



Small Group Student-Produced Podcasts Were Favoured as Assignment Tool for Large-Scale Interprofessional Learning: An Exploratory Study Among Health, Social Care, and Teacher Education Program

Kari Almendingen^{1*}, Astrid Torbjørnsen¹, Bente Sparboe-Nilsen¹, Lisbeth Gravdal Kvarme¹ and Jüratè Saltyte Benth²

OPEN ACCESS

Edited by:

Harrison Yang,
Suny Oswego, United States

Reviewed by:

Paul Young,
University College Cork, Ireland
Sha Zhu,
Central China Normal University,
China
Yinghui Shi,
Central China Normal University,
China

*Correspondence:

Kari Almendingen
kalmendi@oslomet.no

Specialty section:

This article was submitted to
Digital Learning Innovations,
a section of the journal
Frontiers in Education

Received: 29 October 2020

Accepted: 01 September 2021

Published: 17 September 2021

Citation:

Almendingen K, Torbjørnsen A, Sparboe-Nilsen B, Kvarme LG and Saltyte Benth J (2021) Small Group Student-Produced Podcasts Were Favoured as Assignment Tool for Large-Scale Interprofessional Learning: An Exploratory Study Among Health, Social Care, and Teacher Education Program. *Front. Educ.* 6:622716. doi: 10.3389/feduc.2021.622716

¹Department of Nursing and Health Promotion, Faculty of Health Sciences, OsloMet—Oslo Metropolitan University, Oslo, Norway, ²Norway and Health Services Research Unit, Institute of Clinical Medicine, Akershus University Hospital, University of Oslo, Blindern, Lørenskog, Norway

Information and communications technology (ICT) can impact student learning outcomes, and podcasts have opened new possibilities for assessment in interprofessional learning (IPL) by supporting collaborative learning, enhancing communication skills, promote group working and technology competence. Pre-service IPL may thus benefit from ICT to develop interprofessional competencies among all future professionals. Research on student-produced podcast in IPL studies is limited. This study examined 1) how students from teacher education, health and social care educations, along with their supervisors, respond to different assignment formats (podcast, video, and written academic text) in IPL group work, and 2) the attitudes of students and supervisors toward these formats. The instructions and criteria were identical for all assignment tools and required case-based interprofessional group collaboration about real-life scenarios addressing child and youth education, health and well-being. Data were collected from online questionnaires in a mixed-methods exploratory cross-sectional study. The students' and supervisors' response rates were 25.8% ($n = 363$) and 37.1% ($n = 13$), respectively. Among the students, 75.2% submitted podcasts, 23.7% submitted written academic texts, and only 0.8% submitted videos. The students and most of their supervisors preferred podcasts as assignment tool over written text or videos. However, very few students chose the video assessment format, making insight into this format limited. Results did not differ according to age or educational background. Participants expressed that podcasts allowed more discussion, reflection and interprofessional collaboration. Students thought podcasts were fun to produce and allowed for more creativity. In conclusion, both students and their supervisors favored podcasting as the assignment format in IPL group work. The short time frame may however have influenced this choice. Pre-service technologically enhanced learning

cannot replace practice-based learning. However, submission of case-based podcast assignments could prepare students for interprofessional collaboration about complex real-life scenarios.

Keywords: podcast, video, assignment, assessment, blended learning, interprofessional learning, children, case-based learning

INTRODUCTION

Student-Produced Podcasts an Innovative Tool

Candidates from health, social care, and teacher education program are expected to have collaboration and communication skills (Anderson, 2013; Dobbs-Oates and Wachter Morris, 2016; Reeves et al., 2016; Ministry of Education and Research, 2017a; Borg and Drange, 2019; Granrud et al., 2019). To learn, students must interact and work together on specific issues such as group-produced assignments (Ministry of Education and Research, 2017a). Information and communications technology (ICT) can impact student learning outcomes, and have opened new possibilities by supporting collaborative learning (Bartle et al., 2011; Lillejord and Børte, 2018; Nielsen et al., 2020). The use of digital artefacts such as podcasts and videos in learner-generated tasks where students are working together in groups across disciplines is still in an early ages (Reyna et al., 2018). Further on, the students digital media training is neglected, and students are concerned about their technical skills (Pearce and Vanderlelie, 2017; Reyna et al., 2018). Student group-produced podcasts have been suggested to enhancing verbal skills (Reyna et al., 2018; Nielsen et al., 2020), even if research on assessment of student-produced podcasts has mainly been explored in STEM (science, technology, engineering and mathematics) educations. One explanation may be that the digital competence among STEM teachers and students is higher than within other educations. A literature review reported that most studies on science education overlooked the importance of training, providing attractive benefits and supporting useful group processes in use of digital media (Reyna et al., 2018). Some of the STEM studies on student-produced podcasts notably included aspects of communication and collaboration which is highly relevant to health, social care, and teacher education programs. Moreover, although the description of the assignment instructions, learning outcomes and assessment criteria were inconsistent in the STEM studies, they reported on successful use of digital assignments. There is a need for educators to cultivate the student's media literacy, supply them with successful models, give room for creativity and value their efforts (Nielsen et al., 2020) and creation of knowledge during the collective process (Lee et al., 2008; Lillejord and Børte, 2018). There are no consensus regarding approach to the task given to the students regarding designing, implementing, and evaluating the assignment tasks.

Kemp et al. used summative assessment guidelines for the student-produced podcasts with reference to Bell (2007) in a study on undergraduates ($n = 61$) in geography (Kemp et al., 2012). Assessed performance of the completed podcasts in the form of marks, was better than, or similar to, previous years

compared for a traditional field report. This article discusses advantages of the podcast as compared to more conventional forms of assessment. They also found that nervousness among students may be lower than in oral presentations, due to the absence of an examiner in summative assessment. Moreover, the study suggests that the podcast format engaged students, and promoted group working, IT, language and oral communication skills, and a deeper understanding of the geography data.

Bartle et al. (2011) published a study on undergraduate basic chemistry students ($n = 352$) working in small groups to create a podcast explaining an assigned topic, before evaluating classmates' podcasts. Students were requested to assess according to a pre-established rubric with the criteria designed to emphasize skills essential to science communication. This study is relevant for large-scaled educations, and other educations because most students considered the podcast assignment a positive and motivating experience, developing and practicing teamwork and science communication skills.

The assessment brief for DALO (digital audio learning object) (Lee et al., 2008) was used in a study on 53 postgraduate business students (Powell and Robson, 2014). Five key themes emerged in students evaluation; prior attitudes about the use of podcasting, benefits of podcasting, transferable skills, pedagogy and future use of podcasts. This study is relevant for other educations due to the discussion of these themes, and because findings implied that students-generated podcasts are a useful approach to assessment.

Studies on student-produced videos and assessments are very limited. In a study on students from biochemistry (Speed et al., 2018), the students had mixed reactions to the videos as an assignment format. Guidelines for production and assessment criteria were specially prepared. Although students produced high-quality videos and demonstrated engagement, data analysis skills, creativity and critical thinking, issues arose related to student workload, assessment criteria and technological support. In a cell biology class, students play the roles of molecules, proteins, organelles or cell types (Young, 2020), and were in general more positive to the videoing. Both studies (Speed et al., 2018; Young, 2020) discuss the benefits and challenges of student-produced videos and applied summative assessment of the student-produced videos.

Mathany and Dodd (2018) published a small-sized study among 13 students (37% response rate) attending a first-year interdisciplinary seminar course in athletics. The rubric for the assignment divided marks amongst three intended learning outcomes were defined by the educators, and the students provided graded peer-to-peer feedback on the assignment (summative). The bulk of the grades were based on the student's demonstration of critical thinking skills, ability to develop and ask thought-provoking questions, and ability to

synthesize and analyze the comments provided within the interview. Marks associated with the production quality were limited to 15% of the total assignment grade. The study is relevant for other educations because ie., the study suggest a template with timelines for podcast assignments, and because it discuss both benefits and limitations with podcast. Despite some study limitations, this study may imply that interdisciplinary students developed communication and technical skills and came closer to theoretical perspectives.

Interprofessional Learning

Many professionals learn about collaboration in their specific disciplines without having the opportunity to collaborate across disciplines while undergoing training (Lindqvist et al., 2019; Strunk et al., 2019). Children and young people attending school might need health and social care for various reasons. Thus, pre-service training of professionals in all areas of child and youth education, health and well-being, should prepare candidates in teacher education, health and social care study programs to communicate and collaborate interprofessionally (Gillespie et al., 2010; Hesjedal et al., 2015; Norwegian Society of Pediatricians, 2017; The Ombudsman for Children in Norway, 2017; Fukkink and van Verseveld, 2019). Interprofessional learning (IPL) is defined as being present when students from two or more professions learn about, from and with each other to prepare them for interprofessional collaboration (IPC) and improve outcomes in the welfare services and improve collaboration and quality of care (WHO, 2010; Reeves et al., 2016).

In uni-professional educations variability of assessment and feedback may be a challenge, but when academic staff from a range of different professional programs are providing feedback to students on IPL assignments, the variability of feedback may be a real challenge (Strudwick and Day, 2015). All study programs harbor different identities, cultures, traditions and syllabi, all of which may act as barriers to shared learning in IPL courses. IPL course's greatest strength, its interprofessional expertise, can therefore also be a challenge because the diversity of perspectives can lead to differences of opinion regarding how supervision, assessment and individual feedback should be provided. Although IPL is highly recommended and even is a national requirement in health and social educations (Ministry of Education and Research, 2017b), and formative assessment has been suggested playing a vital role in the development and delivery of IPL (Wagner and Reeves, 2015; Barr et al., 2016), to the best of our knowledge only one study has been published on IPL assessment and IPL criteria (Strudwick and Day, 2015). The background for the study was that the educators had found variations in the feedback on an essay delivered by health and social care students participating in a large-scale course. The essays had to be marked by a high number of lecturers with different educational backgrounds. This study highlighted that both students and teachers must have a shared understanding of the assessment wording and the assessment criteria. We have not found any similar IPL studies on the use of digital assignments formats and assessment criteria.

The present study utilizes data from a large-scale IPL study that included bachelor's students in teacher education, health and social care study programs. This study examined 1) how students from teacher education, health and social care, along with their supervisors, respond to different assignment formats (podcast, video, and written academic text) in IPL group work, and 2) the attitudes of students and supervisors toward these formats.

MATERIALS AND METHODS

Setting and Participants

During 6 and 7 January 2020, a large-scale mandatory IPL training course was held within the framework of the Interprofessional Interaction with Children and Youth (INTERACT) project (Almendingen et al., 2021) at Oslo Metropolitan University (OsloMet) in Norway. The IPL course was designed for bachelor students taking health, social care and teacher education study programs. The aim of INTERACT is to meet society's demand for better coordination of services relating to children and young people, involving better interaction between professionals and better cooperation between children, young people and their families, and the professionals.

Students

The bachelor students were enrolled in the following study programs ($n = 1,410$): Early Childhood Education ($n = 250$), Primary and Lower Secondary Teacher Education ($n = 380$), Teacher Education in Art and Design ($n = 60$), Physiotherapy ($n = 150$), Mensendieck Physiotherapy ($n = 85$), Nursing ($n = 160$), Social Work ($n = 150$), Child Welfare ($n = 90$) and Occupational Therapy ($n = 85$). The enrolled students were divided into pre-defined IPL groups each consisting of eight students representing health, social care and teacher education programs. The IPL course was mandatory, and thus no inclusion criteria were applied.

Blended Small-Group Learning Course

The large-scale blended learning IPL course is described in detail elsewhere (Almendingen et al., 2021). The learning outcome was: "The course is about 1) acquiring common knowledge about children and adolescents and 2) learning about the observation of children and adolescents" (Almendingen et al., 2021). The required coursework included participation in a two-day seminar (working in the IPL groups only with no plenary activities) and the submission of an IPL group assignment. The seminar days were structured as a combination of face-to-face IPL group discussions and the use of digital learning materials provided by the learning management system (LMS) Canvas. The latter included case-based learning material (produced by user organizations, employers and public authorities) and mini-lectures (produced by staff and others from the working field). The digital content was available through LMS Canvas from mid-December 2019, so that the students could voluntarily prepare themselves before the IPL

course (Evans et al., 2019). The total provisional workload was 40 h.

Submission of Assignment Tools and Assessment Criteria

The group assignment aimed to link the seminar days, coursework assignments and the syllabus. During the seminar days, the IPL groups solved tasks that resembled the task given for the assignment. The group assignment could be submitted as a podcast (max. 10 min, mp3 format), a video (max. 10 min, mp4 format) or an academic text (max. 3,000 words). There were no training sessions or templates for students on how to produce podcasts or videos. Students recorded the podcasts and videos on private phones or university computers. The assignment instructions were: "Choose one of the four relevant video clips. Briefly describe what you observe in the clip. Choose and discuss a minimum of three academic concepts and use these to analyze and discuss your observations from the video clip. Describe the similarities and/or differences between what the members of the various study programs in your group find interesting in the video clip." The assessment criteria were identical for all the assignment tools, and specially prepared for INTERACT: "Show that you can use professional concepts in the analysis of observation; show that you have initial knowledge of children and adolescents; show that you can give examples of different professionals' views of children and young people; show that you are referring to relevant sources (APA style)."

The supervisors, who were recruited from among the staff, master students and professionals working in the field, visited the IPL groups during the second day of the seminars. The supervisor either approved or failed the groups' coursework and provided each group with feedback on their assignments. Since the IPL course was in an innovative phase and assessment was formative (i.e., assessment for learning), there were no exams or grades. Fewer than five students dropped out of their study programs, and therefore also from the IPL course (Almendingen et al., 2021). Although some IPL groups were told to re-do the same assignments, all group assignments were approved in the end.

Online Evaluation Questionnaires

Both students and supervisors were invited to complete specially prepared online evaluation questionnaires after the IPL course. Because no suitable national or international questionnaire had been developed and/or validated into Norwegian, online questionnaires for the present study had to be specially prepared. The questionnaires developed were based on earlier questionnaire-based quantitative research using an anonymous self-administrated web survey "Nettskjema" (Nettskjema, 2020), and results from the first course delivery (Almendingen et al., 2021). "Nettskjema" is a tool for designing and conducting online surveys with customized features for research. It is easy to use, and the respondents can submit answers from a browser on a computer, mobile phone or tablet. The questionnaires were tested and commented on by university colleges (academic and administrative) and one

student and accordingly revised, thus increasing its face validity. The number of questions was deliberately kept short because the response rate is generally low in student surveys (The Norwegian Agency for Quality Assurance in Education, 2018). The forms contained both numerical and open questions, permitting both quantitative and qualitative analyses. One question to the students in the first course delivery (Almendingen et al., 2021) was: "How did your group submit the assignment?" (closed question). Additionally, we asked them to comment on the assignment criteria (open question). The supervisors (Almendingen et al., 2021) were asked: "Which submission format do you think gives the highest learning outcome (when the course is based on hybrid learning and interprofessional student groups)?" (closed question) and "Can you elaborate on your answer about learning outcomes and the choice of submission format?" (open question). For the present study, we revised and extended these questions into closed questions for the students: "Did your group submit the assignment on Day 2 of the seminar?" (Yes/No/Do not know); "Which submission format did your group choose/should your group choose?" (podcast, video, written text, not yet determined); and "Which submission format do you think provides the highest learning outcome in such an interprofessional group collaboration?" (podcast, video, written text). Open questions for the students included: "Can you elaborate on your answer to what is the best submission format of the assignment (podcast, video or text) in terms of learning outcomes?". Closed questions for their supervisors included: "Which submission format do you think provides the highest learning outcome in such an interprofessional group collaboration?" (podcast, video, written text), and "Which submission format do you think gives the highest learning outcome (when the course is based on mixed learning and interprofessional student groups)?". For the present study, the supervisors were asked a similar/equivalent new open-ended question "Can you elaborate on your answer about learning outcomes and choice of assignment format?". The student questionnaire was provided as an internet link embedded in the students' learning management system (LMS), whereas the supervisor questionnaire was sent out via email. One reminder was sent to increase the response rate.

Data Analysis

The quantitative data were presented as frequencies and percentages for students and supervisors. A χ^2 -test was applied to assess differences regarding the assignment form, giving the best learning outcomes among 1) age groups (dichotomized to less than 25 or 25 years or older) and 2) study programs (dichotomized to "teacher education and child welfare," consisting of Early Childhood Education and Care, Primary and Lower Secondary Teacher Education, Teacher Education in Art and Design Child Welfare since these programs only target children and young people as end users; and "health and social care," consisting of Physiotherapy, Mensendieck Physiotherapy, Nursing,

TABLE 1 | Distribution of respondents, N (%).

Variable	Students (N = 363) ^a	Supervisors (N = 13)
Age		
21 years or younger	205 (56.8)	1
22–24 years	74 (20.5)	3
25–27 years	34 (9.4)	0
28 years or older	48 (13.3)	9
Study program		
Nursing	35 (9.6)	1 (7.7)
Physiotherapy	29 (8.0)	2 (15.4)
Mensendieck physiotherapy	18 (5.0)	1 (7.7)
Teacher education ^b	92 (25.3)	5 (38.5)
Early childhood education	69 (19.0)	3 (23.1)
Occupational therapy	16 (4.4)	0
Child welfare	35 (9.6)	0
Social work	46 (12.7)	0
Teacher education in art and design	23 (6.3)	1 (7.7)
Age		
<25 years	279 (77.3)	4 (30.8)
25 years or older	82 (22.7)	9 (69.2)
Study programs		
Health and social care ^c	167 (46.0)	4 (30.8)
Teaching and child welfare ^d	196 (54.0)	9 (69.2)

^aThe student data has previously been included in a submitted paper.

^bPrimary and lower secondary teacher education.

^cPhysiotherapy, Mensendieck physiotherapy, nursing, social work and occupational therapy.

^dEarly childhood education and care, primary and lower secondary teacher education, child welfare, and teacher education in art and design.

Social Work and Occupational Therapy) as they target all age groups as end users. The statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) v25.

The qualitative part consisted of an analysis of answers to open-ended questions from the electronic questionnaire. The responses were imported into the NVivo software (QSR International), where they were sorted by assignment form (podcast, video or written text), and the arguments were organized into themes. The quotes in the findings section are examples that reflect similar opinions provided by several students or supervisors. To insure quality, the questionnaires' text answers were reviewed by all researchers.

Ethics

Ethical Guidelines for Research at OsloMet were followed (Oslo Metropolitan University (OsloMet), 2021). Further, the study was discussed with the Norwegian Centre for Research Data (NSD) (The Norwegian Centre for Research Data, 2021), which replied that it was unnecessary to report the study to them since if it was completely anonymous and no sociodemographic information beyond the participants' age and gender was collected, as was the case in the current study (NSD reference number 741649). None of the participants were under the age of 18 years. The data were collected through an anonymous web survey using 'Nettskjema' (Nettskjema, 2020), in line with the ethical guideline (Oslo Metropolitan University (OsloMet), 2021). The participants were provided written information about the study beforehand in LMS Canvas. The voluntariness and anonymity of the participants were emphasized, and the participants were informed about the purpose

TABLE 2 | The choice of and experience with the assignment format among students and supervisors.

	Response, n (%)
Students (n = 363)	
Did your IPL group submit the assignment during the seminar?	
- Yes	350 (96.4)
- No	6 (1.7)
- Do not know	7 (1.9)
What type of assignment format did/will your IPL group choose?	
- Written text	86 (23.7)
- Video	3 (0.8)
- Podcast	273 (75.2)
Supervisors (n = 13)	
Had been supervisor previously ^a	
- Yes	6 (46.2)
- No	7 (53.8)
Number of IPL groups supervised	
- One	5 (38.5)
- 2–5	4 (30.8)
- 6 or more	4 (30.8)

^a(Foss et al., 2018; INTERACT, 2017).

of the study and how the data would be used. Answering the questionnaire was considered informed consent to participate. The study complies with the Declaration of Helsinki.

TABLE 3 | The distribution of the answers by students and their supervisors to “Which submission format do you think provides the highest learning outcome in an interprofessional group assignment collaboration?”

	Written text n (%)	Video n (%)	Podcast n (%)
Students (n = 363)	102 (28.1)	15 (4.1)	246 (67.8)
Supervisors (n = 13)	4 (30.8)	0	9 (69.2)

RESULTS

Quantitative Data

Of 1,410 students from all of the included study programs, 363 answered the evaluation questionnaire (a response rate of 25.8%, **Table 1**). More than two-thirds (77.3%) of the students were under the age of 25, 54.0% were attending teacher education and child welfare study programs, and 46.0% were attending health and social care study programs. Of the 35 supervisors, 13 answered the evaluation questionnaire (response rate of 37.1%). Most of the supervisors (9 of 13) were 25 years or older and had backgrounds in teacher education (9 of 13).

Nearly all of the responding students (96.4%) reported that their assignment was delivered during the seminar days (**Table 2**). Of the students, 75.2% submitted podcasts for the assignment, while 23.7% submitted written academic texts. Only three students submitted videos. Among 13 supervisors, five had supervised only one IPL group, four had supervised six IPL groups or more, and seven had no previous experience with supervision.

The best academic learning outcomes came from podcasts (67.8%), written texts (28.1%), and videos (4.1%), according to the students (**Table 3**). According to χ^2 -test, there were no difference between age and educational background groups regarding these findings (data not shown). According to supervisors, the best academic learning outcomes came from podcasts (9 of 13) and written texts (4 of 13); none chose videos.

Qualitative Data

Of the 364 students who replied regarding the preferred assignment, 179 (49.2%) elaborated on their reasons.

The Students’ Experiences and Attitudes The Benefit of Text Format

The students arguing in favour of a text format said producing and editing podcasts or videos take time not directly related to learning outcomes. The students did not feel digitally competent in the suggested productions, and the unfamiliarity was uncomfortable. Instead, they would prefer to use that time to become familiar with the literature of interest and write a good text. They felt writing text made it easier to retain the knowledge, making the knowledge more durable. Writing text required more precise, accurate use of language and gave deeper academic learning, as one of the respondents explained:

“Requires thorough use of curriculum (sources) in a way that podcast or video doesn’t necessarily do.” Child welfare education

“I think that text format is best according to learning outcomes because you need to put yourself in your subject to work in a good way with the text.” Primary and Secondary Teacher Education

The Benefit of Podcasts

The main argument for choosing a podcast as an assignment format was that it allowed more discussion and reflection within the group. The students shared their respective thoughts with the group and arrived at an answer through discussion, which appeared instructive for the group members. They also thought it was fun, and they felt they were more creative. Coming from different professions, the students indicated that they learned more from these discussions. One student wrote:

“By podcast, we get a good discussion where we can share our own thoughts and learn and reflect on each other’s ideas.” Primary and Secondary Teacher Education

An argument for a podcast was that the students felt it was easier to collaborate and to include all the group members. They found they engaged in a common perspective when the different parts of the product were not distributed between the members. The students felt it was easier to show initiative, and everyone in the group participated. They worked together, and the collaboration did not depend on a single student steering or leading the group.

“Using podcasts gives a good collaboration, where everyone has to work together to make a common product.” Childhood education studies

A couple of respondents mentioned that it appeared to be a nice change in assignments. It was fun to do something new, and recording a podcast was a more feasible task than writing a text. The timeframe was short, as one of the students noted:

“My group wasn’t complete, so we didn’t see text assignment as an opportunity as it would have been too much work to be able to finish in 2 days.” Teacher studies—art and design

“It’s a more fun way to learn, you’ll quickly become more engaged, and learn more.” Physiotherapist studies

The Benefit of a Video

The students arguing for recording a video said that the visual impression makes the subject easier to remember. One student expressed it this way:

“I believe video as words and the picture together make the information easier to take along and remember longer.” Primary and Secondary Teacher Education

Some students expressed the same thoughts about videos and podcasts, such as being easier to include all participants and

discuss the subject from multiple perspectives. One student argued against text assignments:

“Podcasts and videos provide a lot of room for discussion and freedom to express yourself without a burdensome requirement to write with an academically correct language.” Physiotherapy studies

The Supervisors' Experiences and Attitudes

Among the seven supervisors responding about which assignment led to the best learning outcomes, six preferred podcasts; the seventh did not state a conclusion because they lacked experience. Their arguments differed, but they were mainly in line with the students' opinions. The supervisors said podcasts were fun and motivating, allowing the students to be more creative, and that podcasting could be a more inclusive task. A couple of the supervisors thought that the timeframe was too narrow for writing text. Finally, some pointed out the necessity of the students' previous insights and experience/inexperience with the technology, as one of the supervisors commented:

“It is about whether the students feel confident in themselves regarding a podcast or text assignment. In my opinion, a podcast is the best. Everyone has the opportunity to speak their opinion and deepen their reflections.” Teacher, childhood education

DISCUSSION

The students and most of their supervisors preferred podcasts as assignment tools over written text or videos. However, very few students chose the video assessment format, making the insights into this format limited. Students indicated that podcasting stimulated collaborative learning and enhanced the participation of all students in the IPL group.

The present finding is in line with the findings from previous studies from uni-professional STEM educations (Lee et al., 2008; Bartle et al., 2011; Kemp et al., 2012; Moryl, 2016; Mathany and Dodd, 2018). The main argument for choosing a podcast as an assignment format was that it allowed more discussion and reflection within the group.

The low usage of videos as an assignment tool in the present study was surprising. Videoed group role-playing was considered a useful cooperative learning format in a cell biology course because it allowed the students to explore and explain diverse scientific topics while simultaneously developing their teamwork and associated skills (Young, 2020). However, students in laboratory practice (Speed et al., 2018) had more mixed responses. Nonverbal communication is visible to the viewers, in contrast to podcasts and written texts. We do not know if videos' lower usage as an assignment tool results from shyness or the time wasted on specific technologies rather than academic discussions.

The participants expressed that a long academic text's workload does not equal a short podcast's or video's workload.

Although some of the students might have been introduced to digital tools allowing them to create and edit documents online while collaborating with other users in real-time such as Google docs and Padlets, the time line might have benefitted the podcast. They expressed that although podcasting gave relevant pre-service training in communications and collaboration skills, the use of “oral academic language” was not as difficult or demanding as in written text. Practising academic writing (individually or as group work) is still essential and a requirement in other parts of the study programs. This study focused on IPL group work and the skills needed in IPC, and clearly the three different assignments formats are not directly comparable.

The criteria “show that you can give examples of different professionals' views of children and young people” intended to help the students to learn from, with, and about each other (WHO, 2010). Grouping students into IPL groups does not automatically make them learn from, with, and about each other (Vasset et al., 2019). These students had limited practical experience to build on from their own study programs. The supervisor supported the students in communication and reflection and helped group members exchange ideas and find solutions they probably would not have found on their own (Lindqvist et al., 2019). However, we cannot exclude that our students and supervisors did not have a shared understanding of definitions, terms and criteria (Strudwick and Day, 2015). The specially prepared criteria were therefore wide, and the supervisors were not expected to grade the IPL group assignments or reward individual performances. Future IPL studies should consider extending IPL assessment criteria to include the WHO's core IPL competencies (roles and responsibilities, values and ethics, interprofessional communication, and teams and teamwork) (Interprofessional Education Collaborative, 2016).

The criteria “Show that you can use professional concepts in the analysis of observation; show that you have initial knowledge of children and adolescents” intended to enhance peer-to-peer learning on the topic of children, young people and their families. Teacher students and child welfare students initially had a higher knowledge base of children and adolescents, and they knew more about their own future professional role than compared to the students from health and social care educations (Almendingen et al., 2021). Such imbalance in the knowledge base may even be present in working life. We did not consider it relevant to focus on the “level of contribution” of each individual student in the group work as previously described in a study on student-produced podcasts among science students (Reyna et al., 2018). The purpose is not for the IPL students to get high marks for communicating science knowledge as described in a recent paper (WHO, 2010; Nielsen et al., 2020). The implementation of IPL is a requirement for all Norwegian health and social care education programs from the academic year 2020/2021 (Ministry of Education and Research, 2017b). On completion of their education, graduates should have achieved the two following shared learning outcomes: “be able to interact across disciplines, professions, and sectors, and across establishments and levels, and should be able to initiate such interaction” and “have

knowledge of children and young people and, as practitioners, should be able to take care of their needs in terms of treatment and/or services, ensure their participation, and safeguard their rights.” OsloMet seized the opportunity to make the present IPL course a part of the response to the new shared requirements. The shared learning outcomes is therefore reflected in these assessment criteria (Almendingen et al., 2021).

The criteria “show that you are referring to relevant sources (APA style)” intended to balance the workload between the different assignment formats and to ensure that all students read and referred to the syllabus. Students from teacher educations and child welfare were however partly familiar with the syllabus from their own education, and time before the submission deadline was limited. Since written competence may not necessarily reflect oral competence, pre-service training, therefore requires teaching and learning strategies beyond the syllabus and passive learning (Ministry of Education and Research, 2017a). Future IPL studies may consider the exclusion of syllabus and academic text as assignment format.

These students had limited prior experience with both podcasts and videos in their study programs and in IPL, which makes it fascinating that we found no differences in responses between the age or education study program groups. This is a novel finding, since to the best of our knowledge no previous large-scale study has investigated student-produced podcasts in teacher, health and social care students. Thus, we may suggest that the assignment tools, not educational background or age, influenced the present student responses.

Nine weeks before the forced digitalization of education due to the COVID-19 pandemic in Norway, these students had limited prior experience producing podcasts as group work assignments. This is interesting since the pandemic forces higher education to use IPC to a much higher degree. How ICT is implemented and used pedagogically is important for students’ learning outcomes, not the technology itself (Lillejord and Børte, 2018; Sambell and Brown, 2020). These 196 IPL-groups worked on campus in a hybrid learning approach (Almendingen et al., 2021). Given the option to choose between academic written text and multimedia formats, the majority submitted podcasts as their assignment tool. Future studies should explore the use of podcasts in virtual pre-service and lifelong IPL training.

Strengths and Limitations

The cross-sectional study design does not allow to determine cause and effect and cannot be used to analyze behavior over time. The response rate was low, but in line with a declining response rate to surveys in general, which threatens the validity and generalizability of findings (Morton et al., 2012; The Norwegian Agency for Quality Assurance in Education, 2018). Although the sample size of the supervisors was small, the response rate was 37.1%. A high response rate is, however, no guarantee of sample quality. Self-selection bias may not be excluded, as responders with strong opinions on digitalization in education—in either direction—might not be excluded, yet the diversity in our sample enhances the robustness of the findings. It is possible that the choice of assessment format was not based on

achieving the best learning outcome but could be constrained by the time available. Moreover, we cannot exclude that the format that they reported having the highest learning outcome was the format that they chose. However, it was the group that will choose the format (text/video/podcast) and with several students in one and the same group, the choice may end up with something they only agree on, but not necessarily something each individual student prefers. The question of which format provides the greatest learning outcome goes to an individual student with the same three choices. Although students cannot compare the format of their own group to other formats, it does not necessarily correspond to individual preferences and the choice that the group ends up with. For example, there are 86 students who are from the group with «academic text», but only 68 of these believe that academic text provides the greatest learning outcome (7 believe film and 11 believe podcast gives the greatest learning outcome). Furthermore, among 273 students who choose podcasts as the format in their group, 234 believe that podcasts provide the greatest learning outcome, while 33 believe that it is an academic text and 6 believe that it is a video. Very few students chose the video assessment format. To ensure reliability and internal validity of the study, we have explored the free-text responses explicitly mentioning both text and podcasts. We found that 47 (26.3% of the responses) include arguments for and against both assignment formats, and these reflect the overall results. However, this study is exploratory, and the responses are spontaneous and should be further explored in new studies. In the present study, students did not observe the reports of students using a different format. In the future, students could watch or listen to student-produced videos and podcasts (for example when preparing for the IPL course). Moreover, the introduction of peer-to-peer assessment may position the students to compare the three assessment formats. Although the assignment approach was not comparable, more than half of the students submitted a podcast, and none submitted a video in our IPL course delivery in 2019 (Almendingen et al., 2021). That course delivery was designed so that the students could meet in extra ILP group meetings after the seminar days, and the deadline for submitting the group assignment was 9 weeks. It is nevertheless interesting that more than half of the students submitted podcast even with 9 weeks deadline. Prior experience with the use of student-produced podcasts and videos was otherwise low at our university winter 2020, and therefore also the supervisors insights into the learning outcomes are most probably constrained by the formats chosen by the students. Some of the supervisors only supervised one group, and even those who supervised several groups are very unlikely to have supervised a group using video. However, despite limitations students and supervisors from different educational backgrounds hold positive attitudes toward podcast. In-depth face-to-face interviews might have revealed more perspectives on the different ICT assignment formats. However, although the number of responding supervisors was only 13 (response rate: 39.1%), the supervisors delivered similar responses to both open and closed questions. Moreover, the anonymous data collection, the large heterogeneous sample size of students, and the different educational backgrounds among supervisors also

strengthen the study. Students from all the nine different study programs included in the study contributed. Moreover, an external statistician was responsible for the statistical analysis. The study was not originally designed as a research study, but we utilized data from an ongoing mandatory educational large-scale initiative that addresses the need for interprofessional competencies and cooperation in welfare services. We are not aware of any other comparable studies that evaluate aspects of digitalization and digital assignments that include students from both teacher education, and health and social care study programs.

CONCLUSION

In conclusion, podcasts were favoured as an assignment tool. The short time frame allowed for the project may have influenced this choice. Very few students chose the video assessment format, making the insight into this format limited. Although students were generally satisfied with the option to choose, they expressed advantages and disadvantages for all assignment formats. Results did not differ according to age or educational background. Future studies should explore the pedagogic and cost benefits of podcasting in higher education as compared to other methods. Assessment of IPL is challenging, and best practices have not been identified. The insights generated from the present study may help to design pre-service IPL courses involving students in not only health and social care study programs but also teacher education and child welfare programs.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

REFERENCES

- Almendingen, K., Šaltytė Benth, J., and Molin, M. (2021). Large Scale Blended Learning Design in an Interprofessional Undergraduate Course in Norway: Context Description and Supervisors' Perspective. *MedEdPublish*. 10 (1), 1–26. doi:10.15694/mep.2021.000162.1
- Anderson, E. M. (2013). Preparing the Next Generation of Early Childhood Teachers: The Emerging Role of Interprofessional Education and Collaboration in Teacher Education. *J. Early Child. Teach. Education*. 34 (1), 23–35. doi:10.1080/10901027.2013.758535
- Barr, H., Gray, R., Helme, M., Low, H., and Reeves, S. (2016). Steering the Development of Interprofessional Education. *J. Interprof. Care*. 30 (5), 549–552. doi:10.1080/13561820.2016.1217686
- Bartle, E., Longnecker, N., and Pegrum, M. (2011). Collaboration, Contextualisation and Communication Using New Media: Introducing Podcasting into an Undergraduate Chemistry Class. *Int. J. Sci. Mathematics Education*. 19, 16–28.
- Bell, A. (2007). *Learning Applications for the iPod and Hand-Held Computers: Rubric for Podcasts* Madison: University of Wisconsin.
- Borg, E., and Drange, I. (2019). Interprofessional Collaboration in School: Effects on Teaching and Learning. *Improving Schools*. 22 (3), 251–266. doi:10.1177/1365480219864812
- Dobbs-Oates, J., and Wachter Morris, C. (2016). The Case for Interprofessional Education in Teacher Education and Beyond. *J. Education Teach*. 42 (1), 50–65. doi:10.1080/02607476.2015.1131363

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The Norwegian Centre for Research Data (NSD) approved the data protection (reference number 741649). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

KA: Conceptualization, Data curation, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing AT: Formal analysis, Writing – review & editing BS-N: Investigation, Methodology, Writing – review & editing LK: Investigation, Methodology, Writing – review & editing JB: Data curation, Formal analysis, Investigation, Methodology, Writing – review & editing.

FUNDING

This study was funded by internal funding from OsloMet.

ACKNOWLEDGMENTS

We first wish to thank the participants. We also wish to thank the academic and administrative staff at Oslo Metropolitan University for their contributions to this work. A special thanks to administrative manager INTERACT Ellen Merethe Magnus and project manager INTERACT Torhild Skotheim.

- Evans, L., Vanden Bosch, M. L., Harrington, S., Schoofs, N., and Coviak, C. (2019). Flipping the Classroom in Health Care Higher Education: A Systematic Review. *Nurse Educ*. 44 (2), 74–78. doi:10.1097/NNE.0000000000000554
- Foss, C., Guldbrandsen, L. M., Løndal, K., Ulleberg, I., Ødegaard, N. B., and Oien, I. (2018). *Constructing Interprofessional Education: The Case of INTERACT (Interprofessional Interaction With Children and Youth)*. NTNU: Its 21 4th conference on interdisciplinary teamwork skills for the 21st century.
- Fukkink, R. G., and van Verseveld, M. (2019). Inclusive Early Childhood Education and Care: a Longitudinal Study into the Growth of Interprofessional Collaboration. *J. Interprof. Care*. 34 (3), 362–372. doi:10.1080/13561820.2019.1650731
- Gillespie, J., Whiteley, R., Watts, W., Dattolo, L., and Jones, D. (2010). Interprofessional Education in Child Welfare: A University-community Collaboration between Nursing, Education, and Social Work. *Relational Child. Youth Care Pract*. 23 (1), 5–15.
- Granrud, M. D., Anderzén-Carlsson, A., Bisholt, B., and Steffenak, A. K. M. (2019). Public Health Nurses' Perceptions of Interprofessional Collaboration Related to Adolescents' Mental Health Problems in Secondary Schools: A Phenomenographic Study. *J. Clin. Nurs*. 28 (15–16), 2899–2910. doi:10.1111/jocn.14881
- Hesjedal, E., Hetland, H., Iversen, A. C., and Manger, T. (2015). Interprofessional Collaboration as a Means of Including Children at Risk: an Analysis of Norwegian Educational Policy Documents. *Int. J. Inclusive Education*. 19 (12), 1280–1293. doi:10.1080/13603116.2015.1057241
- INTERACT (2017). INTERACT (Interprofessional Interaction With Children and Youth) Oslo Metropolitan University. Available at: <https://uni.oslomet.no/interact/seminardager-interact/>

- Interprofessional Education Collaborative (2016). *Core Competencies for Interprofessional Collaborative Practice: 2016 Update*. Washington, DC: Interprofessional Education Collaborative. Available at: <https://hsc.unm.edu/ipe/resources/ipec-2016-core-competencies.pdf>.
- Kemp, J., Mellor, A., Kotter, R., and Oosthoek, J. W. (2012). Student-Produced Podcasts as an Assessment Tool: An Example From Geomorphology. *J. Geogr. Higher Education*. 36 (1), 117–130. doi:10.1080/03098265.2011.576754
- Lee, M. J. W., McLoughlin, C., and Chan, A. (2008). Talk the Talk: Learner-Generated Podcasts as Catalysts for Knowledge Creation. *Br. J. Educ. Technology*. 39 (3), 501–521. doi:10.1111/j.1467-8535.2007.00746.x
- Lillejord, S., and Børte, K. (2018). *Learning and Teaching With Technology in Higher Education - a Systematic Review*. Oslo: Knowledge Centre for Education.
- Lindqvist, S., Vasset, F., Iversen, H. P., Hofseth Almås, S., Willumsen, E., and Ødegård, A. (2019). University Teachers' Views of Interprofessional Learning and Their Role in Achieving Outcomes - a Qualitative Study. *J. Interprof. Care*. 33 (2), 190–199. doi:10.1080/13561820.2018.1534809
- Mathany, C., and Dodd, J. (2018). Student-Generated Interview Podcasts: An Assignment Template. *Collected Essays Learn. Teach.* 11, 65. doi:10.22329/celt.v11i0.4971
- Ministry of Education and Research (2017a). National Curriculum Regulations for Norwegian Health and Welfare Education (RETHOS) Norway. Available at: <https://www.regjeringen.no/en/topics/education/higher-education/nasjonale-retningslinjer-for-helse-og-sosialfagutdanningene-rethos/id2569499/>.
- Ministry of Education and Research (2017b). *Quality Culture in Higher Education*. Oslo: Research Council of Norway.
- Morton, S. M., Bandara, D. K., Robinson, E. M., and Carr, P. E. (2012). In the 21st Century, What Is an Acceptable Response Rate? *Aust. N. Z. J. Public Health*. 36 (2), 106–108. doi:10.1111/j.1753-6405.2012.00854.x
- Moryl, R. L. (2016). Pod Learning: Student Groups Create Podcasts to Achieve Economics Learning Goals. *J. Econ. Education*. 47 (1), 64–70. doi:10.1080/00220485.2015.1106363
- Nettskjema (2020). *Nettskjema*. Oslo, Norway: University of Oslo. Available at: <https://www.uio.no/english/services/it/adm-services/nettskjema/>
- Nielsen, W., Georgiou, H., Jones, P., and Turney, A. (2020). Digital Explanation as Assessment in University Science. *Res. Sci. Educ.* 50 (6), 2391–2418. doi:10.1007/s11165-018-9785-9
- Norwegian Society of Pediatricians (2017). Child Healthcare Atlas for Norway. An Overview and Analysis of Publicly Funded Somatic Health Services for Children (0-16 Years) in Norway in the Period 2011-2014: Ministry of Health and Care Services and Northern Norway Regional Health Authority. Available at: <https://helseatlas.no/sites/default/files/child-healthcare-atlas.pdf>
- Oslo Metropolitan University (OsloMet) (2021). Ethical Guidelines for Research at Oslo Metropolitan University (OsloMet). Available at: <https://ansatt.oslomet.no/documents/585743/53632647/Ethical+Guidelines+for+Reserach+at+OsloMet/3dccee65-e17e-04f6-34d3-a8e58f280c88>
- Pearce, K. L., and Vanderlelie, J. J. (2017). "Teaching and Evaluating Graduate Attributes in Multimedia Science Based Assessment Tasks," in Proceedings of the Australian conference on science and mathematics education.
- Powell, L., and Robson, F. (2014). Learner-Generated Podcasts: a Useful Approach to Assessment? *Innov. Education Teach. Int.* 51 (3), 326–337. doi:10.1080/14703297.2013.796710
- Reeves, S., Fletcher, S., Barr, H., Birch, I., Boet, S., Davies, N., et al. (2016). A BEME Systematic Review of the Effects of Interprofessional Education: BEME Guide No. 39. *Med. Teach.* 38 (7), 656–668. doi:10.3109/0142159X.2016.1173663
- Reyna, J., Meier, P., and Meier, P. (2018). Learner-Generated Digital Media (LGDM) as an Assessment Tool in Tertiary Science Education: A Review of Literature. *J. Educ. Chem.* 6 (3), 93–109. doi:10.22492/ije.6.3.06
- Sambell, K., and Brown, S. (2020). Assessment, Learning and Teaching in Higher Education: Covid-19 Assessment Collection. Available at: <https://sally-brown.net/kay-sambell-and-sally-brown-covid-19-assessment-collection/>
- Speed, C. J., Lucarelli, G. A., and Macaulay, J. O. (2018). Student Produced Videos - an Innovative and Creative Approach to Assessment. *Inter. J. Higher Educ.* 7, 99. doi:10.5430/ijhe.v7n4p99
- Strudwick, R., and Day, J. (2015). Developing Effective Assignment Feedback for an Interprofessional Learning Module-An Action Research Project. *Nurse Educ. Today*. 35 (9), 974–980. doi:10.1016/j.nedt.2015.03.020
- Strunk, J., Dr, D., Pavelko, S., Allen-Bronaugh, D., Myers, K., Gilligan, T., et al. (2019). Interprofessional Education for Pre-service School-Based Professionals: Faculty and Student Collaboration. *Teach. Learn. Commun. Sci. Disord.* 3, 9. doi:10.30707/tlcsd3.1strunk
- The Norwegian Agency for Quality Assurance in Education (2018). The Students' Judgement. Available at: <https://www.nokut.no/en/news/the-students-judgement/>
- The Norwegian Centre for Research Data (2021). The Norwegian Centre for Research Data. Available at: <http://www.nsd.uib.no/>
- The Ombudsman for Children in Norway (2017). NHRI Report to Norway's Fifth and Sixth Periodic Report to the UN Committee on the Rights of the Child. Available at: <http://barneombudet.no/wp-content/uploads/2017/10/The-Ombudsman-for-Children-in-Norway-Supplementary-Report-to-UN-2017.pdf>
- Vasset, F., Brynhildsen, S. E. A., and Kvilhaugsvik, B. (2019). Interprofessional Learning Through a Digital Platform. *J. Res. Interprofessional Pract. Education*. 9, 1. doi:10.22230/jripe.2019v9n1a282
- Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. UK, London: Harvard University Press/Gyldendal Akademisk.
- Wagner, S. J., and Reeves, S. (2015). Milestones and Entrustable Professional Activities: The Key to Practically Translating Competencies for Interprofessional Education? *J. Interprof. Care*. 29 (5), 507–508. doi:10.3109/13561820.2014.1003636
- WHO (2010). *Framework for Action on Interprofessional Education & Collaborative Practice*. Geneva, Switzerland: WHO Press.
- Young, P. W. (2020). Student-Produced Video of Role-Plays on Topics in Cell Biology and Biochemistry: A Novel Undergraduate Group Work Exercise. *Front. Education*. 5, 115. doi:10.3389/feduc.2020.00115

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2021 Almendingen, Torbjørnsen, Sparboe-Nilsen, Kvarme and Salyte Benth. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.