STRUCTURED FLEXIBILITY WHEN LEARNING ABOUT RESOURCE DIVERSITY ON THE GLOBE: THE DOLLAR STREET CASE

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Abstract

The study is situated in a school built specifically with the idea of flexible design in the learning environment providing variation of rooms and furniture combined with access to a range of digital tools to enhance students' 21st century skills. The aim of this study is to investigate how such flexible resources are used and experienced by teachers in practice. The findings demonstrate that teaching in such spatial wholeness requires including flexibility in the planning process and approaching student-driven choices in a meta-structure for students to participate and learn. Teaching *Dollar Street* required extensive collective planning to uphold the shared design throughout the spaces, activities, and resources.

Introduction

Sweden is experiencing a school shortage and is currently in the situation of increased need to build new schools. The number of students in primary school in Sweden is estimated to increase by 16 percent due to high childbearing and extensive immigration (HUI, 2014). Therefore, the challenge is not only linked to the buildings themselves but also how to incorporate the needs of an evolving society characterized by cultural and linguistic diversity, as well as the rapid advancements in technology, to ensure that education remains relevant and future oriented (UNESCO, 2019). It has been argued that a good and flexible learning environment along with digitalization of education are at the forefront of the building plans (Building School Forum, 2021). Such ideas have been implemented in some of the recently built schools in Sweden. The study presented in this paper is situated in a school built with the idea of flexible design in the learning environment providing variation in both rooms and furniture combined with access to a range of digital tools such as surf tablets, projectors, laptops, and interactive screens to enhance students' 21-century skills.

The challenge within this particular research lies in the awareness of the pedagogical conditions of the teaching situation that require time and experimentation in authentic situations (Sofkova Hashemi & Spante, 2016). The design of the overarching project strives to meet the complexity of the learning environment and systematically test teaching designs over time. The flexibility offered by the school in physical classroom design, digitalization, and curriculum includes both opportunities and risks. Learning environments in themselves are becoming increasingly complex, which affects education and how we learn, requiring use of new materials/resources, changes in the beliefs of what represents good and adequate education, and development of new teaching methods (Nieveen & Plomp, 2018). A teacher needs to understand the relationship between digital technology and learning, and choose relevant digital technology based on the learning goals, activities, and processes on which they are designed.

The aim of this study is to investigate how such flexible resources were used in teaching practice and experienced by the teachers.

Literature Review

Previous research has shown the essence of dealing with how digitalization affects individualization in schools and opportunities for equal participation in learning (Selwyn, 2017). Above all, the importance of a reflective practice and a critical approach to the development one wishes to achieve is emphasized, since an ill-considered digitalization in the worst case might lead to negative outcomes (Carter et al., 2017). Inclusion means striving for a learning environment spacious enough to meet students' differences and diverse needs (Swedish School Commission, 2016:163). Combined with digital and spatial conditions, schools have potentially unique opportunities for flexible and inclusive education. Furthermore, the design of a physical space has been shown to be important for how interaction evolves in pedagogic settings (Horne-Martin, 2002; Hipkiss, 2014; Moore & Lackney, 1993).

Over the years, the more student-centred approaches in curriculum have influenced school designs, motivated by notions of a relation between learning and space (Wells et al., 2017). However, this influence has not been as great as might have been expected. Many schools still have traditional school desk arrangements with students in pairs facing the teacher (Sigurðardóttir, 2017). Furthermore, on classroom level, making changes to a "set" design, like that of a strongly classified subject classroom, such as a chemistry classroom, has an impact on teachers and their views on teaching their subject (Veloso & Marques, 2017). Making changes that remove subject identity in the room or force different subject identities into one space might have effects on the teaching that will take place (Leiringer & Cardellino, 2011). Studies on open-plan designed schools have found it difficult to present a final judgment on the implications of the design on learning (Woolner et

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al., 2007). As in many other cases when it comes to teaching and learning, there are few straightforward answers. However, there are studies that show a link between the affordances of classroom designs and style of teaching (Hipkiss, 2014; Horne-Martin, 2002; Moore & Lackney, 1993), suggesting it worthwhile to consider both agents (such as teachers and students) and contents when planning for new school buildings and classrooms, since there are questions of how pedagogical practices constrain, constitute, or co-produce agency (Charteris & Smardon, 2018). The current study therefore provides prospects to answer questions on a scientific basis about what opportunities a flexibly designed school offers, and how these are realized in teaching.

Learners engage in new forms of educational environments through digital technologies in schools, acknowledged as a paradigmatic change in education (Beetham & Sharpe, 2013), moving towards a creative process of *design for learning* of new practices, activities, resources, and tools rather than delivering content to students (Mor & Craft, 2012). In this, teachers design for learning tasks to facilitate students' activities as learners, not their experiences (Sun, 2017), where students have the opportunity to create their own learning paths, previously more controlled by the teacher who could provide a specific material (Boistrup & Selander, 2022). In this activity-centered forward-oriented design of emergent learning situations, teachers relate and facilitate students access to the subject content to be taught and learned based on the three components of the 'didactic triangle' linking student, teacher, and content in a concrete teaching and learning situation (Krogh et al., 2021).

What students should learn, how should they learn it, and why this content with this method for these students, need to be addressed in the teaching design in questions concerning which technology to use, interactivity in the physical and virtual spaces, and when to teach and where (Lund & Hauge, 2011; Sofkova Hashemi & Spante, 2016). The relationships between technology, student, and context that arise thus entail the teacher's responsibility of the design and layout of teaching situations and learning activities (Hudson, 2011; Boistrup & Selander, 2022).

Design of Study

We focus on a teacher team's didactical design (Sofkova Hashemi & Spante, 2016; Boistrup & Selander, 2022) of the thematic work project *Dollar Street* where 51 students in Grade 5 at the age of 10-11 years learned about resource diversity in the world. The analysis of knowledge content, activities, spaces, and resources is based on data from workshop-driven design activities, lesson observations, and a focus group interview with the teacher team. We worked particularly close to six teachers in Grade 5 since parents had given informed consent to conduct classroom observations.

Workshop-Driven Design Activities

Initially, the teacher team was making a so-called rapid prototyping addressing six specific categories in their design: 1) Knowledge; 2) Competence; 3) Time; 4) Space; 5) Resources; and 6) Added value (for the didactical design model see Sofkova Hashemi & Spante, 2016). During the workshop,p teachers worked with identifying learning targets, how to teach, and how to organize each activity in the *Dollar Street* thematic work project.

Lesson Observations

Lesson observations were conducted on six occasions during the thematic work project, following the activities of the Grade 5 students in *the Home Base* comprising an open space area with access to a *Base Room* that holds 50 seated students, a *Theatre* (with tiered seating), several smaller group rooms, benches, and wall cubes (a construction attached to the wall to sit in). Not every lesson was observed but the process was followed with six observations during the initiation of the *Dollar Street* in November 2021 until the final observation that took place in December 2021 when the concluding stage of *Dollar Street* was introduced – How to present your findings.

The observations started with a short interview with the teacher regarding what was planned to be achieved. Then the observation focused on what happened during the session and then, time allowing, a follow up interview with the teachers after the session to capture the direct experience of the conducted lecture with the thematic work. During the observations, field notes and photos were taken to capture the sessions following the timeline of events.

Focus Group Interview with the Teacher Team

Six teachers involved in the thematic work project were then interviewed in a one-hour focus group interview. The focus was the experience of the thematic work project with special reference to the six categories addressed in the didactical design. The interview was transcribed for thematic analysis inspired by Braun and Clark (2006). The themes stemming from the work were labelled as: i) Structure in variation, ii) Value-creating work with assessment as a bonus, iii) Being together in open spatiality, and iv) Development in the teacher team.

Results

In the following result section, we will present the teacher team's plan, observations, and the focus group interview with the teacher team after the thematic work project of *Dollar Street* was completed.

Results from Teacher Team Workshop and Plan

The overarching plan for *Dollar Street* lists the curricular targets specified in the six design categories of didactical design (Knowledge, Competence, Time, Space, Resources, Added value), without specifying the school subjects involved in the project. The plan stipulates two perspectives on the curricular targets: comparing living conditions and resource diversity in different parts of the world, and understanding this on a personal level - "I have this, as a Swede, and in other parts of the world, they have that". The teacher team wanted their students to develop their abilities to reason, argue and reflect and thus build critical thinking by being able to compare and contrast information about living conditions and resource diversity. They planned for the thematic work project to take place twice a week for 60 minutes each time over a six-week period. The plan also includes which spaces to use and time spent on activities with which resources to be used; in this case, much is based on information on a website - *Världskoll* (World check). Apart from the curricular targets and abilities, the teacher team also stated team building and collegial collaboration as added value of the *Dollar Street* project along with cross-curricular activities.

Result from Observations

The structure of the lessons was similar. The lessons started with a few minutes of quiet individual work allowing for students to settle down in the *Home Base* area and for the teachers to check attendance ("soft start"). Then the teacher would introduce the work to be carried out, projecting the plan and activities from a shared document. In the following sections we present short summaries in the format of tables where we emphasize three categories 1) teachers plan, 2) the activity in the lessons and 3) teacher experience of the lesson. The observations from the six lessons underlined observations relating to knowledge content, activities, spaces, and resources. The first observation is summarized in Table 1.

Initially, the use of the learning environment seemed to be quite challenging for teachers and students. The teachers' idea to begin the lesson in *the Theatre* seemed to cause some turmoil in the group. Additionally, teachers' idea to let students select where to sit when working was not followed during the introductory lesson.

Table 1

Observation of Plan, Action, and Experience 19th November

Date: 19th Nov	Observation 1
Teacher plan	Introduce the thematic work and structure of the lessons
Lesson	Students enter loudly into the *Theater*. Introduction to the thematic work starting with <u>climate justice, climate-smart food.</u> Teachers use <u>film clips</u> and demonstrate <u>statistics on websites</u> about countries carbon dioxide emissions. Students are engaged and impatient, want to answer all the time. The teachers hush, separate, and move students. <u>Teachers decide on groups</u> to work on <u>climate-smart food</u> using the available rooms and <u>shared documents</u>. Teachers circulate around the groups in the different rooms guiding and asking what new things the students learned, e.g. that a 6-year-old drinks coffee.
Teacher experience	The students learned new things and they talked a lot all the time.

The week after, they did work with the suggested plans despite the expressed shyness and nervousness to perform a play for each other in groups linked to concepts, as summarized in Table 2.

Table 2

Observation of Plan, Action, and Experience 23th November

Date: 23th Nov	Observation 2
Teacher plan	Understanding concepts linked to living conditions
Lesson	Students are positioned in the *Theater*. The teacher <u>projects</u> concepts linked to <u>living conditions</u> and encourages students to elaborate on them in their own words writing on <u>the white wall</u>. Teacher initiates discussion on the representativeness of <u>images</u> for the concepts and <u>definitions in online dictionaries.</u> Students are invited to discuss in pairs "living conditions". Then they are invited in groups to prepare <u>a sketch of the concepts</u> assigned by the teacher and spread in different rooms. Gathered back in the *Theater*, one group after another <u>performs their sketch</u> while the others guess the concept. They end by individually <u>describing in their own words the concepts</u> they have worked with in <u>shared documents</u> on their tablets.
Teacher experience	Need for practice performance more since many students were anxious and worried to perform in front of the class.

After a while making sure all students understood what to do and how to fill in the table, work in the *Home Base* flowed and students spend much time comparing

additional concepts (Table 3). The concluding comparison using *Menti* was not given much focus as time was running out for both teacher and students.

Table 3

Observation of Plan, Action, and Experience 26th November

Date: 26th Nov	Observation 3
Teacher plan Lesson	To introduce the work for the lesson and get students working. The teacher began by reminding them of listening and being patient during the introduction. Students were to fill in a prepared table <u>comparing three aspects that affect living conditions</u> between three countries on three different continents. The teacher illustrated how to search the <u>website</u> where they collected their information. When working <u>individually (but allowing for cooperation)</u> students were seated in <u>different areas in the *Home Base*</u>. The follow-up in the *Theatre* using Menti collected all student's findings.
Teacher experience	There were differences between groups in how well they understood and were able to complete the tasks and were able to focus.

The following week, the teacher recurringly assured the students that the task for this lesson was different than the previous one. However, many of them repeated the same task initially as from the lesson before (Table 4).

Table 4

Observation of Plan, Action, and Experience 30ᵗʰ November

Date: 30th Nov	Observation 4
Teacher plan Lesson	To introduce the work for the lesson and get them going. Students were seated at the *Theatre* for introduction. The teacher began with informing on the work to come, presentation - the concluding stage of the project, and then focused on lesson at hand. The lesson included additional work <u>comparing countries,</u> but this time with new aspects to be used for their final in-depth study presentations. Some students did not realize the difference between the tasks they had already completed and the ones they were to complete that day. The <u>individual, but cooperative</u> part of the lesson, was conducted in <u>different spaces of the *Home Base*</u>.
Teacher experience	n/a

At this point of the *Dollar Street* project, all students followed the format and had grasped the content of the thematic work (Table 5). The observation also showed that students experienced the project as relevant and showed motivation to work

with the tasks. At the same time, some students experienced that the thematic project was repetitious due to its structure.

Table 5

Observation of Plan, Action, and Experience 7th December

Date: 7th Dec	Observation 5
Teacher plan	Finish their selected in-depth study
Lesson	The *Dollar Street* lesson in the *Theater* starting with individual work to <u>find and document information</u> for the selected in-depth study, using <u>surf tablets and destinated sites,</u> focusing on content such as '<u>forest coverage'</u>, '<u>representatives in parliament, and famine</u> to mention a few, and then group work to decide on how to present the conducted work with the *Dollar Street* theme. Students decided where to sit during the in-depth study in <u>group-rooms</u>, the *Theater*, <u>benches in the *Home Base* area</u> and <u>wall cubes.</u>
Teacher experience	The students could concentrate on the task and could select a room that worked for them. The matrix, created by teachers to document content worked for most students but some needed extra help.

Between observations 5 and 6, students selected methods for presenting their in-depth study. They could for example choose between a film, comic strip or a podcast (Table 6).

Across the groups, the focus for this lesson was to get students going on their in-depth study presentations, and different teachers were allocated different presentation modes based on their competencies or preferences. Students in the film group progressed very differently as they all approached the task from different angles, with a few following the suggested strategy of making a plan first. Many started with creating a dialogue, building "worlds", or selecting characters, and others with selecting a focus for their presentations as they had not yet decided.

Table 6

Observation of Plan, Action, and Experience 14th December

Date: 14th Dec	Observation 6
Teacher plan	Check that they all know what group they are in (T1) Introducing the film making task (T2) and see that they get going.
Lesson	Students were seated in the *Theatre* for introduction during which the teacher (T1) made sure they all knew which presentation <u>group they belonged</u> to and <u>which room</u> they were to go to for further information and guidance. The teacher (T2) presented the work to be carried out in the "film group". Students were introduced to <u>a good strategy and two different film making apps</u>. The film introduction both included <u>teacher instruction and student input</u> to enhance or suggest presented alternatives. Then students were <u>planning their work in groups</u>. The lesson concluded with a follow-up and some more guidelines for the following lessons in order for the students to be able to succeed on time.
Teacher experience	T2 was pleased with the students' progress after the first filming lesson.

Teacher Team's Experiences

Here we present the themes arriving from analysis of the focus group interview with the teacher team (six teachers of mixed subjects) on the experiences of the thematic work *Dollar Street*.

Structure in Variation

The teachers experienced their own development and variation of instruction, being able to repeat a lecture several times: "I thought it was good that we divided into three groups and did a lesson several times. Then we became a little more expert at it" (Teacher 1). The teaching design was organized to keep the students in the same familiar rooms and groups with the teachers circulating. This gave an opportunity to the students to encounter several of the teachers and avoided having them be distracted by circumstances or other frames: "It is a pretty good way to start somewhere in order to keep the content in focus" (Teacher 4).

Value-creating Work with Assessment as a Bonus

The teachers discussed the *Dollar Street* project providing images of the reality that their students could empathize and identify with, thus creating interest, curiosity, and engagement: "I just think how important it is that things and stuff that it is relevant. That there is something that they can relate to" (Teacher 3). They experienced compromising with their subject having limited space for content and

assessment, however, contemplating theme work as a valuable occasion for students to show what they have learned and to apply their skills in a context. Here is a quote about assessment during theme work: "So it is not certain that you can get all the evidence within all those activities, and is it important for you? No. I think we solved it quite well anyway. That is what I feel with my subject's math and sciences, that it will be like good bonus opportunities" (Teacher 4).

Being Together in Open Spatiality

The open spatiality enabled several working areas. The teachers talked about developing a classroom code with their students in a calm and safe environment: "You need to follow a certain code when you are in those environments even if it does not look like a classroom, that you need to adopt certain things that may be classroom coded. However, it is difficult to put it into practice and remember it all the time" (Teacher 4). Pointing explicitly to the open spaces and opportunities to talk among the students, the teachers reveal that both students and teachers need practice that gives the skills to use the spaces as parts in a whole - a feeling of being together and a kind of spatial wholeness/context rather than separate rooms.

Development in the teacher team

The findings demonstrate a student-centered approach in teaching was present in the choice of content as well as in the spatial placement. However, the overall structure regarding the design of the lesson was held rigid by the teachers during theme work, something the teachers experienced as a necessity to be able to accomplish learning in the thematic project work.

Conclusion

The study demonstrates that being together in such an open and digital learning space requires including flexibility in the planning process. In this spatial wholeness, student-driven choices were enhanced by a meta-structure so that students could navigate and develop a sense of recognition and consequently a predictability to learn. Teaching *Dollar Street* required extensive collective planning and negotiation to uphold the shared design throughout the thematic work project and to develop a readiness to re-evaluate the teaching design throughout the spaces, activities, and resources.

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