

Storylab Lessons

A Collaborative Project Between Courses in Journalism and Media Technology

Gunilla Hultén & Malin Picha Edwardsson

Abstract

This article examines Storylab, a collaborative learning project between the journalism programme at Stockholm University and the engineering programme in media technology at the KTH Royal Institute of Technology in Stockholm, designed to combine journalistic storytelling with pervasive media technology. The aim of the study is to identify and reflect on the challenges associated with the approach. The methods used are a survey and semi-structured interviews with the students. The analyses draw on research concerning the current main challenges for the news industry and journalism educators. The results show that Storylab was highly appreciated, and provided students with useful skills for their professional lives. However, not all groups worked well together, and some students wished that the collaboration had been more extensive. Differences in motivations and priorities were mentioned as restraining factors. Therefore, it is argued that for a sustainable media landscape, journalists and engineers must collaborate, and that this cooperation can be brought about during professional training.

Keywords: collaborative learning, higher education, innovation, professional training, storytelling

Introduction

The media landscape is in the midst of a transformational process, involving technology, journalism, and business models (Hultén, Tjernström & Melesko 2010). High demands are placed on media companies to work more innovatively in order to create new products and services (Lowrey 2011). As a result, journalists and engineers need to work more closely together in project-oriented teams. Cross-disciplinary teamwork is one way for the media industry to keep up with the fast-paced development that is required in our changing world. For many media companies, this type of collaboration poses a significant challenge (Lewis & Westlund 2015; Westlund 2011, 2012).

At a time when digital technologies are increasingly diffused within newsrooms, and when industry demands are changing rapidly, educators are expected to keep pace with current developments. Undoubtedly, recent changes within the media industry have profound implications on journalism education and challenge the training of future

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journalists (e.g. Krumsvik 2016; Mensing 2011; Salaverria 2011). In order to adapt to a fast-changing media landscape, 90 per cent of journalism schools in the United States have updated their curricula to reflect these changes (Becker, Vlad & Stefanita 2014: 5). In this article, we examine Storylab, a collaborative learning project between the journalism programme at Stockholm University and the engineering programme in media technology at the KTH Royal Institute of Technology in Stockholm, designed to combine journalistic storytelling with pervasive media technology.

This study seeks to analyse the views of the students participating in the Storylab project in order to identify and to consider the challenges associated with an interdisciplinary approach, and the reported factors facilitating or hindering the collaboration.

Our research questions are:

- 1a. What challenges associated with the interdisciplinary approach did the students identify?
- 1b. What factors have facilitated or hindered the collaboration?
- 2a. What skills did the students consider to be necessary in their future professions?
- 2b. To what extent did these skills correspond to the skills achieved during the course?

Emerging technologies and storytelling

To shed light on our research questions, we draw on research and theory concerning digital technology in newsrooms, digital storytelling and interdisciplinarity. Engineers and developers often work in teams that are separate from the editorial development teams and the business development teams in a media company. However, without the necessary cross-disciplinary collaboration between different professional groups, innovation might become difficult and counter-productive (Westlund 2011; Westlund 2012).

According to Lewis and Westlund (2015), previous research on technology in news work has mainly focused on the editorial implications of organisational change. Furthermore, they argue that there is a blind spot in the literature when it comes to “the human-technology dynamic, as well as the organisational interplay of editorial, technology and business”, and that a “sociotechnical emphasis acknowledges the extent to which contemporary journalism is becoming interconnected with technological tools, processes, and ways of thinking as the new organising logics of media work” (ibid: 21). Journalism scholar Megan Le Masurier notes an intensified need for co-operation within media organisations when increased skills are required in order to create journalism across platforms. She maintains that teamwork and collaboration are a feature of *slow journalism*, a term that includes criticism of the limitations and dangers of the speed of much of mainstream contemporary journalism (Le Masurier 2016).

Technological innovations and tools are constantly being developed in the media. Trends like Virtual Reality, Big Data, drones etc. might become useful for news reporting in the future. However, not much research has been done on the storytelling aspects of these new technologies. According to Angus and Doherty “there is a need for journalists to have a deeper understanding of the ways that technology impacts their work and how best to produce journalism for mobile and networked devices” (Angus & Doherty 2015: 44). Furthermore, they argue, “journalism continues to reflect traditional produc-

tion processes that fail to exploit the potential of new technology” (ibid.). They also contend that journalism practices need to adapt in order to survive: “This means the next generation of graduates must understand, and be able to exploit, the digital platforms and networks that will emerge” (ibid: 45). John Pavlik (2013) identifies innovation as the key to ensuring the long-term viability of news media in the age of global, mobile, networked media.

There is ample research conducted by journalism scholars on the role of technology in news work, organisation of the newsroom, innovative media design, and on the changing conditions of digital news production (e.g. Domingo & Paterson 2011; Nyre 2014; Pavlik 2000; Pavlik 2008; Steensen 2011; Storsul & Krumsvik 2013). However, the storytelling aspects of future journalism, especially in relation to emerging technology, seems to be an underexplored research area. There are, however, contributions that provide valuable insights into this field.

For instance, the research by Pavlik and Bridges sheds light on the emerging technology of *augmented reality* (AR) as a method of storytelling in journalism. They maintain that digital technology holds promise for the future of journalism in that new forms of storytelling might provide more context, and nuance, to reported events and thus engage audiences more successfully (Pavlik & Bridges 2013). Ferrer Conill and Karlsson (2015) focus on the *gamifying of journalism* and note both the potential benefits and the dangers of this new trend. In addition, Appelgren and Nygren (2014) have investigated *data journalism* as an emerging form of storytelling, mixing data analysis, programming and visualisation techniques with traditional journalistic working methods. They identify the lack of time to collect, analyse and present data as current challenges and hampering factors in practising data journalism within streamlined news media organisations (2014: 404). Adding to this, recent research by Skye Doherty (2016) explores how design methods can develop journalistic storytelling and in that way tackle some of the challenges faced by the industry.

The story is central to all forms of journalism. However, there is not one single definition of *Storytelling* regarding stories in traditional media companies. In Gunnar Nygren’s typology of professional ideals within journalism, the *Storyteller* is described in the following way: “[T]o the storyteller, the form and the possibility to create a good story that touches people is at least as important as the content. Personification and dramatization are the basic procedures of daily work” (Nygren 2008: 149; authors’ translation). Research conducted by Hultén and Wiklund (2016) show that the ideal of the *Storyteller* was the professional role that journalism students ranked the highest, followed by the second and third-ranked professional roles, the *Expert* and the *Investigative Journalist*. Over the past five years, the possibilities for digital narrative journalism have increased considerably.

Nevertheless, media companies have been rather reluctant and uninterested in developing the potential that new technologies offer (Lassila-Merisalo 2016). However, research by Ekdale et al. suggests that journalists are increasingly convinced of the merits and the necessity of adapting their practices to newer technological capabilities. The authors conclude that “newswriters broadly are favorable to changes that they believe increase the quality of journalism and are consistent with existing norms and values” (Ekdale et al. 2015: 939). The full potential of digital journalistic storytelling is yet to be seen.

Consequently, the role of storytelling in journalism should not be underestimated, and a student-based project combining and exploring emerging technologies and storytelling was considered to be of significant value. One key concept in this study is *digital storytelling* and it is investigated as a means to integrate the learning activities of technology with journalism. We are loosely inspired by Joe Lambert's view on digital storytelling and his seven steps of effective digital stories, namely: (1) owning your insights, (2) owning your emotions, (3) finding the moment, (4) seeing your story, (5) hearing your story, (6) assembling your story, and (7) sharing your story (Lambert 2010). Lambert mainly centres on the personal story. In the Storylab project, the seven steps have been operationalised into instructions helping the students to design journalistic multimodal storytelling (see "Implementation and course design").

Next in the article, we introduce the interdisciplinary and collaborative theoretical foundations. The following sections give a brief background of the implementation and course design of the project. Then, the results and analyses of the survey are addressed. Subsequently, the views of the interviewed students are introduced. In the concluding section of the article, we draw attention to the implications of the analyses and discuss the provisions to promote interdisciplinarity and collaboration in journalism and media technology education. We also present lessons learned, and suggestions for future collaborative teaching initiatives.

An interdisciplinary and collaborative approach

Research by Weber and Rall (2012) indicates that knowledge exchange, skill sharing, and collaboration between different experts – such as journalists, designers, and programmers – are crucial for design success in newsrooms; and, journalism scholar Dan Gillmor (2016), for example, strongly encourages communication between computer science and journalism students. Thus, increased interdisciplinarity in journalism education would appear to be an issue of utmost importance.

Given the rapid transformation of the media industry, we argue that educators need to address the challenges of collaborating within interdisciplinary teams in their teaching on different levels, in order to prepare the students for "real life" situations and the current development of media technology and journalism (Stocchetti 2014). To already address these challenges at an educational level does, in turn, require non-traditional collaborations across university and faculty borders, and with industry representatives. Research from interdisciplinary teaching initiatives shows several benefits of collaborative approaches. Kavanagh and Cokley (2011) consider sustainability to be the main reason for advocating collaboration between engineering and journalism students. Their project resulted in positive learning effects, with the students gaining an awareness of the necessity to communicate across cultural and disciplinary boundaries. Angus and Doherty (2015) report that journalism students participating in an interdisciplinary teaching initiative gained a deeper understanding of technology and design processes, and that the new insights can provide fresh perspectives on journalism in the future. In an interdisciplinary course on data journalism, involving a collaboration between computer science and journalism educations, the students stated that the skills obtained in the course allowed them to become more competitive in their fields (Plaue & Cook 2015).

In this study, we draw on Newell's definition of interdisciplinarity (Klein & Newell 1997; Newell 2001). An interdisciplinary approach differs from multidisciplinary or cross-disciplinary techniques in that synthesis and integration are stressed. We equally adhere to Jones' view that "interdisciplinary methods allow students to see different perspectives, work in groups, and make the synthesizing of disciplines the ultimate goal" (2009: 76). According to Newell's definition of interdisciplinarity, it includes searching for new information, studying the problem from the perspective of each discipline, and generating disciplinary insights into the problem. Moreover, it comprises integrative perspectives such as creating common ground, constructing a new understanding of the problem, and testing the understanding by attempting to solve the problem (Newell 2001: 15). This stance is closely related to Wiersema's distinction between cooperative and collaborative approaches. He summarises his ideas in the following way:

Collaboration is more than cooperation. I would say that cooperation is a technique to finish a certain product together: the faster, the better; the less work for each, the better. Collaboration refers to the whole process of learning [...]. (Wiersema 2002: 3-4).

In our case "the problem" and "the product" involved the presentation of a journalistic story together with an innovative technical trend. With an interdisciplinary learning project designed to combine journalistic storytelling with pervasive media technologies, we would be able to study the collaboration and different vocational attitudes of the students and draw conclusions that are valid in "real life"; that is the actual professional environment in the media business. Collaboration between different professional groups in the media business was further explored in a follow-up project, described by Picha Edwardsson (2017). Consequently, our case study offers a model for future interdisciplinary projects, and can prove useful when it comes to identifying success factors and obstacles in collaborative projects.

As previously stated, the focus of this article is on the students' views and experiences. Undoubtedly the project also involved pedagogical challenges. However, the ramifications of interdisciplinary pedagogy are beyond the scope of the current study. Suffice to declare that the pedagogical approach mainly aimed at active learning based on team teaching. The learning methods were designed to engage students in applying boundary crossing skills and knowledge, in teamwork with peers in other disciplines.

Implementation and course design

The planning of Storylab started at the beginning of 2015. Storylab aimed at providing students with skills in advanced digital journalistic storytelling that encompassed and integrated text, audio, photo and video publishing on different media platforms. The rationale was the ongoing structural transformation in journalism and the rapid change in the journalistic profession. Journalism training must be able to offer a relevant education that meets the needs of the market, preparing students for a profession in transition. In order to do so, collaboration with other disciplines and media organisations was considered essential.

The collaboration comprised journalism students finishing the three-year bachelor programme in journalism, and engineering students doing their fifth and final year. The

project included two existing university courses that were given approximately the same focus. The 11 journalism students took Specialisation of Theory and Method – Storylab, 7.5 ECTS credits and the 55 engineering students studied The Future of Storytelling, 10 ECTS credits. The students were asked to work together in project groups in order to combine pervasive technologies with journalistic storytelling.

The course project was structured in such a way that the first part began with a total of 17 lectures, out of which 12 were given by external lecturers from the media industry, and a study visit to Svenska Dagbladet. After the initial five weeks of lectures and literature seminars, the students attended a workshop about storytelling with mobile tools, which finished with a mini-hackathon. Over the following eight weeks, the students worked in project groups on their own. Each group consisted of four engineering students and one journalism student, on average. In this interdisciplinary collaboration, the students were instructed to: (1) clarify what the story is about, (2) define your audience, (3) choose a strong angle and describe the purpose of the story, (4) explain what you want to convey to your audience, (5) design and structure a digital story and adapt it to your audience, (6) describe how you plan to collaborate in order to best refine your story, and (7) produce a narrative adding creative media technology solutions (cf. Lambert 2010).

At the end of the term, every group should present an innovative technical solution to a problem, 5–10 years into the future. Each “problem” consisted of a journalistic story based on a historic news event combined with a pervasive technical trend, as follows:¹

1. Big Data storytelling – the Vietnam anti-war movement in the 1960s.
2. Personalised storytelling – The Ridön skating accident in 2006.
3. Interactive storytelling – The assassination of Swedish Prime Minister Olof Palme in 1986.
4. Overcoming shorter attention spans – The Finnish children evacuated during the Second World War.
5. Eyewitness storytelling – The Swedish legislation for free abortion in 1975.
6. The future of audio storytelling – The Swedish extradition of Baltic soldiers in 1946.
7. Point of view filters – The Arab Spring in the 2010s.
8. Virtual Reality storytelling – The introduction of parental leave for fathers in Sweden in 1974.
9. Storytelling through computer games – The Chernobyl disaster in 1986.
10. Our human senses and storytelling – The construction of the Hallandsås Tunnel in the 1990s.
11. Cross-cultural storytelling – The birth of Apple in 1976.
12. Storytelling through moving images – Life on Mars based on the launching of NASA’s rover “Curiosity” in 2011.
13. Storytelling in advertising – no specific story.

All topics above are examples of digital storytelling in media companies. They were chosen because they have a timeless nature yet are still open to contemporary questions. A typical project result could thus be a description or a prototype of a story combined with a technical solution, such as a videogame about the Chernobyl disaster (9), or a web application visualising different points of view of the Arab Spring (7), or a mobile application overcoming short attention spans while featuring the story of the Finnish war children (4).

Data and methods

A combination of quantitative and qualitative methods is used in this study. At the beginning of the course, the students were asked to complete a web-based survey regarding their expectations of the course, what they hoped to learn, how they saw the future of the media business, and their own chances of finding a job in the media business after completing their education. The methodology used was a survey including all 66 students registered for the two courses. The survey was conducted in August and September 2015, and all students responded to the seven-question survey, which included closed- and open-ended questions. Towards the end of Storylab the survey was followed up with 24 semi-structured individual interviews with journalism and engineering students. All 11 journalism students in the project were interviewed. Among the engineering students one was selected from each of the project groups, by means of volunteering, resulting in 13 respondents. We are aware of the methodological shortcomings that may arise from the differences in terms of populations in the quantitative survey and of the dissimilar procedures for collecting the interview data of the study. Therefore, comparisons between the two groups must be made with caution.

The interview sessions were structured in such a way that the first part concentrated on different aspects of the collaboration between Stockholm University and KTH. The second part of the interview concentrated on the respondents' views of the future of the media industry, and their own chances of finding a job within the media industry after having finished their education.

The interviews were conducted between November 2015 and January 2016 by Gunilla Hultén and Malin Picha Edwardsson. Gunilla Hultén was engaged in the application for the funding of the project and Malin Picha Edwardsson was directly involved in the planning and implementation of the project. The respondents were the researchers' students thus entailing an asymmetrical power relation. Although full anonymity of the interviewees was guaranteed, this fact may have affected the answers and must therefore be considered a potential methodological weakness.

The interviews were done at Hultén's and Picha Edwardsson's workplaces, they were between 30 and 45 minutes long, and were digitally recorded and transcribed in their entirety. Since our interest is the informational content of the interviews, we have used a denaturalised transcription method, which has not taken into account vocalisations and nonverbal interactions. In the transcriptions, the interviews have been slightly edited for repetitions, stuttering etc.

The method used for constructing the questionnaire and for analysing the data was inspired by McCracken (1988). The written results analysis process aimed at discerning and organising the emerging patterns and themes in the respondents' answers

(McCracken 1988). The results of the survey and the interviews were then compiled, evaluated, and analysed.

The survey

As mentioned above, the total survey included 66 students, out of which 11 were journalism students and 55 were engineering students (Table 1). Of the journalism respondents, seven were women and four were men. Among the engineering students, 31 respondents were women and 24 were men. All in all, 38 female and 28 male students participated in the study. The journalism students were slightly older than the engineering students. The median age of the engineering students was 24 years and for the journalism students the median age was 27 years.

Table 1. Respondents in the survey

	Female	Male	Total
Journalism students	7	4	11
Engineering students	31	24	55
Total	38	28	66

On average, the journalism students expected more from the course than the engineering students. By choosing one of five sentences that best described their feelings towards the course the students were asked to rank to what degree they looked forward to the module and how much they expected to learn.

Table 2. The students' feelings towards the course

	Journalism students	Engineering students
Mean	4.9	4.4
Std. deviation	0.3	0.8
Total	10	53

Comments: N=63. The scale ranges between 1 ("I don't want to take this course") and 5 ("I am very much looking forward to this course").

As Table 2 shows, all students had high expectations prior to the course. Half of the engineering students stated that they very much looked forward to the class and nine out of ten journalism students gave the same statement.

When asked what type of knowledge would be most important when working in the media industry in the future, a substantial majority of all students agreed on the fact that user-friendly digital designs and cooperation with other professionals are the most important factors for a successful media business (Figure 1).

As Figure 1 shows, there were mostly no or only minor differences in the answers given by journalism and engineering students or between female and male respondents. However, *language skills* had a much stronger support among the journalism students than among their engineering peers. Female students ranked *design and usability* significantly higher than their male fellow students. Male students, on the other hand, placed *ability to cooperate* higher than female students.

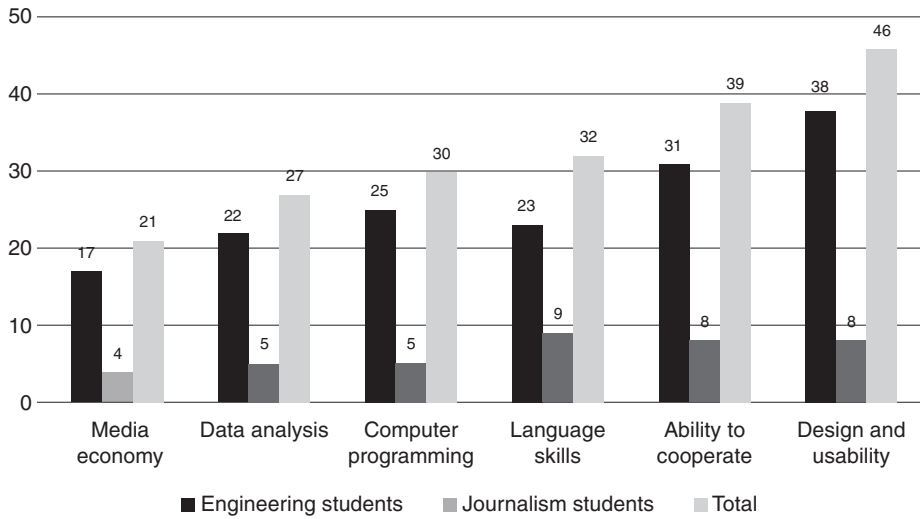


Figure 1. *Opinions on the knowledge the media industry will need in the future (number of responses)*

Comments: The respondents (N=66) could choose one or several options, or state their own opinion. The question was posed: “In your opinion, what type of knowledge would be the most important when working in the media industry in the future?”

The interviews

In this section, we will discuss some of the key themes appearing in the 24 exit interviews with the students. The primary aim of the interviews was to gain insight into the learning experiences and to compare the expectations expressed in the survey with the perceived outcomes of Storylab. Additional purposes were to gather information about the students’ personal views concerning their professional future and to assess the Storylab project in order to enable knowledge transfer for future initiatives.

Expectations and learning outcomes

As mentioned above, most students looked forward to the course. In the exit interviews, we were therefore interested to know if Storylab came up to expectations.² A number of journalism students had expected to learn more about programming. One respondent expressed the following viewpoint:

I was hoping to learn the basics of coding and to gain better knowledge of photography, both still and moving images. But first and foremost to code HTML since it is the cornerstone of web designing. (RJ 2)

And one engineering student explained:

My expectations were: a big project and a big presentation. I was very much into the topic, but expected more insights into current developments and trends. I didn’t think that we would be so free. (RE 10)

Others had gained essential knowledge and training to optimise their bachelor exam projects. “Had I not had the opportunity to learn from Storylab I would not have aimed for such an advanced level”, respondent RJ 8 said. One student offered a different perspective:

I believe that storytelling is the future of journalism. I saw this course as a key asset on my CV. Now I can show that I have been trained in digital media and that I have acquainted myself with storytelling in new forms. (RJ 11)

The storytelling aspects also appealed to the engineering students, and one summarised:

Everybody has a relationship to storytelling. The topic is both easy and complicated at the same time. At the same time, it is a fun topic. I expected to work in groups relatively freely, and learn more about storytelling. (RE 2)

The journalism students also mentioned the value of the input from and cooperation with the industry partner Svenska Dagbladet: “It was rewarding to have that contact with reality”, as RJ 9 put it. Another respondent added:

I expected to learn how to work in groups as in real life and to learn more about the subject. I thought the course was structured in a good way, with theory and inspiration in the beginning, and more focus on the group work at the end. (RE 4)

The collaboration

In the interviews students expressed satisfaction with the collaboration between the two universities on a general level. They wished, however, that the collaboration had been longer and more extensive, and they would have liked more time to work together in the project groups.

One of the aspects of the collaboration that was mentioned in the interviews was the opportunity to see differences in other types of education and educational institutions. As an example, KTH was considered very homogeneous, and by collaborating with Stockholm University, the students could see a different environment and different views on media. “The cooperation is also about learning to know yourself, by meeting others,” as one KTH student expressed it (RE 2). One journalism student answered in a similar vein:

It was fun to work with people who had completely different perspectives. They had unusual views on how to solve the problem or how to tell a story in a new way. It was really great and rewarding. I have continued to work with them a little bit – I help them and they help me. (RJ 7)

One engineering student had the following experience:

Our journalist student was very useful. She was very active, and asked how she could help. The work with the journalist students was valuable. And we learned a lot about their views on media. They are better at media knowledge than we are. (RE 3)

However, not all groups functioned well. Differences in expectations, motivations, and priorities were mentioned as restraining factors. One major obstacle to the collaboration

was the conflicting timetables of the student groups. Nevertheless, most groups managed to find a common ground:

I thought that it was going to be a struggle. But we had a good team, and we struggled only to a certain degree. (RE 13)

Thinking about the future

The survey revealed that half of the students in this study were sure that they would work in the media business within the coming five years, the other half were less certain. However, there were students who had changed their opinions during the project. One journalism student reflected:

My view of what I want to work with has changed during this course. Before, I was very sure that I did not want to work with journalism and that has actually changed. The course has been so inspiring and I feel that I have been given the opportunity to tell a story in my own way. (RJ 7)

And one observed:

On a personal level, the course has meant that I am now convinced that I want to work as a journalist. (RJ 11)

In some cases, the students were concerned about the future in more general terms:

Today, journalists are expected to do everything themselves, but you can't manage that. Therefore, it is important that different disciplines meet. That is something that you should always have in mind, and even encourage. I think that this type of collaboration will strengthen the role of journalism in the future. (RJ 11)

The engineering students had a more optimistic perception of their professional future.

The future is very bright. Society, and the way we have built society, requires media. Media is the new way of living life. We live by consuming media. Media has an incredible power over us. Knowledge: You have to know a little about everything – not least within technology. You have to know how to reach out in the noise, and to position yourself on the market. Journalism is also important. Both technology and society. It is important to collaborate across professional borders. (RE 4)

And another respondent added:

The future for the media industry concerns technology, humans and society. We need to place the human in focus. Media must add value to people. I am sceptical of the statement that technology itself is steering the development – technology determinism. You have to be able to place the human in focus when developing new media services. Think about the human – place the human in focus. (RE 5)

The survey and the interviews together indicate that both engineering and journalism students found cross-disciplinary collaboration vital for the future of the media industry, even though the two student groups in this study had different approaches to the media field.

Discussion

When running such a collaborative learning project, it proved extremely important to communicate and encourage communication on all levels – both with the students involved and internally with other teachers at the universities – in order to ground the project and continuously explain the purpose of the work. The interviews conducted in this study showed that good communication is one of the key components of a successful project. In this project, the students represented 13 different nationalities, none of which had English as their mother tongue. Naturally, this multicultural student group created challenges, but some challenges were unexpected. The language barrier was not the biggest challenge. Instead, some of the student groups consisted of people who were not at all used to working in independent project groups. Consequently, it took some time at the beginning of the course to get everyone to work together.

The quality of the group work, consisting of a journalistic story based on a historic news event combined with a pervasive technical trend as described above, varied considerably. The most successful groups managed to generate a good idea and present this idea in a persuasive way at the end of the course. Some of the groups focused more on the technical trend than the actual story, perhaps due to the fact that there was a majority of engineering students in the project.

In this collaborative project course, however, the final outcome should not solely be measured in terms of the quality of the final presentation but also in terms of the actual collaborative elements. Thus, the process of the students' project work is regarded as important as the final result of their work.

Conclusions

This study has investigated reported experiences of the collaboration between journalism and engineering students within the Storylab course project. The case study discussed here offers an example of digital storytelling integrated with interdisciplinarity, and innovative media technologies in higher journalism education. Within this article we have attempted to illustrate that collaborative learning may be of significance for a sustainable media industry.

The first research questions were: “What challenges associated with the interdisciplinary approach did the students identify?” and “What factors have facilitated or hindered the collaboration?” A common thread in the qualitative interviews was that the interdisciplinary collaborative approach of Storylab was generally appreciated, offered a creative learning milieu, and provided the students with useful tools for problem solving using cross-disciplinary understanding, as well as skills for their future professional lives.

The challenges that the students highlight included communication between students with different disciplines, conflicting schedules and finding common ground in the project groups. Despite these challenges, however, the interaction was well-received and helpful for both groups.

The subsequent research questions were: “What skills did the students consider to be necessary in their future professions?” and “To what extent did these correspond to the skills achieved during the course?” In the survey, a substantial majority of all students agreed on the fact that user-friendly digital designs and cooperation with other professionals are the most important factors for a successful media business. We conclude

that the course design was structured in such a way that the students had a chance to practise these two skills.

A core concern for interdisciplinary studies is the extent to which the students' mutual understanding and communications skills are enhanced (Newell 2001). Both journalism and engineering students reported an awareness of the need to communicate across disciplines but also noted obstacles in integrating journalistic storytelling skills with engineering design.

We also argue that it is of great importance that different professional groups within the media industry work more closely together in project-oriented teams, thus respecting each other's varying skills. By working in cross-disciplinary teams, media companies can become more innovatively oriented, and this is beneficial in creating new products and services.

Based on the results of this study, we argue that interdisciplinary collaboration between different educational programmes is extremely valuable for students, teachers, and for the industry. It is also important to collaborate with representatives from the industry. The interdisciplinary collaboration offers opportunities to experience different views and different educational cultures, thereby enriching the ability to cooperate with different professional groups. The ability to work together in teams consisting of engineers and journalists will become increasingly important in the future, as the development of the media industry is closely connected to technical developments. Storylab made it clear that collaborative learning projects require thorough planning and mutual sharing of knowledge between students and educators.

We maintain that it is crucial for a sustainable media landscape that journalists and engineers collaborate. In order to adapt to a transformational media industry, we further contend that it is of vital importance that this cooperation is brought about at the professional training stage. This case study offers a model for future interdisciplinary projects. The barriers encountered in Storylab are indicators of the challenges encountered in "real life" in the media industry. Consequently, educators need to address these challenges now, as they constrain the development of journalism.

Finally, we offer some suggestions for similarly designed courses in the future in order to encourage interdisciplinarity in journalism education:

- Ground the project internally at the universities involved.
- Bridge cultural and language barriers among the students by discussing key terms and concepts.
- Help students work in cross-disciplinary project groups, by outlining how to start – initially discovering each person's skill, taking advantage of each person's knowledge, making a work plan and appointing a project manager to ensure the progress of the work.
- Help students work together (initially in the project group) to define the problems, goals and the work plan, as well as possible solutions.
- Establish a common ground between the groups involved.

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Notes

1. More information about the KTH students' projects can be found at www.futureofmedia.se/storytelling.
2. In the quotes, the abbreviation RJ signifies a journalism student respondent and RE an engineering student respondent.

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