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The hidden curriculum of temporal organization: an empirical comparison of classroom and workshop practices

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ABSTRACT

Time is intrinsic in all forms of education. A growing body of educational research has begun examining time as something more than a context within which teaching and learning happen. While much of the existing research has tended to focus on either 'objective' clock time or 'subjective' time as experienced by individual teachers or students, this article addresses time as a curricular aspect that organizes everyday school practices. Drawing on practice theory and social theories of time, the article offers a conceptually rich analysis of the temporal organization of in situ educational practices. Based on fieldwork conducted in a Norwegian upper secondary school vocational programme, we compare two practices: solving maths problems on worksheets and building sheds. We argue that the temporal organizations of the practices are an essential part of a hidden curriculum. While the hidden curriculum in the worksheet practice is characterized by individualization, efficiency, inflexibility and a linear orientation towards time, the shed-building practice is characterized by collaboration, quality over efficiency, flexibility and a more event-based orientation towards time. We propose that event-based time serves as a point of contrast to the ubiquitous notion of linear time in education and might inspire new thinking about educational change.

KEYWORDS

Time; temporal organization; social practice theory; hidden curriculum; upper secondary school

Introduction

Time is an inextricable dimension of education and educational research. In his review of how time has been treated in educational research, Alhadeff-Jones (2018) highlights that time tends to be present but is rarely 'systematically questioned' (p. 33). Decuypere and Vanden Broeck (2020) argue that while there are extensive discussions of time in philosophy and social theory, such discussions have not yet made their way into educational research with much force. However, this trend seems to be shifting, as there is now a sizable body of research that explicitly addresses time in various educational contexts. While this literature is wide ranging in perspectives and approaches, there are studies that, for instance, are positioned as critiques of 'traditional' approaches to time in educational research, where time is considered either a 'stable and separate "context"' (Gourlay, 2014, p. 142) or 'a resource that can be invested to increase learning' (Compton-Lilly, 2016, p. 577). Many of such critiques seek to offer more complex understandings of time by highlighting how it is something more than objective 'clock time' and providing accounts of how it is experienced and contested, as well as how it is multidimensional and dynamic (see, e.g. Bennett & Burke, 2018; Lingard & Thompson, 2017).

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While previous works have tended to focus on either 'objective' clock time or 'subjective' time as experienced by individual teachers or students, this article addresses time as a curricular aspect that organizes everyday school practices. This approach implies that temporal organization is connected to other curricular aspects, such as the purpose of and competence developed in educational practices. This article aims to show how an analysis of practices and their temporal organization reveals norms and values embedded in the practices. We further suggest that these norms and values constitute a hidden curriculum (Apple, 2019), which refers to the unintended outcomes of the schooling process (McLaren, 2017). This concept is widely used in the study of gender, race and social class in education and deals with how schooling shapes students in unindended ways through textbooks, course materials, learning situations, classroom organization and informal pedagogical procedures (McLaren, 2017). In this article, however, we do not focus on the implicit biases individual teachers may have or on the outcome for the individual students. Rather, we explore what McLaren (2017, p. 70) calls the 'hidden messages' of school practices, by analysing the practices' temporal organization. In turn, our analysis seeks to discern some of tacit messages on norms and values transmitted through this organization.

The hidden curriculum is underpinned by traditions and power relations (Apple, 2019). Yet power can be resisted, and traditions can be changed, indicating the possibility of having flexibility, improvisation and choice. Rather than being the result of only individual choices, Giroux (1981) emphasizes the importance of making educational practices and traditions visible and, therefore, indicates how they are deeply entrenched in social structures. To pursue such a focus on the hidden curriculum and school practices, a perspective in which time is conceived as neither purely subjective and individual nor purely objective is needed.

One approach that attempts to overcome dichotomies such as subjective and objective time is the social practices perspective (Schatzki, 1996, 2010). Within such a perspective, a central premise is that time and temporality are part of what practices *are*: inherent and inseparable features of the everyday activities that constitute practices (Schatzki, 2010).

Our exploration of the temporal organization of practices takes the form of a conceptually rich empirical analysis. Drawing on Knorr Cetina's (1999) conception of comparative ethnography, we compare different school practices. The empirical starting point is a case study of classroom and workshop practices in a building and construction programme in a Norwegian upper secondary school. Vocational education and training programmes in Norway contain a mix of academic and vocational subjects, with practical and theoretical assignments. This mix is suitable for our exploration, as it provides diverse practices and temporal arrangements.

In what follows, we argue that the patterns in the temporal organization of educational practices accommodate ingrained norms and values. Hence, we show how temporal organization can be understood as an integral part of the hidden curriculum. Our goal is to offer a perspective that attempts to grasp an elusive dimension of in situ educational practices. Ultimately, we hope that such a perspective will be a resource for rethinking commonplace ideas about how educational practices are constituted and thus inspire new ways of contemplating how they may be changed. We start by outlining our theoretical perspectives on time in education and practices before explaining our analytical approach to enable a comparison of the two practices. We use our comparison between worksheet and shed-building practices to reveal ingrained norms and values in each practice. Specifically, we highlight how each practice's temporal organization accommodates these norms and values and, as such, is a constitutive part of the hidden curriculum. We conclude by highlighting how temporal organization might inspire new thinking about educational practices and educational change.

Theoretical perspectives

Our interest in discerning the educational practices' hidden curriculum, where time is embedded in these practices, requires unpacking how we understand the concepts of time and practices. We begin by explaining how we draw on previous works that have adopted a critical perspective on time in education and how we connect some of these perspectives to the idea of time as a part of the hidden curriculum. Next, we explain how we understand educational practices by drawing on social practice theory.

Time in education

As suggested in the introduction, a growing interest in time in education can be found across various theoretical approaches. Due to our interest in revealing norms and values, we draw on a subset of literature from critical perspectives on education that outlines alternatives to time as a taken-for-granted element of education. A common theme in these approaches is a critique of the commonplace linear understanding of time (see, e.g. Biesta, 2013). Such a conception of time assumes a forward movement of 'progress' and 'development', emphasizing education as directed towards qualifying and socializing students into future employment. A school that primarily sees its goal as filling students with knowledge for the future tends to discourage students as acting subjects here and now (Biesta, 2013) and privileges the future to the present.

Others have pointed out that linear time typically refers to abstract time: decontextualized time (time without nature or human interaction)—clock time (Rappleye & Komatsu, 2016). Rappleye and Komatsu (2016) contend that such an understanding of time posits perpetual progression and forward movement. Such a forward-moving conception of time, they state, can be contrasted with circular or event-based understandings of time, in which events 'govern' temporality. For example, a task such as mowing the lawn is governed by weather and 'the time it takes' rather than clock time.

In contrast to event-based or circular time, however, the dominant linear temporal logic leads to a view that progression in education is linear (Rappleye & Komatsu, 2016) and that knowledge is logical, hierarchical and nontemporal (Popkewitz, 2017). Such an education is about assessable competence in which students follow a fixed and predefined set of steps in cohorts according to age (Biesta, 2013). Holt (2002) argues that this regime of never-ending progression, where progress is often assessed through high-stakes tests, restricts teaching and learning. A consequence of emphasis on fast-paced progression is that much content is crammed within a short period and students' performance is accountable through the use of measurable variables (Buddeberg & Hornberg, 2017). To counter this regime, Holt (2002) makes an argument for 'slow schools', which offer the temporal space for scrutiny, argument and resolution. Holt's (2002) argument resides in the notion that today's schools are too 'fast'.

This sort of fast pace is part of what Rosa (2013b) labels 'social acceleration', which he claims is a key feature of contemporary society. In both society and schools where social acceleration is high, time management is an essential part of being a student (Rosa, 2013a). Rosa (2013a) argues that schools and educational systems have a hidden curriculum related to temporality—schools are unaware of what they communicate to students regarding temporality. While Rosa (2013a) stresses the importance of making knowledge about time into explicit school content, aligned with Portelli's (1993) recommendation of making the hidden curriculum as explicit as possible, our approach is, to paraphrase Giroux (2020), unsettle common-sense assumptions by making the workings of temporal organization in educational practices visible. Giroux (1981) argues that the term hidden curriculum positions schools as political institutions linked to the larger society. We adopt a similar perspective in which we understand schools as historical *and* contemporary institutions—as social sites in which actors are both constrained and mobilized, where elements of structure and agency come together (Giroux, 1981). To grasp such an understanding of schools, we turn to social practice theory, which focuses on practices rather than structures or individuals as a key unit of analysis.

Education as social practices

Social practice theory is a branch of social theory that seeks to overcome the actor–structure dichotomy (Reckwitz, 2002b; Spaargaren, 2011). The theory can be contrasted with views that hold that the social is the sum of individual actions and mental states or that social phenomena can be explained solely by structures and systems (Schatzki, 2005). The performance of a practice is bound to context (Schatzki, 2005): the context of a material world, as well as expectations, norms and traditions. Schatzki (2001) defines practices as 'embodied, materially mediated arrays of human activity centrally organized around shared practical understanding' (p. 11). According to Schatzki, then, practices are organized embodied activities relying on some sort of shared understanding among the participants.

Such a shared understanding implies there are normative specifications of what is considered an appropriate performance of a practice (Warde, 2013). For example, in our empirical context, there are certain acceptable ends and purposes in school practices, and there will be standards and rules that govern what is appropriate (e.g. national curriculum adherence) and, thus, possible sanctions (Shove et al., 2012). When performing a practice, the participants draw on material arrangements (Reckwitz, 2002a). For example, the way traditional worksheets are organized—and the types of knowledge they convey—enables and constrains how the subject matter at hand is perceived and can be worked with by students. Over time, teachers and students gain substantial experience in what typical school practices are, they have expectations regarding how to deal with different subject matters and they rely on materials in the form of curriculum documents, textbooks, tools and so forth.

The existence of practice traditions and shared understandings of practices prompts questions of how power operates and what understandings are privileged. While Sayer (2013), for example, critiques social practice theory for not being sufficiently concerned with power and the wider political-economic context, Watson (2017) considers a process perspective on power (e.g. Foucault, 1994) compatible with this theoretical approach. Such perspective accounts for power as inherent in practices through actions of domination and contestation (Giroux, 1981). Expectations and traditions enable and constrain actions; hence, practices can be changed by, for instance, students contesting specific rules and expectations of them. In this way, power processes generate what we understand as space for manoeuvring, a key term in our analysis. The space is created and re-created by both structures and the participants in the practice. In this respect, space for manoeuvring captures power as a relational process embedded in practices rather than as an ability or quality residing in individuals or structures.

In sum, when performing a practice, participants are doing and saying something—using artefacts, knowledge and skills, as well as having intention or meaning shared by others—repeatedly (Shove et al., 2012). Additionally, practices interact with other practices (Blue & Spurling, 2017; Shove et al., 2012). There are other practices that affect classroom practices (Kemmis et al., 2014), for instance, making timetables or cleaning routines. Building on Blue (2019), we understand time as something woven into the fabric of all practices—time is not an external entity. The interwoven nature of practices and time makes this theoretical perspective challenging to operationalize in terms of empirical analysis. However, as we explain in depth in the next section, we have attempted to construct an analytical approach that simplifies this theoretical perspective somewhat, but that is still precise enough.

Methods and analytical approach

Our empirical material was generated from doing fieldwork in one class in a building and construction programme in a Norwegian upper secondary school. According to Gherardi (2019), ethnographic approaches are suitable when investigating social practices, as these practices deal with situated everyday activities. A team of three researchers, including both

authors, conducted participant observation for 20 days from January to May 2018. The field notes focused on descriptions of everyday events and knowledge activities among students and teachers in vocational subjects and in Norwegian, English, science and maths. We compared field notes to calibrate our observational focus and discussed our understandings of various episodes.

In addition to the field notes, we conducted group interviews with students and teachers, respectively. A few of the students declined to be interviewed, so the interviews represented only a sample of the students who participated in the overall study. During the interviews, we asked for the students' and teachers' clarifications and understandings of some of the observed episodes. We also organized a meeting with the students, teachers and school management to present our preliminary analysis and solicit feedback and comments. As analytical perspectives tend to be in flux throughout a project (Levinson, 2010), the details of our analytical framework developed after these feedback sessions. Although key stakeholders commented on and confirmed our initial impressions and understandings of the material we collected, they were not involved in the later analytical stages. Standard procedures to ensure anonymity and privacy were followed, and the Norwegian Data Protection Services approved the project (no 57,882).

Analytical framework and procedure

Our theoretical and analytical interest in social practices rather than in individuals or structures (Spaargaren, 2011) required identifying and selecting key practices for analysis. We decided to focus on a selection of diverse classroom and workshop practices we identified based on our observations and field notes, being well aware that practices can be identified and demarked differently (Hui, 2017; Warde, 2013). Moreover, variation is the norm in the performance of practices (Hui, 2017)—there are no two identical practices, but they can be similar. To ensure a large variation range, the initial selection was based on differences in subject matter and assignments and on the assumption that the traditions within the subjects would influence the practices.

The analytical approach we developed to identify these differences and similarities builds on the theoretical perspectives presented in the previous section, especially social practice theory. However, as mentioned above, this conception of practices is tricky analytically because time is inseparable from practices. For analytical purposes, we extricated the temporal organization from practices by using Southerton's (2006, 2020) conception of temporal dimensions as an analytical lens.

The selected practices were first written out as rather flat descriptions from which we analysed temporal dimensions (Southerton, 2006, 2020). Southerton (2006) has used these dimensions to compare, for example, how different everyday practices (such as watching TV, eating and shopping) produce temporal organization of everyday life. Our interest, however, is in how such dimensions are configured as a way of organizing classroom and workshop practices. This framework combines both metric and qualitative attributes of time and comprises five dimensions: periodicity, sequence, tempo, duration and synchronicity.

- Periodicity: School schedules—and activities—are repetitive and can be measured in weeks, days, school hours or minutes. However, there are also qualitative aspects within a practice. Activites can be repeated regularly or irregularly and/or frequently or infrequently. Periodicity can also be seen across years; however, this is beyond the scope of this article.
- Sequence: This is the order of school activities (e.g. first, next and last). A sequence can have a fixed order in the sense that one activity or event leads to another, or the order can be more open (e.g. one activity might be followed by several [parallel] activities).

- Tempo: This refers to the pace—being fast, deliberate or slow/leisurely—when partaking in an activity. Being able to do schoolwork at high speed is often seen as important; it can be seen as being efficient.
- Duration: This dimension can be metric, measured in minutes and hours, or qualitative, as in 'long' or 'short' activities.
- Synchronicity: This dimension captures features such as multitasking: going in and out of different practices and juggling different activities as opposed to 'staying on task'. Synchronization inside a practice is also possible—for instance, when participants divide labour and learning activities between themselves.

In our analysis, the temporal organization of a practice is constituted by these five dimensions, their characteristics and their salience in the particular practice. By making a matrix of temporal dimensions and the selected practices, we made visible the temporal differences between the practices.

To grasp *what* was being temporarily organized, in the second round of analysis, we scrutinized the characteristics of each of the practices by using Shove et al.'s (2012) approach to empirical investigations of practices. They explain that their approach is a simplification of the theoretical foundation of practice theory. We agree with their assertion that the approach enables an analysis that is both practically feasible and theoretically precise enough. By applying Shove et al.'s (2012) conceptualization of social practices to educational practices, our analysis operationalizes educational practices as a configuration of the following three elements and the links between them:

- Artefacts: These are the material objects and tools that are part of the practice. The main artefact, such as worksheets or textbooks, is the centre of the learning process and is the key artefact used in building and showing competence.
- Competence: This is the know-how or background knowledge, knowing how to evaluate performances and knowledge and skills for performing a practice. Competence can be explicitly or tacitly demonstrated and serves some kind of purpose.
- Purpose: During our initial analyses, we identified two categories of purposes: internal and external. Internal purposes are purposes that are legitimate within a school setting (e.g. preparing for exams), and an external purpose is a purpose with a rationale located in the world outside school (e.g. projects completed for a business). The purpose(s) is connected to the design of the main artefact.

By analysing and comparing these elements, the differences between 'what went on' in the practices were made visible. In this stage of the analysis, we first individually identified the three practice elements and then compared and discussed our interpretations until we agreed on how to describe the three elements of each practice. Building on the results from the first two rounds of analysis, we conducted a third round, where we interpreted, compared and discussed the space for manoeuvring in each of the practices.

As explained in the Theoretical Perspectives section, the term space for manoeuvring captures power as a relational dimension embedded in the practices. Someone or something sets standards and expectations for the practices (Shove et al., 2012; Watson, 2017) and, thus, for the practice elements. Moreover, in schools, time is organized and 'spent' more or less aligned with standards and traditions of good timekeeping and pacing of activities. This leads to the question of whether it is possible for the participants to set their imprint or make choices in the practice and if the participants (partly) comply with or resist the practice.

To collate and condense these three rounds of analysis, we made a table (see, Table 5 in the section Summing up the two practices) that provides an overview of the key differences between practices according to the temporal dimensions, practice elements and the space for manoeuvring.

Practice elements, temporal organization and space for manoeuvring—Key differences

In this section, we present our analysis of two of the observed practices. The practices we observed can be described along a multidimensional continuum where the configuration of elements, temporal organization and space for manoeuvring vary. From the analysed practices, we chose to present the two practices that appeared most different from one another: shed building and problem solving on worksheets. This decision was made because such a comparison would yield an analysis with clearer and more defined differences than if we had compared practices that seemed quite similar.

To set the scene for the practices described below, it is necessary to describe how other social practices—and the outcome of practices such as creating the national curriculum—influence and delimit these practices (Kemmis et al., 2014; Watson, 2017). The national curriculum constructs an overarching regime for educational practices by specifying the number of years a particular educational programme should take, the total hours of a study programme, how the subjects are to be distributed and the number of hours they should be taught, what these subjects are to contain, and how and when they should be assessed. Like other vocational study programmes in upper secondary schools, the standard organization of the programme is two years in school, followed by a two-year apprenticeship in a company. Vocational subjects are the main subjects for all the years. Other subjects (e.g. Norwegian) are taken in the two first years, while maths is only part of the students' first year. Students typically enrol when they are 16 years old. Within this overarching regime, schools have considerable autonomy to distribute and sequence subjects and content the way they see fit. The school in our study had a standard way of segmenting the day into periods, with breaks in between.

We first present our analysis of solving maths problems on worksheets and then our analysis of shed building. At the end of this section, we provide a summary of the key features of each practice.

Solving maths problems on worksheets

Maths classes were usually located in a fairly traditional classroom (Johansen, 2018; Leijon, 2016), with the teacher's desk at the front of the room and four rows of individual student desks and chairs facing the teacher's desk. Sometimes, students moved chairs and tables next to each other to facilitate collaboration and social engagement. The students had maths for 135 minutes once a week throughout the school year. The teacher explained that this way of organizing the time available for maths was intended to facilitate a variety of activities, including ones that required more sustained focus than several shorter time blocks would allow for.

While the activities in the maths classes we observed varied, solving problems on worksheets was a frequent practice. In a typical example of such worksheet practice, the teacher handed out a worksheet with geometry problems at the beginning of the class period. The worksheet was 13 pages long and included a two-page answer key at the back. The problems on the sheet were divided into sections—with each section following the same structure, starting with an example or a general statement as an introduction (a recipe) to several similar problems. All problems required a single answer, and each problem was 'simple' in that it required a few steps rather than long chains of calculations, deliberation and argumentation. There was no introductory lecture or plenary explanation of the worksheet or any kind of plenary summing up; instead, the students read the instructions and worked on the problems. The students sat at their desks and wrote answers to the problems directly on the worksheets, often using their mobile phones to do calculations.

The worksheet practice centred on following instructions and producing correct answers at a relatively high speed to develop the competence of solving a particular kind of maths problems. Table 1 shows a condensed version of the temporal dimensions of this worksheet practice.

Table 1. Temporal dimensions in worksheet practice.

Periodicity	Repetitive pattern: recipe—problems, over and over
Sequence	Fixed order: a predefined line of similar maths problems to be solved
Tempo	High speed valued (not all students complied)
Duration	135 minutes. Each problem was for a short duration. Working with the whole worksheet was confined within the class period
Synchronicity	Social activity disrupted practice but allowed to some extent

The worksheet mandated clear repetitive structures. The short periodicity left few opportunities to inquire about mathematical problems or work collaboratively, other than to exchange information. The sequence of problems was fixed, and each problem 'belonged to' a relevant recipe. Students moved through the problems at varying speeds. The teacher walked around the classroom, encouraging students to stay on task and helping each student, and frequently stated, 'We're a bit rushed for time'. It was important to have a fast pace.

This worksheet practice ended when the class ended. The teacher gave a rather loose encouragement to finish the worksheet at home: next week, there was to be another topic. The last of the temporal dimensions, synchronization of activities such as social talk, was disruptive to the practice. Although social talk was tacitly allowed to some extent, students were encouraged to stay on task.

The temporal dimensions described above constitute the practice's temporal organization, which interplays with the configuration of three practice elements: main artefact, competence and purpose. Table 2 shows the main features of the worksheet practice.

Table 2. Main features of the worksheet practice.

Main artefact	Worksheets containing delimited problems, each with a single correct answers and a given recipe (algorithm)
Competence	Skills in solving decontextualized maths problems and applying correct algorithms
Purpose	To prepare for tests and exams and a possible future application of general principles in contextualized problems

Although there are several artefacts in use in this practice, the main artefact is the worksheet, which consists of predefined, discrete and decontextualized problems. The problems are provided, and there is a set procedure, algorithm, for solving them. By applying the algorithm correctly, the student produces the one correct answer to each of the problems. The students were used to this type of worksheet, and they had (most likely) worked with similar geometrical problems in lower secondary school, implying they had (some) competence when participating in this practice. The competence they were intended to develop consisted of being (even more) able to apply the correct algorithm to solve these decontextualized problems and do so quickly. This competence is predefined by the tradition of school maths—particularly in many written tests and exams, where speed is seen as essential and not the ability to solve contextualized problems. As none of the problems on the worksheet were related to any sort of practical setting, the practice can be said to have an internal (school) purpose in that it drills the students in the kind of problem solving they will encounter in future tests and exams at school. However, as for most 'theoretical' education, the intention is that students learn the principles so they can be transferred to future situations, if needed.

This combination of practice elements and temporal organization provides students with little space for manoeuvring. The practice provides few possibilities of having choices and improvising, and no possibility of making authentic inquiry. Students could choose to comply with the practice or resist it. The students not only frequently engaged in good-humoured banter as a way to 'shorten' periods but also did their calculations—maths was an important subject to them. To sum up, in the worksheet practice, there is little room for setting a personal imprint on the main artefact, competence is predefined and there is little possibility of influencing the temporal organization.

Building sheds

The shed-building practice took place in one of the school's workshops. All the workshop spaces were large and had high ceilings, with adjacent storerooms. There were stationary tools (e.g. circular saws) and the individual students' equipment in designated places. Unlike in the classroom, students moved freely, fetching tools and materials, looking at other students' solutions to problems, sometimes helping each other and sometimes engaging in social talk.

Building sheds is a practice that is part of the vocational subjects of the Building and Construction Programme. The vocational subjects involve practical assignments and theoretical principles within several vocational areas since the programme educates for a range of occupations, including painting, bricklaying, carpentering and plumbing. Earlier in the school year, the students had worked with several smaller, less complicated constructions. During our fieldwork, we saw students engage in different assignments, including shed building. All the students we observed participated in building at least one shed during the school year; some built several. The sheds were pre-ordered by people in the local community who used them as garden sheds.

The school had decided that vocational subjects should be organized as two full days and one half day. The students spent the whole school day every Monday, Tuesday and half Thursday in the workshop. At the beginning of the day, the teacher divided students into teams of two or three so that students deemed more advanced by the teacher teamed up with less capable ones.

When compared to most of the classroom practices, shed building appeared less teacher driven. While less teacher driven in a 'lecture sense', the workshop days still required teachers to oversee and supervise the activities. Table 3 provides an overview of the shed-building practice's temporal dimensions.

Table 3. Temporal dimensions in the shed-building practice.

Periodicity	Variation between repetition, 'doing over' and progress. Parts of the practice were repeated over different timescales. Work that was not 'good enough' needed to be redone
Sequence	Order of activities was partly open for choice, depending on the situation
Tempo	Deliberate pace valued. Speed varied with tasks and competence
Duration	Weeks, while activities within the practice lasted a short duration
Synchronicity	Social activity, to some degree, was necessary for the practice. Multitasking was expected and part of the ethos was helping others and learning

There was a clear repetitive structure in the organization of the days in the workshop. All workshop days started with students changing into work clothes, protective boots and hard hats. The students took breaks as scheduled in the school timetable, and the day always ended with the students cleaning up the workshop and putting away tools and materials. Depending on what students were working with, there could be repetitive activities, such as measuring, sawing and then hammering. Thus, there was, at times, a fixed order. However, it was possible to change the sequence of activities (to some degree). Some teams also had to repeat certain steps because they

did not 'get it right' the first time. The possibility of changing sequence when constructing the shed made it, for example, possible for students to do less taxing work when they were tired—unlike the worksheet practice.

Each team worked at its own pace, and thus, the sheds were at different completion stages. Consequently, the students were not all doing similar activities as in the maths worksheet practice. The point seemed to be keeping a deliberate pace, and it was considered a problem when students went too fast. Fast 'production' instead of learning meant the students missed a deliberative aspect of the activities: the point was not just to finish but to find good solutions and make a nice shed. To make a nice shed, students needed to pay attention to how different techniques, strategies and methods produced different results, quite the opposite of the fast-pace efficiency the worksheet practice aimed for. Hence, the shed-building practice was directed by the quality of the outcome rather than by a designated time. Conversely, in the worksheet practice, the practice ended when the lesson ended. In contrast to most of the classroom practices we observed during our fieldwork, this practice lasted several weeks, whereas a typical worksheet practice in maths lasted less than half a school day. The way the teams collaborated was also in contrast to the worksheet practice. The teams worked together and divided labour between themselves, synchronizing activities. Students also shared techniques and solutions to problems across teams, synchronizing different practices. For instance, if students had to wait for something, they could 'pop over' to the neighbouring group to chat, observe or help.

The temporal dimensions described above constitute the shed-building practice's temporal organization, which interplays with the configuration of three practice elements: main artefact, competence and purpose. Table 4 highlights the main features of the shed-building practice.

Table 4. Main features of the shed-building practice.

Main artefact	The shed made after construction drawing—a rich artefact in the sense that it contained many parts/problems
Competence	Technical and practical skills and knowledge, as well as contextualized problem solving ('carpenter inquiry')
Purpose	To provide the basis for a) the assessment of students (internal purpose) and b) work life, as well as constructing a nice shed for a costumier (external purpose)

When trying to conceptualize the shed-building practice as a relationship between the three practice elements, it is immediately apparent that there are numerous artefacts in play: safety equipment, materials, and electric and manual tools. However, we consider the shed to be the main artefact since it is the reason the other artefacts are in use. The richness of the shed requires that there are many competences in play, both verbalized and embodied. They range from more tacit skills (e.g. how to hammer) to explicit problem-solving skills (e.g. troubleshooting a crooked frame). Importantly, the competences were integrated in the making of the artefact. For example, learning to use a portable electric saw, including the required safety precautions, was part of the practice. To a large extent, these competences were developed through collaboration between students (and supervised by teachers), as there was the possibility of moving around and talking with and helping peers. However, only rarely did the teacher address the whole class to point out some problem, technique or solution.

This practice had both an internal (school) purpose and an external purpose. The latter was twofold. First, students were to gain carpentry competence and social competences required to do well in the construction industry, such as ways of working and speaking (e.g. helping each other and participating in friendly banter). Second, the sheds had been ordered by customers in the local community; therefore, the sheds needed to be of a quality that satisfied the needs of real customers. The internal purpose included developing technical construction competences graded in school.

The combination of the practice elements and the temporal organization provides a larger space for manoeuvring in this practice than in the worksheet practice. The national curriculum and the school's schedule provide quite a different space for manoeuvring within the shed-building practice than in the worksheet practice, as the former allows for longer continuous periods and thus makes it more possible to be flexible in the time spent on the workshop practices. Aside from this temporal curriculum feature of the vocational subjects, there are also other differences between the two practices' spaces for manoeuvring. In shed building, there are opportunities to choose between different activities, as the sequence of what needs to be done is partly open. There are also opportunities for students to find different solutions to problems. Thus, the students are left with a larger space for manoeuvring than they have in the maths class. In addition, the students can move freely in the workshop, and they talk to, share with and help each other. Talking and helping were also a part of the worksheet practice but were less systematic and more limited, as the character of problems was less concrete and 'simpler'. Concrete artefacts and contextualized problems are good conversation starters. To sum up, the space for manoeuvring in the shed-building practice gives room for setting (some) personal imprints on artefacts. Here, competence is more loosely predefined, and there is some possibility of influencing the temporal organization. Moreover, there was less student resistance to the practice compared to the worksheet practice.

Summing up the two practices

Table 5 shows the key features of the two practices and highlights their differences. This table is a condensed version of Tables 1–4. In addition, the last row of Table 5 sums up the practices' space for manoeuvring.

Table 5. Key features of the practices.

	Worksheet practice	Shed-building practice
Periodicity	Repetitive pattern: recipe—problems	Variation between repetition, 'doing over' and progress
Sequence	Fixed order: a predefined line of similar maths problems to be solved	Order of activities is partly open for choice, depending on the situation
Tempo	High speed valued	Deliberate pace valued
Duration	135 minutes	Weeks
Synchronicity	Social activity disrupted practice but allowed to some extent	Social activity, to some degree, is necessary for practice
Main artefact	Worksheets containing delimited problems with fixed answers and a given recipe	The shed made after construction drawing—a rich artefact in the sense that it contains many parts/problems
Competence	Skills in solving decontextualized maths problems	Technical and practical skills and knowledge, as well as contextualized problem solving
Purpose	To prepare for tests and exams	To provide the basis for a) the assessment of students and b) work life, as well as construct a nice shed for a costumier
Space for manoeuvring	Limited The practice gives little room for setting a personal imprint on the artefact, competence is predefined and there is little possibility of influencing the temporal organization	Larger The practice gives room for setting (some) personal imprint on artefacts, competence is more loosely predefined and there is some possibility of influencing the temporal organization

Hidden curriculum of temporal organization

In this section, we draw on the previous analytical description to elaborate norms and values ingrained into the practices. Norms and values are difficult to pinpoint; hence, we have attempted to operationalize them as that which seems to be normal ('the participants seem to usually do it like this') and worthwhile ('this seems to be important/valuable for the participants'). As explained in the

introduction, the hidden curriculum is the unintended learning outcomes, implicit messages and expectations sustained by ingrained norms and values implicitly valued in a practice (Apple, 2019; Giroux, 1981; Portelli, 1993). Time plays a significant, but so far underexplored, role in practices, their ingrained norms and values and, thus, in the hidden curriculum. To explain the norms and values regarding time, we draw on Rappleye and Komatsu (2016) notions of time—especially what they describe as linear time, where events are arranged after each other and ruled by time,—and event-based time, where events rule time.

Worksheet practice: individualization, efficiency over quality, inflexibility and linear time

In the worksheet practice, one can say that delimited skill acquisition and individualization is valued and becomes the norm because the school purpose is decoupled from everyday life and the structure of the artefact restricts collaboration possibilities. It is difficult to collaborate when tasks are repetitive and delimited to short responses; synchronization of practices, such as talking to others, becomes more disruptive than productive. In this practice, individual students following a fixed procedure repeatedly is highly valued; there is no need for a critical mindset or the ability to improvise. The point is to gain competence to pass tests and exams, which are individually based. As such, this can be seen as part of the 'test-culture' that Biesta (2010, 2013) and Holt (2002) argue against, although on a smaller scale.

In this practice, efficiency was valued regardless of the work quality. High speed was important—the important thing was to finish and be 'fast'. The worksheet was over when the class period was over, regardless of the quality or level of completion of the worksheet. The combination of artefact, sequence and periodicity gave an impression of an assembly line, where students could mass-produce answers to similar problems; thus, efficiency was important. According to Alhadeff-Jones (2018), when students do tasks in this manner, it can lead to boredom and alienation, as there is little possibility of thinking.

This way of dealing with knowledge, the artefact and competence, and the temporal organization limits students' space for manoeuvring. This makes the practice appear inflexible. In spite of the individualization, the individual students have little choice in what to do in the practice. The message embedded in this practice is that it is important to follow other people's rules and structures, as well as standards of knowing. There is very little space for mathematical inquiry, speculation or the act of relating geometrical problems to lived life. The assembly-line style of answer production was not perceived as very meaningful by the students, as one of the students said in an interview, 'When it is a short assignment, then it is just doing . . . it does not give you anything'. The student's idea here is that 'doing'—moving through time and tasks—dominated the practice. At times, the students resisted the practice by engaging in other practices synchronously, such as talking or surfing the internet, but overall, they complied. García and De Lissovoy (2013) argue that education with the aim of skills acquisition so students can 'pass' promotes delimited agency and a servile and obedient attitude. The researchers contend that when students and teachers have little control over time, 'efficiency' is expected and that when low performance on tests is sanctioned, constructive resistance is difficult.

The combination of the worksheet structure, the competence sought, the limited purpose and the temporal organization leads to the norm of linear time. Linear conceptions of time in schooling are strongly coupled with the view where knowledge is accumulated by moving from one delimited problem to the next (Rappleye & Komatsu, 2016), and the purpose is measurable knowledge for tests (Biesta, 2013). In the worksheet practice, there was a linear sequence of similar discrete tasks that did not build on each other to make a new composite artefact. Rappleye and Komatsu (2016) argue that (in a Japanese context) this sort of linear time leads to nihilism amongst young people—there is a loss of meaning when instrumental activities are ruled by clock time. The students in our study also suggested a connection between time and meaning: when 'it is just doing', time becomes void of meaning.

Shed-building practice: collaboration, quality over efficiency, flexibility and event-based time

Collaboration was valued both explicitly and more indirectly in the shed-budling practice. Since students worked in teams, collaboration was acknowledged and openly discussed as an important part of the practice. However, there was a more subtle recognition of the existence of a collective culture where people have different skill levels, but all could contribute because the shed offered a range of activities, from easy to difficult. The role of synchronization as something that enables collaboration was also implicit. Students could walk and talk and switch between practices. In this mode of collaboration, the dominating value was not necessarily 'staying on task' but being attuned to switching tasks when appropriate and necessary to make team members work well together. These collaboration values and norms are perhaps more common in vocational education but in stark contrast to the individualized efficiency in schools discussed by authors such as Biesta (2013) and García and De Lissovoy (2013).

In the shed-building practice, the values of performing good work, making the shed nice and striving to master carpentry were sometimes verbalized but more often not. The temporal organization worked largely in accordance with these values. The shed was not finished before it was ready for the customer; thus, the external purpose sustained a focus on quality. Furthermore, if something was not right, it had to be redone, or if it was a big issue (such as a crooked frame), problem solving was required to minimize the consequences. Students deemed more competent (by teachers and peers) had the higher responsibility of ensuring the work quality. It was acceptable not to be fast, as long as the student was willing to strive for competence. In fact, workshop teachers worried about students being too concerned with 'production' and speed and not concerned enough with identifying and deliberating problems, as well as learning the right techniques. Hence, the shed-building practice seems to deem quality over efficiency—unlike the worksheet practice and traditional schooling, which place a high value on efficiency (Holt, 2002). We speculate this may be because the richer artefact (the shed) and the nature of building and construction competence are different from what is observed in more academic school subjects.

The space for manoeuvring in the shed-building practice was qualitatively different from that in the worksheet practice; it was larger and gave the practice a more flexible quality. Student groups organized their time within the boundaries of the school schedule. The timetable allowed the students a lengthy engagement with shed building, both mentally and physically. The richness of the main artefact in combination with a long duration made it possible to switch between activities with different qualities and different difficulty levels. The main artefact also made it possible for students to develop a range of competencies—for instance, work ethics, exchange of know-how and collaboration. Thus, there were multiple things going on simultaneously in the workshop, sheds were at different stages of completion, and students and teachers moved around. At first glance, the workshop might seem messy and disorganized, with a lot going on simultaneously, whereas the worksheet practice appears ordered and organized. However, the flexibility in the shed-building practice can contribute to a kind of emancipation of students that is more difficult in more inflexible practices.

Another norm is event-based time: the shed had to be finished. (If a shed was not finished by a certain date, all students collaborated to complete it.) The long duration made it possible to 'take the time needed' to complete the task properly. In the shed-building practice, the duration of the practice was determined by the quality of the shed. The shed had to be deemed of good enough quality to be delivered to the customer. For the students, it was important to create something nice, functional and lasting. This added positive value to the practice. When the focus is on quality and 'getting it right', the time is more event-based than linear. Event-based time involves time measured according to events rather than the clock (Rappleye & Komatsu, 2016). Here, the event of building the shed ruled over the clock.

Discussion and concluding remarks

Based on two in situ educational practices in vocational education, we have argued that a practice's temporal organization is a vital aspect of its norms and values. What the practice is about combined with how it is organized temporally, provide the practice with space for manoeuvring for students and teachers. In turn, this interaction between practice elements, temporal organization and space for manoeuvring provides the practice with a set of characteristics: ingrained norms and values—that is, the hidden curriculum. We analysed two different practices. The first was a maths practice where more traditional academic knowledge was acquired linearly through a sequence of delimited tasks, individual work and efficiency were valued and inflexibility became a norm. In this practice, time is linear, with discrete tasks lined up after the other, and the task is 'completed' when the time is up. The second was a vocational practice in which the shed was a rich artefact that had to be worked with over time collaboratively. Quality was highly valued, and there was more flexibility in the sense that there were choices and possibilities to set imprints on the main artefact and gain competences. In the shed-building practice, time is event-based in that the construction of the shed controls time.

Our perspective is necessarily incomplete. For example, we have not investigated how physical space interacts with the hidden curriculum. Even if understanding how time and space work together is important for understanding practices (Lefebvre, 2004; Schatzki, 2010), it would have made our analysis even more complex and less clear. Similarly, we have not explored teachers' and students' interests or motivations and how these might influence temporal organization and a hidden curriculum. Moreover, we have chosen two of several possible practices for this article in order to make a more pointed analysis. Another choice of practices could have revealed other norms and values.

However, by offering a detailed comparative analysis of two different educational practices, we hope to have provided a complementary way to consider how time works in education. The purpose of our conceptual analysis is not just to show how it is possible to theorize temporal organization and practices for the sake of theory but also to demonstrate how such an analysis can reveal norms and values that may otherwise be difficult to see. While time in education has been explored as subjective time (time as perceived by individuals) or as an objective structural category (time as measured by the clock), we add another way of thinking about time: time as embedded in practices. Additionally, we propose that the concept of event-based time can offer a point of contrast to the ubiquitous notion of time as linear in education. Such perspectives, we hope, can facilitate unsettling common-sense assumptions (Giroux, 2020) about time in education and, particularly, how temporal organization enables and privileges certain knowledge (artefacts and competence).

Ultimately, the purpose of such unsettling is to point out how educational practices might be rethought and changed. Other education researchers with a social practice perspective have similar aspirations. Kemmis et al. (2014) argue that to change education, educational practices need to change. Shove et al. (2012) claim that to change social practices, practice elements and how they are connected need to change. Our analysis adds to such perspectives by highlighting the value of considering temporal organization embedded in practices in order to facilitate a change.

Is it then possible for traditional academic school subjects to change towards a school that does not assume a perpetual forward movement of 'progress' and 'development' (Biesta, 2013), and (at least at times) have an event-based temporal organization? Our empirical material allows us to only speculate on the answer to this question. What might event-based mathematics education look like? Although mathematics education research does not seem to be concerned with event-based time as a concept as such, some approaches can facilitate a more object-centred education, where the purpose is 'more than just exams'. Such approaches can be modelling, problem-solving or inquiry-based teaching and learning. In recent decades, researchers in the field of mathematics education have become increasingly aware of the need to provide students with time to think creatively (e.g. Lithner, 2008) and critically (e.g. Jablonka, 2020). Nosrati (2015) has argued for the importance of 'temporal freedom' in mathematical thinking, suggesting that the design of mathematical tasks should move away from 'a system with regard only for the demands of clock-time'

(p. 34). In other words, studies suggesting the value of reducing speed and elongating activities to provide time for mathematical reasoning are starting to emerge. However, more event-based maths—where the object is more extensive and contains a broader spectrum of competencies—will be in conflict with contemporary school tradition, where mathematics is a subject with temporal control and restrictions on students (Nosrati & Andrews, 2018). Indeed, the maths teacher in our study made a similar point. She explained that she felt a strong responsibility to prepare students for the exam and that the worksheets were 'effective', even if they were not very meaningful beyond that purpose.

If it is possible to imagine event-based maths, would it be possible to imagine shed-building with a temporal organization more like the academic school subjects? For example, might building a shed be broken down into short, repetitive discrete components? It would be possible to imagine making the shed in an assembly line manner with a fixed duration for each of the tasks in the production. However, such a practice would not adhere to the aims of the national curriculum of educating skilled workers and citizens with a creative, investigative and critical mindset (The Norwegian Directorate for Education and Training, 2019). Nevertheless, in both the practices investigated here, other temporal organizations are possible, suggesting that the current practice traditions are indeed traditions, not inherent features of the school subjects.

As such, our analysis is in line with Apple (2019) who argues for the need for a greater understanding of latent assumptions that is part of the school tradition and underlay curricular choices. And while our analysis is particular to our specific context, we believe that the conceptual framework we have constructed here might be adapted to other educational contexts. The combination of parsing a practice into its constitutive elements and analysing the temporal organization may, in fact, offer a quite practical way of pinpointing assumptions, norms and values that underpin practices and curricular choices. For example, the assumption that more time will remedy students' poor learning outcomes is not necessarily the most useful starting point for facilitating more meaningful education. Understanding how time is embedded in a practice, however, might inspire perspectives that question how practices' purpose, competence and artefacts work together with time. We hope that such an understanding will enrich the ways both researchers and educators think about time in education.

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