SELF-ORGANIZED LEARNING ENVIRONMENTS (SOLE) METHOD. PEDAGOGICAL IMPLICATIONS FOR PRIMARY CLASSES

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Abstract. A Self-Organized Learning Environment (SOLE) is a program designed to support self-directed learning. Sugata Mitra, an education scientist, first popularized the term in 1999, referring to an approach he developed from his Hole in the Wall experiments (Appelton, 2008). Researcher Mitra's experiments demonstrated that most groups of children can learn to navigate internet-connected devices on their own, and research since then has continued to support his conclusion that groups of students, with access to the internet, can learn almost anything on their own (Hawkins, 2021).

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S. Mitra's findings also supported the design of certain platforms such as StartSOLE.org, a digital tool used by thousands of teachers in classrooms to boost inquiry-based learning. In 2022, S. Mitra was awarded the Brock Prize in Education Innovation for his transformative work in rethinking how students learn (Bransford, 2008). Self-organized learning environments (SOLEs) are created when teachers and/or parents encourage children to work as a community to answer their own vibrant questions using the internet or other means. The methodological steps for implementing the SOLE method are (O'Malley, 2017):

1) Students are given an important question or challenged to think of a question of their own. They are presented with or asked to write their own 'Big Question' which is related to a specific aspect of the curriculum. "Big Questions" should not have an easy answer and should be a genuine process of discovery that can be related to the curriculum or any area of interest. "Big questions" can be used to introduce new concepts, encourage a greater breadth of knowledge and understanding, use skills in context, encourage competitive learners to share results or reinforce learning, and introduce cross-curricular education. This time should last no more than 5 minutes.

2) Students choose their own groups and can change groups at any time. A group of 4-6 students is considered the most effective number. This ensures that all pupils are fully involved. In some cases, students may decide to change groups and exchange information (Hawkins, 2021). Students can then learn to share tasks, compare, interpret and share results. The organisational moment lasts about 2-3 minutes.

3) Students begin to search for answers to the "big question", all the while they are using the internet-connected device, but also any other relevant metarium in the room, and obviously they can move around freely, talk to each other and share their ideas.

4) Students can explore in any direction they like: there may not be one right answer. The teacher should facilitate, encourage and motivate, but not provide answers. In some cases, open-ended and supportive questions can be helpful, but for the most part, teachers should stay in the background. It is quite possible to spoil several correct answers to the same question. Students have the opportunity to make their own decisions about the data collected, setting their own criteria at team level for eligibility and inclusion of information in the final presentation. In total for stages 3 and 4, students have approximately 40-45 minutes.

5) The time at the end of the research period is used to prepare the presentation of the work, with the teacher ensuring that all participants have a role.

6) Groups present what they have learned at the end of the session, with all students taking ownership of the results. Similarities are presented and differences can be highlighted. All students should be involved in the feedback and demonstrate ownership of the research. This stage is one of the most important elements of the session as it gives them a chance to think more deeply about what they have found and how they have found it.

7) The actual presentations of the research results will be the highlight of the activity. Students can choose the form of presentation: information board, banner, poster, a small dance or a song; whichever method they choose to present should help to disseminate the results in an attractive way.

What is "The Big Question"? The increased attractiveness of the SOLE educational experience method has its source in the fascinating questions that arouse students' curiosity. When launching a SOLE, it is important for the teacher to use playfulness and paraverbal language to motivate students even more. By demonstrating their own curiosity when introducing questions for students to explore, adult facilitators will create an open, flexible, and encouraging space for students to take intellectual risks (Hawkins, 2021).

We have found that big, open-ended, challenging, and interesting questions are often the best "big" questions for SOLE inquiries. Unanswered questions, such as "Who created space?"/"Does cocoa milk come from brown cows?"/"What is joy?"/"What is the most effective way to stay kids forever?" encourage students to offer theories instead of concrete answers. While it may be tempting to ask questions

with seemingly easy answers, it's important to ask big-picture questions that promote deeper and longer conversations.

The important questions are the ones that don't have an easy answer. They are often open-ended and difficult; they may even be unanswerable (O'Malley, 2017). Their purpose is to encourage deep and long conversations rather than easy answers.

These questions encourage children to offer theories, work collaboratively, use reason and think critically (Mitra, 2010). A good big question will connect multiple subject areas: "What is a queen bee?", for example, does not touch on as many different topics as "What would happen to the earth if all the bees disappeared?". Some questions are ambiguous, some precise, some easy and some poignant (Hawkins, 2021). They may relate to what students are learning in school, they may come from their everyday experiences, or they may be something completely new.

Here are the main reasons for choosing this teaching method:

- Students aged 8-12 choose their own groups of four and their own questions to explore;
- They can collaborate with other groups already formed in the classroom and take information back to their own group;
- Students can move freely throughout the physical environment provided by the workspace;
- Students can change groups at any time, but with clear justification;
- Students can talk to each other and discuss with other groups;
- They can improve their ability to launch or formulate questions;
- Develop interest in research and investigation;
- Change the management hierarchy, with pupils becoming the ones who prepare the presentation material;
- Promoting reflexivity, with the idea that students can also learn on their own at the centre; learning to learn;
- Develops digital skills;
- Take responsibility for their learning experience;
- Improve reading comprehension, literacy, behaviour, language, creativity and problem solving skills;
- Develop habits to become a lifelong learner;
- Strengthen their interpersonal skills;
- Successfully integrate what they already know into classroom discussions;
- Develop a more trusting relationship with educators and adults in general;
- Creates cultures of curiosity and child-centred learning;
- Provide more opportunities for both independent thinking and collaboration;
- Opportunity to actively participate in your child's learning;
- Cultivate a culture of curiosity in the home;
- Reinforce and build on what your students have already learned at school.

SOLE is an innovative pedagogy designed to facilitate students' development of 21st century learning skills. In short, groups of students participating in a SOLE activity identify and explore a research question, which can be provided by websites such as startsole.org, by the teacher, or by the students themselves (Mitra, 2010). Although the term 'self-organised learning environment' implies that students organise themselves into groups, the actual process of organisation varies. Some teachers allow students to create their own groups, some teachers assign groups, and some teachers negotiate with students to determine groupings (Appelton, 2008).

Each group, consisting of four to five students, usually has access to at least one device with internet connectivity. Students spend about 30 minutes in the group searching for information relevant to their question. After the research period, students spend about 20 minutes preparing a presentation. Presentations can be some sort of visual display or even artistic endeavors such as plays or songs (O'Malley, 2017). Each group presents to the class and usually then answers questions from their peers. After the presentation, students may have an opportunity to reflect and self-evaluate; sometimes teachers provide feedback on one or more aspects of the process.

Each SOLE activity helps students develop their learning skills in different ways. Questions can also be aligned to teaching objectives. The Start SOLE platform has a database of questions that align questions to teaching objectives, as well as an app to support teachers (Hawkins, 2021).

To help students develop 21st century skills, it is essential to shift the focus of the learning and teaching paradigm away from individual effort and toward group achievement with distinct contributions from each member. Students want to be involved and engaged in their own learning. It is also important to recognise the role of the internet in our lives. It is our playground, our commercial hub and an important learning tool (Biggs, 2014).

In the current century, the nature of work has changed the skills essential for success. In order to provide students with the skill sets they will need, we need to pursue very different types of learning than what has been commonly observed in traditional classrooms (Mitra, 2010). The seven skill sets are critical to students' academic success and future success in the workplace. These skill sets form the basis for learning typical of the contemporary age (Biggs, 2014). Work in today's century requires more complex communication and expert thinking and less reliance on routine cognitive and manual skills. Innovation, digital literacy and life and career skills are needed to thrive. SOLE's activities and pedagogy framework provide a valuable context and toolkit that develops habits of mind that will support their academic success and future workforce plans (O'Malley, 2017).

SOLE demonstrates how teaching geared to each student's learning environment and knowledge, when combined with coaching and collaboration throughout the

process, will increase the likelihood of deep learning. This pedagogy empowers students to use what they have learned in the classroom to create real change, and teachers to become the new frontier leaders for academic education academic success in the 21st century (Mitra, 2010).

The introduction of SOLE may involve a change in the role of the teacher from a transmitter of knowledge to a facilitator of learning, integrating into the learning process with students and keeping students on task, especially in the particular case specific to primary grades (O'Malley, 2017).

This approach enables students to understand and use information and data effectively. The teacher should ensure that all pupils understand the expectations of the 'Big Question' plus any new vocabulary and promote inclusion by ensuring that all primary pupils take ownership of the outcomes. There should be a common approach for all pupils through peer support and sharing of roles. The facilitator will observe that pupils are interacting with ICT for the purpose given, using safe practices and gathering different types of information. All students should demonstrate ownership of the results and participate in formulating an effective conclusion. This is an opportunity for the teacher/facilitator to engage in 'depth' to ensure understanding (Bertucci, 2010).

The group's access to digital technology in the form of laptops and tablets plays an important role in this methodology. Where there are limited resources in the classroom teachers can work in creative ways to maximise efficiency by carefully guiding students in assigning roles within the group, for example, some doing digital media research, others processing information while others preparing analysis and feedback (Hawkins, 2021).

There is a possibility, especially in the preparatory class or at the beginning of Grade 1 when pupils do not have sufficient writing and reading skills, that the analysis of 'Big Questions' can be done without the use of computers, for example, with the help of textbooks, topic maps, suggestive pictures, atlases, magazines, etc.

Communication and collaboration are central to the SOLE process with primary school pupils because pupils are eager to learn through self-education.

The process requires maintaining equal opportunities for all pupils regardless of their school, material or social situation (Mitra, 2010). Curricular needs and individual learning requirements through student collaboration must be at the heart of the process. The school environment and teaching resources will influence the development of the SOLE process in the school. A consequence of this is a quite different implementation of the same methodology, but with the same core objectives (O'Malley, 2017).

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