The Postdigital Museum in the Making? Examining Teachers' Attitudes Towards Digital, Hybrid and Blended Educational Museum Programmes

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Abstract

The purpose of this paper is to achieve a better understanding of teachers' needs and challenges when participating in museums' digital, hybrid, or blended educational programmes and resources in a post-pandemic reality. The paper also investigates the conditions that exist at different schools to enable participation and the use of the museum's offer. Results from ten interviews with teachers in Småland, Öland, and Jämtland Härjedalen in Sweden are presented, and the results are analysed through the theoretical lens of the postdigital. This study shows the importance of digital/analogue and blended/hybrid museum programmes being planned, designed, and implemented with interactive affordances. Furthermore, it is suggested that insights and methods derived from transmedia storytelling could be used by museum educators to a larger extent, in order to move towards a more interactive and co-creative pedagogy. Finally, the results demonstrate that museums and schools have much to gain from working closer together to move towards what can be called a postdigital pedagogy.

Keywords: Digital outreach, blended learning, heritage, pedagogy, education, postdigital, transmedia storytelling

Introduction

A post-pandemic reality means several new challenges and opportunities for museums, which require long-term thinking and a strategic approach (Högberg et al. 2022; Heritage et al. 2023). One of the most significant set of challenges and opportunities relates to the museums' digital presence and pedagogy. COVID-19 meant that museum educators quickly developed new digital skills and, in many cases, began to appear in new digital arenas and use a larger variety of digital tools. It also brought about experimentation with hybrid and blended educational formats. During COVID-19 several mappings were carried out on how museums and other cultural heritage organisations adapted to remain relevant during the sudden crisis (see also Levin 2020). These were carried out in Europe (NEMO 2021; Zourou and Pellegrini 2021), the USA (Knight Foundation 2020; American Alliance of Museums 2021), in Nordic/Baltic countries (Wollentz 2023), the United Kingdom (King et al 2021), Denmark (Bille 2021), as well as on a global level (ICOM 2020; UNESCO 2020; Axiel 2020).[1] The mappings demonstrate that many museums quickly mobilized their digital capacity to maintain a relationship with a target group. Initially, these solutions often took the form of replacing the museums' usual on-site activities (such as a guided tour through the exhibitions) with digital streaming via Facebook and/or YouTube. Further into the pandemic, innovative solutions were developed that went beyond simply replacing a programme that was previously on-site.

In relation to the mappings, it is relevant to underline that museums reacted to a global crisis. During the pandemic, museum educators found solutions through a more experimental approach in which long-term or strategic thinking was rarely prioritized. It was a question of handling a sudden crisis that had not been anticipated and that museums were therefore unprepared for. Furthermore, there was no consensus on how long the crisis would last. Interviews with museum educators (Wollentz 2023) show that many museum professionals,

at least in a Nordic and Baltic context, express a need for reflection. It seems to be unusual that the lessons learned in digital pedagogy during COVID-19 have found their way into more long-term strategies and operating documents at museums, at least when interviews were conducted with museum educators in Sweden, Finland, and Estonia during the spring and summer of 2022 (Wollentz 2023). These interviews were conducted in connection with the Erasmus+ funded project Digital Solutions for Applied Heritage – Exploring Transnational Learning Opportunities (DiSAH).[2] The nine pedagogues that were interviewed were selected after a survey sent widely within the museum sector in Sweden, Finland, and Estonia. The survey received a total of 85 responses (see Wollentz 2023 for a more detailed review of the survey).

The interviews and the survey made it clear that many museums may need support in developing their digital pedagogy activities. To move forward, museums may need to learn from the target groups that they want to reach (Wollentz and Kuhlefelt 2021). Graham Black (2012) argues that one of the most important future challenges for a museum is to focus on the collaborative engagement between the museum and its users. Since teachers and students tend to be a high priority and a large target group for many museums, it is relevant to investigate how teachers relate to the museums' digital, hybrid, or blended educational programmes and resources in a post-pandemic reality, as well as what conditions exist at different schools that make it possible to participate and use the museums' offerings. Thus, our purpose in this paper is to achieve a better understanding of teachers' needs and challenges. Our hope is that this can in turn help museums to develop their digital pedagogy activities in a more sustainable way. Of particular interest is the geographical distance between the school and the museum as many museums have a large geographical area to reach out to, which means that digital solutions can become an invaluable resource for establishing a relationship.

In this paper we present results from ten interviews with teachers in Småland, Öland, and Jämtland Härjedalen in Sweden, which were carried out during the autumn and winter of 2023 in a preliminary study called 'Digitalt, analogt eller både och?' ['Digital, Analogue or Both?'] (DABO), funded by the Swedish National Heritage Board, where the Nordic Center of Heritage Learning and Creativity (NCK), Jamtli (the regional museum of Jämtland and Härjedalen), and Kalmar County Museum participated. However, before we proceed it is useful to explain how we approach the term "digital" within the museum sector. We understand the digital work at museums from a broad perspective. While focus is on pedagogical outreach towards schools, we are not narrowing it down to specific forms of pedagogical activities or programmes. In defining digital work at museums, we draw upon Parry and Dziekan (2021) who have identified four key meanings which are all relevant in our work:

1. Digital as something we use, e.g. as a set of tools to manage different tasks at the museum.

2. Digital as a process, e.g. as a vision, a strategy, as the ways work is managed at the museum.

3. Digital as something we create, e.g. as in creating artwork, interactive exhibitions, digital collections.

4. Digital as a cultural condition, e.g. as in the context that museums find themselves in contemporary society, a context which museums are interpreting and positioning themselves in relationship to in order to stay relevant and to have an impact.

Background

The DiSAH project

Within the above-mentioned DiSAH project – which set the foundation for the study in this paper – a survey was distributed widely within the museum sector in Sweden, Finland, and Estonia to attempt to map out where museum educators currently stand in their digital pedagogy. What are the main challenges and opportunities? Follow-up interviews with nine

respondents were also carried out during the spring and summer of 2022. The results showed that there is an uncertainty in many museums related to questions such as: which lessons in digital pedagogy are relevant to continue developing in a post-pandemic reality?, and how do we navigate a present where many people seem to suffer from a "digital fatigue"? As a museum educator in Finland expressed it:

> Because of the pandemic, we jumped into this faster than we might have otherwise, and so we haven't had time to sit down and do long term planning…now that we are going back to normal and people have started to dare to visit the museums again. It is absolutely true that we have to sit down and think about how we should use these resources. That is the interesting thing, how much should be live and how much should be digital?[3]

The survey and the interviews in the DiSAH-project made it possible to identify four key challenges for museum educators in a post-pandemic reality:

- How to meaningfully connect and even move beyond the dichotomy between the digital and the physical in outreach.
- How to stimulate active participation and co-creativity by digital means.
- How to achieve a more long-term and sustainable focus and agenda in digital outreach.
- How to get the most out of digital outreach in the face of limited resources and time.

Issues around active participation, co-creation, and sustainability are closely linked to how digital tools can facilitate the creation of more long-term and sustainable relationships with different target groups that go beyond time-limited projects or activities (see Simon 2010, Hancox 2021, Wollentz and Kuhlefelt 2021, and Grinell et al. 2023). The results from DiSAH were published in autumn 2023 in a handbook targeting museum professionals, particularly museum educators, who want to innovate their digital pedagogy, with a strong focus on co-creation and active participation (Wollentz 2023).

Towards DABO

The insights gained from the DiSAH project clarified the motive to talk to teachers about how they relate to the museums' digital pedagogy. During the fall of 2022, NCK, Jamtli, and Kalmar County Museum therefore sought funding from the Swedish National Heritage Board for a preliminary study named DABO, with the aim of better understanding the teacher's needs, challenges, and perspectives. What makes teachers choose a digital museum programme instead of an on-site activity? How can the digital and the analogue (the "phygital") complement each other in each learning situation (see Debono 2021)? What are the biggest challenges for teachers in taking advantage of the digital resources that museums already offer?

We realized that teachers are likely to encounter specific types of challenges when collaborating with museums and in digital pedagogy, and that these challenges are interesting to put in relation to those expressed by museum educators. These are the results that are presented in this paper, with the hope that it can serve as an incentive for future studies. As a theoretical framework, we start from the idea of the postdigital (Pepperell and Punt 2000; Parry 2013; Jandrić et al. 2018; Giannini and Bowen 2019; Parry and Dziekan 2021), which we will now present.

Theory

The postdigital

The concept of the postdigital (Jandrić et al. 2018) is used as a theoretical lens to approach digital pedagogy in museums and schools. It is also a concept that is gaining traction in

varied disciplines, and has been used at least since the beginning of the 2000s (Pepperell and Punt 2000). However, it can be a challenging concept to apply, as it is often employed in very diverse ways with varied implications. Nevertheless, the very "messiness" of postdigital as a concept can be seen as inevitable given the complexity and "wickedness" of the many challenges that face contemporary society:

> The postdigital is hard to define; messy; unpredictable; digital and analog; technological and non-technological; biological and informational. The postdigital is both a rupture in our existing theories and their continuation. However, such messiness seems to be inherent to the contemporary human condition (Jandrić et al. 2018: 895).

Nevertheless, there are certain common threads within the concept of the postdigital that are particularly relevant in the context of the findings from our study. These common threads we will proceed to highlight.

The postdigital does not imply that we move towards an era in which the digital is unimportant. Instead, one of the common threads, relevant to this study, is how the postdigital signals a need to move beyond dichotomies, especially that between digital and non-digital. The postdigital challenges the possibility and benefit of making clear-cut distinctions between digital and analogue. Instead, it highlights how there is a constant and seamless switching between different media forms prevailing in the contemporary era. Rather, marking certain activities as digital or non-digital can become reductive and counterproductive. A second relevant common thread is how the concept implies a critique of terms which assume a certain linear and determined development regarding the digital, such as the idea that we are experiencing a digital revolution (Negroponte 1998; Pepperell and Punt 2000).

In a museum context these two common threads signal a radical critique of compartmentalized thinking, and an opportunity to imagine an alternative. It is possible to refer to what has been called a postdigital museum (Parry 2013), which is a museum where there are no clear-cut distinctions between digital and physical outreach, but rather a seamless integration with no clear boundaries between the two, and where the digital is not siloed into specific departments (Parry 2013; Giannini and Bowen 2019: 561). As elegantly expressed by Tula Giannini and Jonathan Bowen:

> the boundaries between physical and digital, real and virtual blur becoming integral, the separation between people and institutions, inside and outside the walls becomes porous allowing for collaboration, partnerships and sharing (Giannini and Bowen 2019: 561).

In such a way, the postdigital does not only concern the breaking down of barriers between departments within the organisation, but also a tearing down of barriers between the physical museum building and surrounding society. A postdigital museum exists in many different media and forms, way beyond the walls of the building itself and sometimes even beyond a specific geographical region. There is no hierarchy in values between what is digital and physical, which means that the digital is not an inferior version or a substitute for a visit to the museum. The physical museum building is still of significance, as well as the museum collection. Instead of a competition between digital and physical there exists a complementary and symbiotic relationship which makes it fruitless to clearly separate the two (Debono 2021). In addition, there is less focus on in terms of the technology itself, and more focus on with regards to how and where the technology is being used, who is using the technology, and for what purposes (Parry and Dziekan 2021: 21). In such a way, the use of technology turns into a critical process that is people-centered, context-based and value-led (Parry and Dziekan 2021: 24). Furthermore, in this kind of museum, it is possible to allow for a more collaborative, inclusive, co-creative, and transmedial relationship with an audience through for example transmedia storytelling (Hancox 2021).

Transmedia storytelling is a non-linear form of storytelling that has become increasingly common during the last 20 years. It is a form of storytelling that is more attuned to a postdigital museum, signifying stories that are unfolding over many platforms and media. There may be multiple points of entry and multiple endings to such story, and importantly, no matter the

point of entry, each part provides a valuable and meaningful contribution to the overall story, whether the media is digital, analogue, or blended/hybrid (Jenkins 2014; Hancox 2017; Kidd 2018). Transmedia storytelling is by its definition built upon a seamless switching between different media, in which hierarchies between different forms of media are flattened, and which each part contributes in a unique way to the overarching story. People can enter, experience, and exit the museum through many different points. It focuses upon how the visitor can be part of and contribute to the story in different ways. Instead of starting with a focus on the media (which tools and platforms we will use), the point of entry will be: how can we work with different media to make people develop their own relations to this theme or place?[4] And how can we make people be part of telling the story? Transmedial storytelling can thus allow for a more participatory and co-creative relationship between museums and schools. However, it is also important to add that a transmedial approach to storytelling is not necessarily beneficial for learning, as the use of a greater variety of different media can become redundant and the overall experience unfocused. Nonetheless, there is great potential for increased learning if a transmedial approach is used with attention to detail and with an understanding of and care for audiences (see Kidd 2018: 274). This makes it particularly interesting to apply the concept of the postdigital to study the relationship between museums and schools in digital pedagogy. However, before we undertake this, it is useful to clarify how we approach learning at cultural institutions such as museums.

Learning in a museum context

Black (2012) argues that a paradigm shift has occurred when it comes to the role of museums in society. As part of this shift it has become important that learning experiences in museums are imbued with quality and variety. Furthermore, an engaging museum can be considered central as a source of inspiration and learning amidst societal change. Palmyre Pierroux (2019) writes about the challenges in the museum sector to adapt to updated views of knowledge, learning and learners.

Black (2012) distinguishes between formal and informal learning in museums. All learning consists of a process and an outcome: the process concerns how we learn and the outcome concerns what we gain, and the formal learning process in a museum is based on the understanding that there is a body of knowledge at the museum for the visitors to discover and learn. On the other hand, informal learning exists at the museum by offering an environment in which visitors can think creatively and critically, solve problems, and make meanings for themselves. Wollentz et al. (2021) argue that the museum can have a form of supplementary role in relation to the formal teaching at a school.

The importance of creating an environment that presents opportunities for communication has been explored in museum studies through the introduction of sociocultural theories. In their emphasis on mediated human activity, these theories have gained broad acceptance, introducing new areas of inquiry into the role of physical contexts and social interaction for meaning-making in museums (Pierroux 2019). The basis for our approach to the social aspects of learning is a focus upon the importance of communication, and how resources in the vicinity support this process. In other words, learning is viewed as a collaborative phenomenon (Säljö 2013).

The Generic Learning Outcomes (GLO) framework (Hooper-Greenhill 2004; Wollentz et al. 2022) is useful to approach the concept of learning at museums. GLO was developed by the University of Leicester at the beginning of the 2000s, specifically to find a suitable vocabulary and a suitable frame to address the learning that takes place in archives, libraries, and museums (Figure 1). The model is useful as it distinguishes between five different areas of learning that can take place: knowledge and understanding; skills; behavior and progression; enjoyment, inspiration, and creativity; and attitudes and values. This is beneficial as it understands the multifaceted nature of learning as something that encompasses something far more than simply learning new knowledge. This means that GLO is focused on learning processes as much as on outcomes (Black 2018; Wollentz et al. 2021, 2022; Sonne et al. 2023). Furthermore, GLO implies that learning is lifelong, that it can occur in many different spaces and contexts, and that it is multi-directional, e.g. the museum pedagogue or teacher

is also part of a process of learning when meeting visitors/students, or when applying new digital tools within education. In addition, visitors/students also learn from each other. It has been argued that such an approach to learning will make it possible to develop more long-lasting and participatory relationships to the museum (Black 2018), which connects to the values of the postdigital museum as highlighted above.

Figure 1. The Generic Learning Outcomes. Developed by University of Leicester.

New modes of learning

For teachers, the digitization of schools creates pressure to change how they look at classroom teaching, and how they design for learning (Bezemer and Kress 2015). It also creates a need for teachers to go beyond the traditional practices of planning lessons and acting as distributors of knowledge. Therefore, digitization enables designing for new modes of learning and teaching such as "blended" and "hybrid" learning.

The concept of "blended" learning is described by Stefan Hrastinski (2019) as a rather new concept, while the term hybrid activities is a more common concept to use. The term blended learning can be understood metaphorically as an inclusive, blended learning umbrella, under which different perspectives and aspects of conditions for learning exist. According to Hrastinski (2019) the two most used definitions are blended learning systems that 'combine face-to-face instruction with computer-mediated instruction' (Graham 2006: 5), and the 'thoughtful integration of classroom face-to-face learning experiences with online learning experiences' (Garrison and Kanuka 2004: 96). The terms of hybrid and blended learning can be used interchangeably according to Graham (2009). The definitions of blended/hybrid learning are characterized by an openness that signals the mixing of two or more things, namely analogue or digital (Hrastinski 2019). This could consist of different types of mixes, for example mixing media, mixing theories of learning, mixed pedagogics, or mixed contexts (Oliver and Trigwell 2005). Throughout this paper we will most often refer to this kind of activity as blended/hybrid rather than making a clear-cut distinction between the two concepts.

When approaching the concepts of participation, interaction, and co-creativity in the context of learning we see them as closely related. However, building upon the distinction made by Nico Carpentier: 'interaction is seen as the construction of socio-communicative relationships, and participation is linked to power and decision-making' (2015: 22). In such a way, incorporating interactive affordances in a learning context can represent a step towards a

more participatory experience related to decision-making, as well as the possibility of exerting influence. To take it one step further, through participation there may even be a sense of shared ownership of the process, which would be defined as a co-creative learning situation (Simon 2010). Thus, while not holding identical meanings, the three concepts are linked.

Method

During the autumn and winter of 2023, 10 semi-structured interviews with teachers were conducted. Seven of these were conducted in the region Jämtland Härjedalen, which is located in Northern Sweden, two interviews were carried out in Småland and one interview in Öland, both located in Southeastern Sweden. The teachers were responsible for classes between grade one and grade nine in the Swedish elementary school. The interviews were arranged through email and carried out through Microsoft Teams. They were recorded and thereafter transcribed. The interviews followed a set of questions (**Appendix I**) but were semi-structured so that additional follow-up questions could be asked depending on how each interview developed. Each interview lasted approximately one hour and was carried out in Swedish. The quotes used in this paper have been translated into English. The Swedish Research Council's ethical research principles (2011) have been adopted. The respondents have fictitious names in the text to ensure anonymity.

Both Kalmar County Museum and Jamtli aim to reach out to a large geographical area that consists of many rural places that are far from cities. In addition, public transport is not always reliable or regular, which causes additional challenges for both museums and schools. Thus, when selecting suitable teachers to interview, the goal was to interview teachers both at schools with close proximity to the museum, and schools that are geographically far away. This was done in order to be able to identify whether the geographical distance affected attitudes and experiences of a museum's digital offering. Instead of interviewing many teachers, we chose to conduct in-depth interviews with a selection of teachers, which we deemed would produce a more layered and nuanced picture. However, it is important to keep in mind that these interviews are not necessarily representative for all parts of Sweden, and that teachers in large cities, such as in Stockholm or in Gothenburg, may hold different perspectives on digital pedagogy at museums. There is thus much potential in follow-up studies in Sweden and abroad.

Thematic analysis was used to analyse the transcribed interviews (Raleigh Yow 2014; Bernard 2017; Gray 2018). An understanding of the results was gradually allowed to emerge through a movement between theory and empiricism. In the first phase, *initial codes* were generated in the data. The data were coded by markers of different colours. When the same colours appeared several times in the data, in different places, a theme was established. Of importance is to relate the emerging themes to the purpose of the paper. Finally, the following themes were defined: "Teacher's experiences of digital lesson design during COVID-19," "Prerequisites and constraints", "Safe spaces by digital means", "It's a didactic complement", and "The digital and the interactive".

Results

Teacher's experiences of digital lesson design during COVID-19

When it comes to experiences during the pandemic, some teachers saw no major differences in teaching compared to how it was before 2020. Stina says that they used both digital and analogue methods before and after the pandemic,[5] for example Google Classroom is continuously used as a tool. Another digital tool mentioned is Google Meet. Charlotte says that this facilitates the work because all work material, links, and forms are on the same platform.[6]

One change during the pandemic was increased awareness and knowledge of digital platforms and digital learning materials. The teachers who describe that they switched to teaching fully online, describe it as not giving long lectures digitally with the students, but rather making shorter briefings and then having a dialogue with the students via the computer. One teacher (Stina) expresses it as a difficulty not being able to have eye contact with the students.

The analysis reveals variations on whether the digital solutions that the teachers learned to use during the pandemic continued to be used afterwards. Cathrine believes that the pandemic created such a longing to be able to teach in the classroom with the students that the analogue teaching methods increased immediately after.[7] In the same way, she believes the demand for physical learning materials increased after the pandemic. However, several teachers give examples of how digital solutions, such as working with group assignments, sending weekly letters, and meetings such as development talks and teacher team meetings, have continued by the use of digital tools.

Prerequisites and constraints

Teachers' experiences of using programmes in museums vary from visits as infrequent as every few years to visits a couple of times per semester. Geographical distance and availability of online content influences the use of digital museum materials in teaching. Another significant influencing factor is the time consumption. Even if a school is located close to the museum, a visit might take too much time from the regular time schedule. Several teachers refer to it as a "makeshift solution" to take part in a digital programme rather than visiting the museum on site. As Cathy says 'compared to not getting it (physical visit) at all, it's good'.[8] The fact that several digital teaching solutions were used during the pandemic has also meant that now after the pandemic many teachers wish to visit the museum physically. However, the lack of time also seems to have increased after the pandemic in "making up" for the time that one feels has been lost with digital solutions, which might have led to less visits to museums. Travel times can also motivate the choice of booking a digital programme. As Anna puts it, 'you don't have to spend a whole day traveling to participate in a program for an hour'.[9] Charlotte believes that digital programmes are easier to fit into the regular school schedule as you do not have to 'take time from other adjacent lessons'. She also thinks that digital programmes are not as demanding on staff resources compared to bringing the entire class to the museum.

Another geographical aspect that Amelia mentions is that for students at schools in sparsely populated areas, meeting other adults can mean a lot.[10] This can in fact motivate the choice of a digital programme, as it can create a plurality in the teaching if, for example, a researcher or a museum pedagogue talks through Zoom or Teams. Elsa also highlights the advantages for rural schools in using digital school programmes.[11] It is a matter of democracy that everyone should have the same opportunity to 'go to Jamtli even though we are sitting in the classroom', she says.

Safe spaces by digital means

Two of the teachers believe that digital programmes create better conditions for learning because the teaching can then take place in the students' everyday environment, in a safe classroom. Cathy says that 'there is so much else for the students to take in when they come to a new place'. Charlotte believes that the digital can also be an asset as a special educational tool as the student can easily choose different paths, for example listening instead of reading. Lina also believes that the children can become so engrossed in everything else around them when they visit a museum.[12] In the classroom they can instead pay attention and be more focused on taking in knowledge. This is considered to be particularly important in cases where the teacher is responsible for a student group that is a bit anxious or where several children are in need of special support. Stina, on the other hand, believes that students can show a lack of attention precisely because they are so used to a digital environment, which, as she says, can mean that 'in today's digital world, a physical meeting with a wow effect is always better'. In sum, teachers see a value in the use of digital tools to allow consumption of content in safe spaces which can accommodate different needs and ways of expressing oneself. However, some teachers are also concerned that the digital environment makes students less focused.

"It's a didactic complement"

The analysis shows that most teachers believe that the digital can and should function as

a complement to more analogue, traditional teaching methods. Charlotte says 'no one is completely against it [digital programs], but you want to use both in parallel'. Lina also believes that 'completely digital tools do not promote the students' knowledge, but instead they can be used as a supplement'. The teachers thus divide the teaching into digital and analogue methods and tools. Charlotte believes that digital teaching methods cannot be the same as the traditional (analogue) ones. Instead, new teaching methods must be developed by adapting them to a digital form.

Teachers see opportunities in how digital programmes supplement regular teaching that takes place in the classroom. Anna says that digital programmes can 'provide extra input before or after a specific lesson, something to refer to with the students afterwards'. On the contrary, Charlotte believes that it is precisely the before-and-after work that you do yourself as a teacher, for example preparing the students beforehand and reflecting upon the experience afterwards, without any support from a museum programme. She believes that the digital can deepen the experience by contributing something that you as a teacher cannot do yourself, such as showing something 'behind the scenes of the museum, from the magazines?' – in other words, showcasing objects that are not available to see in the open exhibitions (see also Wollentz 2023). Furthermore, Cathrine believes that the digital complements the physically limitless, bringing 'the feeling of being able to visit anything [...] when it comes to things far away', which gives a 'fantastic feeling'.

The fact that several teachers during the pandemic were forced to learn to teach in new ways was highlighted by Cathrine as something positive: 'everything changed. We had to rethink teaching […] it was positive because so many of us were forced to learn'. In the analysis, an interesting discrepancy appears between acting as a teacher reproducing their teaching method – even though the tool itself changes, in this case changes to a digital one – and finding a new form of pedagogy. It seems that some teachers describe how they continue their teaching as they have always done, even though they use digital tools, while other teachers describe examples of how to change their way of teaching precisely because the digital tool is the medium through which one teaches. Charlotte observes that digital teaching methods cannot be the same as traditional ones, and must be developed independently and adapted to a digital form. All in all, this also reveals that teachers approach digital learning in very different ways.

The digital museum programme can supplement the content of traditional learning materials. Charlotte believes that a museum programme can add a 'focus on local history, different from the focus of other educational material producers. This can also be combined with digital orientations where the students visit various historical places in the city/community, both digitally or physically with digital guidance'. Digital tools can also contribute to opportunities for students to be independent and mobile outdoors, for example at an open-air museum or in their hometown using tools such as augmented reality.

When it comes to hybrid/blended solutions, teachers see that these can make it easier to adapt and supplement the regular teaching. For example, pre-recorded material can be used by a teacher in the classroom before a visit to the museum. It is also mentioned that you can use digital learning resources from the museum after a physical visit to immerse yourself and prolong the learning process. Hybrid/blended solutions are also seen as important because it is believed by teachers that human meetings need to take place physically. Stina states that a digital meeting cannot take over because the 'physical meeting is important for feelings [...]'. In such a way, museum programmes that include both online and on-site (at the museum) activities are often preferable to fully online solutions.

The digital and the interactive

All the teachers involved in this study believe that interaction is an important factor in capturing students' concentration and attention both in online and on-site programmes. Some believe that the interactive offer is even more important for younger students. Elsa says that for the younger children the 'concentration time is shorter and you need to work with variety, combine different methods'. Activities such as listening to a recorded lecture are seen as the opposite of being interactive.

It also turns out that interactivity can take place between students sitting together in front of a screen, rather than through interaction with the programme or the lecture broadcast via the screen. However, this requires that only a limited number of students sit in front of the same device. Elsa says that 'to have a really good discussion through the digital screen, there should be no more than six people'. Cathrine believes that with all digital programmes, interactivity depends on the purpose, as well as how and in what way the interactive element is prepared and anchored. She says that 'if the students don't feel comfortable, it becomes difficult. It becomes clear when they are not confident in the task'.

Stina believes that something always happens when students are involved and interact. 'Exactly what happens is unimportant, but [what is important is] that they are activated in some way', she says. It seems that when interactivity is used with digital learning resources it is able to capture students' attention, and as Stina says, 'to be caught, you need the interactive, so you need more than just a website'. Overall, many teachers think that digital museum programmes are less interactive than on-site museum programmes, and thus, that digital solutions can be a hindrance rather than a resource in stimulating interactivity among students.

Discussion

The analysis reveals that teachers divide teaching into digital and analogue methods and tools and that digital methods can be used to complement the analogues. A majority believe that the digital can and should function as a complement to the more analogue, traditional educational programmes that museums offer. The analogue methods seem to be regarded as the norm, as most teachers describe these methods as creating the best conditions for learning. Some teachers say that the choice of teaching methods shifts in relation to what tools will be used, while others say that choosing teaching methods is independent of what tools are used. An interesting discrepancy appears between acting as a teacher that *reproduces* their teaching method despite the fact that the tool itself changes (in this case to a digital one) or acting as a teacher *producing* new ways of teaching in relation to the digital. According to Staffan Selander (2017), the digitalization of schools means a challenge to change how teachers look at classroom teaching, and how they design for learning. This can be regarded as a paradigm shift that influences whether teachers continue to reproduce teaching as they have always done it, or they adapt new teaching methods to the digital form. This becomes especially important to analyse in relation to the theoretical lens of the postdigital (Parry 2013; Jandrić et al. 2018). Why do the teachers interviewed regard the analogue – in this case the physical visit to the museum – as the norm, while the online visit is rather approached as a complement, as an *add-on*? Why do the interviewed teachers never see the physical visit to the museum as a complement to an online experience? This way of thinking, highly present among the teachers participating in this study, seems far removed from a seamless switching between forms of media (Debono 2021), e.g. as in transmedia storytelling (Hancox 2017, 2021). Instead, it seems to maintain a form of compartmentalized thinking through a clear separation between the two.

There is indeed a reflection among teachers that a new form of pedagogy is required, as highlighted above. Jeff Bezemer and Gunther Kress (2015) emphasize a need to go beyond the traditional practices of teaching because the digitalization of schools means a pressure to change how to approach teaching. There may be value in considering how both digital and analogue approaches to teaching can complement each other, and by doing so, becoming something different and better as a new unit. But what if complementing traditional teaching methods or analogue museum programmes with digital tools and solutions, requires a glimpse or a hint of what combination of these two can be achieved? To move forward from discourse in which the analogue – e.g. the physical visit to the museum – is regarded as the static norm, we believe there is a vital need to visualize what postdigital pedagogy at museums would look like. This may require a major shift – not only in pedagogical methods – but also in terms of thinking about the role of the digital in educational programmes, towards a more integrated approach to learning.

It is fair to say that most museums, at least in the Nordic context in which we have conducted research, would still not be classified as fully postdigital, as compartmentalized

thinking is still very widespread (Wollentz 2023). Our results indicate that the same may hold true for educational institutions, even though the term postdigital is more commonly applied within the field of education. For example, the field has its own established journal on the theme, which has been called 'the pioneering academic journal focusing on postdigital themes and research approaches in education'.[13]

It is also worth noting that the physical visit to the museum is deemed to have a higher "wow factor" than a digital experience. This attitude among teachers seems to contrast with other reports focusing on learning at museums which often emphasizes digital media as a key to achieving a "wow factor", which in turn stimulates curiosity and a willingness to learn more (Kairos Future 2020). In contrast, the digital experience is deemed to have other values, such as the ability to experience a museum programme from the classroom, so that it takes less resources and time, and that digital tools can make the experience more attuned to students with special needs by allowing them to participate within a safe space and on their own terms. It is possible that teachers have this view of the museums offering, as they are used to the digital educational programmes that museums offered as a reaction to the global pandemic. These initiatives seldom had the purpose of creating a "wow-factor", but rather maintaining a contact with an audience through replacing on-site activities with online activities (Wollentz 2023). While digital solutions, especially extended reality (XR) – including augmented and virtual reality – are often promoted as a way to "wow" an audience and to draw people in, it does not seem like teachers in our study view the educational programmes at museums in such a light.

One aspect that cuts through the dialectic between the digital and the analogue, or between conducting teaching in the classroom or at the museum, is what opportunities exist for interaction. All the teachers say that it is interaction that is the most important prerequisite for capturing the students' attention, which in turn highlights the importance of the social dimensions to the Generic Learning Outcomes framework (Wollentz et al. 2022). A digital programme at the museum that does not involve students in a way that allows them to be interactive is not considered to contribute to learning. This study thus shows the importance that digital/analogue and blended/hybrid museum programmes are planned, designed, and implemented with interactive affordances (Eriksson Bergström 2021). It is of great importance that museum educators are both aware and have knowledge of how they create possible conditions for interactivity.

A motive among teachers to blend learning activities, which combine face-to-face and online learning, is a perceived improvement in the quality of learning. By combining the advantages of the two approaches, teachers believe analogue and digital teaching can complement each other. However, as Hrastinski (2019) argues, it is not often specified what these advantages actually are. Based on the perspectives of teachers, we argue for the value in starting from interactivity as the core in creating educational museum programmes. Interactivity can be regarded as the boundary object (Star and Griesemer 1989) that both merges the blended/hybrid activities, but also further expands the learning that can be extracted from them.

These insights into interactivity could make it possible to leave the discourse of compartmentalized thinking that has prevailed, visible through the clear separation between the digital and the analogue. Highlighting interactivity in the designing of didactic school programmes, imbued by a variation of different tools and methods, might be a way to move towards an emerging practice of the postdigital museum.

Conclusion

In this paper our aim has been to receive a better understanding of teachers' needs and challenges when participating in museums' digital, hybrid, or blended educational programmes. To achieve this we interviewed ten teachers in three different regions in Sweden. When analysing the results, we applied the theoretical lens of the postdigital. The study highlights the importance in planning, designing, and implementing digital/analogue and blended/hybrid museum programs with interactive affordances.

As a summary, it is relevant to identify key challenges for teachers when it comes to

participation in digital, hybrid, or blended learning activities that museums are offering schools. The three points below represent our attempt to list the main key challenges identified in the interviews, and after these points we reflect upon what this might imply for museum educators when developing pedagogical programmes for schools. The three key challenges among teachers are the following ones:

> • How to move away from a compartmentalized concept of digital/analogue – in which the digital becomes a complement to the norm – towards a more integrated and less hierarchical approach.

> • How to find a more united focus and common direction for the use of digital tools among teachers.

> • How to find formats that enable more participatory and interactive use of digital/blended/hybrid museum programmes.

These key challenges are closely related to the development of a new form of pedagogy which is more centred around a seamless switching between different forms of media, both digital and analogue. For museum educators, these key challenges point to the benefit in applying a more transmedial approach to storytelling when developing pedagogical programmes for schools. It is worthwhile considering how to narrate a story through many different forms of media, where there are multiple points of entry and exit to the story. There does not have to be a "right" and "wrong" way to take part in a transmedial story, whether it is through digital or analogue means. This could also help find more interactive, participatory, and even co-creative ways of engaging with students, as transmedia storytelling can allow for students to participate themselves in the narration to a larger extent and do so on their own terms (Hancox 2017, 2021). For example, this can be done through interactive tools such as Mentimeter or the use of different social media platforms. By using digital tools to allow students to add their own voices to the transmedial story, it is likely that they will develop a more personal relationship to a place, history, or theme.[14]

There are clear overlaps between the key challenges identified among teachers in the project presented here, and those identified among museum professionals in the DiSAH project as presented in the background. Both museum professionals and teachers are still in the process of moving towards a more integrated approach between different forms of media. There might even be a common need for what can be called a postdigital pedagogy. It is thus clear that museums and schools have much to gain from working closer together to proactively face the future.

Acknowledgements

Notes

1   See also Museum Booster, 'Museum Innovation Barometer', Museum Booster 2021. https://cultureactioneurope.org/wp-content/uploads/2021/08/Museum-Innovation-Barometer-2021.pdf, accessed 14 February 2025.

2   The Nordic Centre of Heritage Learning and Creativity, 'Digital Solutions for Applied Heritage'. The Nordic Centre of Heritage Learning and Creativity 2023. http://nckultur.org/digital-solutions-for-applied-heritage/, accessed 16 April 2024.

[3]   Museum educator in Finland, interview by Gustav Wollentz, video call, 2 June 2022.

[4]   Klas Grinell, 'Transmedielt berättande', Göteborg's Konstmuseum 2022. https://goteborgskonstmuseum.se/forskning/digitala-relationer/transmedialt-berattande/, accessed 9 May 2024.

[5]   Teacher in Sweden, interview by Adam Norman, video call, 14 September 2023.

[6]   Teacher in Sweden, interview by Malin Bäkström, video call, 9 November 2023.

[7]   Teacher in Sweden, interview by Adam Norman, video call, 29 April 2023.

[8]   Teacher in Sweden, interview by Malin Bäkström, video call, 22 November 2023.

[9]   Teacher in Sweden, interview by Malin Bäkström, video call, 16 November 2023.

[10]   Teacher in Sweden, interview by Malin Bäkström, video call, 20 November 2023.

[11]   Teacher in Sweden, interview by Malin Bäkström, video call, 14 November 2023.

[12]   Teacher in Sweden, interview by Adam Norman, video call, 1 November 2023.

[13]   See the Postdigital Science and Education journal. https://link.springer.com/journal/42438

[14]   Klas Grinell, 'Transmedielt berättande', accessed 9 May 2024.

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Appendix I

Introductory questions

1. Can you describe the school you work at? Where is it? How big is it? Which age groups? How far is it to the nearest museum? What background do you have as a teacher?

2. Have you previously used educational programs offered by [KCM/Jamtli]? Which?

3. Have you used digital/online programs that museums offer? Which ones? In what contexts and when? Are they still used? What was the value in them? If not: why has the school not used such programs? What would it take for you to start using them?

The school's digital experience

4. Can you describe how the school changed digitally during Covid-19? Which activities went completely digital?

5. How has digital pedagogy/learning developed since Covid-19?

6. How does it look now? Have some activities remained completely digital?

7. Do you notice it heading in any direction? If so: which one?

8. What concerns do you have when it comes to future developments in digital learning and pedagogy?

9. What are your wishes when it comes to future developments in digital learning and pedagogy?

10. What lessons about digital learning came with Covid-19 that the school still uses?

11. What kind of technical equipment is there at the school today? Does the school have the capacity to cope with what you want?

12. Is there technical expertise/support? What does that support look like? (what skills are there, IT educator, janitor, etc.?

13. What is the attitude towards digital learning/pedagogy at school today? Are there several different approaches between teachers, management, students?

The digital and the interactive

14. When using digital educational programs, how important do you think it is that they are interactive for students? What kind of interactivity do you see as particularly important?

15. Based on your experiences, what do you think works to make digital programs interactive (e.g. Mentimeter, etc.)?

16. Do you have any concrete positive examples of what you see as successful interactivity in a digital educational program (the example can come from museums but it can also be in other contexts)?

17. How do you see your own educational role in connection with a digital program? More practical (technique), order or pedagogy (e.g. creating engagement)?

Digital, physical and/or hybrid museum programs

18. As a teacher, how do you see what completely digital educational museum programs can add to learning? Do you think it can add something beyond what a physical museum visit contributes? If so, what?

19. In what contexts would you choose a fully digital museum program before a visit to the museum? Why? What factors come into play? Distance, infrastructure, theme, lack of time, admin etc?

20. What do you see as the biggest challenge in fully digital museum programs?

21. Do you have experience with an educational museum program where some elements were digital/online while others were on site? If so: Can you describe what it looked like and your experience of it? If not: does it sound interesting?

22. In which contexts would it be interesting and how do you think it can add to learning?

23. How do you think that digital and physical can balance each other? For example. in connection with preparation, for evaluation or otherwise?

Final question

24. Do you have any other reflections that you would like to share?

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