets, where students can write about topics, develop ideas and present research at any time, is that the project descriptions become more detailed. The students who are more interested in writing than talking are presented with a format where they can thrive. In a detailed introduction to Belbin's team role framework in relation to project groups, Anita Mac highlights how different roles strengthen collaboration in the group (Mac, 2028). She describes how different roles can be understood on a scale of introversion and extroversion. A face-to-face on-site project group formation process can favour outgoing, enthusiastic, and confident roles (Mac, 2018; Hagedorn-Rasmussen, 2018). In contrast, the online format might help analytic, task-oriented, and less outgoing roles to flourish. As the online format is a platform that encourages reflections and comments, students can express themselves via writing. Students can write comments and suggestions in surroundings of their choosing, e.g. at their computer at home. However, there might be students who feel more comfortable speaking their ideas aloud or who are better at developing ideas verbally. They might find that the online format is less supportive of their learning. Hopefully, future experiments and further refinements will show ways in which different roles can benefit from a combination of online and face-to-face formats for interaction between teacher, student, and material in the process of forming project groups.

What cannot be replaced

However, a real challenge presented itself during the above-mentioned *step three*, when the students were to finalise group formation, and when individual students were to decide which group to join. At first, we thought that it was the decision on which group the students expected to join, that was the 'hard choice' to make. Upon reflection, we discovered that it was the actual decision of choosing or 'closing' the group that became prolonged or even impossible. Online, the decisive moment of saying: 'OK, that's it' or 'This is the group of people who will work together' was not easy.

In order to give an impression of the relevance of such reflections in teaching, I will use the cases where we changed between presence on campus and online teaching during the days of group formation [the grey box].

Reflections based on memory work[4]:

In the settings with blended learning[5], we alternated between an open format online reminiscent of a brainstorming on a Padlet (resembling an online whiteboard) one day, and the next day we organised the topics in a more closed format, still online on a new Padlet. The students could discuss the topics online via written comments. We asked the students to mark by 'liking' the projects they wanted to join. On the second day, the students were also present at the lecture hall in combination with the online format. As the facilitator, I asked the students about the status of the project ideas in the classroom. The students had the opportunity to air their ideas and invite others to join their groups. We deleted the ideas that were no longer active from the Padlet.

One dilemma recurred when we were approaching the crucial situation where the students were to choose the specific topic they wanted to work on and, equally importantly, whom they wanted to work with in their project group. When the project formation was coming to an end, the students had been working on the topics they had chosen online. Each time, they had written and commented on the Padlet, and they had the opportunity to discuss and comment in class.

In the assessment of the situations, we found out that it was very hard to 'socially read' whether the students were ready to finalise the group formation. It is harder to get to the moment when it is possible to 'close' the groups.

When students meet in person they tend to talk more freely. The use of laughter and the 'buzzing' atmosphere that tend to stem from the groups in face-to-face encounters is less frequent online. It seems that it is easier to make a decision when people meet in person. When we changed from an online setting to a setting with on-site presence, only very few students chose to change groups at this stage. Most of them decided to work in the groups they had already showed interest in online. We realised that it is easier to move on to finalising the stage in which the students select the group of people they want to work with if they meet in person.

What we learned from the situations of blended learning as described here was that personal presence was of the essence. It is something that cannot be fully replaced. The online format also presents an important limitation. The positive connectedness or resonance that happens when people meet in person (Rosa, 2017) is

[4] To minimise traceability, the situation is described in more general terms, and context from two different occasions has been blended into one.

[5] When the universities went into partial lockdowns, the situation was completely new to all. In cases involving partly face-to-face and partly online learning, the teachers and students were allowed to be on campus. There were restrictions on attendance, numbers of students and movement based on the reproduction rate of the COVID-19 virus and other factors. Facemasks and social distancing were among the measures applied.

challenged.

One way of addressing this in a fully online version of group formation is to invite the students to take part in an exercise where they get to know a little more about each other before they start; for example, they are invited to post a short presentation of themselves on a Padlet, on a voluntary basis. It can be a brief written description, a short talk or a video. This is one way of introducing a social aspect to an online format, when face-to-face interaction is eliminated.

Another way is to make room for individual feedback in the group channels the students established (see above). In on-site project group formation, the facilitator can offer supervision in groups. However, the facilitator needs to move between different locations if the students are spread out in different rooms or dispersed over a wide area. Instead, via video call in Microsoft Teams the groups can easily be 'visited' during the second step of the process by the facilitator. The groups can ask the facilitator to 'visit' via the chat function. It opens a possibility to supervise directly in the process of formulating research problems. Moreover, the facilitator can be easily available for the groups that need help to consolidate or split their groups in step three. Naturally, if sufficient time is available. In sum, the recommendations are: a) to add an online social dimension, and b) to make sure that the online format includes video sessions with smaller groups. Nevertheless, the case shows that we must pay attention to the social dimensions as well. Online formats can enhance the academic considerations. However, it seems that decision making and collective excitement is promoted in face-to-face situations on-site.

In addition, a recurring dilemma is that the process of group formation can be experienced as an 'elimination race' by some students (for a social psychology perspective see Westerling, 2018). One of the most important tasks for the facilitator is to make sure that this is limited as much as possible and to take care of the students who might feel that they have fallen behind in such a race. Central to this is the possibility for students to experience that their differences and different approaches to project work are recognised within the group (Paludan, 2018). This aspect is important during the formation of groups. Formation of project groups is a social process with academic considerations to address (Westerling, 2028). The facilitator needs to perform a balancing act if conflicts between the social and the academic interests are to be minimised (Hagedorn-Rasmussen, 2018). By offering formats where different team roles (Mac, 2018) can flourish the online tools can prove to push for a revitalised dialogue on how to facilitate project group formation in both PPL and PBL settings (Kjeldsen & Andersen, 2015; Westerling, 2018; Bundgaard et al., 2021).

Further research on project group formation

A subgoal of this article is to present a three-step model for inspiration to other facilitators of project group formation. Accordingly, the word *topic* is used to make it accessible for a broader field of facilitators. The process of project group formation can vary in relation to time spend on formulating a research *problem*. Project group formation is often characterised as being relatively open (Hagedorn-Rasmussen, 2018). The participants agree on a topic and they start delimiting it. Ideally, in PPL the group agrees on a problem-formulation during the process, before they 'close' the group for new members. However, often the formulation of a specific research problem that can be written in one or a few sentences is done during time in between closing the group and writing a short description of the project to be used for allotting the right supervisor for the group.

Further research could take on the task of diving deeper into the phase of problem formulation and the role of the facilitator in this important task.

Conclusion: Strengthening the process for the future

The format for group formation has not seen many changes or innovations in relation to electronic or online

tools throughout the years. The lockdowns came as an exogenous shock to the status quo of teaching. The analysis shows that the timely use of specific online tools can help address some of the challenges that previously impacted this key aspect of student-driven problem-oriented group work.

The theories of PPL and PBL are widely used especially at reform universities. There is a strong theoretical underpinning of the concepts of student-centred learning and problem-oriented project learning. However, there is less research on the actual process of facilitating the formation of project-groups, especially in relation to the use of online tools. This article adds to the field of research by presenting an adaptive three-step model for facilitation of project group formation where blended learning or full online participation can be the case.

Via analyses of the cases presented, it is stressed that facilitators using online tools should be aware that clear communication and student involvement are essential for making the process work. That online tools can strengthen academic written communication of the process, thereby giving both students and teachers the opportunity to benefit from more elaborated project ideas. Further, it is suggested that students with a more analytical and less outgoing team role might benefit from using asynchronous online tools. However, a central finding is that personal presence is of the essence and that this dimension cannot be fully replaced. Special attention should be paid to the possible benefits of formats based on blended learning focusing on different team roles and recognition of differences in the student group.

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