**Futuremaking and digital engagement:
From everyday interests to educational trajectories**

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Abstract

In this article, we explore and discuss how educational trajectories relate to the overall learning lives of students, with their learning identities and trajectories of participation across different contexts of learning. The focus is on how young people take advantage of digital technologies in pursuing learning futures for themselves based on interests developed outside of school. Sociocultural studies have in different ways examined the use of artefacts, cultural resources and literacy practices as part of human developments over time. Our interest is about how digital technologies create new possibilities for futuremaking in the intersection between formal and informal ways of learning. We will provide personal narratives of three young people that are deeply engaged in creative activities involving new technology; gaming, k-pop (Korean popular music) and Lego Robotics. The analysis show how digital technologies and media practices, that young people participate in outside school, become resources when creating futures for themselves.

Keywords: Learning lives, futuremaking, educational trajectories, digital technology, informal learning

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Introduction

Efforts to understand the dynamic processes of learning situated across space and time, beyond the here and now, are presently challenging traditional definitions of learning and education. This is partly defined by technological developments creating new mobilities (Leander, Phillips & Taylor, 2010) and transformation of learning environments (OECD, 2017). Whereas most studies of learning explore intra-institutional experiences, our interest is to track individual learning trajectories across domains and contexts, online and offline. The major challenge today, however, is to find ways of understanding the interconnections and networking between different learning contexts.

The focus in this article is on how young people take advantage of digital technologies in pursuing learning futures for themselves based on interests developed outside of school. The insight that young people take advantage of strong interests in their everyday lives, like sports or music, to seek out options for their future is not new (Singh, Uijtdewilligen, Twisk, van Mechelen & Chinapaw, 2012; Fornäs, Lindberg & Sernhede, 1995). However, our interest is to explore and discuss how digital technologies create new possibilities for ‘futuremaking’ in the intersection between formal and informal ways of learning (Facer, 2011; Erstad, Gilje, Sefton-Green & Arnseth, 2016). It is important to gain more knowledge about this issue because it might tell us something about how young people take advantage of resources in contemporary societies, made available through digital technology, and how such resources become part of their identity work over time. This thematic focus also raises issues about how boundaries between contexts of learning are created and sustained, about agency and trajectories of participation among learners in epistemic communities, and enables us to reflect on the broader sociocultural transformations of education in the 21st

century. This article provides new understanding of how young people construct future trajectories for themselves and the role of digital media.

Sociocultural studies have in different ways examined the use of artefacts, cultural resources and literacy practices as part of human developments over time (Cole, 1996; Lemke, 2000). The current study is a continuation of these perspectives. In our research, we have used the term ‘learning lives’ (Erstad, 2013; Erstad, et al., 2016) to unpack a focus on students in motion across contexts of learning. On an analytical level, we have studied different knowledge practices, learning identities and transformative practices that young people are involved in, across school and everyday life (Silseth, 2018; Silseth & Erstad, 2018). Digital media are defined as embedded parts of these practices. In this article, we present empirical data from one large scale ethnographic project in Oslo studying young people with different ethnic backgrounds across school and diverse community settings. Methods used have been observations/field notes, interviews and data gathered by the informants themselves. We will provide personal narratives of three young people that are deeply engaged in creative activities involving new technology; one boy (18 years old) that is actively involved in *gaming* outside of school, which build on his personal interest in this activity when developing his educational trajectory; one girl (15 years old) interested in *k-pop* (Korean popular music) building her own educational prospect about Korean language and culture; and one boy (15 years old) using an ethnic community centre as a playground for pursuing his interest in *mathematics and Lego Robotics*. The analysis is guided by the following research question: *How can digital technologies become resources for young people when creating futures for themselves?* The aim is to better understand processes of futuremaking and the sociocultural dynamics of young people’s lives that are important during such processes.

Personal trajectories across time and space

During the last two decades there has been an increasing interest in studying and exploring how young people learn across different contexts, inside and outside school, and over time by mapping trajectories of participation that individuals are involved in (see for example Ludvigsen, Lund, Rasmussen, & Säljö, 2011; Nespor, 1997; Leander, Phillips & Taylor, 2010; McLeod & Yates, 2006; Silseth & Arnseth, 2011). As a field of research, it is diverse and fragmented, with different theoretical positions and methodological approaches. The common features center around issues of identity, agency and the role of digital media in interest driven activities (see for example Ito et al, 2013), as well as studying learning over time and in different settings (see for example Sefton-Green & Rowsell, 2015).

In a special issue by Esteban-Guitart, Coll, and Penuel, (2018), young people's use of digital tools to connect learning experiences across different settings and over time are discussed. In their overview of the research field two aspects stand out. First, how research documents the potency of youth agency in creating new activities, communities, and pathways for interest-related pursuits, and, second, how the ways that peers, adults, and different sociocultural contexts afford and constrain opportunity. The overall aim for this research is to promote more equitable youth learning across diverse settings.

Some meta-reviews have also tried to summarize specific areas like 'informal learning' (Rogoff, Callanan, Gutierrez & Erickson, 2016), 'border crossing' (Akkerman & Bakker, 2011) and continuity and discontinuity of crossing boundaries between formal and informal learning (Bronkhorst & Akkerman, 2016). These reviews and special issues show a field of research in development and how it provides alternative understandings of what counts as learning (Green & Luke, 2006). We draw on the insights from the studies mentioned above to engage in issues of co-constructing personal futures as a novel approach to research on trajectories of participation across different learning settings.

Of more immediate significance for the issues raised in this article are examples of studies where personal and biographical narratives about learning and literacy are studied. Most of these studies focus on identity and ways of positioning within different contexts (Wortham, 2006; Leander, 2002), about gender construction (Thomson, 2009; Zacher Pandya, 2009) and about the use of artefacts and cultural resources in developing life trajectories for oneself (Barron, 2006; Nelson, Hull & Young, 2013). For example, in her research Brigid Barron (2006) investigates how digital technologies can serve as catalysts for collaborative learning ecologies across home, school, and community settings with the goal of creating more equitable opportunities for the development of expertise and interest-driven learning. She has documented learner pathways to expertise through personal social networks, and designed settings for learning. Another example is the work done by Glynda Hull on digital storytelling by youth and on the use of social media to create collaboration and networking across cultural boundaries of marginalized youth. Her publications together with one young adult, and how he develops his personal trajectory of becoming an artist by engaging in creative practices with digital media are examples of such personal narratives (Lundby, 2008; Erstad & Sefton-Green, 2013).

Such examples of studying narrative processes are important because they provide deeper understanding of the trajectories of learning that young people experience. What is interesting in several of these studies is to what extent the learning trajectories studied are seen as alternatives and ways of distancing oneself from formal educational institutions, or if they are seen as a mix of formal and informal contexts that individuals move between. Building on this body of research, the current study aims to examine how young people create their educational prospects and trajectories in diverse ways.

Futuremaking, trajectories of participation and learning lives

In studying how young people create opportunities for themselves of importance for their educational futures across formal and informal contexts we relate to theoretical positions focusing on people within social practices and the provision of opportunities within different spatial settings. Of special interest in this article is to explore how young people use digital and cultural resources from different settings to both reflect about themselves as learners and how this opens up trajectories of participation and prospects for their own futures.

In her book ‘Learning futures’, Keri Facer (2011) uses the concept of ‘future-building’ to criticize what she sees as the basic orientation of all education; “equipping young people to compete in the global economy of tomorrow as potential socio-technical futures that are latent in contemporary developments” (2011, p. 103). Facer defines this as inadequate in understanding how young people position themselves and how educational institutions need to find ways to address much broader orientations towards learning and living in digital futures. Not only about qualifications for future work, but more broadly about what future orientations represent for us today. That is, how young people think about their own futures and about the resources and contexts where they pursue options for themselves.

In our project, we have used the term ‘futuremaking’ to engage in conversations with young people about their past, present and future orientations, both within their own community and more globally (Erstad et al., 2016). Futuremaking can be defined as a combination of past, present and future orientations of the self, especially as expressed in times of transitions from one level of schooling to the next or life changes. One aspect of futuremaking relates to the meaning of the term “choice,” especially as it is used in discussions of the transitions between levels of schooling or between education and work (Tynjälä, Stremström and Saarnivaara, 2012). Choice is often presented to young people in an existential fashion, as being a “choice” about what they want to do or become (Hegna, 2014).

However, we want to focus more on how choice is framed as a series of decisions: of choosing between concrete options, both in the short and long term; between places and institutions; and between local and global routes. Together these decisions are seen to foreclose or open up other possible narratives about the future. Making a future is, then, primarily a narrative process, of justifying, rationalizing, and selecting evidence to support an emerging story about the self.

The notion of 'trajectory' provides an analytical lens for understanding learning activities across time and space. Our interest is about ways people may be engaged in processes of learning within different situations and contexts that define trajectories of participation (Rasmussen, 2012). Participation trajectories are closely linked to identity as a “capacity for particular forms of action and hence a capacity to interpret and use environmental affordances to support action” (Edwards & Mackenzie, 2008, p. 165). We use the notion of trajectory as a way of identifying the pathways that a person, or an object, goes through within and across situations over time. We ought, then, to explore how participants are not merely situated in time and space, but also how they are actively networking learning resources across space-time configurations (Leander, Phillips, & Taylor, 2010, p. 8). To analyse how people do this is particularly important in knowledge economies in which people are regularly faced with new challenges that require the innovative use of knowledge and expertise.

We have taken up the term ‘learning lives’ (Erstad, 2013; Erstad & Sefton-Green, 2013) to unpack how learning occurs in the daily lives of young people. Our interest has been to find out what it means for learners to be in motion across contexts of learning, and how they connect different domains of knowledge in their emergent practices of social and mediated learning and living. The aim of a “learning lives” approach is to make explicit the mobilization of resources or affordances within specific contexts (Wertsch, 1998), and, at the

same time, address agency as the capacity to adapt to changing roles, within different contexts (Holland, Lachicotte, Skinner & Cain, 1998; Hull & Schultz, 2001). Thus, this approach has been concerned with grasping how learners operate as ‘agentive selves’ in cultural settings (Hull & Katz, 2006). In these settings, learners negotiate their identities through interacting and producing diverse artefacts in a community of learners.

In this article, we will explore how three young people are engaged in futuremaking activities, in which new media and digital technology are important artifacts for participation, as part of their learning lives, and look into how these become resources for imagining possible futures and educational trajectories.

Methodological approach

The data presented here are drawn from a large-scale research project titled ‘Local Literacies and Community Spaces: Investigating Transitions and Transfers in the “Learning Lives” of Groruddalen’ (2009–2013). Methodologically, we have employed ethnography as ‘logic of inquiry’ (Green, Skukauskaite & Baker, 2012). The fieldwork was conducted in several neighborhoods in a multiethnic community, the Grorud Valley (Groruddalen), in the eastern part of Oslo. The valley is characterized by its mix of industry and its historically working class community, which has, in the past decade, become a suburb with one of the largest migrant populations in Norway encompassing a diversity of origins and languages. We selected two kindergartens, two lower secondary schools and two upper secondary schools in the community representing different neighborhoods and demographics.

The research design for the main study started in the classrooms and kindergartens, where we spent about eight months conducting observations and interviews following whole classes in different subject domains and study programs. 60 students in three different age cohorts (20 in each; 5-6 years old, 15-16 years old, 18-19 years old) were sampled after

spending several months in their class, choosing academically strong and weak students according to their teachers and grades, and an equal number of boys and girls. All students were then followed in their transition into the next level of schooling for another eight to ten months. In this article, we have chosen one boy and one girl in 10th grade entering upper secondary school, and one boy at the end of upper secondary school entering a Folk high school. These three students were chosen because their narratives represent different perspectives on how learners' use diverse cultural resources to reflect about themselves as learners across contexts and on how they defined future directions for themselves. We could have chosen other students, but each case is unique in its way of futuremaking, and the ones presented here represent an interesting diversity in using digital tools as ways of developing their future trajectories as learners.

The main source of data collection was field notes and interviews that were done systematically with all informants at different times during the fieldwork. All transcribed interviews and field notes were coded in NVivo and created the baseline for our analysis. We developed a coding protocol with key conceptual structures that allowed us to trace a range of selected ways of identity formation, trajectories of participation and future orientations. These categories were operationalized as time and space relationships, in interviews as reflections on personal past, present and future as well as observing them over two years, and spatially as ways of studying subjects in different contexts. Especially, future orientation was elaborated as part of each interview (four in all) with all subjects over a two years period, and in observing different practices they were involved in and how these practices had implication for their choices as part of transitions to new educational levels. In addition, we added video data, artefacts that were created as part of the fieldwork and several data types created by the informants themselves (photos of their homes and neighborhoods, maps and diaries). This gave us a rich data set to create narratives of the learning lives of the

individuals in order to develop a coherent presentation of data on a personal level (Goodson, Biesta, Tedder, & Adair, 2010, Thomson, 2009). These are structured as stories about people's lives as told by themselves (Goodson & Gill, 2011; Polkinghorne, 1995). Focusing on the personal narratives of three young learners enable us to examine complex relationships between participation and interests across formal and informal contexts, and issues that contribute to the development of their learning lives.

From everyday interests to educational trajectories: Three personal narratives

In this section of the article, we will present the three narratives as telling cases of young people and how their personal interests become resources for educational prospects and trajectories. Each narrative is unique as a personal trajectory, at the same time there are common features that become apparent. The reason why one of the narratives is presented in more length than the two others is simply that we have more and better data on that person. We start with Andreas, who is finalizing 13 years of schooling at the end of upper secondary school.

Andreas – the possibility of becoming a game designer

Andreas was deeply engaged in games and game design. In one interview he explains that he, in grade 8 at the age of 11, started to do animation and editing of images and video in his leisure time. We first met Andreas at Barnsley upper secondary school in November 2010, where he followed the academic track of social studies. As part of the research project, one task was to take photos of their own room and local community with their mobile phone and send these photos to us. In two of these photos taken by Andreas, as illustrated in Figure 1, we can see his interest in games, as well as his interest in soccer (Real Madrid as his favourite team).

Figure 1.

The photos shown in Figure 1, taken by Andreas in his room at home, document how that space is filled with objects that express his major interests, such as posters, dvd's and games. We are not doing a multimodal analysis of this geosemiotically environment, but these photos provide a personal indication of his interests and the role they play in his private spaces at home. At school he was not able to pursue these interests as part of the social sciences program.

Finishing upper secondary school opened new opportunities for Andreas, and he gradually realised that it was possible to bring his interest-driven production practices into an educational space in a folk high school. The Scandinavian model of folk high schools allows for a year of “schooling” after upper secondary school, without any grades, and has become quite popular among certain groups of youth that are bored of traditional schooling. These schools are often placed in non-urban areas, which means that students who attend them have to live at the institution. Today there are over 70 different schools in different parts of the country. This type of schooling reflects a traditional, Scandinavian idea of education, namely, *bildung*, of providing opportunities for interest-driven activities. Admission to these schools is not based on prior academic achievement, which, in principle, makes education in the folk high school accessible to everyone. The programmes provided at these institutions target personal experiences and interests, such as theatre, music, travel, athletics, designs, arts, crafts, and lifestyle issues. Because of the ingrained and institutional nature of this tradition, there was a clear division between students in our data of non-western immigrant backgrounds and students of non-immigrant backgrounds in their approaches to the option of attending a folk high school. As we will see here, this represents ways that middle-class

young people in particular draw on a particular set of resources, especially qualities of reflexivity, in order to create a certain kind of existential space for making a future that contains within it its own logic.

In mid-April 2011 we did an interview with Andreas just before the deadline for applying further education after upper secondary school. About his choice to enter a folk high school he states:

Andreas: I think it [the choice] is my own, mostly anyway. They [his parents] do not say something like ‘go and take that or that.’ They were delighted when I became more ... decided what I wanted.

Interviewer: But when did you decide really?

Andreas: That was maybe last year, when I discovered the education and game design and stuff.

Interviewer: You searched a bit on the web to see what options you had?

Andreas: Well, I [also] visited an event where you could sign up [for more information about the different schools]. And on one stand, there was this person who offered arrangements in England, so he could help with information about the different opportunities and email these to me.

(Interview, mid-April 2011)

For Andreas, it became important to join one specific folk high school that had a media and design programme. When we talked to him after the first semester at that school, he told us he enjoyed a wide variety of different practices. When comparing it to his experiences with academic programmes in upper secondary, Andreas emphasized how much he worked in front of the screen at this school and the engagement with these activities:

Andreas: It is like upper secondary school in the way that we sit in the MD [media design] lab, and sit in front of our PC, and the teacher explains what we should do using a projector on a large screen. And on Tuesdays we usually have a photo specialist that comes to school, and then we divide the class in two groups, where one group goes with him and does something and the other group is with the main teacher.

(Interview, January 2012)

The interview then moved into questions about his future orientations, and he expressed that he saw himself as a game designer in the future, and hoped to test this possibility out during his year in folk high school. The school offered him a safe environment that allowed him to attend a school without competing with others, and to test out whether gaming and game design were interests he wanted to pursue.

Andreas used one of the media programmes on a folk high school to continue to work on his interest-driven practices of media production that had occupied his leisure time for the last 7 years. When comparing it to his experiences with academic courses in upper secondary school, Andreas emphasised how much he worked at folk high school and how he had developed as an animator:

Andreas: We have been taught to create 3D figures using a software programme, using key-frames to move them around, creating short animations and short films. We have also used like a ‘competition’ software programme that allow us to integrate our 3D models into a video clip from reality, like put them together. My intention is to use this to create computer games.

Interviewer: Is it like you expected or more difficult?

Andreas: Well I have spent several afternoons, after school, learning Premier Pro to edit, trying to learn it before we go on a study tour to London.

Interviewer: So what are your plans after this year at folk high school?

Andreas: I have thought about game design in Oslo, but it is also tempting to go abroad, but it is a bit scary to be away from everybody you know.

(Interview, January 2012)

This sheds light on how the folk high schools offer quite specific courses where students can use their time during the day, as well as nights and weekends, to learn skills related to what they are interested in, in this case software. For Andreas, the structure of the school days and the fact that he lived at the school allowed him to work and understand how to edit and animate films. These skills might bring him into game design in his future studies, and become part of Andreas' futuremaking. Even though folk high schools do not give him specific qualifications for applying to higher education, the year at the folk high school gave him an opportunity to stay away from home and try out if game design could be part of his learning trajectory in the coming years. In doing so, Andreas used the year in the folk high school as a gap year, to put it in an educational context, where he can follow his interests without making a final decision on what he wants to study in higher education.

Thus, this case illustrate how Andreas' interest-driven activities became resources in his orientations towards future educational trajectories, but also that particular forms of study programs enable learners to 'test out' what they want to be, and become important contexts for futuremaking.

Lien – popular culture as resource for change

When we first met Lien, she went to a multi-ethnic lower secondary public school located in the eastern part of Oslo in Norway. Her parents were originally from Vietnam, and Lien was born in Norway (see Roth and Erstad (2016) for more about this part of Liens life trajectory). She started to develop an interest in literature and reading books at an early stage in life, and she had a special interest in the genre of crime fiction. When observing Line in class, she appear as a reserved student, which was also confirmed in conversation with the teacher. She seldom raise her hand during lessons and she sits quietly at her desk. In fact, she tells us that since she is not participating verbally in class this influences her grades negatively.

An important interest-driven activity for Lien is related to being part of a community dedicated to Korean, and particular k-pop, culture. K-pop is a particular genre of popular music from South-Korea. K-pop artists often sing in Korean, but can also use other languages such as English. Psy, with his song Gangnam Style, is perhaps the most famous international k-pop artist. This interest has been important for her trajectories as a learner both inside and outside school. During the fieldwork, Lien was given an assignment where she had to present herself to an imaginative peer. Here she wrote:

Hello!

My name is Lien, and I am a 16 year old girl. I am a Norwegian citizen. I am from Vietnam. I have recently colored my hair brown/orange. I am 1,56 meter tall and wear colorful and sometimes very dark, emo-like cloths.

In my leisure time I work out, listen to music, read news and play videogames on PlayStation 3. The last few months the culture in South-Korea has influenced me to a great extent in ways that made it part of me now. I don't care much about what happens around me, I don't read VG or other Norwegians newspapers. The

one thing I read is news from ALLKPOP.COM. This page is very important to me, I use it often even when at school. What makes it so useful is that all I need to know about TV-programs, music, movies etc, is on that page. On that page it is only Korean news, but everything is in English. It is easy to read and understand, and they work day and night. Sometimes there is also contests.

(Assignment November 2011)

In this written assignment at school, Lien positions herself as a person who do not engage in what she perceives as common issues addressed in Norwegian mainstream media, but decides herself what to do and follow, and what communities she should be part of. What also becomes clear is that she uses a specific site in order to pursue her interest in Korean culture and k-pop. Technology and new media has been an important part in this interest. She was introduced to some Korean drama series by a friend, and from there she entered into different communities consisting of members with a shared interest in Korean popular culture. In particular, this includes music, music videos, TV-series, clothing and fashion and of course Korean language.

When talking to Lien in lower secondary school, she tells about her desire to attend a language program in Korean that they only have at one school in Oslo. She wants to learn more about Korean culture and k-pop and view Korean language as key in this process. She decides to take this course even though the school is situated in another part of the city and she has to travel for 2 hours from where she lives, back and forth. Later, when talking to Lien after she has started in upper secondary school, she tells about her interest in Korean culture and her learning trajectory related to this. She explains that during summertime, between lower and upper secondary school, she spent much time preparing herself for this course in Korean language. As part of these preparations, she used a computer program that enables the

user to learn Korean language. She became aware of this program on a blog that she often reads called www.annyoung.blogg.no. This blog is written by a girl devoted to k-pop, and this blogger promoted a program called Byki 4 Express as well suited for learning Korean language. In the interview, Lien also reflects upon her interest in Korean culture and what learning and taking a course in Korean language means to her as a learner:

Lien: It is just interesting right. Like, when you're interested in something, like a movie, then you get curious and have to find out who has made the movie and like much strange stuff. It started with me being interested in a song, then it was the group, then I found out where they came from, first I thought they came from China, then it was Korea. Then I watched like those types of shows.

Interviewer: Yes.

Lien: Like variety shows that they attended. Then I thought it was funny to follow and then I followed other things too. So therefore I should take [a course in] Korean to understand what they say. And at the same time they say it in a wise way. And I found out that it is difficult to use the language. So then I thought that if I take [a course in the] language, maybe I can develop my brain and stuff.

Interviewer: Because it is in a way difficult?

Lien: Yes, in my Korean course it was like 30 students the first year, now it is only 10 left.

Interviewer: Is it difficult?

Lien: Many students immediately drop out. I felt like, yes, maybe I am clever if I take Korean and all that. Hehe.

(Interview April 2012)

When she reflects upon her interest in Korean culture and language, she connects it to a curiosity about these things that was spawned from watching popular shows and music from Korea online. Then she became curious to find out more about what they were talking about in these shows and songs. For Lien, it was not enough to just watch media products connected to this culture, she wanted to learn more about Korean culture and really understand the complexity of it by learning the language. Furthermore, what is also interesting about this is that many of her fellow-students in the Korean class dropped out, and she was one of the few students who continued to take the course. This made her feel like an achiever that started to participate competently in a field that was difficult for many of her peers; a feeling that she was not that familiar with in regular classes when attending lower secondary school. An important change in her learning trajectory had taken place.

Hence, this case illustrates how popular culture, media practices and technology become resources to explore possible future trajectories, but also resources that shape actual trajectories that influence educational choices and become valuable resources in learners' futuremaking.

Ugur – community spaces as educational provision

In the first interview with Ugur he explains that he lives a happy and active life with lots of friends in a neighborhood in the Grorud Valley. His family has a large ethnic and extended family network. Ugur is interested in computers, computer games, social media, math, sports, and to be in the local youth club. He has a computer in his bedroom, and talks proudly of a toy helicopter he constructed and built. He also emphasizes that he spends a lot of time using his iPhone for playing games and surfing on the internet.

During the field work, when Ugur attended lower secondary school, we talked to him during a Math lesson. During the lesson Ugur plays iPhone games and he commented:

The Math level here is basic. Really basic! I cannot be bothered working with Math in school any more. That's why I play computer games, you know? (whispers while looking at the teacher). I practice at the Centre....don't tell my parents (laughs)

(Interview, April 2011).

When we talked to the teacher she mentioned that she lets Ugur play with his phone during class, and let him sleep at his desk, as long as he is quiet. She thought it was better to let him sleep if he was tired instead of disturbing others in the class since he performed ok on the tests in Math. She is not worried about him, but she states that Math is not Ugur's preferred or strongest subject. However, we discovered that at the out-of-school Turkish Centre that he spends time at after school, Ugur is deeply engaged and involved in mathematics and Lego Robotics. He ranks the 'teachers' at this cultural center in the local community as much more engaging than the teachers at school; most of them are Turkish bilingual university students. He could identify better with them since they had the same cultural background and he could use the language spoken at home. About the student 'teachers' at the cultural center he explained;

You have clever people, engineering students, technology students" (he looks proud). You are one of two or three youngsters getting help from one student in a very small classroom. Very good! Very good! I joined the Math class to become as good as my older brother in Math

(Interview, April 2011).

Ugur also joined the technology courses at the center because he remembered having fun building a steam engine with Lego Technics at home when he was younger; a present from his mother in his childhood. An interest started to develop and he spent time exploring the internet for manuals, built helicopters etc. He discovered that he could solve and manage technological challenges in a research-based manner by seeking up information and solve problems. Simultaneously he developed a competence in using computers, both regarding software and hardware. In primary school, friends and teachers started to ask him for help, and he developed a role as a computer ‘wiz’ in his social network. Ugur’s development of skills and competencies in digital technologies has given him a methodological and research based attitude.

Without having deep understanding of electricity or electronics per se his experience with e.g. Lego Robotics allows him to experiment and solve problems. Figure 2 shows a photo he took himself and sent to us on how he connected TV antennas, wireless networks etc. at home by logically understanding how they should be assembled based on color codes, socket design, and using manuals and illustrations found on the Internet.

Figure 2.

Ugur’s interests and competences with computers have also transferred to other activities. He made, on his own initiative, a video for the graduation ceremony at lower secondary school (Figure 3). It is based on video clips and pictures taken with his iPhone during the school year. The movie was a huge success (observation at the graduation ceremony, June 2011). In his edited movie Ugur seems to be inspired by the road movie genre (using the escape metaphor related to leaving school) and silent movie genres (using Chaplin style ‘comedy’).

Figure 3.

After his success, Ugur explains what he feels about this experience:

It is nice when people applaud your work. You get attention, you get respect...I became very happy, you know? People begin to say hello to you. You get new friends. This does something with your self-esteem, you know? You can do something, you know? It is nice when people applaud your work. I know that I can if I want!

(Interview, June 2011).

His interest in digital technologies has also ‘paid off’ in the formal context of learning after transferring to upper secondary school. Ugur and some classmates won 2nd price at a prestigious entrepreneur competition in Oslo for upper secondary students. The group combined electronics and digital devices creating a standby mode energy saving device combining knowledge from the work he had done at the out-of-school Turkish Centre and his own experiments at home (Interview, February 2012). During the interviews it is clear that the experiences and technological skills that Ugur has developed gives him good self-esteem and shape his learning identity. He has developed his competencies and interests in Math and Technology not at school, but at a local ethnic community center and at home, which turns out to become very important for his future trajectory. His grades are average in some subjects, but his interests in digital technology and math gives him status and confidence. His dream is to return to Turkey establishing a profitable business because it is easier and less bureaucratic there than in Norway.

This case is interesting because it illustrates how a student that is disengaged in mathematics in school, can be engaged in this topic when it is contextualized in meaningful ways. In comparison to Andreas and Lien, Ugur's futuremaking is less specific, but draws on engagement within a context outside of school that expands his interest in Math.

Futuremaking in the 21st century

Schools are important institutions in our societies. However, it is important to explore how learners' educational trajectories relate to the overall "learning lives" of students, with their learning identities and trajectories of participation across different contexts of learning. Prior research has shown how young people often are influenced by strong interests in their everyday lives, like sports or music, when orienting towards possible future trajectories of participation (Singh, Uijtdewilligen, Twisk, van Mechelen & Chinapaw, 2012; Fornäs, Lindberg & Sernhede, 1995). In this article, we have tried to extend this research by examining and discussing how digital technologies and media practices, that young people participate in outside school, become resources when creating futures for themselves. We have seen how such resources become tools for playing with possible future trajectories of participation and learning in multiple and complex ways.

The analysis showed how Andreas, who was deeply engaged in gaming and game design, mobilized this interest in future learning trajectories. He used the year in the folk high school as part of his educational trajectory in following his interests where he could try out and play with different roles and participation patterns regarding future occupations. In the learning environment of the folk high school, Andreas developed skills and knowledge that might be used in future studies and professional development as a game designer.

On lower secondary level, Lien was a quiet and withdrawn student who was not happy about her grades and performance. Interestingly, the analysis shows that her interest in

k-pop culture represented an important change in her life and educational trajectory. When she became part of k-pop communities online, that triggered her curiosity and interest in Korean culture, she wanted to find out more about this culture. This oriented her towards learning Korean, both by using computer programs and taking classes at a specific school. These processes made her more confident as a learner. Popular culture, media practices and technology became resources to both play with possible future trajectories and for engaging in futuremaking.

The analysis displayed how Ugur was highly disengaged in math classes; however, this was not due to his lack of interest in mathematics. His wish about being an accountant is interesting because in order to succeed as an accountant you have to be competent in math. Ugur was highly engaged in the mathematics activities in the community center he was a member of. Here, mathematics were connected to technology practices and Lego Robotics. Ugur developed skills and competencies in digital technologies that gave him a methodological and research based attitude that might become an important resource in his futuremaking. It is his self-initiated out-of-school practices that have had a major impact on his performance at school. Ugur takes advantage of the methodological way of working in Math, Science and in project work at school. Thus, he developed his competencies and interests in Math and Technology not at school, but at a local ethnic community center and at home, which turns out to become a very important resource in his futuremaking.

The concept of futuremaking enables us to deal with complex issues considering how young people plan and play with resources that are part of contemporary media and technological practices for the purpose of envisioning or imagining future educational trajectories and possible selves. It enables us to examine important features of the digitalization of youth practices. How students view themselves, in light of past and future trajectories, has implications for what they can and will do regarding their future.

Sociocultural studies have examined the use of artefacts, cultural resources and literacy practices in developing life trajectories for oneself, as referred to in this article (Cole, 1996; Lemke, 2000). Our study is a prolongation of these perspectives. The case of Andreas, Lien and Ugur, are interesting examples of how personal interests are intertwined with more formal pathways of learning, and how interest-driven activities are co-constructed as actual resources for futuremaking and educational trajectories.

References

- Akkerman, S. F., & Bakker, A. (2011). Boundary crossing and boundary objects. *Review of Educational Research*, 81(2), pp. 132–169.
- Barron, B. (2006). Interest and self-sustained learning as catalysts of development: A Learning Ecology Perspective. *Human Development*, 49(4), pp. 193–224.
- Bronkhorst, L. H., & Akkerman, S. F. (2016). At the boundary of school: Continuity and discontinuity in learning across contexts. *Educational Research Review*, 19, pp. 18-35.
- Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, MA: The Belknap Press of Harvard University Press.
- Edwards, A., & Mackenzie, L. (2008). Identity shifts in informal learning trajectories. In B. van Oers, W. Wardekker, E. Elbers, & R. van der Veer (Eds.), *The transformation of learning* (pp. 163–181). Cambridge, England: Cambridge University Press.
- Erstad, Ola (2013). *Digital Learning Lives: Trajectories, Literacies, and Schooling*. Peter Lang Publishing Group.
- Erstad, O. & Sefton-Green, J. (eds.) (2013). *Identity, Community, and Learning Lives in the Digital Age*. Cambridge: Cambridge University Press.

- Erstad, O., Gilje, Ø., Sefton-Green, J. & Arnseth, H.C. (2016). *Learning Identities, Education and Community. Young lives in the cosmopolitan city*. Cambridge University Press.
- Erstad, O., Kumpulainen, K., Mäkitalo, Å., Schröder, K.C., Pruulmann-Vengerfeldt, P. & Jóhannsdóttir, T. (Eds.) (2016). *Learning across contexts in the knowledge society*. Rotterdam: Sense Publishers.
- Esteban-Guitart, M., Coll, C. & Penuel, W.R. (2018). Learning across Settings and Time in the Digital Age. *Digital Education Review*. No. 33. Editorial.
- Facer, K. (2011). *Learning futures. Education, Technology and Social Change*. London: Routledge.
- Fornäs, J., Lindberg, U. & Sernhede, O. (1995). *In Garageland: Rock, Youth and Modernity*. London: Routledge.
- Goodson, I.F., Biesta, G.J.J., Tedder, M. & Adair, N. (2010). *Narrative learning*. Milton Park: Routledge.
- Goodson, I.F. & Gill, S.R. (2011). *Narrative pedagogy: Life history and learning*. Pieterlen, Switzerland: Peter Lang.
- Green, J. & Luke, A. (Eds.) (2006). *Introduction: Rethinking Learning: What Counts as Learning and What Learning Counts*. *Review of Research in Education*. Vol. 30.
- Green, J., Skukauskaite, A. & Baker, W.D. (2012). Ethnography as epistemology. In J. Arthur, M. Waring, R. Coe & L. Hedges (Eds.) *Research methods and methodologies in education*. Los Angeles: SAGE. Pp. 309-321.
- Haapasaari, A., Engeström, Y. & Kerosuo, H. (2016) The emergence of learners' transformative agency in a Change Laboratory intervention, *Journal of Education and Work*, 29:2, pp. 232-262,
- Hegna, K. (2014). 'Changing educational aspirations in the choice of and transition to post-

- compulsory schooling—a three-wave longitudinal study of Oslo youth'. *Journal of Youth Studies*, 17 (5). pp. 592-613.
- Holland, D., Lachicotte, W. J., Skinner, D., & Cain, C. (1998). *Identity and agency in cultural worlds*. Cambridge, MA: Harvard University Press.
- Hull, G., & Schultz, K. (2001). Literacy and learning out of school. *Review of Educational Research*, 71, pp. 575–611.
- Hull, G. A., & Katz, M-L. (2006). Crafting an agentive self: Case studies on digital storytelling. *Research in the Teaching of English*, 41(1), pp. 43–81.
- Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., Schor, J., Sefton-Green, J. & Craig Watkins, S. (2013). *Connected Learning: An Agenda for Research and Design*. Irvine, CA: Digital Media and Learning Research Hub.
- Leander, K. (2002). Locating Latanya: "The Situated Production of Identity Artifacts in Classroom Interaction". *Research in the Teaching of English*, Vol. 37, No. 2 (Nov., 2002), pp. 198-250
- Leander, K., Phillips, N. C., & Taylor, K. H. (2010). The changing social spaces of learning: Mapping new mobilities. *Review of Research in Education*, 34, pp. 329–394.

- Lemke, J. (2000). Across the scales of time: Artifacts, activity, and meanings in ecosocial systems. *Mind, Culture, and Activity*, 7(4), 273-290.
- Ludvigsen, S., Lund, A., Rasmussen, I. & Säljö, R. (Eds.) (2011). *Learning across sites. New tools, infrastructures and practices*. Oxford, England: Routledge.
- Lundby, K. (Ed.) (2008). *Digital storytelling, mediatized stories: Self-representation in new media*. New York, NY: Peter Lang.
- McLeod, J. & Yates, L. (2006). *Making modern lives. Subjectivity, schooling and social change*. New York, NY: State University of New York Press.
- Nelson, M.E., Hull, G.A. & Young, R. (2013). Portrait of the artist as a younger adult: multimedia literacy and ‘effective surprise’. In Erstad, O. & Sefton-Green, J. (eds.) (2013). *Identity, Community, and Learning Lives in the Digital Age*. Cambridge: Cambridge University Press. Pp. 215-232.
- Nespor, J. (1997). *Tangled up in school. Politics, space, bodies, and signs in the educational process*. Mahwah, NJ: Lawrence Erlbaum.
- OECD (2017). *The OECD Handbook for Innovative Learning Environments*. Paris: OECD.
- Polkinghorne, D. (1995). Narrative configurations in qualitative analysis. In J.A. Hatch & R. Wisniewski (eds.) *Life history and Narrative*. London: Falmer.
- Rasmussen, I. (2012). Trajectories of participation: temporality and learning, In Norbert M. Seel (ed.), *Encyclopedia of the Sciences of Learning*. Springer. Part 20/T. pp. 3334 – 3337.
- Rogoff, B., Callanan, M., Gutierrez, K. & Erickson, F. (2016). The Organization of Informal Learning. *Review of Research in Education*, Vol. 40, pp. 356–401.

- Roth, S. & Erstad, O. (2016). Positional identities in educational transitions: connecting contemporary and future trajectories among multiethnic girls. *Ethnography and Education*. 11(1), pp. 57- 73.
- Sefton-Green, J. & Rowsell, J. (Eds.) (2015). *Learning and literacy over time. Longitudinal perspectives*. New York: Routledge.
- Silseth, K. & Arnseth, H.C. (2011). Learning and identity construction across sites: A dialogical approach to analysing the construction of learning selves. *Culture & Psychology*. pp. 65- 80 .
- Silseth, K. (2018). Students' everyday knowledge and experiences as resources in educational dialogues. *Instructional Science*, 46(2), 291-313.
- Silseth, K., & Erstad, O. (2018). Connecting to the outside: Cultural resources teachers use when contextualizing instruction. *Learning, Culture and Social Interaction*, 17, 56-68.
- Singh, A., Uijtdewilligen, L. o., Twisk, J W. R., van Mechelen, W., & Chinapaw, M. J. M. (2012). Physical Activity and Performance at School. A Systematic Review of the Literature Including a Methodological Quality Assessment. *Arch pediatr adolescent medicine*, 166(1), 49-55.
- Thomson, R. (2009). *Unfolding lives. Youth, gender and change*. Bristol, England: The Policy Press.
- Tynjälä, P., Stentröm, M.-L., & Saarnivaara, M. (Eds.). (2012). *Transitions and transformations in learning and education*. Dordrecht, Holland: Springer.
- Wertsch, J. V. (1998). *Mind as action*. New York, NY: Oxford University Press.
- Wortham, S. (2006). *Learning identity: The joint emergence of social identification and academic learning*. Boston, MA: Cambridge University Press.
- Zacher, J.C. (2009). Christina's Worlds: Negotiating Childhood in the City. *Educational*

Studies, 45:3, pp. 262 — 279.