Received: 18 November 2021 | Accepted: 4 April 2022

DOI: 10.1111/bjet.13222

ORIGINAL ARTICLE

British Journal of Educational Technology BERA

For to all those who have, will more be given? Evidence from the adoption of the SELFIE tool for the digital capacity of schools in Spain

Jonatan Castaño Muñoz[1] | **Artur Pokropek**[2] | **Lilian Weikert García**[1]

[1]Human Capital and Employment Unit, European Commission, Joint Research Centre, Seville, Spain

[2]Educational Research Institute (IBE), Warsaw, Poland

Correspondence
Jonatan Castaño Muñoz, Human Capital and Employment Unit, European Commission, Joint Research Centre, Seville, Spain.
Email: jcastanno@us.es

Funding information
European Commission

[Corrections made on 8th June 2022, after first online publication: The third author's affiliation details have been corrected in this version.]

Abstract

This paper explores participation trends in interventions that promote self-evaluation exercises on the effective use of digital technologies in schools. We use a unique dataset consisting of 83,185 respondents from 924 Spanish schools that used SELFIE, a tool based on self-reflection questionnaires that capture different dimensions of school's digital capacity. We benefit from a natural experiment situation caused by the parallel use of SELFIE by two groups of schools. The first group was externally selected as part of a representative sample of Spanish schools. Conversely, the second group voluntarily decided to use SELFIE as a diagnostic tool for a subsequent self-evaluation exercise. Moreover, a subset of schools were located in regions where authorities embedded SELFIE in broader digitalisation programmes. By comparing these groups, it is shown that schools that decide to participate in SELFIE voluntarily are those with a lower initial digitalisation level. It is also found that the promotion of the use of SELFIE as part of public interventions can increase participation but mainly attracts digitally advanced schools. In conclusion, policy interventions

aiming to develop the digital capacity of schools need to plan how to reach those schools that need it more in order to be more equitable.

KEYWORDS
digital divide, digital education, Matthew effect, self-evaluation, self-reflection tools

Practitioner notes

What is already known about this topic
- Research has shown the existence of a Matthew effect in the usage of digital technologies in education.
- The promotion of schools self-evaluation exercises on digital education is a common policy intervention that is growing in importance.
- There is a surprising lack of attention to the inequitable effects that programmes aiming to incorporate technologies in educational institutions may generate.

What this paper adds
- This paper investigates the self-selection trends and (un)equity effects of SELFIE, an EU programme designed to prompt schools' self-evaluations of digital capacity.
- When schools decide autonomously, schools with low digital capacity levels tend to participate in SELFIE more.
- Incorporation of SELFIE into broader public programmes enlarges participation in SELFIE.
- Incorporation of SELFIE into broader public programmes over-attracts digitally advanced schools.

Implications for practice and/or policy
- Public policies promoting self-evaluation exercises on school digital capacity in schools might be a good way for upscaling these exercises.
- However, these policies should be carefully designed to reduce inequalities and reach these schools that need digitalisation more.

INTRODUCTION

The presence of the Matthew effect, a cumulative advantage benefiting individuals and institutions with more resources, has been demonstrated in different areas (Perc, 2014; Rigney, 2010) including education (Kerckhoff & Glennie, 1999; Perc, 2014; Walber & Sai, 1983) and digital technology usage (Mingo & Bracciale, 2016).

Research also demonstrates the existence of a Matthew effect in the usage of digital technologies in education. Schools serving students from privileged backgrounds tend to promote more sophisticated and creative uses of technology (Hohlfeld et al., 2008; Reich, 2020). In addition, educational opportunities using technologies, even if these are open, tend to be used more and better by individuals with good self-regulation and digital skills (Castaño-Muñoz et al., 2017; Littlejohn et al., 2016; Yang et al., 2018).

When analysing the origins of the Matthew effect and its possible solutions, research has focussed on the role of public interventions. Empirical literature suggests that in some settings these interventions can increase the gap between low and highly resourced individuals or institutions if corrective measures are not taken into account. Examples cover a range of topics such as social policies (Pisoni, 2018), active market policies (Bonoli & Liechti, 2018) or educational interventions (Pavolini & van Lancker, 2018).

However, there is a surprising lack of attention to the inequitable effects that programmes aiming to incorporate technologies in educational institutions may generate. This is specially important in a post COVID-19 pandemic context, where the use of technologies has become more important (Beardsley et al., 2021). This paper contributes to filling this gap by focussing on a specific type of intervention on this topic: the promotion of school self-evaluation exercises (Chapman & Sammons, 2013; Kampylis et al., 2016).

To shed light on this topic, we focus on the specific case of SELFIE, a European self-reflection tool based on validated questionnaires and designed to provide information to schools to facilitate a self-evaluation process of their effective use of digital technologies (see: https://education.ec.europa.eu/selfie). To analyse whether this tool is being used more by schools that already have a large digital capacity, we take advantage of a unique setting. During the same time-period (April 2019–March 2020), two different groups of Spanish schools participated in SELFIE. The first group filled the SELFIE questionnaires as part of a voluntary self-evaluation exercise decided by themselves. Conversely, schools from the second group were randomly selected to participate in a study aiming at measuring the average digital capacity of Spanish schools. By comparing digital capacity of the two groups, we obtained valuable insights into the relationship between existing digital capacity of schools and the decision of using self-evaluation tools on this topic.

LITERATURE REVIEW

School self-evaluation exercises and schools digitalisation

Demand for schools' accountability increased during the last century. Governments have promoted external and standardised assessments of the schools (Grek et al., 2013) and decentralised self-evaluation approaches performed by schools themselves (Croxford et al., 2009; European Commission, 2020). Self-evaluations are based on an iterative cycle of diagnosis and informed planning of strategies and actions (Chapman & Sammons, 2013) that can lead to benefits to those schools that perform them compared to those that do not. SELFIE, the programme covered in this paper, is a tool that has been designed to promote the complete iterative cycle of schools' self-evaluations. Thus, participation (or not participation) in SELFIE can generate inequalities.

In general, self-evaluation exercises can lead to sustainable school improvements (Hall & Noyes, 2009). The literature signals that these approaches are effective for organisational development (Fullan & Watson, 2000; Høyrup, 2004) and identification of specific school improvement needs (Nevo, 2001). Moreover, empirical research shows a link between participation in schools' self-evaluation and enhanced teaching and learning quality (Hofman et al., 2009) through the development of improvement plans (Caputo & Rastelli, 2014) and (internal) data driven decision-taking (Cosner, 2011; Marsh et al., 2010; Williamson, 2016). In order for these benefits to become a reality, the literature identifies the need for certain conditions (Vázquez & Gairín, 2014) in all the self-evaluation phases: conduct, results and feedback (Vanhoof et al., 2014). Some elements are the use of adequate data collection instruments for diagnosis, the implementation of good communication and multistakeholder collaboration processes, the definition of shared objectives or the provision formal support

to transformative actions including external support or expert advice (Antoniou et al., 2016; Devos & Verhoeven, 2003; Vanhoof & van Petegem, 2011).

Research has noted that not all schools participate to the same extent. Schools with an appropriate school culture, greater needs for improvement in the topic covered, greater innovation capacity, and with an established professional learning community, participate in self-evaluation exercises more (Schildkamp & Visscher, 2009; Vanhoof et al., 2009).

As schools are increasingly required to improve their use of digital technologies, public authorities are promoting self-evaluation exercises in this direction. The usual approach is to develop and/or promote tools that aim to support and facilitate school self-evaluation exercises (Kampylis et al., 2015). In general, these tools take the form of self-reflection questionnaires covering different dimensions that facilitate the effective use of digital technologies in educational settings and are meant to be answered by teachers and/or school leaders (students are rarely included). Without pretensions to being exhaustive, some examples of this type of tools are: Opeka and Ropeka in Finland, Digital Mirror in Estonia, eLEMER in Hungary, Digital Schools of Distinction and eLearning Roadmap in Ireland, NAACE self-review framework and 360° safe in the UK, the self-evaluation tool created in the e-school programme in Croatia or the European commission's SELFIE tool [see Kampylis et al. (2016) for a description and comparison of some of these tools].

Benefits of digital technology in education

Interventions aiming at digitalising schools are carried out under the assumption that digital technologies can help to improve school operations and students' learning outcomes. Research is ambiguous in this respect, but recent studies tend to show that digital technology can have positive effects in learning outcomes when it promotes good instructional design principles.

In this sense, the literature signals the potential of technology for personalised interventions such as targeted behavioural interventions and differentiated computer-assisted learning (Escueta et al., 2017; Surma & Kirschner, 2020). It also signals the positive role that enhanced interaction (Bernard et al., 2009) can play. Innovative types of assessment (Kapsalis et al., 2019) and well-designed online feedback (Fyfe, 2016; Hattie & Timperley, 2007) can contribute to the implementation of good practices such as assessment of previous knowledge, connection of previous knowledge with new concepts, and the provision of effective guidance (Fyfe, 2016). The widened access to complementary online resources that the use of technology entails can have a positive effect in learning too (Heppen et al., 2012), specially when the resources contain additional embedded guidance such as annotated examples (McLaren et al.,2016) and supportive videos (de Koning et al., 2018). Moreover, online resources can facilitate the use of bimodal content and knowledge representations (Moreno & Mayer, 2007) and the implementation of new effective pedagogical models including flipped classroom (Cheng et al., 2018; van Alten et al., 2019).

In addition to traditional learning-outcomes, another important potential benefit of using digital technologies in education is the development of the digital competence of students (Carretero et al., 2017). Research has also shown the need for early and guided interventions for effective development of students' digital competence (Fraillon et al., 2019; van Dijk & van Deursen, 2014).

Conditions for an effective use of digital technologies in schools

The capacity to reap the benefits of incorporating technology in education depends on a series of prerequisites and characteristics in which schools differ. The literature has developed

several interrelated theoretical concepts that aim to identify and integrate them. Three of the most prominent concepts are *digital maturity* (Balaban et al., 2018), *e-capacity* (Vanderlinde & van Braak, 2010) and *digital capacity* (Costa et al., 2021). Building on previous work and definitions, this paper uses the term digital capacity to refer to the extent to which culture, policies, infrastructure, and digital competence of students and staff support the effective integration of technology in teaching and learning practices.

Despite their differences, all these concepts share a holistic and multidimensional approach. Consequently, they can be broken down into different dimensions that facilitate the effective incorporation of digital technologies in education by schools (Voogt et al., 2011), which may vary across schools and that derive from scientific research.

First, they cover the *technical and infrastructural* dimension, which is strongly related to technology usage in the school (Tondeur et al., 2012). Second, they cover the *techno-pedagogical knowledge* that teachers need to use the technologies for *preparing lessons* (Meneses et al., 2012), *teach in effective ways* and *innovate in the feedback and assessment processes* (Lachner et al., 2019). It has been found that pedagogical expertise is a prerequisite to judging the specific potential of digital technologies in different contexts and for different activities (Lachner et al., 2019). In this context, a third dimension usually covered by the theoretical constructs is *access to professional development*. This aspect plays an essential role in equipping teachers and institutions with the right skills to make the right use of digital technologies in their job (Fernández-Batanero et al., 2020). Moving to the students level, a fourth dimension identified by some of the theoretical concepts above points out the importance of the *development of the digital competence of students* (Waycotte et al., 2010) for a better use of technologies in education and as a learning outcome. Research shows that some schools emphasise the acquisition of this competence more than others do (Fraillon et al., 2019). Finally, all concepts encompass *organisational and leadership* aspects that are identified as another set of drivers for efficient uses of digital technologies in schools (Tondeur et al., 2012). Therefore, research signals the critical role of school culture and the characteristics of school leaders (Chang, 2012; Kozma, 2008; Ottesttad, 2013; Tondeur et al., 2012). Finally, a last aspect signalled to get the most out of digital technologies, is its incorporation as tools for *internal and external community and network building* (Kong, 2019).

Schools self-evaluation exercises and the digital capacity divide

Not all schools are equal regarding the characteristics and preconditions that facilitate the effective use of technology covered in the section above. Consequently, some schools need more help than others as they start from a worse position. In this respect, it can be said that there is a "digital capacity divide" between schools.

Students from different schools are exposed to different uses of technology in and outside the school (Attewell, 2001; Hohlfeld et al., 2008). Research shows that more effective and creative uses of technology are associated with schools where students come from privileged backgrounds (Reich, 2020). Moreover, students in these schools receive greater mentorship and personalised guidance from teachers and parents (Reich, 2020).

The promotion of self-evaluation exercises and tools for use of technologies more effectively aim to reach all school types; however, it is unclear if this is true. *On the one hand*, schools with lower digital capacity may consider that the final transformations derived from self-evaluation exercises fit their needs for digital improvement better than others. If this were the case, literature predicts that they would use these tools more (Schildkamp & Visscher, 2009) producing an equalising component and would contribute to closing the existing "digital capacity divide" between schools. *On the other hand*, disadvantaged schools may participate in school self-evaluations of their digital capacity less frequently

than advantaged ones. Some of the mechanisms identified by the literature as drivers of this phenomenon are: a lack of motivation and information (Walber & Sai, 1983), bad attitude towards evaluations and self-evaluations (Vanhoof et al., 2009), low usefulness of digitalisation when compared to other priorities (Schildkamp & Visscher, 2009) and uneven distribution of school leaders across schools in terms of experience, education (Loeb et al., 2010) and interest on technology (Chang, 2012).

Moreover, schools with high digital capacity may be more innovative and open to change and, consequently, find self-evaluation exercises more adapted to their, already digitalised, practices and use them more (Schildkamp & Visscher, 2009; Vanhoof et al., 2009). If this were the case, the use of self-reflection tools would be contributing to the Matthew effect in educational systems (Kerckhoff & Glennie, 1999; Perc, 2014) by increasing the digital advantage of already digitally advanced schools.

If the development of interventions promoting self-evaluation exercises on schools digital capacity aims to guarantee that no school is left behind and reach those with more room for improvement, it becomes essential to know more about the mechanisms that lead to schools participation and how these interventions are influencing the digital capacity divide among schools.

PURPOSES OF THE STUDY

Following the research line analysing the determinants of self-evaluation exercises and the role of public interventions on enhancing/diminishing inequality, this paper focuses on digital education and presents a case study from Spain focussing on promoting SELFIE, a diagnostic tool that aims to inform and promote self-evaluation exercises concerning a more effective use of digital technology in education. The main aims of this paper are as follows:

- To determine whether the SELFIE tool attracts schools with low digital capacity and more room for improvement.
- To determine whether the integration of the tool in broader school digitalisation programmes can affect the self-selection process in SELFIE use.

METHODS

Instrument

The study presented in this paper is based on data collected using SELFIE, an online tool launched by the European Commission in October 2018 that aims to help schools diagnose, reflect and take actions on their use of digital technologies in different areas. To do this, the tool gathers the anonymous views of the whole school community—school leaders, teachers and students—via validated questionnaires. Upon completing the SELFIE exercise, the tool automatically generates an interactive online report only accessible by the school. This report provides aggregated data with insights on the strengths and weaknesses of their use of digital technologies for teaching and learning. The tool is based in the theoretical Digitally-Competent Educational Organisations framework, also known as DigCompOrg (Kampylis et al., 2015).

SELFIE is available for primary (ISCED 1), lower-secondary (ISCED 2), upper-secondary general (ISCED 3), upper-secondary vocational (ISCED 3—VET), and post-secondary non-tertiary education levels (ISCED 4—PSNTE).

SELFIE questionnaires comprise a set of core items, which are mandatory for all schools and some predefined optional questions, which the schools can choose from. In addition,

schools can add up to ten specific questions to suit their own needs and context. Furthermore, the questionnaires include some additional items about the use of digital technologies inside and outside the school and a few demographic questions.

The questionnaires for school leaders and teachers are analogous. The core items are structured in eight areas that are a development of the DigCompOrg areas and are theoretically underpinned by the academic literature on the conditions for an effective use of digital technologies in schools covered in point 2.3[1]:

- A: Leadership
- B: Collaboration and networking
- C: Infrastructure and equipment
- D: Continuing professional development
- E: Pedagogy—support and resources
- F: Pedagogy—implementation in the classroom
- G: Assessment practices
- H: Student digital competence

Students over 9 years of age can participate with an easier and shorter version of the questionnaire. Full list of items used in SELFIE are presented in online Appendix (part A).

Psychometric analyses have confirmed the robustness of the core items for the group of self-selected schools (see Costa et al., 2021, and more specific details in online Appendix parts B, C and D). These core items are intended to measure different dimensions of digital capacity and are the focus of this paper. The questionnaire's core items are composed of statements with five answer options (from 1: Strongly disagree—In my experience, this is not true at all—to 5: Strongly agree—In my experience, this is very true). Respondents also have the choice in all items to opt-out by selecting the "Not applicable" or "Prefer not to say" answer options.

Data

The analysis performed in this paper used a unique data set of SELFIE application that was collected in Spain between April 2019 and March 2020. All schools participating in this study completed the SELFIE questionnaires simultaneously during this period. However, they did it in two different settings, which allowed the generation of two groups of data that could be compared with regards to our research questions. The groups are as follows:

- Self-selection group: schools decided to participate without intervention by researchers as part of a voluntary self-evaluation exercise.
- Representative random sample schools and respondents within the school were randomly selected for participation by researchers and the participation was made mandatory by Spanish Ministry of Education to guarantee the quality of the sample. The selection was part of a study aimed at measuring the average digital capacity of Spanish schools (Castaño Muñoz et al., 2021).

Moreover, to have finer analysis and to control for possible biases and respond to the second purpose of the study, regions in Spain were split into two groups according to the regional governmental level of support for SELFIE implementation.

- Regular group: comprised Spanish regions (all except two) where the tool was available, but regional governments employed no special political methods to encourage schools to participate.

- Prompting group: includes two Spanish regions where schools were actively encouraged by regional government (but not forced) to participate in SELFIE. These regions followed a parallel approach and the same methods to encourage participation. They integrated the tool in broader voluntary school digitalisation programmes covering schools receiving public funds (public or charter) and without other selection procedures: all interested schools that applied were accepted. These programmes were disseminated through the regional education administration websites and their government-schools communication channels. The programmes aimed to help schools to develop and improve an initial digitalisation action plan that had to be proposed by the schools. The use of SELFIE was strongly recommended in the first steps of the process to diagnose the school's digital capacity, the weaknesses and strengths, but was not mandatory. Successful participation in the programme was associated with various incentives for the school. These covered the opportunity to participate in more advanced programmes in ICT and innovation, preference in the access to specific teaching and learning resources, preference for participation in continuous professional development activities, institutional advice, facilitation of the development and implementation of the digital action plan, and (soft) official school recognition (official banner to be shown on the school website and social media). In some of the prompting regions, participation in the programme can also involve some individual incentives such as career enhancement credits for teachers and school leaders. These programmes have been shown to be effective for upscaling participation in SELFIE: since the launch until the current date, 58% of schools participating in SELFIE come from prompting regions while these regions account only for 28% of the schools in Spain.

In this paper, we restricted our analysis to data from primary (ISCED 1), lower-secondary (ISCED 2), and upper-secondary general (ISCED 3) schools since they are the levels for which data from the representative sample is available. As we can confirm that results are not driven by a specific ISCED level (see online Appendix F) despite the different uses of digital technologies in different school phases, we used the pooled data of these three ISCED levels as main source for our analysis. For students, only ISCED 2 and 3 were analysed, because the student questionnaire for ISCED 1 is much shorter and has no questions in some of the areas such as assessment practices. Moreover, we excluded some schools for which the information was not of enough quality for our purpose (see note 1 in Table 1). The number of respondents and schools that participated in this exercise is presented in Table 1.

Table 2 presents the descriptive statistics of schools used in the analysis. The regular numbers in the cells in the table present raw statistic while numbers in parentheses are the results after weighting. Sample weights were used for the randomly selected group to adjust the sample to the characteristics of the population of Spanish schools, teachers and

TABLE 1 Group sizes with number of respondents and schools. Students only include lower and upper secondary (ISCED 2 and 3)

Group sizes (number of schools)	Sample		Self-selected	
	Regular	Prompting	Regular	Prompting
School leader	1288 (362)	433 (127)	846 (267)	704 (233)
Teacher	5940 (364)	1990 (127)	4889 (333)	4060 (271)
Student	8457 (222)	2727 (79)	12,495 (138)	13,134 (119)

Note: To guarantee a minimum participation rate and comparability across groups within the school rate, only schools with at least ten respondents that come from two different respondent groups have been included. This is why the number of schools does not match exactly across school leaders and teachers. If we focus on students, the exclusion of primary (ISCED 1) also plays a role.

TABLE 2 Descriptive characteristics of respondents (in raw percentage with weighted percentage in brackets)

Per cent in group (Per cent weighted)	Sample		Self-selected	
	Regular	Prompting	Regular	Prompting
School leaders				
Primary (ISCED 1)	34.8 (48.4)	36.0 (48.8)	48.1 (48.4)	47.2 (48.8)
Lower-secondary (ISCED 2)	32.1 (25.9)	32.1 (25.1)	43.0 (25.9)	38.3 (25.1)
Upper-secondary (ISCED 3)	33.2 (25.6)	31.9 (26.0)	08.9 (25.6)	14.5 (26.0)
Public	69.6 (62.6)	73.2 (70.2)	65.9 (66.1)	81.0 (80.3)
Selfie awareness from authorities	–	–	17.0 (19.0)	50.4 (50.6)
Teachers				
Primary (ISCED 1)	34.1 (45.4)	32.3 (43.7)	52.9 (45.4)	47.3 (43.7)
Lower-secondary (ISCED 2)	33.2 (27.3)	34.6 (27.5)	39.6 (27.2)	40.3 (27.5)
Upper-secondary (ISCED 3)	32.7 (27.4)	33.1 (28.8)	07.5 (27.4)	12.5 (28.8)
Public	67.0(70.8)	76.5 (77.9)	73.1 (72.7)	82.7 (81.7)
Selfie awareness from authorities	–	–	18.7 (19.9)	50.7 (53.3)
Students				
Lower-secondary (ISCED 2)	59.5 (59.1)	52.8 (58.0)	85.7 (59.1)	82.4 (58.0)
Upper-secondary (ISCED 3)	40.4 (40.9)	47.2 (42.0)	14.3 (40.9)	17.5 (58.0)
Public	60.6 (65.4)	74.3 (73.1)	53.5 (49.0)	69.3 (78.0)
Selfie awareness from authorities	–	–	14.5 (16.8)	55.8 (56.4)

students. Ad hoc weights were applied to the self-selected group that fix the proportion of ISCED schools in each group to be the same as in the population. As Table 2 shows, there is no balanced distribution across levels before weighting in the self-selection group. Therefore, this procedure was necessary to ensure that school differences were focussed on in terms of digital capacity avoiding school level playing a confusing role.

Descriptive statistics also show that our divide for regular and prompting regions is valid. In the prompting regions, information about the programme was given by the educational authorities to schools more than three times more often than in regular regions, that is to say, in half of the cases.

Empirical methodology

We used multiple group confirmatory factor analysis (MG-CFA) to estimate the levels of digital capacities measured by different respondent groups in each of the eight SELFIE areas (factors) with unbiased standard errors (Brown, 2015). Previous psychometric analysis indicate that digital capacities as measured by SELFIE are highly reliable and could be comparable across investigated groups. Detailed psychometric analysis can be found in the Appendix including validation of the theoretical dimensionality structure of SELFIE (part B), evaluation of the quality of indicators used in the tool for both groups (part C) and assessment of the measurement invariance (part D).

In order to assess the self-selection bias that may exist in the use of the SELFIE and to explore if it increases/decreases the digital capacity divide between schools, we compare the estimated levels in the SELFIE-area indicators (factors) of self-selected versus randomly selected schools. Moreover, to analyse the effect of public interventions in this difference, we separate this comparison between regular and prompting regions.

The values from the randomly selected group provide a good reference of what would have been the use of SELFIE in the absence of the self-selection bias related to digital capacity. Therefore, the statistical procedure implemented was simple: the means of the eight SELFIE areas across self-selected groups were compared with the means of the randomly selected groups establishing a 95% confidence interval (95CI) and using robust standard errors that accounts for the nested structure of the sample. When values from the self-selected group are significantly higher than values from the randomly selected one, it can be said that the use of SELFIE is increasing the digital capacity gap (causing a Matthew effect). On the contrary, there is an equaliser effect when values of the self-selected group are lower than the reference group.

In each comparison, the values of each area (factor) for the reference group (the group randomly selected) were set to have a mean of zero and standard deviation of one while the mean and standard deviation for the comparison group (self-selected group) was freely estimated using weight to guarantee the same proportion of schools in each ISCED level as in the sample data. The results are presented on a standardised metric and can be interpreted as standardised effect sizes directly referring to Cohen's *d* values.

In order to discard the possibility that our results are driven by the results in a specific school level, we checked differences in the results by ISCED level (see online Appendix part F). Since the results are almost the same, all analyses presented in the main body of the paper were performed on pooled data from all school phases to increase the power of our analysis. However, regular and prompting regions were analysed separately.

R-based *lavaan* software (Rosseel, 2012) was used in all of the analysis. We used full information maximum likelihood estimation to account for missing data and standard robust errors to account for the nested structure of data (respondents nested in schools). Responses to the SELFIE tool were treated as continuous indicators.

RESULTS

The latent means of all dimensions of digital capacity, as measured by SELFIE, were compared for school leaders, teachers and students. The bars represent the difference of means between the self-selected and reference group (representative sample) with 95% confidence intervals (CI). The results for regular and prompting regions for all school phases (ISCED levels) together are shown separately. More extensive analysis (see online Appendix part F) showed that patterns found in the analysis presented in this paper are virtually the same for every ISCED level. Therefore, it was decided to present results on an aggregate basis that give us much more power due to larger group sizes.

Focussing on school leaders (Figure 1), a clear selection pattern emerges. In regular regions, school leaders from self-selected schools have significantly lower values for digital capacity in 5 out of 8 dimensions and lower for the other 3 (Leadership, Infrastructure, and Pedagogy-support and resources) but not statistically significant at 95%. On the other hand, the direction was exactly the opposite in prompting regions. Self-selected schools show higher digital capacity in 7 out of 8 dimensions and were also higher in the assessment practices dimension although the difference is not statistically significant.

Analogue comparisons were made for teachers and presented in Figure 2. Although the effect sizes are smaller is some dimensions, the general trend in all of them is very similar to

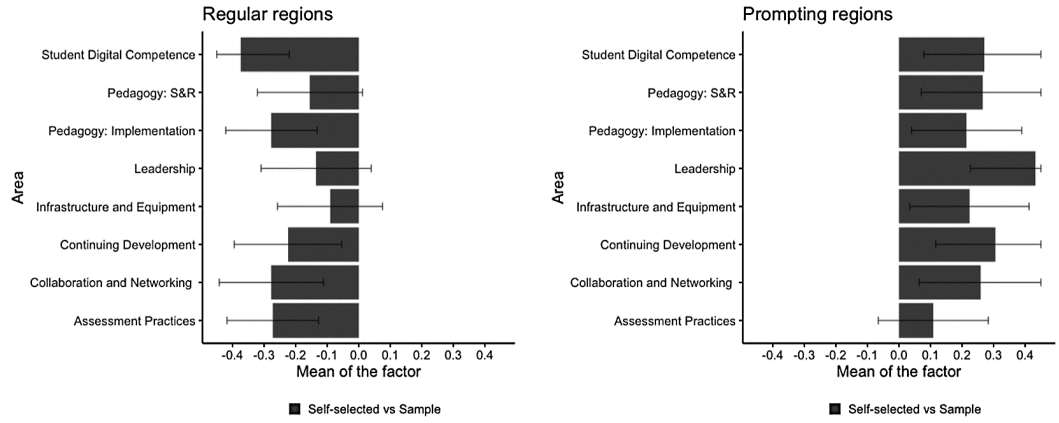

FIGURE 1 School leader views on differences in digital capacity between schools in the self-selected group and schools in the randomly selected group (reference). Values by factor and type of region. (i) Reported values are factor means with 95% CI. (ii) CI higher than 0.4 were truncated

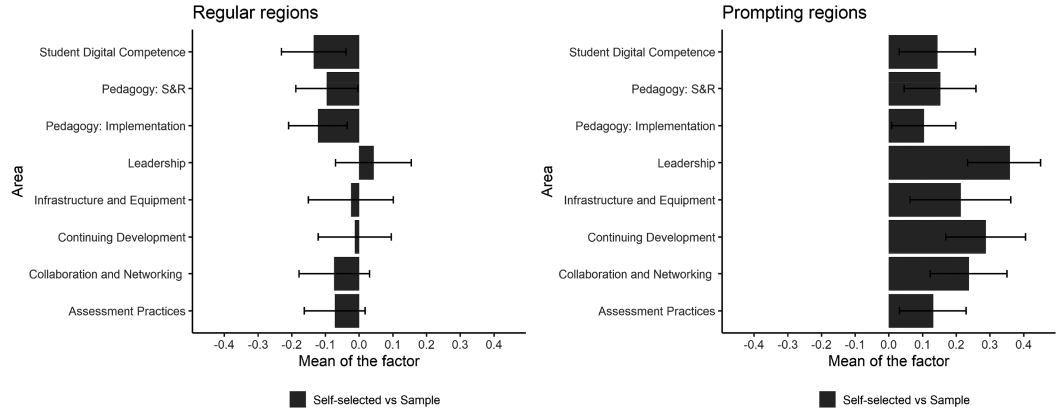

FIGURE 2 Teacher views on differences in digital capacity between schools in the self-selected group and schools in the randomly selected group (reference). Values by factor and type of region. (i) Reported values are factors means with 95% CI. (ii) CI higher than 0.4 were truncated

the detected for school leaders. Teachers perceive that, in regular regions, digital capacity of schools in the self-selected group is significantly lower than population averages in three dimensions: Pedagogy-implementation in the classroom, Student digital competence, and Pedagogy–support and resources. It is reassuring to see that this negative difference was also perceived by school leaders in the two first dimensions, and it was significant at 90% in the third. On the other hand, as with school leaders, according to teachers, the direction of self-selection effect in prompting regions is opposite to regular regions. In prompting regions, self-selected schools have on average higher digital capacity on all dimensions.

Finally, Figure 3 reports the differences in digital capacity of schools as reported by students. Focussing on regular regions, a similar trend to the one detected when analysing school leaders and teachers is observed. Students in schools from the self-selected group give lower values than students in schools selected randomly. However, only a small significant effect is found in two of the four dimensions covered: Student Digital Competence and Infrastructure and Equipment, although this last only accepting a 90% of confidence level.

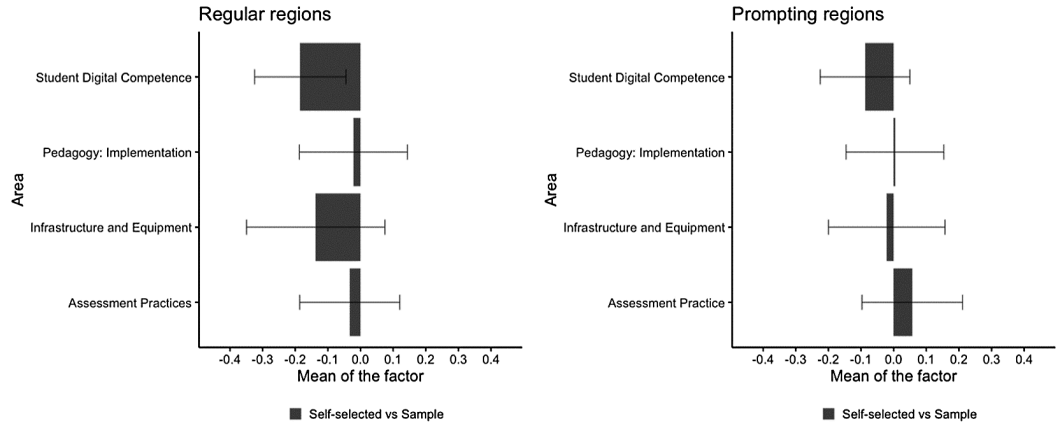

FIGURE 3 Student views on differences in digital capacity between schools in the self-selected group and schools in the randomly selected group (reference). Values by factor and type of region. (i) Reported values are factors means with 95% CI. (ii) CI higher than 0.4 were truncated

On the other hand, there is not a clear trend in prompting regions, and this is the only case where we could not find statistical differences between self-selected schools and schools from the representative sample.

In assessing the results from the three respondents groups together, it can be concluded that in general, the schools in regular regions that decide to participate in SELFIE have significantly lower digital capacity values than the average Spanish school (evidence for equalising effect). However, this selection trend changes in prompting regions, where the regional authorities have integrated SELFIE into broader digitalisation programmes (evidence for Matthew effect). This overall pattern is robust and also holds when public and private schools are analysed separately except for students in public schools in prompting regions (see part E of the online Appendix for details).

The results presented so far suggest that the involvement of educational authorities could attract schools with higher digital capacity. However, it cannot be ruled out that prompting regions are somehow special, and this effect is not driven by the fact that the authorities are involved. To check this assumption, we focus on prompting regions and compare the digital capacity of schools in these regions that declared that information about SELFIE was provided by educational authorities with schools in the same regions that have information about SELFIE from another source. The results are presented in Figure 4.

In prompting regions, schools informed by educational authorities that participated in SELFIE have higher digital capacity in all dimensions according to school leaders and teachers. Less clear results are found based on student responses where no significant differences are found. Focussing on the two first groups, the strongest differences (significant at 95% confidence level) are visible for Leadership and Collaboration and Networking. Moreover, school leaders report significant differences in Assessment Practices, and teachers in Continuous Professional Development. These results confirm that the involvement of educational authorities incorporating SELFIE in broader programmes could have affected the self-selection process towards the more digitally capable schools.

CONCLUSIONS

Participation in self-evaluation exercises is considered effective for school development. Consequently, it may be beneficial in the development of digital capacity in schools. Under

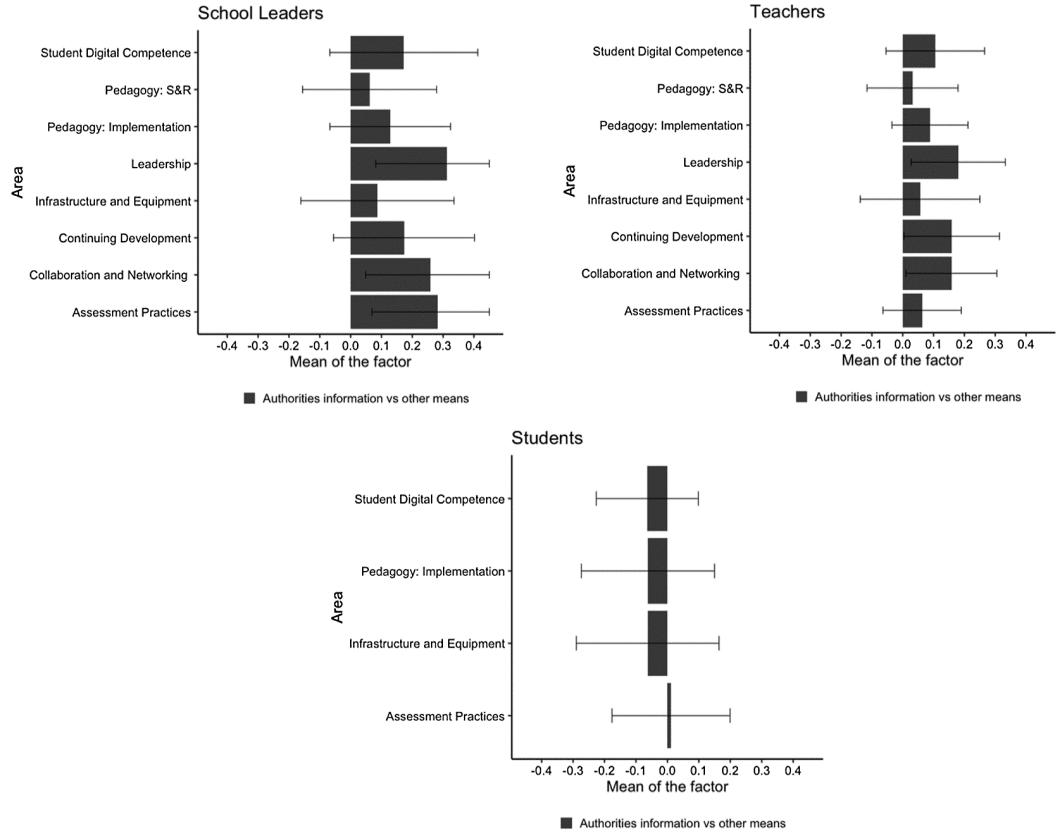

FIGURE 4 Views of school leaders, teachers, and students on differences in digital capacity between schools informed about SELFIE by educational authorities and schools informed via other sources. Only prompting regions. (i) Reported values are factors means with 95% CI. (ii) CI higher than 0.4 were truncated

this assumption, public bodies are promoting the creation and use of tools that inform, support and prompt schools self-evaluation exercises on this topic. However, little is known about the participation patterns in this type of interventions. If digitally advanced schools adopt these tools more, there is a risk of increasing the digital gap and leaving behind the schools that need it more (Matthew effect). Conversely, if schools that lag behind in digitalisation adopt them to a greater extent, these tools can have an equalising component.

This paper has presented evidence on how Spanish schools adopt one of these tools: SELFIE. The results support the idea that the use of SELFIE can have an equalising effect since schools with lower levels of digital capacity tend to use it more in regions where SELFIE is not part of broader policy interventions. This result confirms the importance of the need for digital improvement over other possible inhibiting factors associated to low digital capable schools in Spain.

However, the results also show that, under certain conditions, there is a risk that SELFIE more often reached schools with high digital capacity. It has been shown that this happened when regional public authorities integrate the tool into broader digitalisation programmes (prompting regions) that have some features that may attract more digitally capable schools. First, SELFIE was integrated as a diagnostic tool into programmes that help in developing digitalisation plans, and consequently, schools that already had developing those plans in mind may be more attracted. Second, SELFIE was incorporated into basic programmes in which schools are required to participate before moving on to advanced digitalisation

programmes. This feature can attract schools that have already enough digital capacity to be interested in participating in the second step. Third, public authorities offered formal recognition for participation, which can attract schools that already have good digital capacity and want official recognition to show to the external world. Finally, in some cases, teachers and school leaders can obtain some individual incentives such as career enhancement credits, and some schools with already advanced digital capacity may have seen these programmes as an easy way to achieve them.

The interpretation of the results presented is based on two main assumptions. Firstly, the self-selection effect of participation on SELFIE is measured assuming that it can lead to complete self-evaluation exercises. While the use of the tool does not automatically entail an improvement if no further actions are taken, it is assumed that it is a first step and good indicator of interest on change and development of further self-evaluation exercise. Second, as pointed out by previous studies, the results are interpreted assuming (as policy interventions do) that self-evaluation exercises are efficient in transforming the school and have a positive impact on its digital capacity. Both are very plausible assumptions. However, if it were not the case, the different patterns of participation in SELFIE would not have any impact in either self-evaluation participation or in generating a Matthew effect. Future research using longitudinal data could confirm these two assumptions.

The results presented are robust for all educational levels and separating public and private schools (in the latter case, the evidence suggesting the association between public incorporation of SELFIE in broader programmes and the high level of digital capacity of schools using SELFIE is especially robust). The results also stand when the effect of public involvement is examined in-depth: schools participating in SELFIE that were informed about the tool by regional governments from prompting regions (and therefore most likely to obtain the information as part of the dissemination campaign of a wider public programme on digitalisation), have higher digital capacity than schools in the same regions who discover SELFIE by other means.

Despite their robustness, the results also have some limitations. The first limitation is that evidence is presented from case study research in a single country, and generalisability of the results in other countries and other policy interventions cannot be guaranteed. However, the results can orient future research and policies in other contexts. A second limitation is that measurement error cannot be disregarded completely. Even though we have proved the robustness of the SELFIE tool in psychometric terms and have shown the appropriateness of the items for different types of schools (self-selected and randomly selected), problems are still possible such as different motivation or social desirability of responses (Faddar et al., 2018). Therefore, it is reassuring that our results are highly consistent using school leaders and teacher questionnaires data. However, students' results are a little more ambiguous, and although they mainly support the existence of an equalising component in regular regions, data from students do not show the generation of Matthew effect in prompting regions where SELFIE was part of a broader digitalisation programme. In line with previous literature, one explanation for this weaker effect among students can be that students are less reflective or cognitively process the items differently from teachers and school leaders (Faddar et al., 2017). However, we cannot discard alternative explanations such as different levels of awareness about the purpose of digital technologies use or different level of interest in some of the areas. An in depth analysis of the causes of different values between students and other respondent types could be an useful research avenue for future studies on schools self-reflection instruments as it would inform the quality of its results.

Our main conclusion is that the policy interventions might be a good way of upscaling and extending self-reflection exercises on school digital capacity in schools. However, they might sometimes do it in ways that are not intended. For instance, they can create inequalities among schools and leave those schools with more room for improvement behind. Policy interventions

should be very carefully designed if the aim is to reduce inequalities. They need to plan their strategy for dissemination, communication and participation incentives in an inclusive way to reach schools that need it more and consider the risk of Matthew effect generation.

ACKNOWLEDGEMENTS

This research has been funded by the European Commission. The authors thank the colleagues who provided feedback on early versions of the paper: Panagiotis Kampylis and Patrícia Costa.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest and they do not have competing interests.

ETHICS STATEMENT

Data collection was approved by the Data Protection Office of the Joint Research Centre. It complies with all legal and ethical requirements. Participants to this research have declared their informed consent. During the analysis, data has been anonymised to guarantee privacy and anonymity.

DISCLAIMER

The views expressed in this article are purely those of the authors and should not be regarded as the official position of the European Commission.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are stored by the European Commission. The authors were granted access to the data for this research. Restrictions apply to the availability of these data. The datasets used follow the data policies and legislation of the European Commission and SELFIE tool.

ENDNOTE

[1] While the initial DigCompOrg framework areas were initially validated through literature review and expert judgement the final reorganisation in eight areas in SELFIE is underpinned by subsequent psychometric analysis (See Costa et al., 2021). The relationships between the literature review in point 2.3, DigCompOrg and SELFIE areas are as follows:

- *Organisational and leadership aspects* dimension in point 2.3 relates to "Leadership and governance practices" in DigCompOrg and to area A in SELFIE.
- *Internal and external community and network building* dimension in point 2.3 relates to "Collaboration and networking" in DigCompOrg and to area B in SELFIE.
- *Technical and infrastructural* theoretical dimension in point 2.3 relates to "Infrastructure" in DigCompOrg and to area C in SELFIE.
- *Access to professional development* theoretical dimension in point 2.3 relates to "Professional development" in DigCompOrg and to area D in SELFIE.
- *Techno-pedagogical knowledge-preparing lessons* theoretical dimension in point 2.3 relates to "Teaching and learning practices" in DigCompOrg and to area E in SELFIE.
- *Techno-pedagogical knowledge-teach in effective way* theoretical dimension in point 2.3 relates to "Teaching and learning practices" in DigComp Org and to area F in SELFIE.
- *Techno-pedagogical knowledge innovate in the feedback and assessment processes* theoretical dimension in point 2.3 relates to "Assessment practices" in DigCompOrg and to area G in SELFIE.
- *Development of the digital competence of students theoretical dimension in point 2.3 relates to a part of "Teaching and learning practices" and to area H in SELFIE*.

REFERENCES

Antoniou, P., Myburgh-Louw, J., & Gronn, P. (2016). School self-evaluation for school improvement: Examining the measuring properties of the LEAD surveys. *Australian Journal of Education*, *60*(3), 191–210.

Attewell, P. (2001). Comment: The first and second digital divides. *Sociology of Education*, *74*(3), 252–259. https://doi.org/10.2307/2673277

Balaban, I., Redjep, N. B., & Calopa, M. K. (2018). The analysis of digital maturity of schools in Croatia. *International Journal of Emerging Technologies in Learning*, *13*(6), 4–15. https://doi.org/10.3991/ijet.v13i06.7844

Beardsley, M., Albó, L., Aragón, P., & Hernández-Leo, D. (2021). Emergency education effects on teacher abilities and motivation to use digital technologies. *British Journal of Educational Technology*, *52*, 1455–1477. https://doi.org/10.1111/bjet.13101

Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. A., Tamim, R. M., Surkes, M. A., & Bethel, E. C. (2009). A meta-analysis of three types of interaction treatments in distance education. *Review of Educational Research*, *79*(3), 1243–1289. https://doi.org/10.3102/0034654309333844

Bonoli, G., & Liechti, F. (2018). Good intentions and Matthew effects: Access biases in participation in active labour market policies. *Journal of European Public Policy*, *25*(6), 894–911. https://doi.org/10.1080/13501763.2017.1401105

Brown, T. A. (2015). *Confirmatory factor analysis for applied research*. Guilford Publications.

Caputo, A., & Rastelli, V. (2014). School improvement plans and student achievement: Preliminary evidence from the Quality and Merit Project in Italy. *Improving Schools*, *17*(1), 72–98. https://doi.org/10.1177/1365480213515800

Carretero, S., Vuorikari, R., & Punie, Y. (2017). *DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use*. Publications Office of the European Union.

Castaño Muñoz, J., Weikert Garcia, L., & Herrero Ramila, C. (2021). *Analysing the digital capacity of Spanish schools using SELFIE*. Publications Office of the European Union.

Castaño-Muñoz, J., Kreijns, K., Kalz, M., & Punie, Y. (2017). Does digital competence and occupational setting influence MOOC participation? Evidence from a cross-course survey. *Journal of Computing in Higher Education*, *29*, 28–46. https://doi.org/10.1007/s12528-016-9123-z

Chang, I.-H. (2012). The effect of principals' technological leadership on teachers' technological literacy and teaching effectiveness in Taiwanese elementary schools. *Education Technology and Society*, *15*(2), 328–340.

Chapman, C., & Sammons, P. (2013). *School self-evaluation for school improvement: What works and why?*. CfBT Education Trust.

Cheng, L., Ritzhaupt, A. D., & Antonenko, P. (2018). Effects of the flipped classroom instructional strategy on students' learning outcomes: A meta-analysis. *Educational Technology Research & Development*, *67*, 793–824. https://doi.org/10.1007/s11423-018-9633-7

Cosner, S. (2011). Teacher learning, instructional considerations and principal communication: Lessons from a longitudinal study of collaborative data use by teachers. *Educational Management Administration & Leadership*, *39*(5), 568–589. https://doi.org/10.1177/1741143211408453

Costa, P., Castaño-Muñoz, J., & Kampylis, P. (2021). Capturing schools' digital capacity: Psychometric analyses of the SELFIE self-reflection tool. *Computers & Education*, *162*, 104080. https://doi.org/10.1016/j.compedu.2020.104080

Croxford, L., Grek, S., & Shaik, F. J. (2009). Quality assurance and evaluation (QAE) in Scotland: Promoting self-evaluation within and beyond the country. *Journal of Education Policy*, *24*(2), 179–193. https://doi.org/10.1080/02680930902734095

de Koning, B. B., Hoogerheide, V., & Boucheix, J.-M. (2018). Developments and trends in learning with instructional video. *Computers in Human Behavior*, *89*, 395–398. https://doi.org/10.1016/j.chb.2018.08.055

Devos, G., & Verhoeven, J. E. (2003). School self-evaluation: Conditions and caveats: The case of secondary schools. *Educational Management Administration & Leadership*, *31*(4), 403–420. https://doi.org/10.1177/0263211X030314005

Escueta, M., Quan, V., Nickow, A. J., & Oreopoulos, P. (2017). Education technology: An evidence-based review. Retrieved 12 September 2019, from http://www.nber.org/papers/w23744

European Commission. (2020). Supporting school self-evaluation and development through quality assurance policies: Key considerations for policy makers. Report by ET2020 Working Group Schools. Retrieved 20 December 2020, from https://euagenda.eu/upload/publications/supporting-school-self-evaluation-and-development.pdf

Faddar, J., Vanhoof, J., & De Maeyer, S. (2017). Instruments for school self-evaluation: Lost in translation? A study on respondents' cognitive processing. *Educational Assessment, Evaluation and Accountability*, *29*, 397–420. https://doi.org/10.1007/s11092-017-9270-4

Faddar, J., Vanhoof, J., & De Maeyer, S. (2018). School self-evaluation: Self-perception or self-deception? The impact of motivation and socially desirable responding on self-evaluation results. *School Effectiveness and School Improvement*, *29*(4), 660–678. https://doi.org/10.1080/09243453.2018.1504802

Fernández-Batanero, J. M., Montenegro-Rueda, M., Fernández-Cerero, J., & García-Martínez, I. (2020). Digital competences for teacher professional development. Systematic review. *European Journal of Teacher Education*. Retrieved 20 December 2020, from https://www.tandfonline.com/doi/full/https://doi.org/10.1080/02619768.2020.1827389

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Duckworth, D. (2019). Preparing for life in a digital world—IEA International Computer and Information Literacy Study 2018 International Report. Retrieved 09 November 2020, from https://bit.ly/2rWbGM9

Fullan, M., & Watson, N. (2000). School-based management: Reconceptualising to improve learning outcomes. *School Effectiveness and School Improvement*, *11*(4), 453–473.

Fyfe, E. R. (2016). Providing feedback on computer-based algebra homework in middle-school classrooms. *Computers in Human Behavior*, *63*, 568–574. https://doi.org/10.1016/j.chb.2016.05.082

Grek, S., Lawn, M., Ozga, J., & Segerholm, C. (2013). Governing by inspection? European inspectorates and the creation of a European education policy space. *Comparative Education*, *49*(4), 486–502. https://doi.org/10.1080/03050068.2013.787697

Hall, C., & Noyes, A. (2009). New regimes of truth: The impact of performative school self-evaluation systems on teachers' professional identities. *Teaching and Teacher Education*, *25*(6), 850–856. https://doi.org/10.1016/j.tate.2009.01.008

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81–112. https://doi.org/10.3102/003465430298487

Heppen, J. B., Walters, K., Clements, M., Faria, A. M., Tobey, C., Sorensen, N., & Culp, K. (2012). *Access to Algebra I: The effects of online mathematics for grade 8 students. NCEE 2012-4021*. U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance.

Hofman, R., Dijkstra, N. J., & Hofman, V. H. A. (2009). School self-evaluation and student achievement. *School Effecctivenness and School Improvement*, *20*(1), 47–68. https://doi.org/10.1080/09243450802664115

Hohlfeld, T. N., Ritzhaupt, A. D., Barron, A., & Kemkerhon, K. (2008). Examining the digital divide in K-12 public schools: Four-year trends for supporting ICT literacy in Florida. *Computers & Education*, *51*(4), 1648–1663. https://doi.org/10.1016/j.compedu.2008.04.002

Høyrup, S. (2004). Reflection as a core process in organisational learning. *Journal of Workplace Learning*, *16*(8), 442–454. https://doi.org/10.1108/13665620410566414

Kampylis, P., Devine, J., Punie, Y., & Newman, T. (2016). Supporting schools to go digital: From a conceptual model towards the design of a self-assessment tool for digital-age learning. In L. Gómez Chova, A. López Martínez, & I. Candel Torres (Eds.), *Proceedings of the 9th International Conference of Education, Research and Innovation* (pp. 816–825). IATED Academy.

Kampylis, P., Punie, Y., & Devine, J. (2015). *Promoting effective digital-age learning—A European framework for digitally-competent educational organisations*. Publications Office of the European Union.

Kapsalis, G., Ferrari, A., Punie, Y., Conrads, J., Collado, A., Hotulainen, R., Rama, I., Nyman, L., Oinas, S., & Ilsley, P. (2019). *Evidence of innovative assessment: Literature review and case studies*. Publications Office of the European Union, Luxembourg, https://doi.org/10.2760/552774, JRC118113

Kerckhoff, A., & Glennie, E. (1999). *The Matthew effect in American Education*. JAI press.

Kong, S. C. (2019). Partnership among schools in e-learning implementation: Implications on elements for sustainable development. *Educational Technology & Society*, *22*(1), 28–43.

Kozma, R. B. (2008). *Technology, innovation and educational change. A global perspective*. International Society for Technology in Education.

Lachner, A., Backfisch, I., & Stürmer, K. (2019). A test-based approach of modeling and measuring technological pedagogical knowledge. *Computers & Education*, *142*. https://www.sciencedirect.com/science/article/pii/S0360131519301988

Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. *The Internet and Higher Education*, *29*, 40–48. https://doi.org/10.1016/j.iheduc.2015.12.003

Loeb, S., Kalogrides, K., & Horng, E. (2010). Principal preferences and the uneven distribution of principals across schools. *Education Evaluation and Policy Analysis*, *32*(2), 205–229. https://doi.org/10.3102/0162373710369833

Marsh, J., McCombs, J. S., & Martorell, F. (2010). How instructional coaches support data-driven decision making: Policy implementation and effects in Florida middle schools. *Educational Policy*, *24*(6), 872–907. https://doi.org/10.1177/0895904809341467

McLaren, B. M., van Gog, T., Ganoe, C., Karabinos, M., & Yaron, D. (2016). The efficiency of worked examples compared to erroneous examples, tutored problem solving, and problem solving in computer-based learning environments. *Computers in Human Behavior*, *55*, 87–99. https://doi.org/10.1016/j.chb.2015.08.038

Meneses, J., Fabregues, S., Rodríguez-Gomez, I., & Ion, G. (2012). Internet in teachers' professional practice outside the classroom: Examining supportive and management uses in primary and secondary schools. *Computers & Education*, *59*(3), 915–924. https://doi.org/10.1016/j.compedu.2012.04.011

Mingo, I., & Bracciale, R. (2016). The Matthew effect in the Italian Digital Context: The progressive marginalisation of the "poor". *Social Indicators Research*, *135*, 629–659. https://doi.org/10.1007/s11205-016-1511-2
Moreno, R., & Mayer, R. (2007). Interactive multimodal learning environments. *Educational Psychology Review*, *19*(3), 309–326. https://doi.org/10.1007/s10648-007-9047-2
Nevo, D. (2001). School evaluation: Internal or external? *Studies in Educational Evaluation*, *27*, 95–106. https://doi.org/10.1016/S0191-491X(01)00016-5
Ottesttad, G. (2013). School leadership for ICT and teachers' use of digital tools. *Nordic Journal of Digital Literacy*, *8*(1), 107–125.
Pavolini, E., & van Lancker, W. (2018). The Matthew effect in childcare use: A matter of policies or preferences? *Journal of European Public Policy*, *25*(6), 878–893. https://doi.org/10.1080/13501763.2017.1401108
Perc, M. (2014). The Matthew effect in empirical data. *Journal of the Royal Society Interface*, *11*, 1–15. https://doi.org/10.1098/rsif.2014.0378#d3e1840
Pisoni, D. (2018). Between idealism and pragmatism: Social policies and Matthew effect in vocational education and training for disadvantaged youth in Switzerland. *Social Inclusion*, *6*(3), 289–300. https://doi.org/10.17645/si.v6i3.1515
Reich, J. (2020). *Failure to disrupt, why technology alone can't transform education*. Harvard University Press.
Rigney, D. (2010). *The Matthew effect: How advantage begets further advantage*. Columbia University Press. https://doi.org/10.7312/rign14948
Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, *48*(2), 1–36.
Schildkamp, K., & Visscher, A. (2009). Factors influencing the utilisation of a school self-evaluation instrument. *Studies in Educational Evaluation*, *35*(4), 150–159. https://doi.org/10.1016/j.stueduc.2009.12.001
Surma, T., & Kirschner, P. (2020). Technology enhanced distance learning should not forget how learning happens. *Computers in Human Behavior*, *110*, 106390. https://doi.org/10.1016/j.chb.2020.106390
Tondeur, J., Valcke, M., & van Braak, J. (2012). A multidimensional approach to determinants of computer use in primary education: Teacher and school characteristics. *Journal of Computer Assisted Learning*, *24*, 494–506.
van Alten, D., Phielix, C., Janssen, J., & Kester, L. (2019). Effects of flipping the classroom on learning outcomes and satisfaction: A meta-analysis. *Educational Research Review*, *28*, 1–18. https://doi.org/10.1016/j.edurev.2019.05.003
van Dijk, J., & van Deursen, A. (Eds.) (2014). Solutions: Learning digital skills. In *Digital skills: Unlocking the information society* (pp. 113–138). Palgrave Macmillan.
Vanderlinde, R., & van Braak, J. (2010). The e-capacity of primary schools: Development of a conceptual model and scale construction from a school improvement perspective. *Computers & Education*, *55*, 541–553. https://doi.org/10.1016/j.compedu.2010.02.016
Vanhoof, J., & Petegem, V. (2011). Designing and evaluating the process of school self-evaluations. *Improving Schools*, *14*(2), 200–212.
Vanhoof, J., Van Petegem, P., & De Maeyer, S. (2009). Attitudes towards school self-evaluation. *Studies in Educational Evaluation*, *35*(1), 21–28. https://doi.org/10.1016/j.stueduc.2009.01.004
Vanhoof, J., Van Petegem, P., Verhoeven, J. C., & Buvens, I. (2009). Linking the policymaking capacities of schools and the quality of school self-evaluations: The view of school leaders. *Educational Management Administration and Leadership*, *37*(5), 667–686.
Vázquez, M. I., & Gairín, J. (2014). Institutional self-evaluation and change in educational centres. *International Journal of Leadership in Education*, *17*(3), 327–352. https://doi.org/10.1080/13603124.2013.812747
Voogt, J., Knezek, G., Cox, M., Knezek, D., & ten Brummelhuis, A. (2011). Under which conditions does ICT have a positive effect on teaching and learning? A Call to Action. *Journal of Computer Assisted Learning*, *29*(1), 4–14. https://doi.org/10.1111/j.1365-2729.2011.00453.x
Walber, H. J., & Sai, S. L. (1983). "Matthew" effects in education. *American Educational Research Journal*, *20*(3), 359–373.
Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B., & Gray, K. (2010). Digital divides? Student and staff perceptions of information and communication technologies. *Computers & Education*, *54*, 1202–1211. https://doi.org/10.1016/j.compedu.2009.11.006
Williamson, B. (2016). Digital education governance: Data visualization, predictive analytics, and "real-time" policy instruments. *Journal of Education Policy*, *31*(2), 123–141. https://doi.org/10.1080/02680939.2015.1035758
Yang, T. C., Cheng, M. C., & Chen, Y. (2018). The influences of self-regulated learning support and prior knowledge on improving learning performance. *Computers & Education*, *126*, 37–52. https://doi.org/10.1016/j.compedu.2018.06.025

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How to cite this article: Castaño Muñoz, J., Pokropek, A., & Weikert García, L. (2022). For to all those who have, will more be given? Evidence from the adoption of the SELFIE tool for the digital capacity of schools in Spain. *British Journal of Educational Technology*, *53*, 1937–1955. https://doi.org/10.1111/bjet.13222