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Self-organised learning: Empowering the most marginalised schools of rural Greece?

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Abstract

Despite increasing demands in the labour market for higher-order thinking skills, along with OECD reports highlighting an urgent need for a curriculum reform in the crisis-ridden country that will aim to adopt a more holistic approach to the education and development of its young people, Greece is still ranking among the lowest across 30 OECD countries in terms of performance on 21st century competencies, such as creativity, while also performing well below average on foundational literacies such as scientific and cultural and civic literacy. It should be hardly surprising that the structural constraints imposed by a debt-ridden economy seem to weigh heavily on the administrators, who, recognising the need for the nation to play catch-up, are currently amidst a curricular reform for a number of secondary school subjects, yet inevitably pushing over 500 of the most marginalised primary schools operating in rural and socioeconomically challenged parts of the country down the list of priorities. It is against this very backdrop, then, that questions such as "How can we do more with less?" have greater currency than ever. This ongoing scholarship investigates the design of a targeted intervention aiming to provide support for the more disadvantaged state schools where there is currently no provision for the teaching of English as a Foreign Language (EFL) due to geographical and budgetary constraints. 'Self-organised learning' as an alternative, cost-effective model for the enactment of the primary English curriculum to current approaches has been put to the test. Pupils from eight such schools participated in a quasi-experiment consisting of weekly sessions where they were encouraged to self-organise, take responsibility for the direction of their own learning, demonstrate initiative, and collaborate effectively. Preliminary findings are discussed in terms of behavioural changes regarding the above-mentioned skills, including the participants' preparedness to self-direct.

1. Introduction

With Greek education expenditure having been cut by an estimated 36% (European Union, 2015) in the current harsh economic context and educational outcomes remaining weak compared to other Southern European countries (OECD, 2017), along with findings placing Greece at the top of the list of countries with a marked disparity in the quality of educational provision between rural and urban areas as a result of an uneven distribution of resources across the country (OECD, 2018), it is important to understand fully the potential of alternative educational and pedagogical approaches in ensuring all students – including those in geographically remote and disadvantaged areas – are given equal opportunities to high quality learning.

The magnitude of the impact of the severe sovereign debt crisis that Greece has been faced with since 2010 is perhaps best reflected in the acute shortage of teachers that has led to a number of subjects not being taught at all throughout the year or, worse still, schools being shut down completely. This is observed particularly in remote villages and islands where the number of children is not deemed sufficient to justify the recruitment of a full-time teacher. As a result, children are expected to travel long distances in order to attend schools in towns or villages where educational facilities are indeed available, or to simply receive access to an abridged version of the curriculum in their local school unit.

It is against that backdrop that this study is set as there seems to be a dire need for more accessible teaching pedagogies that will suit those particular contexts. The aim of the present scholarship then is to test an alternative pedagogical approach to English as a Foreign Language (henceforth EFL) by measuring its appropriateness and effectiveness in those new contexts. Self-Organised Learning Environments (SOLE) is a relatively new learning model which appears to be a potentially effectual – yet not sufficiently tested at the time of writing this – response to the aforementioned issues. This study investigates the impact of SOLE and computer-supported tasks on EFL learning by means of measuring the amount of progress achieved by a group of primary learners attending ultra-small schools in rural Greece. It is anticipated that any results obtained from the study will offer valuable insights into the ways in which alternative educational environments can help address the issue of insufficient teaching resources in schools operating in remote areas.

2. Literature review

The concept of Self-Organised Learning Environments (SOLEs) was developed by Mitra and researchers at SOLE Central, Newcastle University and constitutes a relatively new pedagogical approach with only very limited research data available in the context of language teaching and learning. It draws on an earlier series of experiments carried out in India which found that groups of children, when provided with appropriate resources that could generate an adequate level of motivation to induce learning, were able to attain computer literacy with minimum intervention from adults (Mitra, 2000; Mitra & Rana, 2001; Mitra, 2003; Mitra et al., 2005). This subsequently came to be known as Minimally Invasive Education (MIE). SOLEs consist of a learning process whereby a Big Question at the beginning of a session provides a springboard for students' engagement in an exploratory enquiry task in pursuit of a plausible answer. Insofar as learners are working in small groups and are given access to the Internet, no intervention from a knowledgeable adult (i.e. teacher) is needed in this phase. This is then followed by a group presentation of findings and then a review and feedback phase. It is only in those latter stages where the presence of a 'mediator' would actually be beneficial by means of helping encourage and facilitate a discussion about the question itself and the investigation process as well as by providing timely feedback (Mitra & Dangwal, 2010).

The SOLE approach is positioned alongside the long-established dominant educational framework of constructivism and the notion that children actively construct knowledge rather than acquire it from someone else (Piaget, 1973). In line with constructivist ideas, learning occurs through a contextualised process of meaning-making which involves active attempts to connect newly-discovered facts with prior knowledge. A constructivist learning experience therefore should be structured by a facilitator just enough to provide the parameters with which to achieve the learning objectives but should do so in a manner that permits enough freedom and flexibility for the learners to research, interact and arrive at their own discoveries (Savery & Duffy, 1995). Previous research conducted on the impact of SOLE has demonstrated positive results in the areas of computer science and mathematics (Inamdar & Kulkarni, 2007) and English pronunciation (Mitra, Tooley, Inamdar, & Dixon, 2003) while compelling evidence also suggests that children are able to teach themselves algebra with minimal adult interference (Nicaud, Bittar, Chaachoua, Inamdar, & Maffei, 2006). Applied to the context of EFL, progress was found to have been made among adult learners in terms of confidence and oral fluency levels (Stanfield & Unlu, 2016).

However, despite calls for further empirical research repeatedly being made in the literature (see for example Dolan et al., 2013) there has been no systematic quantitative evaluation to date of SOLE's impact on student learning outcomes across the different skills of the EFL curriculum so as to determine whether semi-autonomous learning could actually support existing curricular demands in a more holistic fashion. Indeed, this lack of concrete empirical data has given rise to a considerable amount of criticism with critics appearing rather dubious about children's ability to teach themselves a language in the absence of teacher intervention as per the mainstream model (Dellar, 2014). Dellar's critique has some resonance with Harmer's (2014) concerns about the lack of clarity in the teacher's role in a SOLE, who warns that such a self-organised learning design seems to leave the need for scaffolding and facilitating of learners' work unmet. Additionally, the need for children to develop the range of thinking and reasoning skills alongside skills in research and information awareness has often been highlighted in the literature as a prerequisite for successful collaborative enterprises of this type (Leat, 1999; Mitra & Arora, 2010; Dolan et al., 2013; Sowey, 2013). Yet, how best children can be guided towards mastering such a skill set in

a learning context with minimal teacher/mediator input is yet to be understood.

The present study is therefore an attempt to empirically address the above criticisms from the existing literature, including the gaps that have been highlighted in order to improve understanding around the potential of SOLE in maximising learning gains in educational settings where academic resources, including teachers, are currently scarce.

The research questions that the study seeks to answer have been formulated as follows:

1. Can SOLE help us address the lack of EFL teachers in schools operating in geographically remote areas in Greece?

2. What is the impact, if any, of SOLE on primary EFL learners in terms of (a) learning outcomes, and (b) their preparedness to self-direct?

Hypotheses

It was hypothesised that:

1. Measurable progress would be achieved by the group that would have received the intervention, in terms of the language skills pertinent to the present study (i.e. listening, speaking and writing), as well as vocabulary acquisition and grammatical awareness.

2. It was assumed that, due to the highly communicative nature of SOLE, participants would score higher on the oral component of the post-test compared to their baseline scores.

3. Methodology

3.1. Research Design

In order to draw conclusions regarding the extent to which SOLE could be implemented at scale in an attempt to address the lack of EFL teachers in schools operating in geographically remote areas in Greece (RQ1), a quasi-experimental design has been employed. More specifically, for the investigation of the first part of Research Question 2, a pre-test and a post-test benchmarked to the Common European Framework of Reference for Languages (CEFR) (Council of Europe, 2017) have been administered to a group of learners. The tests will be used to measure progress achieved in three language skills pertaining to the study (Listening, Speaking, and Writing) over a period of one school term (i.e. three calendar months) and will enable the researcher to run a comparative means analysis and thereby determine whether a statistically significant difference between the two tests can be observed. Hudson and Llosa (2015, p. 77) remind us that it is when research "aspires specifically to discover causal relationships among manipulated variables" that these designs are particularly called for; in other words, when questions such as "To what extent does the presence/absence/amount of X (independent variable) cause Y (the dependent variable) to change?" are posed within it; a comparative design of this kind which draws on quantifiable empirical data then will enable the researcher to gain immediate and clear insights into the extent to which the intervention has had a significant impact on the attainment of the desired learning outcomes for the group that received it and then draw relevant inferences in relation to the main research question.

In answering the second part of Research Question 2, observational data has been collected from video recordings of the live sessions, which, by the end of the fieldwork, are expected to amount to a total of 64 hours.

3.2. Sample

Due to the aims of the study and nature of the research design, purposive sampling has been selected as the most appropriate sampling technique as it will allow the researcher to assess eligibility for participation in terms of the student population of the schools, the geographical location as well as the resources available. A preliminary a priori power analysis performed using G*Power version 3.1.9.4 indicated that in order to be able to reach meaningful conclusions about the significance of any differences in mean scores on the repeated measures with adequate statistical power, a sample size of approximately 34 participants would need to be tested (based on a statistical power of 80%, a two-tailed significance level of 5% and while looking to determine a medium effect [d = .5, r = .3], as per Cohen's [1988] levels). Learners were therefore selected from a number of primary schools (Years 1–6) located in villages in remote areas in Greece in which English is not currently taught due to lack of a teacher and where English is not the medium of instruction. To address the potential limitations that emerge from this choice of sampling technique, emphasis was placed on capturing maximum location variation and breadth to permit the identification of important common patterns which cut across the sample.

The mean age of the participants who received the intervention was recorded in years and months at the start of the fieldwork testing in November 2018 (N = 47, M = 10 years 5 months, SD = .92, min. = 8 years 7 months, max. = 12 years 3 months). The participants were in Years 6 (N = 18), 5 (N = 20), 4 (N = 5) and 3 (N = 4) during the fieldwork timeframe (academic year 2018-2019). This age range was chosen for two reasons.

First, in Greece the national EFL curriculum prior to Year 3 focuses primarily on the development of pupils' oral communication skills. Their exposure to the English alphabet merely aims to sensitise them to the letters and only constitutes a secondary learning objective, i.e. children up to Year 2 are not expected to go beyond the stage of letter recognition and reproduction, which only involves tracing. Systematic teaching of the alphabet does not begin until Year 3, when children are deemed mature enough to be introduced to the processes of comprehension and production of oral and written English (Dendrinos, 2013). Given that the scope of the present study involves the development of literacy and writing skills as one of the

core objectives of the intervention, it was reasoned that only pupils who were at a level of English competence where these skills were being taught in a more focused and systematic fashion should participate.

Second, Year 3 is an appropriate time to begin a focused yet age-appropriate integrated-skills second language learning programme as by this time children will have generally already acquired the phonological system of the Greek language; having learned and used that system for sufficient time, it can be expected that they will have developed the mental and linguistic capacities and the conceptual maturity to start developing an awareness of the graphic and phonic systems of the English language (ibid.). Some educators and researchers, such as Conger (2009), may point to the 'Critical Period Hypothesis' (CPH) and suggest that the earlier the onset of second language acquisition the faster the rate at which young learners will become minimally proficient. However, the need to align the linguistic objectives of the intervention with those set out in the national curriculum for the sake of comparability called for a more pragmatic approach.

3.3. Criteria for School Selection

Following systematic research, a preliminary short list of schools that were deemed appropriate to support and receive the intervention was made in February 2018. The considerations in the selection process were a non-availability of an English language teacher, school classification and location, the children's ages and access to technological equipment and the internet. With regard to this last criterion, a minimum requirement to participate in the study was that each school had at least one working computer.

In locating these schools, a list was obtained from the Ministry of Education containing details of all the small rural primary school units in the country operating multi-grade classes. 1,174 schools were listed in total, of which 591 were immediately excluded because they were classified as operating with more than two teachers, thereby suggesting a high probability of an English teacher being available in the school.

Next, eight geographical regions were randomly selected, and both continental Greece and the island of Crete were included. Feasibility of carrying out visits to all the participating schools, mandated that smaller islands with only one potentially eligible school be eliminated. The eight regional units selected comprised a total of 117 small rural schools. Of these, contact was able to be established with only 51 head teachers, who were asked about the English language provision and teacher availability in their schools during the school year 2017-2018, and the presence of technological equipment in the school. This process of elimination eventually led to the identification of 11 eligible schools, of which only 8 were able to complete the pre-testing process and hence receive the intervention.

3.4. Participating Schools

All the schools that received the intervention were mixed gender state primary schools in rural areas of Greece operating with a maximum of two teachers each (including the head teacher, whose professional duties in these schools normally also involve teaching responsibilities). As a result, they share multiple common characteristics, as shown in Table 1 below. The schools have been pseudonimised, as have the names of the villages in which they are located. With only one school in each one of the localities that the study went to, this was a necessary step to avoid the schools participating being individually identifiable.

School	**Region**	**Distance from Regional Unit Capital** (in km, by car)	**Elevation** (in metres)	**Population** (2011 census)	**No. of Pupils in Group**
Delphi	Macedonia	33	870	408	3
Arsinoe	Epirus	58	1160	396	3
Elaia	Thessaly	11	150	533	3
Marathonion	Epirus	6	20	466	10
Demos	Epirus	12	50	350	4
Minos	Crete	65	110	426	12
Morphe	Crete	24	60	519	8
Palaeopolis	Crete	19	100	654	4

Table 1: Participating Schools which Received the Intervention

Note that for the purpose of the intervention Marathonion was split into two experimental groups due to the relatively large number of pupils and a lack of physical space in the room where the school's only computer was located.

3.5. The Intervention

The intervention began in January 2019 and ended in May 2019. It consisted of twelve online weekly sessions of approximately 45 minutes each and took place via the videoconferencing platform Google Hangouts. The relatively short duration of each session has been mandated by a need to match that of class periods in state primary schools.

During each session, pupils were asked to work in groups in order to perform tasks with the support of a computer and the Internet, including collaborative enquiry and surveying. They explored questions such as '*What makes children happy?*', '*What does your dream school look like?*', while they were also guided through the process of conducting comparative price analysis on a list of everyday food items in order to answer the question '*Greece Vs England: Where is food more expensive?*'. In line with the traditional SOLE methodology, pupils were first shown a short video or picture, which served to activate their schema and stimulate their interest and curiosity about the topic. They were subsequently encouraged to work in groups in order to use the Internet and explore the question that had been posed to them. Due to restrictions in the number of computers available in the schools, pupils were all working on one machine, mostly as one group. Towards the end of the session, participants were given time to present their final products – be it a poster, survey findings or other data they had discovered - orally to the researcher, who was beamed into the classroom through the screen or a projector – and the class teacher, who was oftentimes present to offer support with the technology, as and when necessary. During

that stage, the researcher provided feedback on the pupils' use of language and prompted deeper consideration of the topic with further questions.

Other sessions were less enquiry-driven and more structured in nature and focused on developing the learners' writing skills and grammatical awareness as well as vocabulary use in context. Such sessions took the form of collaborative writing tasks, where the participants were introduced into the various stages of the writing process, and were invited to act on feedback provided on their writing tasks (which they would have already submitted through the online platform). To this end, the participants were guided through the process of revising, editing and re-submitting their work with a view to improving their score. To promote peer-scaffolding and autonomy in the drafting process, the learners were invited to work collaboratively on the writing tasks using Google Documents, and leverage the various internet tools at their disposal when they were uncertain of their language choices.

In order to enable the researcher to obtain comparable results in terms of the participants' learning outcomes, an asynchronous online learning component was also designed to be combined with the live sessions. This comprised a self-paced course series which consisted of five proficiency levels (Beginner – Intermediate), each of which contained in turn an average of 20 lessons. The courses were all mapped to the National Curriculum for English and the lessons in each course were designed such that they matched those in the textbooks used by primary schools across the country. Again, this was done in the interest of comparability.

Each pupil was assigned a level at the end of the pre-testing process and was then encouraged to work her own way through the course at her own pace and in her own time. Importantly, the courses were all gamified in that with every lesson that the pupils completed, they earned stars and were also able to unlock the next lesson and progress through the level. "Gamification" is a relatively new term used by researchers to refer to "the use of video game *elements* (rather than full-fledged games) to improve user experience and user engagement" in non-game contexts (Deterding, Dixon, Khaled, & Nacke, 2011, p. 2426). Previous research has argued that taking game mechanics and gameplay features such as avatars, badges, points, leaderboards, levels, and progress bars and incorporating them into the learning process can trigger positive engagement amongst primary and secondary learners (Mystakidis, Lambropoulos, Fardoun, & Alghazzawi, 2014), while Halloluwa, Vyas, Usoof, and Hewagamage (2018) report that participation in a gamified learning experience encouraged Sri Lankan pupils as young as eight years old to take ownership of their own learning, thus suggesting a shift towards a more learner-driven collaborative environment.

The preliminary analysis that follows is based on observations from the first six sessions only, and the participants' online activity on the self-paced component.

3.6. Ethical Considerations

All research was conducted according to the British Educational Research Association Ethical Guidelines for Educational Research (BERA, 2018) as well as the Newcastle University Code of Good Practice in Research (Newcastle University, 2018), and gained the approval of the Faculty of Humanities and Social Sciences Research Ethics Committee at Newcastle University. Measures were taken to ensure that participants knew exactly what the research involved before consenting. Information sheets were translated into Greek and were provided and discussed with all the headteachers, parents and children, ensuring they had the opportunity to ask questions, that they knew they could withdraw at any time and that their anonymity would be protected.

The children who received the intervention would not otherwise have been attending any English classes in their schools, and therefore the intervention did not introduce learning risks that might have arisen in the case of deviation from normal school practice.

3.7. Limitations

Even though non-randomised observational studies have not traditionally been considered to be equal grade evidence compared with true experiments due to risks such as confounding and bias, a quasi-experimental design was deemed more appropriate in this instance for two reasons. The first is that of feasibility of identifying and recruiting similar micro-schools operating in rural areas where English was being taught as a subject. Second, a counterbalanced design whereby a set of schools that had initially received the innovation would then become a control group during the second half of the intervention period would have truncated the actual length of the intervention by half, thus compromising the chance of any meaningful changes in learning occurring. Even so, possible limitations as regards generalisability of findings should still be considered.

Furthermore, the results gathered come from a relatively small sample size of primary learners, and they may not be representative of learners in other educational tiers and schools from other regions. As the study is still ongoing and the present analysis relies exclusively on data obtained during the first six sessions of the treatment, any conclusions should be treated with caution. Despite these limitations, it is believed that the preliminary findings from this study contribute significant insights into what transpired over the initial six-week period of the intervention and provide a solid foundation to build upon as the investigation continues.

4. Findings and Discussion

Even though the results from the statistical analyses of the tests are not yet available, and therefore the potential effects of the intervention have not been quantitatively measured as of yet, a range of initial insights as to the participants' behavioural changes and their preparedness to self-regulate have indeed been obtained by way of observing the recordings of the first six sessions, and by reviewing their tracked activity on the online component. As a result, this part of the analysis will take a qualitative approach in trying to make sense of and interpreting the data obtained to date.

Following the parents' written consent, live sessions were recorded with the use of the screen casting software *Ice Cream Screen Recorder*. This has allowed the researcher to track behavioural changes over the course of the intervention since the beginning of the fieldwork.

4.1. Social-affective skills

One first observation from the recordings of the live sessions reveals a gradual yet apparent development in the participants' social-affective skills. Indeed, in the first few sessions learners seemed to be facing a certain degree of difficulty in managing the freedom and flexibility that the SOLE setup was affording them, and seemed to be operating in a context of isolation from their peers, with their attention turned primarily to the researcher, who was running the session from the other side of the screen. This often led to the most extroverted and confident child taking the lead, without however knowing how to encourage her peers to contribute to the ask on hand. As a result, what can be observed in those initial sessions is pronounced reluctance on the part of the quieter personalities or less able pupils to participate in the group work.

This should be hardly surprising. As Koutrouba, Kariotaki, and Christopoulos (2012) point out, the highly teacher-centred classroom in Greek state schools allows little room for the cultivation of the affective and social objectives of the teaching and learning process. Instead, the teacher is seen as the sole transmitter of knowledge, which inevitably results in rendering collaborative learning tasks redundant, thus stifling learners' self-activation and initiative.

However, once given the freedom to take control of the task dynamic and once the teacher's presence becomes less pronounced and less intrusive, learners as young as 8 years old seem to become more willing to turn to each other for help when they begin to struggle, and, equally, to proactively offer praise and encouragement to less-able peers. Interestingly, this has become manifest across all groups taking part in the present study. The following dialogue, which occurred during Week 5 of the present research, serves to illustrate how such tendencies become apparent amongst a group of eight-year-old learners who are just learning to spell their first words in English:

(translated from Greek)
Pupil 1: *Miss, have I spelt it correctly?*
Teacher/Researcher: *I can't see it very clearly through the camera, so why don't you go show it to someone who has written it already and ask them if your spelling is okay?*
Pupil 1: *OK… Elena, is this correct?*
Pupil 2: *Let me see… No, your 'l' needs to be longer. Here, look at mine. You need to make this line longer. Go ahead.*

Conversations such as the above and instances of proactive help-seeking – including knowing which peer to turn to depending on the kind of problem – become more prevalent as the participants progress through the programme than they were at the beginning of the intervention.

4.2. Self-regulation

Self-regulation has been defined as "self-regulated thoughts, feelings, and behaviors that are oriented to attaining goals," and as "the self-directed processes by which learners transform their mental abilities into academic skills" (Zimmerman, 2002, p. 65). In the context of the present study, it had originally been anticipated that having mostly been exposed to heavily teacher-driven educational environments where the decision-making process is primarily tasked to the teacher, the learners would struggle to take control of their own decisions and choices. Interestingly, a closer review of the learning analytics data available to the researcher through the application used for the asynchronous learning component, it becomes evident that the children have indeed been voluntarily making their own choices which have been oriented towards attaining their learning goals, without any interference from the teacher. Figure 1 below shows the number of attempts this learner has made at each task and the amount of improvement made between attempts.

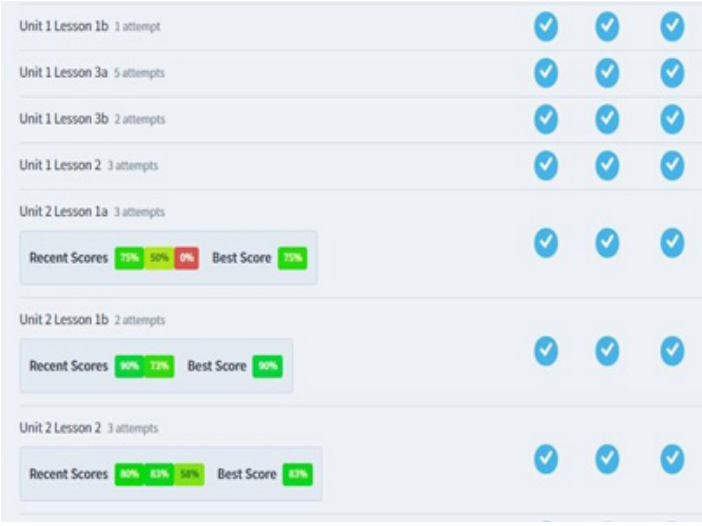

Figure 1: Screenshot from a learning analytics page

This type of behaviour and choices could partly be attributed to the presence of a range of gamification features which seem to instil an element of competitiveness in the participants, who seek to outperform their peers and earn as many stars as possible. On the other hand, this is a rather pronounced phenomenon across the eight groups that participated in the present study, and therefore merits further exploration during the interviews with the participants, which are envisaged to take place at the end of the post-testing process. Indeed, if, once given the freedom and the incentive to take control of their own learning and regulate their own behaviour and choices in order to attain their learning goals, children can move away from an increasing amount of teacher-dependency which is currently permeating the learning process inside the Greek state school classroom, and enable them instead to become more autonomous learners, then, in this regard, SOLE will have to be recognised as containing elements which are superior to the pedagogies currently employed in state schools across the country.

5. Conclusion

The main aim of this study is twofold: (a) it aims to evaluate the potential of SOLE in enhancing language learning in resource-scarce educational settings, and (b) it seeks to provide a pedagogical framework within which computer-supported learning approaches can operate to allow learners greater latitude to self-organise, take responsibility for the direction of their own learning, and collaborate effectively.

The preliminary results obtained from the recordings of the first six sessions of the programme suggest a gradual shift away from patterns of teacher dependency towards a greater degree of preparedness on the part of the learners to co-manage the learning process with their peers and leverage each other's particular skills in order to troubleshoot. Furthermore, personalised data retrieved from the online learning platform which the participants used to complete tasks at home revealed significant amounts of control and autonomy by the participants, who appeared to be actively monitoring and directing their actions towards self-evaluation and self-improvement. Such competencies have often been linked with a high sense of self-efficacy (Schunk, Meece, & Pintrich, 2012) and academic success (Pintrich, 2000). However, at this stage of the analysis it is impossible to establish a direct relationship between students' behavioural tendencies and their subsequent academic outcomes, thus this remains an open issue for the future. Conducting a comparative means analysis of the learning gains across two independent groups of learners from micro-schools operating in regions with similar sociodemographic characteristics can be even further illuminating in terms of the effects of SOLE on primary learners' relative academic success.

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