

Student's perspectives about their learning profile before and after Covid-19 Percepción de los alumnos sobre su perfil de aprendizaje antes y después del Covid-19

*,**André Moura, *Amândio Graça, **Ann MacPhail, *Paula Batista

*University of Porto (Portugal); **University of Limerick (Ireland)

Abstract. Changes in educational paradigms have affected the understanding of how individuals learn. The emergence of Covid-19 has created unprecedented disruption in the education systems. This study attempts to analyse students' perceptions of their learning profile before and after Covid-19, using two different cohorts of students from five schools. Participated in October 2019 (first application) 369 students, and in November 2021 (second application) 294 students. These are students of two educational cycles: grades 7-9 and 10-12. The Effective Lifelong Learning Inventory questionnaire has seven dimensions: 'moving and learning', 'critical curiosity', 'making sense', 'creativity', 'learning relationships', 'strategic awareness', 'resilience'; and it was administered to understand how students self-assess their learning profile. Descriptive and inferential statistics were calculated to analyse the data and detect possible differences in the learning profiles. The results show that students in grades 7-9 seem to have been the most affected by Covid-19 (means were statistically significant in all dimensions except 'resilience') when compared to students in grades 10-12 (statistically significant only in 'critical curiosity', 'learning relationships' and 'meaning making' dimensions). In conclusion, the learning profiles have changed between the applications in both cycles. A higher percentage of students rated themselves worse in almost all dimensions in the second application. However, the increased autonomy during Covid-19 could explain the average increases in 'resilience' in grades 7-9 and 'creativity' in grades 10-12 from the first to the second application.

Keywords: grades 7-9; grades 10-12; learning power; learning provisions; effective lifelong learning inventory; covid-19.

Resumen. Los cambios en los paradigmas educativos han afectado la comprensión de cómo los individuos aprenden. La aparición del Covid-19 ha creado una disrupción sin precedentes en los sistemas educativos. Este estudio intenta analizar las percepciones del alumnado sobre su perfil de aprendizaje antes y después del Covid-19, usando dos cohortes diferentes de alumnos de cinco escuelas. Participaron en octubre de 2019 (primera aplicación) 369 alumnos, y en noviembre de 2021 (segunda aplicación) 294 alumnos. Son alumnos de dos ciclos educativos: años 7-9 y 10-12. El cuestionario Effective Lifelong Learning Inventory con siete dimensiones: mudanza y aprendizaje, curiosidad crítica, darle sentido, creatividad, relaciones de aprendizaje, conciencia estratégica, resiliencia; fue administrado para entender cómo los estudiantes autoevalúan su perfil de aprendizaje. Estadística descriptiva e inferencial fueron calculadas para analizar los datos y detectar posibles diferencias en los perfiles de aprendizaje. Los resultados muestran que los alumnos de 7-9 parecen haber sido los más afectados por el Covid-19 (las medias eran estadísticamente significativas en todas las dimensiones excepto resiliencia) al ser comparados con los estudiantes de 10-12 (estadísticamente significativas solamente en las dimensiones: mudanza y aprendizaje, curiosidad crítica, darle sentido). Concluyendo, los perfiles de aprendizajes han cambiado entre las aplicaciones en los dos ciclos. Un mayor porcentaje de estudiantes se puntuó peor en casi todas las dimensiones en el segundo momento. Sin embargo, la mayor autonomía durante el Covid-19 podría explicar los aumentos medios en 'resiliencia' en los grados 7-9 y 'creatividad' en los grados 10-12 de la primera para la segunda aplicación.

Palabras-clave: año 7-9; año 10-12; poder de aprendizaje; disposiciones de aprendizaje; effective lifelong learning inventory; covid-19.

Fecha recepción: 18-07-22. Fecha de aceptación: 30-01-23

André Moura

luisandrepmoura@hotmail.com

Introduction

Any educational system should work to improve students' learning (Tannehill, 2017). In a primary perspective, learning is the process of acquiring something new, that was not previously on the possession of the individual. The understanding of how individuals acquire learning has been changing throughout the years, by questioning the views of learning as directly and fully derived from the conception of teaching circumscribed to a transmission from a teacher to a student (Allal, 2020; Baird, Andrich, Hopfenbeck, & Stobart, 2017; Swaffield, 2008). Learning changed from being understood as a unidirectional process to a bidirectional one where students can learn from each other, and teacher can also learn from them. In addition to that, the acknowledgement that learning is not a result from a linear process like 'filling a vase' gained attention, but rather a (scaffolded) construction within a relational

activity influenced by the context, students' characteristics, and interests (Broadfoot, 2017; Graça, 2015). In light of this understanding, learning theories as socio constructivism uphold that learners have an active role in their learning (Allal, 2020; A Fletcher, 2018), i.e., teaching others, learn with and from others, and regulating their learning (self-regulation, for example, by using self-assessment).

Related to the change of the traditional understanding of learning as a transmission of knowledge is the need of preparing students for the 21st century, by providing them with resources (many times called as soft skills), which is believed will be useful on their future (OECD, 2019; Siarova, Sternadel, & Mašidlauskaitė, 2017). The process of training these soft skills tends to require students to have a more active role in the teaching-learning process, by being involved or responsible for taking some decisions. For example, engaging students in their teaching-learning process, in constructing and/or regulating their

learning, in making them aware of what is valued and they are supposed to learn, provide students with opportunities for making decisions, accepting responsibilities, becoming critical about what they and others do, taking initiative rather than waiting for others to teach or do for them (Anna Fletcher, 2016; Tolgfors, 2019). In this way, students are expected to gain from schools, while learning contents, the disposition to learn how to learn and the capability to transfer it and be successfully in their life (Crick, 2007; Siarova et al., 2017).

Requiring a proactive role can be uncomfortable for many students, but helpful in a fast-changing world in which 'adapting' seems the 'watchword'. Promoting autonomy, creativity, self-awareness, and space for students to be active participants in their learning may be not only challenging for education systems and teachers, but also imperative to meet the demands of 'this new world' (Crick, 2007; OECD, 2019). So, education has to be rethought if transformation on schools and learning are intended (Jefferson & Anderson, 2022). If those challenges were not enough, the emergence of a pandemic would raise new ones and expose weaknesses even more.

Covid-19 pandemic impact on school students

The emergence of Covid-19 pandemic created a large disruption in the education system of almost all countries and territories (Pokhrel & Chhetri, 2021). Due to the fast increase of number of people contracting the virus, governments across the world took several measures, trying to control the transmission of the infection. These measures included physically closing schools, moving classes to online modes, avoiding contacts and gatherings during lockdown (Haser, Dogan, & Erhan, 2022; Pokhrel & Chhetri, 2021; Walters, Simkiss, Snowden, & Gray, 2022). This forced teachers, students, parents, and everyone else to adjust to 'a new way of living' without being ready for that. Different strategies, like asynchronous and/or synchronous lessons, TV broadcasting classes (live or recorded), online platforms and apps were used across all countries, trying to keep students' access to educative contents and learning opportunities (Reimers & Schleicher, 2020). However, this does not mean that all students had equal opportunities to learn or that these strategies were effective in promoting students' learning (Haser et al., 2022).

Online teaching, although necessary, was in most of the cases reported by parents and students as of poor quality and unsatisfactory to improve students' learning (Cui et al., 2021; Thorell et al., 2022; Walters et al., 2022). This can be, in some cases, due to the lost hours (e.g. missing online classes) or opportunities for learning, students had (Andrew et al., 2020). One of the most common challenges students had to deal with was related with their ability to learn mostly because students felt limitations on the understanding of the subjects, teachers' non-clear explanations due to unstable internet connections, lack of opportunities to ask questions or have after-

class contact with teachers (Martínez, Roa, Osorio, Velandia, & Polanco, 2020). Findings on the study of Tejerina and Ríó (2022) showed that Covid-19 restrictions impacted students' perceptions regarding their physical education classes, with students identifying positive and negative aspects. Most of parents on the study of Thorell et al. (2022) claimed to feel almost left on their own to help their children with learning homework's. However, these authors also identified that teachers' support and contact with children and parents was different across the countries.

Online classes not only had an impact on students' academic success, but also affected their behaviours, learning experiences and skills like ability to focus and learn, motivation, involvement in the activities and having pleasure in learning (Balayar & Langlais, 2022; Walters et al., 2022). Findings on the study of Intelangelo et al. (2022) indicate Covid-19 restrictions had a big (negative) impact on living habits such as nutrition, physical activity and sleep of the university population of Argentina. This shows that the impact was intense even on older (adults) students.

The transition to online environments had different impacts on students. Those more in-need of school, more at-risk, with less means of access (McKendall et al., 2021) as well as those more dependent on teachers, more passive learners, less autonomous, without self-study and self-regulation skills (Tomasik, Helbling, & Moser, 2020; Yang, 2020) suffered more seriously. Then, students' profile and characteristics like ability to change and adapt became a key resource for students to be succeed and go through all the difficulties they faced throughout those learning environments (Martin, Collie, & Nagy, 2021). The extent of students' learning losses is still unknown and will most likely have a long-term effect on students' profile and life (Andrew et al., 2020; McKendall et al., 2021; Tomasik et al., 2020).

Attending to this scenario, this study intends to analyse students' perspectives about learning and compare cohorts at the same grade levels before and after Covid-19 pandemic by using the Effective Lifelong Learning Inventory (ELLI) questionnaire (Crick, Broadfoot, & Claxton, 2004). This questionnaire contains seven dimensions: 'changing and learning', 'critical curiosity', 'meaning making', 'creativity', 'learning relationships', 'strategic awareness', 'resilience', and was chosen, considering it allows to understand how an individual locate their perspective of learning, "in relation to these dimensions at any given time, and in any particular context" (Crick et al., 2004, p. 248).

Authors of this study believe that Covid-19 may have had an impact on students' learning perspectives and profile, considering the change from face-to-face to online teaching, from being physically with others to being at home and almost on their own, and from being more dependent (to need) to be more independent. Although several studies report Covid-19 had a negative impact on students' learning (Cui et al., 2021; Thorell et al., 2022;

Walters et al., 2022), we have not identified any studies comparing the impact of Covid-19 in grades 7-9 and 10-12. Therefore, this study addresses the following research questions:

RQ 1) In what extent Covid-19 pandemic affected students' learning perspectives?

RQ 2) Are the learning perspectives of students in grades 7-9 and 10-12 affected in the same way?

Methods

Participants

Participated on this study, 663 students of 30 classes from five schools chosen for convenience in the area of main Porto, Portugal (Patton, 2002). There are students from two education cycles: twelve classes in 3rd Cycle of Basic Education (grades 7-9; 13-15 years old) and eighteen classes in Secondary education (grades 10-12; 16-18 years old). In two distinct moments, students from those five schools were invited to answer to the ELLI questionnaire (Crick et al., 2004). The first application took place in October 2019 (before Covid-19) and the second application was in November 2021 (after Covid-19). On the first application, 369 students of six classes in grades 7-9 and nine classes in grades 10-12 filled the questionnaire, and a different cohort of 294 students of six classes in grades 7-9 and nine classes in grades 10-12 did it on the second application, as shown in Table 1. No students coincide on both applications but all of them belong to the same five teachers' classes (two from grades 7-9 and three from grades 10-12) who have been collaborating with university for more than 10 years.

Table 1.
Number of participants by moment of application.

| | First application (October 2019) | Second application (November 2021) | Total |
|----------------|-------------------------------------|---------------------------------------|-------|
| Grades 7-9 | 128 | 95 | 223 |
| Grades 10-12 | 241 | 199 | 440 |
| Total students | 369 | 294 | 663 |

Participants directly or indirectly involved in this study (i.e., students and person responsible for them, in the case of minors) signed an informed consent form authorising students' voluntary participation. The researcher explained the questionnaire purpose and the possibility to not join or to leave the study at any time, without any consequence. School authorities in which the research took place and the ethics committee of the university to which the researcher belongs granted ethical approval to the study (CEFXXX 15 2019). Each school signed an informed consent form authorising the study.

Instrument

The ELLI questionnaire was developed with the intention of creating a tool to identify the factors that influence lifelong learning and for using subsequently as a self-assessment instrument for learners (Crick et al., 2004). ELLI questionnaire was tested with considerable cohorts

of students across a range of ages and proved to be robust when subjected to factor analytic studies (Crick et al., 2004).

This questionnaire has a high potential to understand the learning power and its influence on learners' attitude towards (improving) their learning. According to Chambers and Williams (2018, p. 5), "a person's Learning Power determines, even dictates, their propensity for change, and directs those behaviours that influence and underpin performance throughout life". Aspiring that learners become responsible for their learning, aware of their learning and their capacities, this questionnaire intends to be a support for that, by allowing students to self-assess in which level they are.

The questionnaire is composed by 74 questions in which students must rate themselves on a Likert scale of four choices: 0-25, 26-50, 51-75, 76-100, going from 'almost never' to 'nearly always'. Answers illustrate how students see themselves in seven dimensions: critical curiosity (CC), learning relationships (LR), meaning making (MM), creativity (C), strategic awareness (SA), resilience (R), and changing and learning (CaL) (Chambers & Williams, 2018; Williams, 2018). The number of questions that belong to each dimension is not necessarily the same, e.g. eight questions are related to critical curiosity, 10 to learning relationships, 10 to meaning making, nine to creativity, 12 to strategic awareness, 20 to resilience, and five to changing and learning. These dimensions allow to distinguish students' profile, active from passive learners, more from less autonomous and/or engaged learners (Table 2). These dimensions are seen more like attitudes or dispositions to learn how to learn rather than capabilities or skills (Chambers & Williams, 2018). Although learners may be more familiar or having some dimensions more developed than others, it is believed that dimensions can all be found and improved in each learner, with the appropriate support in the right context (Chambers & Williams, 2018; Williams, 2018).

Validation content to Portuguese

To be able to use the questionnaire, researcher contacted by email those who created it. A written authorisation was given and both parties agreed in the use and sharing of results. The researcher started the content validation process to Portuguese language by translating the questionnaire to Portuguese. Later, a researcher's supervisor also translated the questionnaire to Portuguese without looking to researcher's translation. Another researcher's supervisor compared the two translations and translated, considering both translations and her own opinion. Researcher and these two supervisors met for discussing and get a 'final version' at this stage. After finding agreement, researcher submitted the Portuguese version to a Portuguese expert in the English idiom to translate the Portuguese version to English without having access to the original version of the questionnaire. After the Portuguese-English translation, the researcher submitted the original version and the new English version to his native English

speaker supervisor to compare both versions. Nine phrases were identified as having a different meaning. These nine phrases - one from the critical curiosity, two from learning relationships, one from creativity, two from strategic awareness, and three from resilience dimensions - were submitted again to the whole process of translation, discussion, retroversion, and comparison of English versions.

After being approved this new version, the questionnaire in the Portuguese language was applied in a class of 28 students with ages between 14-16 years old to query if questions were clear to students. Students pointed a missing word in two questions – one from creativity and another from resilience - which were edited to ratify the content validation.

Table 2.
Characterisation of the dimensions.

| | |
|--|---|
| Critical Curiosity | |
| Someone who is passive, wait for others to teach something, and finds questions unpleasant | Someone who is proactive, questions, wants to know more and investigates deeper than the surface |
| Learning Relationships | |
| Inability to work alone and/or being over-dependent on others | Someone's abilities to learn with and from others, but also on their own. Knows what is best and how to take the best of both situations |
| Meaning making | |
| A learner who accumulates new information without understanding 'the big picture' and how this new learning fits on what they already knew | A learner who links new and previous knowledge, connecting differences sources of knowledge and try to integrate those new ideas in their opinions |
| Creativity | |
| Someone who struggle to be original, think differently, see different perspectives, and is rule bounded | A person who thinks and acts 'outside the box', who is innovative, find different solutions for being open to their imagination |
| Strategic Awareness | |
| A learner who considers the learning process as something they cannot control, facing learning as a mere task they have to do, without any intention of trying to understand it | A learner who likes to understand and feel control of their learning process to be able to perform better, plan and apply different strategies to find out what works best for their learning |
| Resilience | |
| A learner who is not very resilient feels insecure and unable to deal with challenges, struggles when the going gets tough and/or they make mistakes, remaining stuck on negative emotions | Someone who can overcome difficulties, frustrations, and fears, move away from their comfort zone and face challenges with a positive attitude |
| Changing and Learning | |
| A learner who is static, disinterested, does not believe on their ability to change, and does not take responsibilities for their learning | A learner who has a positive attitude towards new learning, using new learning and knowledge to change the way they live, improving their mind and viewing learning as a lifelong process |

Source: Adapted from Chambers and Williams (2018, pp. 8-14) and Williams (2018, pp. 16-30)

Data collection

The questionnaire was applied during the entire months of October 2019 and November of 2021, always at these teachers' class time. The researcher explained the questionnaire and its purpose to students from all classes before they fill it. Students filled the questionnaire online in google forms in a quiet room only with the presence of the researcher and other three or four colleagues from their class. On average, every class took approximately 90 minutes to complete the questionnaire. All students were offered the chance to ask any questions throughout the fulfilment of the questionnaire, opportunity to leave and not return or just take a break. Some did clarify some aspects that were not clear for them while others did not.

Researcher ensured anonymity to all students who joined the study. To ensure the maximum of confidentiality, no personal information, of any kind, was collected about students. All students received different codes, e.g., 1AGT1-1, 1ASPA-1,

Data analysis

The first step of analysis was looking into potential differences in classes profiles per education cycle on the first and second application of the questionnaire, by considering all dimensions together. For that, means of all classes in the seven dimensions were calculated and grouped by education cycle and moment of application, in Microsoft Excel and used to create four "radar charts".

The second step led to the analysis per education cycle of how students rated themselves in every dimension individually on the first and second application of the questionnaire. Students' scores were grouped in three distinct levels on each dimension: low (means of answers less than or equal to 50), moderate (means between 50 and 75), or high (means above 75) level. To identify in which level students were, a formula was created in Microsoft Excel $=SE(Cell\ number \leq 50; "1"; SE(E(Cell\ number > 50; Cell\ number \leq 75); "2"; SE(E(Cell\ number > 75; "3")))$ to allow counting how students' answers are distributed among each dimension, i.e. if students means is 50 or less, they get the number one; if is between 50 and 75, they get the number two; and if is over 75, they get the number three. These values (one, two and three) were then used to calculate the relative frequency of answers per dimension. This led to the creation of four 'bar charts' with the distribution of answers per dimension in grades 7-9 and 10-12 and moments of application.

Later, data were exported to SPSS 27 to proceed the analysis and identifying if differences on means were statistically significant. For that, normality of data distribution was tested and proved to have a normal distribution by looking into values of skewness and kurtosis, varying between -1 and 1 (Marôco, 2010), histogram, Q-Q plot and boxplot graphs. Means and standard deviation were then considered. Inferential tests were applied with t test of independent samples being run to analyse if means were

statistically significant in the different dimensions from the first to the second application in grades 7-9 and 10-12. The level of statistical significance was established at $p \leq 0.05$. Accuracy for data entry on Excel and SPSS was checked by two researcher's supervisors and was noticed to be over 99.9%

Results

Student's learning Profile

All means decreased from the first to the second application of questionnaire in grades 7-9 and 10-12, except from Resilience in grades 7-9 and Creativity in grades 10-12, which indicates Covid-19 lockdown may have had an impact on students' learning perspectives (RQ1).

In terms of moment of application, it is possible to acknowledge that the students' profiles per grade level (Figures 1 and 2) differ the most from each other in grades 7-9. The differences of profiles between grade levels in each moment was higher in the 2nd application.

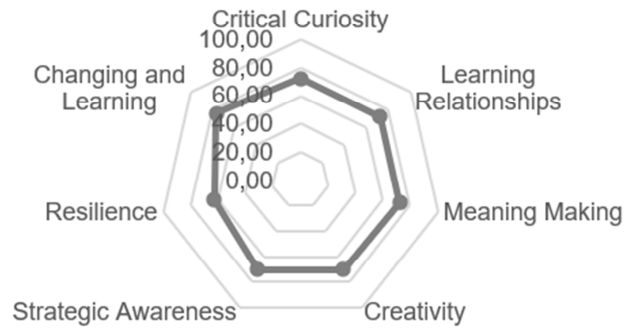
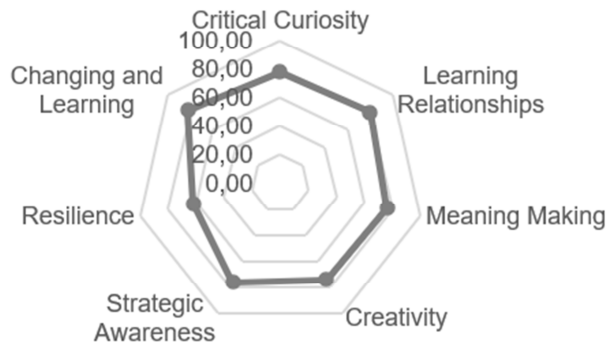


Figure 1. Profile 1st and 2nd application in Grades 7-9

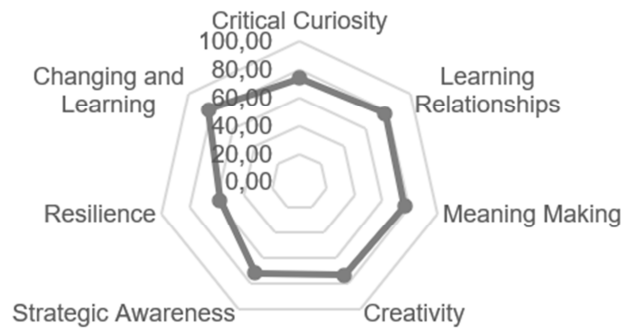
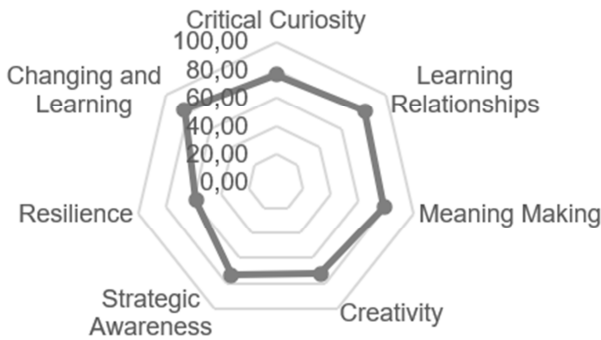


Figure 2. Profile 1st and 2nd application in Grades 10-12

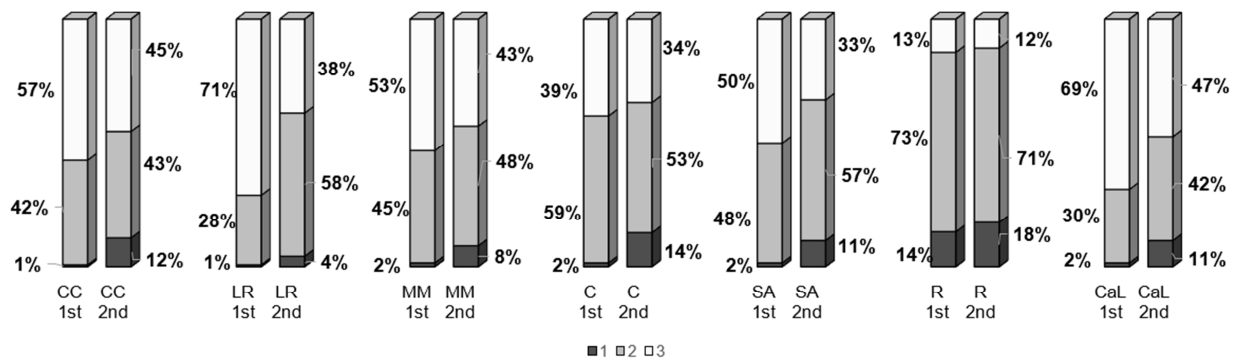


Figure 3. First and second application in grades 7-9. Students who scored themselves ≤ 50 are in dark grey, $50 < x \leq 75$ are in grey and above 75 are in light grey

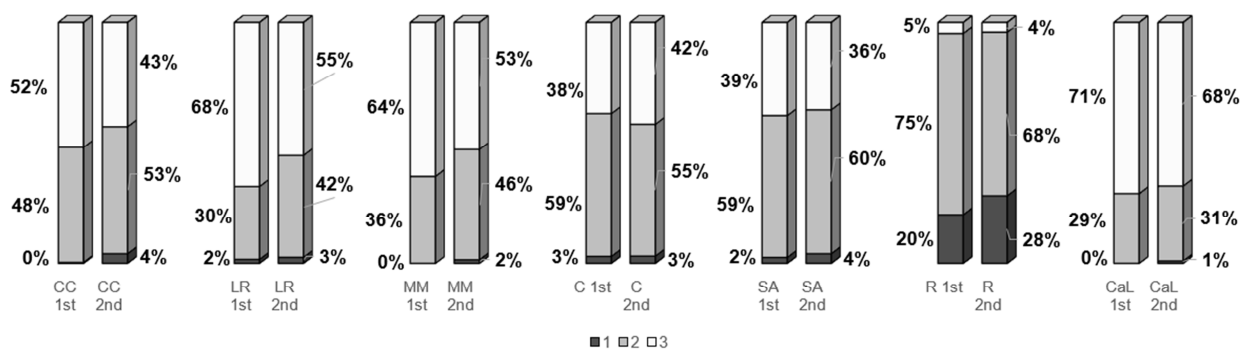


Figure 4. First and second application in grades 10-12. Students who scored themselves ≤ 50 are in dark grey, $50 < x \leq 75$ are in grey and above 75 are in light grey

Looking into the ‘bar charts’ (Figures 3 and 4), it is possible to identify that a higher percentage of students reported having low levels of a dimension in the second application when compared to the first. The major differences on students who rated themselves poorly are found on critical curiosity, meaning making, creativity, strategic awareness, and changing and learning in grades 7-9, and resilience in grades 10-12. There is also a considerable reduction on the number of students who have means above 75 on the second application when compared to the first, for example, on the dimension’s critical curiosity, learning relationships, meaning making, strategic awareness and changing and learning in grades 7-9, and critical curiosity, learning relationships and meaning making in grades 10-12. There is also a decrease on the number of students who rated themselves between 50 and 75 on the dimension resilience in grades 10-12. In an opposite direction, the percentages of students who scored themselves between 50 and 75 is substantial higher on the second moment, particularly on the dimensions learning relationships, strategic awareness and changing and learning in grades 7-9 and learning relationships and meaning making in grades 10-12.

Table 3. N, means, standard deviation, Sig, and confidence Interval (CI) – grades 7-9

| | | Grades 7-9 | | p | 95% CI of the Diff | |
|-----|--------|------------|---------------|--------|--------------------|-------|
| | | n | mean (SD) | | Lower | Upper |
| CC | Before | 128 | 77.93 (10.34) | 0.003* | 1.84 | 9.09 |
| | After | 95 | 72.47 (15.51) | | | |
| LR | Before | 128 | 80.00 (11.01) | 0.001* | 4.67 | 10.85 |
| | After | 95 | 72.24 (12.30) | | | |
| MM | Before | 128 | 76.23 (9.88) | 0.014* | 0.83 | 7.26 |
| | After | 95 | 72.18 (13.40) | | | |
| C | Before | 128 | 73.83 (9.66) | 0.030* | 0.37 | 6.99 |
| | After | 95 | 70.15 (14.06) | | | |
| SA | Before | 128 | 75.96 (10.51) | 0.001* | 2.34 | 9.10 |
| | After | 95 | 70.24 (14.02) | | | |
| R | Before | 128 | 61.90 (10.76) | 0.601 | -3.85 | 2.23 |
| | After | 95 | 62.71 (12.17) | | | |
| CaL | Before | 128 | 82.03 (12.01) | 0.003* | 2.08 | 9.88 |
| | After | 95 | 76.05 (16.22) | | | |

* Statistically significant differences when $p \leq 0.05$

Table 4. N, means, standard deviation, Sig, and confidence Interval (CI) – grades 10-12

| | | Grades 10-12 | | p | 95% CI of the Diff | |
|----|--------|--------------|---------------|--------|--------------------|-------|
| | | n | mean (SD) | | Lower | Upper |
| CC | Before | 241 | 76.47 (10.29) | 0.010* | 0.64 | 4.74 |
| | After | 199 | 73.78 (11.38) | | | |
| LR | Before | 241 | 80.93 (10.91) | 0.002* | 1.21 | 5.56 |
| | After | 199 | 77.55 (12.05) | | | |
| MM | Before | 241 | 78.82 (10.17) | 0.013* | 0.53 | 4.54 |
| | After | 199 | 77.55 (12.05) | | | |

| | | | | | | |
|-----|--------|-------|---------------|---------------|-------|------|
| | | After | 199 | 76.28 (11.02) | | |
| C | Before | 241 | 72.57 (11.33) | 0.452 | -2.98 | 1.33 |
| | After | 199 | 73.40 (11.62) | | | |
| SA | Before | 241 | 73.47 (10.82) | 0.124 | -0.46 | 3.78 |
| | After | 199 | 71.81 (11.75) | | | |
| R | Before | 241 | 58.02 (9.52) | 0.632 | -1.39 | 2.29 |
| | After | 199 | 57.57 (10.12) | | | |
| CaL | Before | 241 | 83.07 (11.20) | 0.687 | -1.77 | 2.69 |
| | After | 199 | 82.61 (12.58) | | | |

* Statistically significant differences when $p \leq 0.05$

Students’ learning perspectives by grade

Looking into research questions, it is possible to realise that Covid-19 lockdown had an impact on students’ learning perspectives (RQ1) both in grades 7-9 and 10-12, although differently (RQ2). Differences were statistically significant in all dimensions in grades 7-9, except for resilience (Table 3). On the other hand, in grades 10-12, means are only statistically significant in the critical curiosity, learning relationships and meaning making dimensions (Table 4).

Discussion

Findings suggest that Covid-19 may had an impact on students’ perspectives about learning. This impact seems to be bigger in grades 7-9, where the differences are significant in all dimensions, except for resilience, while in grades 10-12 differences are only significant in three dimensions (critical curiosity, learning relationships, and meaning making). One possible reason for students in grades 10-12 have, apparently, suffered less with Covid-19 could be related with the fact of being older students, i.e. students on those grades tend to be more autonomous and independent learners (Eccles & Roeser, 2009). In fact, students’ characteristics like being more dependent on teachers, more passive learners, less autonomous, without self-study and self-regulation skills was considered to be one of the reasons for students suffering more impact (learning losses) with Covid-19 (Tomasik et al., 2020; Yang, 2020).

Although several studies report the negative impact of Covid-19 on students’ learning (Cui et al., 2021; Thorell et al., 2022; Walters et al., 2022), few studies seem to have compared the impact of Covid-19 in grades 7-9 and 10-12. In this study, the impact of Covid-19 was visible in both grades when looking, for example, into the ‘bar charts’, considering that a higher percentage of students

reported having low levels of a dimension in the second application in comparison with the first as well as less students scoring themselves in higher levels. However, the impact is more prominent on students in grades 7-9. Contrarily, the study of Steinmayr, Lazarides, Weidinger, and Christiansen (2021) identified students' learning outcomes was less affected in grades 7-9. However, a linear comparison cannot be established, considering the different methodological approaches of the studies. On our study, students' learning outcomes are not assessed.

Critical curiosity, learning relationships and meaning making were the dimensions more affected in both grades. This can be linked to mental health issues raised with the emergence of Covid-19 (Walters et al., 2022). The insecurities and uncertainties brought by Covid-19 may have led students to 'leave education to second plan', being less predisposed, worried, and curious to learn new things (critical curiosity) and/or associate new with previous knowledge (meaning making). Simultaneously, having online classes, being at home, and socially distanced from colleagues may have prevented or limited students of working with peers, and having to work more on their own (learning relationships).

Although almost all means decreased in both grades from the first to the second application, one dimension in each grade, resilience in 7-9 and creativity in 10-12, increased. Authors of this study believe that the (brutal) impact Covid-19 had on students in grades 7-9 as well as the less support from teachers and/or colleagues led them to become more resilient and go through things by themselves. Harris and Jones (2020) alerted that some young people might have felt trapped or isolated at home and to the importance of school leaders focusing on emotional responses of those in their schools, considering the (negative) impact Covid-19 might have had on everyone's health and wellbeing. On the other hand, the increase of creativity in grades 10-12 may be related with more chances to work in autonomy, independently, and without close teachers' guidance which created opportunities to find different solutions. Having more time on their own, without being guided to follow some path may have flourished students' different thinking, something that have been advocated for school (teachers) to promote (Crick, 2007; OECD, 2019).

It is important to acknowledge that students' perspectives about themselves can be more or less accurate, especially because there is a tendency for students to rate themselves higher than what they really are (Burson, Larrick, & Klayman, 2006). This is likely to have happened on this study with some students on both moments of application, however, there are no way of knowing in which cases it happened. On the other hand, when applying the questionnaire, the researcher alerted students that this questionnaire was not for their teachers which may have taken pressure for some 'students' shoulders' and prevented others to see it as something with influence on their grades, leading them to be fairer with their self-

assessment. This relates with Brown, Andrade, and Chen (2015)'s belief about self-assessment being more accurate or having more chances of reducing inaccuracy when is private and not used for grading purposes.

Students more used to self-regulation process (e.g. self-assessment) or who received training tend to find easier to self-assess themselves (their learning profile) and be more accurate (Carroll, 2020; Thawabieh, 2017). Although on this study, students only filled the questionnaire once, it is fair to say that students in grade 10-12 are more likely to have experienced self-assessment processes (e.g. in their classes) before participating in this study, and subsequently, being more accurate. On the other hand, on the study of Ng and Earl (2008), they found that students who over-estimated their self-assessment were also the ones who learned more, were more positive and were more focused in learning which led the authors to question if accuracy should be the focus.

There is a need for further studies to explore how Covid affected or changed students' learning profile and perspectives, by using instruments that can capture other dimensions. Such studies should also consider how has education adapted to changes on students' learning profiles after Covid-19.

Conclusions

This study intended to analyse students' perspectives about learning before and after Covid-19 pandemic by using two cohorts of different students from the same five schools. Learning profiles changed, according to the moment of application and grades. The profiles that differ the most from each other are the 1st and 2nd application in grades 7-9 and the 2nd application of grades 7-9 and grades 10-12. Students on the first moment scored themselves higher than on the second. On the second moment, there was a higher percentage of students scoring themselves worse in almost all dimensions. Regarding the first research question, it was visible that Covid-19 pandemic changed students' perspectives. The degree of how it changed, was different in grades 7-9 and 10-12.

Findings show means decreasing in almost all dimensions from the first to the second application, except for 'resilience' in grades 7-9 and 'creativity' in grades 10-12. Students' learning perspectives showed to have been significantly affected by Covid-19, mainly in grades 7-9 with six of the seven dimensions with statistically significant differences. The impact was smaller in grades 10-12 with only three of the seven dimensions (critical curiosity, learning relationships and meaning making) being statistically different. This shows that in relation to the second research question, students in grades 7-9 were more affected by Covid19. The fact of older students being more autonomous was an important aspect to suffer less with Covid-19, and may be related with the fewer impact of Covid-19 lockdown in grades 10-12.

Means in 'resilience' in grades 7-9 and 'creativity' in

grades 10-12 increased from the first to the second application. Authors of this study believe this can also be related with Covid-19 lockdown. Being more alone, having less support from teachers and/or colleagues could have led students to become more resilient. On the other hand, being on their own may have led students to have more opportunities to think freely without being limited for someone's feedback or directions.

Limitations

The ELLI questionnaire can only measure students' perspective in relation to any of the seven dimensions, but cannot determine how accurate students' self-assessment are. Considering students tend to value themselves higher than reality (Burson et al., 2006), results always have to be read carefully. Students' performance, literacy levels, experience, and training seem to influence the accuracy of students' self-assessment. The ideal situation would be having the same students filling the questionnaire on both occasions. However, this cross-sectional study also allows us to have an idea of how Covid-19 lockdown might have affected students' learning perspectives.

The number of questions (74) may be overwhelming for some students, which may lead them to start filling the last questions without too much attention or criteria. Filling the questionnaire during class time can also have influenced some to take longer and others to do it faster. Last but not least, the fact of not being administered by one of the staff trained to use ELLI questionnaire can also have influenced the predisposition to fill and/or understanding of the questionnaire.

André Moura <http://orcid.org/0000-0003-2690-1029>

Amândio Graça <http://orcid.org/0000-0003-1539-4201>

Ann MacPhail <http://orcid.org/0000-0003-1875-0582>

Paula Batista <http://orcid.org/0000-0002-2820-895X>

Funding: This work was supported by Fundação para a Ciência e a Tecnologia: [Grant Number SFRH/BD/137848/2018].

Acknowledgments: We would like to thank Juliet Williams and Patricia Broadfoot for their contribution, support, availability and sharing of the ELLI questionnaire. This work would not have been possible without their help.

References

- Allal, L. (2020). Assessment and the co-regulation of learning in the classroom. *Assessment in Education: Principles, Policy & Practice*, 27(4), 332-349. doi:10.1080/0969594X.2019.1609411
- Andrew, A., Cattan, S., Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A., & Sevilla, A. (2020). Inequalities in Children's Experiences of Home Learning during the COVID-19 Lockdown in England. *Fiscal Studies*, 41(3), 653-683. doi:10.1111/1475-5890.12240
- Baird, J.-A., Andrich, D., Hopfenbeck, T. N., & Stobart, G. (2017). Assessment and learning: fields apart? *Assessment in Education: Principles, Policy & Practice*, 24(3), 317-350. doi:10.1080/0969594X.2017.1319337
- Balayar, B. B., & Langlais, M. R. (2022). Parental Support, Learning Performance, and Socioemotional Development of Children and Teenagers During the COVID-19 Pandemic. *The Family Journal: Counseling and Therapy for Couples and Families*, 30(2), 174-183. doi:10.1177/10664807211052496
- Broadfoot, P. (2017). Time to tame the leviathan? Perspectives and possibilities for a new era in assessment. *Assessment in Education: Principles & Practice*, 24(3), 415-423. doi:10.1080/0969594X.2017.1336428
- Brown, G. T. L., Andrade, H. L., & Chen, F. (2015). Accuracy in student self-assessment: directions and cautions for research. *Assessment in Education: Principles, Policy & Practice*, 22(4), 444-457. doi:10.1080/0969594X.2014.996523
- Burson, K. A., Larrick, R. P., & Klayman, J. (2006). Skilled or unskilled, but still unaware of it: how perceptions of difficulty drive miscalibration in relative comparisons. *Journal of Personality and Social Psychology*, 90(1), 60-77. doi:10.1037/0022-3514.90.1.60
- Carroll, D. (2020). Observations of student accuracy in criteria-based self-assessment. *Assessment & Evaluation in Higher Education*, 45(8), 1088-1105. doi:10.1080/02602938.2020.1727411
- Chambers, M., & Williams, J. (2018). *Building Learning Power with elli: An introduction to Learning Power with the Effective Lifelong Learning Inventory*. Bristol: Pathways to Learning Ltd.
- Crick, R. D. (2007). Learning how to learn: the dynamic assessment of learning power. *The Curriculum Journal*, 18(2), 135-153. doi:10.1080/095851707014445947
- Crick, R. D., Broadfoot, P., & Claxton, G. (2004). Developing an effective lifelong learning inventory: The elli project. *Assessment in Education: Principles, Policy & Practice*, 11(3), 247-272. doi:10.1080/0969594042000304582
- Cui, S., Zhang, C., Wang, S., Zhang, X., Wang, L., Zhang, L., . . . Zhou, X. (2021). Experiences and Attitudes of Elementary School Students and Their Parents Toward Online Learning in China During the COVID-19 Pandemic: Questionnaire Study. *Journal of Medical Internet Research*, 23(5). doi:10.2196/24496
- Eccles, J. S., & Roeser, R. W. (2009). Schools, Academic Motivation, and Stage-Environment Fit. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of Adolescent Psychology* (pp. 404-434). New York: Wiley.
- Fletcher, A. (2016). *Engaging students with assessment as learning: scaffolding classroom practice to build students' self-efficacy and agentic engagement*. Paper presented at the Research and Innovation in Classroom Assessment

- (RICA), Brisbane.
- Fletcher, A. (2018). Assessment to develop students' strategies and competence as learners. In M. Barnes, M. Gindidis, & S. Phillipson (Eds.), *Evidence-Based Learning And Teaching* (pp. 123-137). Milton Part: Routledge.
- Graça, A. (2015). O discurso pedagógico da educação física. In R. Rolim, P. Batista, & P. Queirós (Eds.), *Desafios renovados para a aprendizagem em educação física* (pp. 11-27). Porto: FADEUP.
- Harris, A., & Jones, M. (2020). COVID 19—school leadership in disruptive times. *School leadership & management*, 40(4), 243–247.
- Haser, Ç., Dogan, O., & Erhan, G. K. (2022). Tracing students' mathematics learning loss during school closures in teachers' self-reported practices. *International Journal of Educational Development*, 88, 1-8. doi:10.1016/j.ijedudev.2021.102536
- Intelangelo, L., Gutiérrez, N., Bevacqua, N., Mendoza, C., Guzmán-Guzmán, I. P., & Jerez-Mayorga, D. (2022). Effect of confinement by covid-19 on the lifestyle of the university population of argentina: Evaluation of physical activity, food and sleep [Efecto del confinamiento por covid-19 sobre el estilo de vida en población universitaria de argentina: Evaluación de la actividad física, alimentación y sueño]. *Retos*, 43, 274-282. doi:10.47197/retos.v43i0.88461
- Jefferson, M., & Anderson, M. (2022). Transforming Education: Reimagining Learning, Pedagogy and Curriculum (BOOK REVIEW). *Australian Journal of Education*, 0(0), 1-3. doi:10.1177/000494412211093819
- Marôco, J. (2010). *Análise estatística com utilização do SPSS* (3ª ed ed.). Lisboa: Edições Sílabo.
- Martin, A. J., Collie, R. J., & Nagy, R. P. (2021). Adaptability and High School Students' Online Learning During COVID-19: A Job Demands-Resources Perspective. *Frontiers in Psychology*, 12. doi:10.3389/fpsyg.2021.702163
- Martínez, Ó., Roa, A., Osorio, J., Velandia, M., & Polanco, J. (2020). Percepción de los estudiantes de secundaria sobre la educación virtual en tiempos de aislamiento social. In Ó. Martínez, A. Roa, J. Osorio, M. Velandia, & J. Polanco (Eds.), *Educación en tiempos de aislamiento social en Colombia: Percepciones de los avances, dificultades y retos tras el Covid 19* (pp. 32-58). Guayaquil-Ecuador: Ediciones Grupo Compás.
- McKendall, S. B., McKendall, A., Chester, A., Morton, C., Freeland, S., Kuhn, S., & McMillion, M. (2021). High School Students' Learning During the COVID-19 Pandemic: Perspectives from Health Sciences and Technology Academy Participants. *Journal of STEM Outreach*, 4(1), 1-13. doi:10.15695/jstem/v4i2.09
- Ng, J. R., & Earl, J. K. (2008). Accuracy in self-assessment: The role of ability, feedback, self-efficacy and goal orientation. *Australian Journal of Career Development*, 17(3), 39-50. doi:10.1177/103841620801700307
- OECD. (2019). *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners* (Vol. 1). Paris: OECD Publishing.
- Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods* (3th ed.). California: Sage Publications.
- Pokhrel, S., & Chhetri, R. (2021). A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning. *Higher Education for the Future*, 8(1), 133–141. doi:10.1177/2347631120983481
- Reimers, F. M., & Schleicher, A. (2020). *Schooling disrupted, schooling rethought: How the Covid-19 pandemic is changing education*. Paris,: OECD Publishing.
- Siarova, H., Sternadel, D., & Mašidlauskaitė, R. (2017). *Assessment practices for 21st century learning: review of evidence*. Luxembourg: Publications Office of the European Union.
- Steinmayr, R., Lazarides, R., Weidinger, A. F., & Christiansen, H. (2021). Teaching and learning during the first COVID-19 school lockdown: Realization and associations with parent-perceived students' academic outcomes. *Zeitschrift für Pädagogische Psychologie*, 35(2–3), 85–106. doi:10.1024/1010-0652/a000306
- Swaffield, S. (2008). *Unlocking Assessment: Understanding for reflection and application*. New York: Routledge.
- Tannehill, D. (2017). Engaging Young People in Active Learning. *editorial*, 12, 3-4.
- Tejerina, D., & Río, J. (2022). Educación Física y Covid-19. Percepciones de alumnado y lecciones de futuro (Physical Education and Covid-19. Student perceptions and lessons for the future). *Retos*, 45, 814–820. doi:10.47197/retos.v45i0.91751
- Thawabieh, A. M. (2017). A Comparison between Students' Self-Assessment and Teachers' Assessment. *Journal of Curriculum and Teaching*, 6(1), 14-20. doi:10.5430/jct.v6n1p14
- Thorell, L. B., Skoglund, C., Peña, A. G. d. l., Baeyens, D., Fuermaier, A. B. M., Groom, M. J., . . . Christiansen, H. (2022). Parental experiences of homeschooling during the COVID-19 pandemic: differences between seven European countries and between children with and without mental health conditions. *European Child & Adolescent Psychiatry*, 31, 649–661. doi:10.1007/s00787-020-01706-1
- Tolgfors, B. (2019). Transformative assessment in physical education. *European Physical Education Review*, 25(4), 1211-1225. doi:10.1177/1356336X18814863
- Tomasik, M. J., Helbling, L. A., & Moser, U. (2020). Educational gains of in-person vs. distance learning in primary and secondary schools: a natural experiment during the COVID-19 pandemic school closures in Switzerland. *International Journal of Psychology*, 56(4), 566-576. doi:10.1002/ijop.12728
- Walters, T., Simkiss, N. J., Snowden, R. J., & Gray, N. S. (2022). Secondary school students' perception of theonline teaching experience during COVID-19: Theimpact on mental wellbeing and specific learning

- difficulties. *British Journal of Educational Psychology*, 1-18. doi:10.1111/bjep.12475
- Williams, J. (2018). *Learning to Learn with elli: An introduction to Learning Power with the Effective Lifelong Learning Inventory*. Bristol: Pathways to Learning Ltd.
- Yang, X. (2020). Teachers' perceptions of large-scale online teaching as an epidemic prevention and control strategy in China. *ECNU Review of Education*, 3(4), 739–744. doi:10.1177/2096531120922244