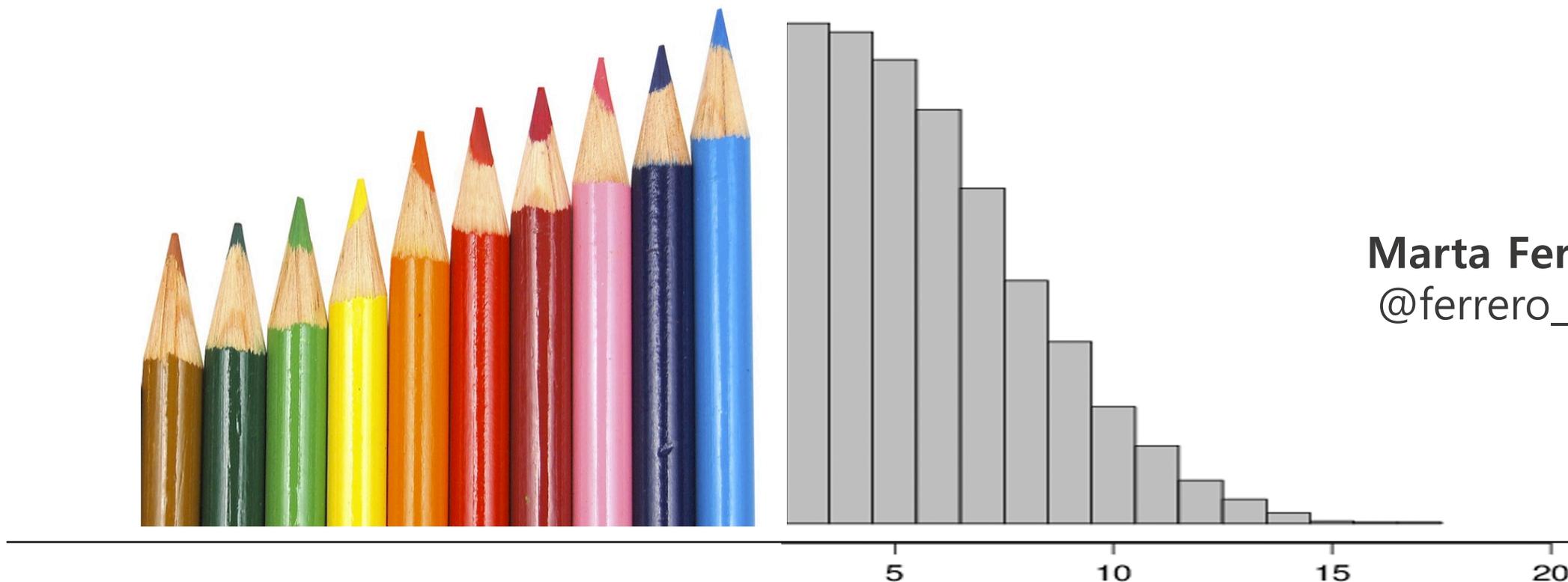


# Trazando puentes entre la **práctica educativa** y la **investigación**: Retos y oportunidades



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i Innovació Educativa



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de les Illes Balears



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# JORNADA CONTINUA VERSUS PARTIDA

El eterno dilema

**INDICADORES Y RESPONSABLES DE LA EVALUACIÓN:**

<b>INDICADORES</b>	<b>RESPONSABLES/MÉTODO</b>	<b>EVALUACIÓN</b>
Rendimiento académico	Profesores de ciclo/ Evaluaciones	Fin de cada curso
Atención y fatiga alumnos y profesores	Profesores y Equipo Directivo/Encuesta	Fin de cada curso
Participación actividades complementarias y extraescolares	Profesores y monitores de actividades	Fin de cada curso
Aceptación de la jornada escolar	Encuesta a padres, alumnos y profesores	Fin de cada curso
Incidencia en la matrícula	Equipo Directivo	Comienzo y final de curso
Aprovechamiento de espacios e instalaciones	Equipo Directivo	Fin de cada curso
Formación del profesorado	C.P.Rs.	Fin de cada curso

**ANEXO III: CUESTIONARIO AL PROFESORADO**

Con este cuestionario pretendemos obtener información relevante sobre la implantación de la jornada continua. Nos interesa conocer tu opinión en varios aspectos con el fin de valorar este tipo de horario.

NOMBRE: \_\_\_\_\_ APELLIDOS: \_\_\_\_\_

NIVEL/ETAPA QUE IMPARTE: \_\_\_\_\_

Lea cada una de las cuestiones y ponga una cruz en la respuesta que mejor refleje lo que piensa:

<b>CUESTIONES</b>	<b>SÍ</b>	<b>NO</b>	<b>IGUAL</b>
1) Considero positiva la experiencia de tener jornada continua.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) Las actividades Extraescolares propuestas al alumnado me parecen suficientes, variadas y adecuadas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) La jornada continua facilita el proceso de enseñanza-aprendizaje.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4) La jornada continua ha favorecido el contacto con las familias del alumnado.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5) He recibido información suficiente del seguimiento de la jornada continua.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6) Este tipo de horario ha influido positivamente en mi metodología de trabajo.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7) Las reuniones que mantengo con mis compañeros de ciclo son más amplias y efectivas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8) He tenido algún problema para desarrollar mis programaciones de aula con este tipo de horario.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9) He realizado actividades de formación que no hubiera podido hacer sin este horario.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10) En general, preferimos la jornada continua.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Si deseas hacernos llegar algún otro tipo de opinión o sugerencia que nos ayude a mejorar el proyecto de jornada para el próximo curso, escríbelo a continuación, por favor:

.....

.....

.....

.....



Jornada escolar partida y continua. ¿Existen evidencias que motiven el cambio en la gestión del tiempo escolar en España?

Francisco José Morales Yago<sup>1</sup>, Arturo Galán<sup>2</sup>, Ramón Pérez Juste<sup>3†</sup>

Recibido: Febrero 2017 / Evaluado: Marzo 2017 / Aceptado: Mayo 2017

**Resumen.** El efecto del tipo de jornada escolar (partida frente a continua) sobre los resultados de los estudiantes ha sido un tema poco estudiado, aunque conflictivo en el ámbito nacional por sus implicaciones sociales y laborales. Los objetivos generales del trabajo son dos: primero constatar si existe asociación entre resultados académicos y tipo de jornada escolar y, segundo, analizar las preferencias del profesorado por un tipo u otro de jornada y las razones que las motivan. Trascurridas tres décadas desde que comenzó a implantarse la jornada continua en algunas comunidades autónomas, se puede concluir que los progresos académicos esperados han sido reducidos y equiparables a los experimentados por comunidades que han permanecido en jornada escolar partida. Para realizar un estudio de la cuestión desde la percepción del profesorado, se ha utilizado metodología de encuesta (N=400), combinada con entrevistas semiestructuradas (N=30). Los resultados evidencian que los profesores prefieren la jornada escolar continua, aduciendo motivos como la posibilidad de incrementar su formación o menos desplazamientos al centro.

**Palabras clave:** Jornada escolar; profesorado; rendimiento; aprendizaje; organización escolar.

[en] Time in school. Are there evidences to support the changes on the school time management in Spain?

**Abstract.** The effect of the school time (from 8:30 to 15 versus from 9 to 17) on the results of the students has been a subject scarcely studied, but conflicting in the Spanish national context due to its laboral and social consequences for teachers and families. The two main objectives of this work are: first, inquire whether there is an association between academic performance and type of school schedule; second, to analyze teacher preferences for one type or another of school schedule and the reasons for thinking so. Three decades since 8:30 to 15 schedule began to be implemented in some regions, it can be concluded that the expected academic progress have been reduced and comparable to those experienced by communities that have remained in 9 to 17 schedule. By survey methodology (N = 400) combined with semi-structured interviews (N = 30), it is evident that teachers prefer the shorter schedule, adducing reasons such as the possibility of increasing professional development or fewer rounds to the center.

**Keywords:** schoolschedule; teachers; school achievement; learning; school management.

**Sumario.** 1. Introducción. 2. Horario escolar y rendimiento académico. 3. Método. 4. Análisis de Datos sobre la jornada escolar en España. 5. Valoración de la jornada escolar por parte del profesorado.

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# Rythmes de vie et rythmes scolaires

## Aspects chronobiologiques et chronopsychologiques

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Roger Fontaine

Nadine Le Floc'h



ELSEVIER  
MASSON



## School entry, afternoon care, and mothers' labour supply

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Frauke Peter<sup>1</sup>

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**Abstract** The availability of childcare is a crucial factor for mothers' labour force participation. While most of the literature examines childcare for preschool children, we specifically focus on primary school-aged children, estimating the effect of formal afternoon care on maternal labour supply. To do so, we use a novel matching technique, entropy balancing, and draw on the rich and longitudinal data of the German Socio-Economic Panel (SOEP). We show that children's afternoon care increases mothers' employment rates and their working hours. To confirm the robustness of our results, we conduct a series of sensitivity analyses and apply a newly proposed method to assess possible bias from omitted variables. Our findings highlight how childcare availability shapes maternal employment patterns well after school entry.

**Keywords** Afternoon care · Maternal labour supply · All-day schools · Entropy balancing

**JEL Classification** J13 · J63 · J65

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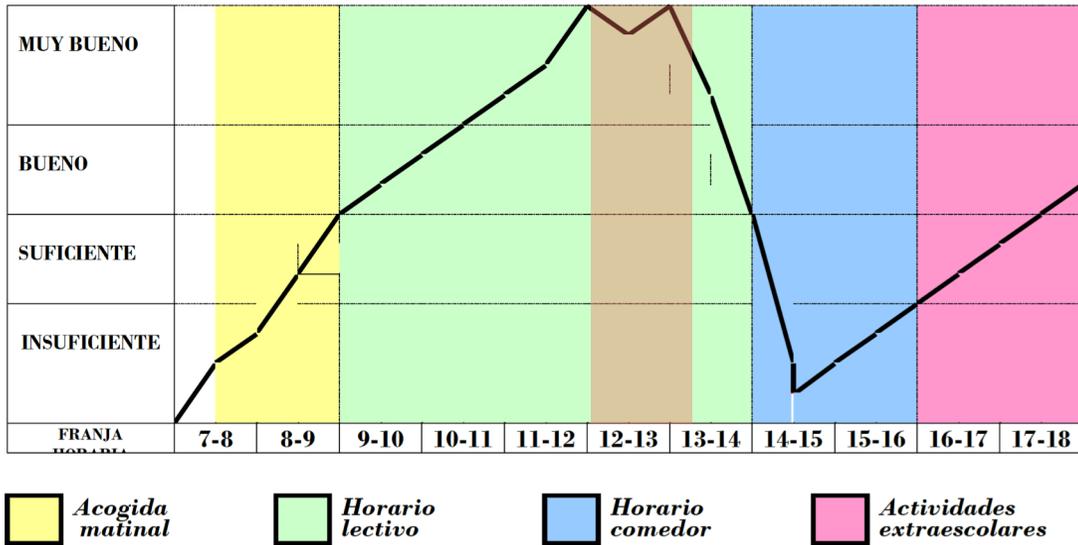
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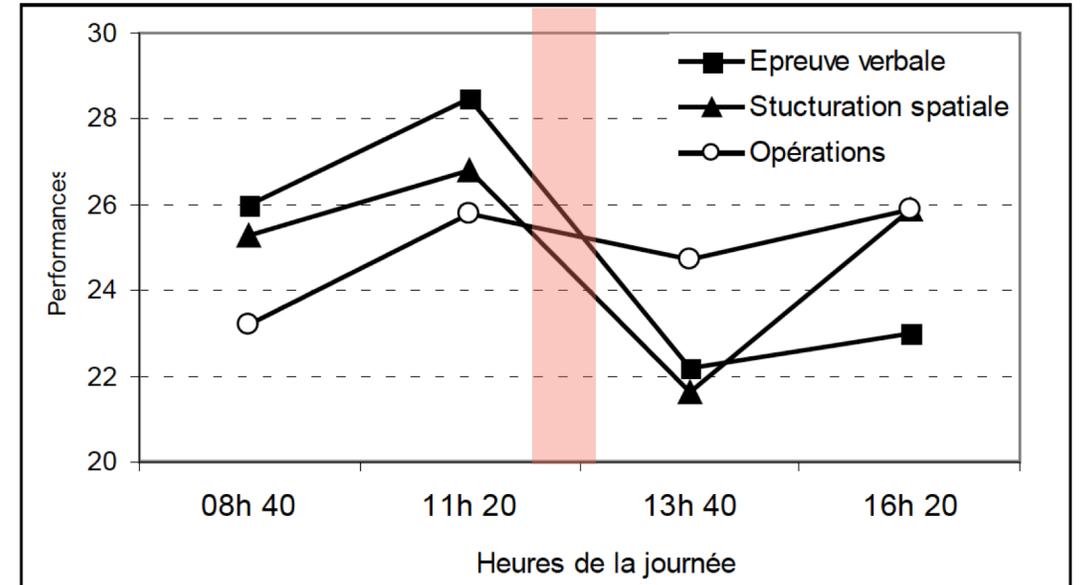
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Fuente desconocida



**Gráfico 13: Variaciones diarias en el rendimiento de los alumnos de 10-11 años después de 3 eventos. Fuente: Testu (1994), INSERM, 2001, p. 54, citado en Suchaut, B. (2009, May).**





**LAS TIC EN EDUCACIÓN**  
¿Revolucionarán la educación?



**LAS TIC EN EDUCACIÓN**  
 ¿Revolucionarán la educación?



## Review

## Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension

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## ARTICLE INFO

Keywords:  
Reading comprehension  
Reading media difference  
Digital-based reading  
Paper-based reading  
Meta-analysis

## ABSTRACT

With the increasing dominance of digital reading over paper reading, gaining understanding of the effects of the medium on reading comprehension has become critical. However, results from research comparing learning outcomes across printed and digital media are mixed, making conclusions difficult to reach. In the current meta-analysis, we examined research in recent years (2000–2017), comparing the reading of comparable texts on paper and on digital devices. We included studies with between-participants ( $n = 38$ ) and within-participants designs ( $n = 16$ ) involving 171,055 participants. Both designs yielded the same advantage of paper over digital reading (Hedge's  $g = -0.21$ ;  $d = -0.21$ ). Analyses revealed three significant moderators: (1) time frame: the paper-based reading advantage increased in time-constrained reading compared to self-paced reading; (2) text genre: the paper-based reading advantage was consistent across studies using informational texts, or a mix of informational and narrative texts, but not on those using only narrative texts; (3) publication year: the advantage of paper-based reading increased over the years. Theoretical and educational implications are discussed.

## 1. Introduction

There has been a gradual shift from paper-based reading to reading on digital devices, such as computers, tablets, and cell-phones. Although there are clear advantages of digital-based assessment and learning, including reduced costs and increased individualization, research indicates that there may be disadvantages as well, as described below. In addition, findings from previous reviews of studies on the effects of digital reading on comprehension have been inconclusive (Dillon, 1992; Kingston, 2008; Noyes & Garland, 2008; Singer & Alexander, 2017b; Wang, Jian, Young, Brooks, & Olson, 2007). The current paper presents a meta-analysis of recent studies that investigated the effects of paper versus digital media on reading comprehension. In addition, we also explored the effects of several potential moderator variables whose influence may help to explain previous inconsistencies among study results.

## 1.1. Text comprehension and the role of media

Theoretical models of reading comprehension have extensively considered the interplay among reader characteristics, text content and design, and reading instructions (for a review see McNamara & Magliano, 2009). However, the factor of the medium has

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1747-938X/© 2018 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Learning through Hand- or Typewriting Influences Visual Recognition of New Graphic Shapes: Behavioral and Functional Imaging Evidence

Marieke Longcamp<sup>1,2</sup>, Céline Boucard<sup>2</sup>, Jean-Claude Gilhodes<sup>2</sup>, Jean-Luc Anton<sup>3</sup>, Muriel Roth<sup>3</sup>, Bruno Nazarian<sup>3</sup>, and Jean-Luc Velay<sup>2</sup>

## Abstract

Fast and accurate visual recognition of single characters is crucial for efficient reading. We explored the possible contribution of writing memory to character recognition processes. We evaluated the ability of adults to discriminate new characters from their mirror images after being taught how to produce the characters either by traditional pen-and-paper writing or with a computer keyboard. After training, we found stronger and longer lasting (several weeks) facilitation in recognizing the orientation of characters that had been written by hand compared to those typed. Functional magnetic resonance im-

## INTRODUCTION

Several decades ago, the seminal work of Held and Hein (1963) with “motorically” deprived kittens experimentally proved that motor knowledge acquired through active exploration is important in processing spatial information from vision (see also Paillard, 1991). This view is now widely accepted as can be seen from more recent reports of activations in different parts of the cortical motor system during perception (Mecklinger, Gruenewald, Besson, Magnié, & von Cramon, 2002; Chao & Martin, 2000), mental rotation (Lamm, Windschberger, Leodolter, Moser, & Bauer, 2001; Richter et al., 2000), and judgment of spatio-temporal features of objects (Schubotz & von Cramon, 2002). In addition, some studies have directly assessed the role of motor learning in the reorganization of the neural networks involved in object processing (Weisberg, van Turenout, & Martin, 2007; Pollmann & Maertens, 2005; Wolfensteller, Schubotz, & von Cramon, 2004) with results showing that after learning, visual presentation of the stimuli elicits activations in brain regions involved in the programming of the response specifically associated to the stimuli during learning.

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aging recordings indicated that the response mode during learning is associated with distinct pathways during recognition of graphic shapes. Greater activity related to handwriting learning and normal letter identification was observed in several brain regions known to be involved in the execution, imagery, and observation of actions, in particular, the left Broca's area and bilateral inferior parietal lobules. Taken together, these results provide strong arguments in favor of the view that the specific movements memorized when learning how to write participate in the visual recognition of graphic shapes and letters. ■

Visual processing of graphic shapes is a very fine spatial skill because graphic shapes have precisely defined configurations and orientations that are crucial features for quick recognition, hence, for efficient reading (Coltheart, Rastle, Perry, Langdon, & Ziegler, 2001). Results of several studies strongly suggest that motor knowledge acquired through learning how to write contributes to the visual recognition of letters. Firstly, neuroimaging and brain-damaged patient studies showed that regions of the cortical motor system participate in recognition (Longcamp, Anton, Roth, & Velay, 2003, 2005; Kato et al., 1999; Anderson, Damasio, & Damasio, 1990) and visual imagery of characters (Raj, 1999; Kosslyn, Thompson, & Alpert, 1997). Secondly behavioral studies have indicated that handwriting memory facilitates recognition (Longcamp, Boucard, Gilhodes, & Velay, 2006; Longcamp, Zerbato-Poudou, & Velay, 2005; Flores d'Arcais, 1994; Hulme, 1979) and mental imagery of characters (Kosslyn, Cave, Provost, & Von Gierke, 1988).

The issue of the contribution of handwriting movements to visual perception of characters is of primary importance when one considers the striking change arising in our writing habits with the extended use of computer keyboards, and the progressive disappearance of traditional handwriting from our everyday lives. Computers are now being increasingly used at school, even by very young children in kindergarten. If children happen to learn how to write with a keyboard before they



## Computers and students' achievement: An analysis of the One Laptop per Child program in Catalonia

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## ARTICLE INFO

Keywords:  
Student performance  
Education policy  
OLPC  
Secondary education

## ABSTRACT

We analyse the impact of a One Laptop per Child program introduced by the Catalan government on student achievement. Using longitudinal population data for students in secondary education during the period 2009–2016, our identification strategy exploits variations across cohorts within schools. Although participation into the program was not random, we control for a number of school characteristics that influenced school participation. The empirical results consistently indicate that this program had a negative impact on student performance in Catalan, Spanish, English and mathematics. Test scores fell by 0.20–0.22 standardised points, which represent 3.8–6.2% of the average test score. This negative effect was stronger among boys than it was among girls (differences ranging from 10% to 42%).

## 1. Introduction

Education has moved into the digital era, and laptops and other technologies have been progressively introduced into classrooms around the world. This diffusion has been partly fostered by public authorities, often as part of the One Laptop per Child (OLPC) program, whereby an education authority provides laptops to children (for free or at a subsidized cost) instead of traditional textbooks. The value of OLPC programs is rarely questioned, as they appear to be modernising schools and boosting pupils' acquisition of information and communication technology (ICT) skills. However, in the economics literature, no consensus has yet been reached about the impact of OLPC programs in particular, and the use of computers in general, on student skills and academic performance.

In this study, we analyse a program implemented by the Catalan government (known first as eduCAT1 × 1 and later as eduCAT2.0), aimed at providing laptops, wireless connectivity and digital boards to participating schools. Specifically, we study the impact that this program had on student performance in Catalan, Spanish, English and mathematics.

This paper adds to the existing literature on the effect of computer use on academic achievement in two main aspects. First, there are only a few studies examining the impact of an OLPC program on student performance in Europe. Second, our analysis considers population data for students in secondary education for an entire educational administration (the region of Catalonia) and not just a local experience limited to a few schools.

Our results consistently show that the eduCAT program had a small, but statistically significant negative effect on student performance. This negative effect is greater among boys than among girls. In order to check the robustness of these findings,

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# LAS TIC EN EDUCACIÓN

## ¿Revolucionarán la educación?



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# LA TOMA DE DECISIONES EN EDUCACIÓN

Continua y a diferentes niveles

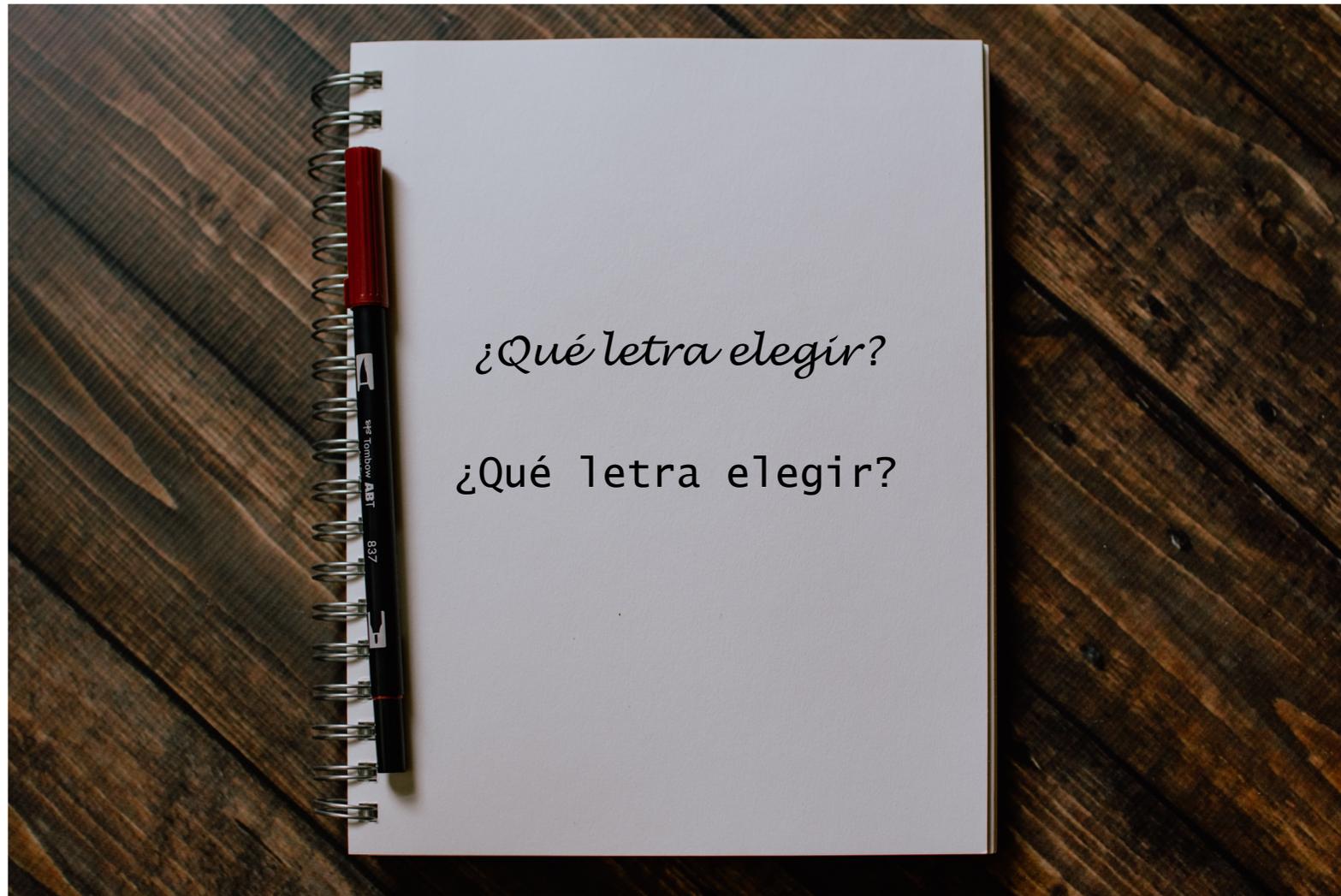


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# LA TOMA DE DECISIONES EN EDUCACIÓN

Continua y a diferentes niveles



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# LA TOMA DE DECISIONES EN EDUCACIÓN

Continua y a diferentes niveles



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# LA TOMA DE DECISIONES EN EDUCACIÓN

Continua y a diferentes niveles



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**FUENTES DE INFORMACIÓN PARA LA TOMA DE DECISIONES**  
Experiencia propia y ajena, conocimiento, valores, intuiciones...

## THE LEARNING CHANNELS

**V**ISUAL  
SEE IT.



**A**UDITORY  
HEAR IT. SAY IT.



**K**INESTHETIC  
DO IT.



La "sabiduría práctica" no siempre es suficiente...

## Learning styles and pedagogy in post-16 learning

A systematic and critical review

learning & skills research centre

This report critically reviews the literature on learning styles and examines in detail 13 of the most influential models. The report concludes that it matters fundamentally which instrument is chosen. The implications for teaching and learning in post-16 learning are serious and should be of concern to learners, teachers and trainers, managers, researchers and inspectors.

# Learning Styles

## Concepts and Evidence

Harold Pashler,<sup>1</sup> Mark McDaniel,<sup>2</sup> Doug Rohrer,<sup>3</sup> and Robert Bjork<sup>4</sup>

<sup>1</sup>University of California, San Diego, <sup>2</sup>Washington University in St. Louis, <sup>3</sup>University of South Florida, and <sup>4</sup>University of California, Los Angeles

**SUMMARY**—The term “learning styles” refers to the concept that individuals differ in regard to what mode of instruction or study is most effective for them. Proponents of learning-style assessment contend that optimal instruction requires diagnosing individuals’ learning style and tailoring instruction accordingly. Assessments of learning style typically ask people to evaluate what sort of information presentation they prefer (e.g., words versus pictures versus speech) and/or what kind of mental activity they find most engaging or congenial (e.g., analysis versus listening), although assessment instruments are extremely diverse. The most common—but not the only—hypothesis about the instructional relevance of learning styles is the meshing hypothesis, according to which instruction is best provided in a format that matches the preferences of the learner (e.g., for a “visual learner,” emphasizing visual presentation of information).

The learning-styles view has acquired great influence within the education field, and is frequently encountered at levels ranging from kindergarten to graduate school. There is a thriving industry devoted to publishing learning-styles tests and guidebooks for teachers, and many organizations offer professional development workshops for teachers and educators built around the concept of learning styles.

The authors of the present review were charged with determining whether these practices are supported by scientific evidence. We concluded that any credible validation of learning-styles-based instruction requires robust documentation of a very particular type of experimental finding with several necessary criteria. First, students must be divided into groups on the basis of their learning styles, and then students from each group must be randomly assigned to receive one of multiple instructional methods. Next, students must then sit for a final test that is

the same for all students. Finally, in order to demonstrate that optimal learning requires that students receive instruction tailored to their putative learning style, the experiment must reveal a specific type of interaction between learning style and instructional method: Students with one learning style achieve the best educational outcome when given an instructional method that differs from the instructional method producing the best outcome for students with a different learning style. In other words, the instructional method that proves most effective for students with one learning style is not the most effective method for students with a different learning style.

Our review of the literature disclosed ample evidence that children and adults will, if asked, express preferences about how they prefer information to be presented to them. There is also plentiful evidence arguing that people differ in the degree to which they have some fairly specific aptitudes for different kinds of thinking and for processing different types of information. However, we found virtually no evidence for the interaction pattern mentioned above, which was judged to be a precondition for validating the educational applications of learning styles. Although the literature on learning styles is enormous, very few studies have even used an experimental methodology capable of testing the validity of learning styles applied to education. Moreover, of those that did use an appropriate method, several found results that flatly contradict the popular meshing hypothesis.

We conclude therefore, that at present, there is no adequate evidence base to justify incorporating learning-styles assessments into general educational practice. Thus, limited education resources would better be devoted to adopting other educational practices that have a strong evidence base, of which there are an increasing number. However, given the lack of methodologically sound studies of learning styles, it would be an error to conclude that all possible versions of learning styles have been tested and found wanting; many have simply not been tested at all.

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## The Scientific Status of Learning Styles Theories

Daniel T. Willingham<sup>1</sup>, Elizabeth M. Hughes<sup>2</sup>, and David G. Dobolyi<sup>1</sup>

### Abstract

Theories of learning styles suggest that individuals think and learn best in different ways. These are not differences of ability but rather preferences for processing certain types of information or for processing information in certain types of way. If accurate, learning styles theories could have important implications for instruction because student achievement would be a product of the interaction of instruction and the student's style. There is reason to think that people view learning styles theories as broadly accurate, but, in fact, scientific support for these theories is lacking. We suggest that educators' time and energy are better spent on other theories that might aid instruction.

### Keywords

learning styles, academic achievement, cognitive style, individual differences, teaching methods

Learning styles theories are varied, but each of these theories holds that people learn in different ways and that learning can be optimized for an individual by tailoring instruction to his or her style. For example, one theory has it that some people learn best by watching (visual learners), some by listening (auditory learners), and some by moving (kinesthetic learners). Thus, a first grader learning to add numbers might benefit from an introduction that respects her learning style: the visual learner might view sets of objects, the auditory learner might listen to rhythms, and the kinesthetic learner might manipulate beads on an abacus. How marvelous it would be if this theory (or a similar theory) was true. Ideas that students had found elusive would suddenly click, all due to a modest change in teaching practice. But is the theory true?

Certainly, belief in learning styles theories is widespread. A recent review (Howard-Jones, 2014) showed that over 90% of teachers in five countries (the United Kingdom, the Netherlands, Turkey, Greece, and China) agreed that individuals learn better when they receive information tailored to their preferred learning styles. Although data on U.S. teachers are limited (Ballone & Czerniak, 2001), our experience has been that belief in the accuracy of such theories is widespread among the broader public. To test this impression, we conducted a brief survey using Amazon Mechanical Turk. Participants ( $N = 313$ , 53.4% female, mean age = 35.2 years) rated on a 7-point Likert-type scale (1 = *strongly disagree* and 7 = *strongly agree*) their agreement with this statement: “There are consistent differences among people in how they learn from different experiences; specifically, some people generally learn best by seeing, some generally learn best by listening, and some generally learn best by doing.” The mean rating was 6.35 ( $SD = 1.11$ ).<sup>1</sup> We observed this strong belief even though literature

reviews over the last 30 years have concluded that most evidence does not support any of the learning styles theories. The purpose of this article is to (a) clarify what learning styles theories claim and distinguish them from theories of ability, (b) summarize empirical research pertaining to learning styles, and (c) provide suggestions for practice and implications supported by empirical research.

### What Are Learning Styles Theories?

Researchers have defined “learning styles” in several ways (Messick, 1984; Peterson, Rayner, & Armstrong, 2009), but because we are interested primarily in applications to education (and not, e.g., in how personality dimensions impact learning), we focus on learning styles as (a) differential preferences for processing certain types of information or (b) for processing information in certain ways. The former definition would include learning styles theories that differentiate between visual, auditory, and kinesthetic learners (Dunn, Dunn, & Price, 1984) or between visual and verbal learners (Riding & Rayner, 1998). Learning styles theories based on preferences for certain types of cognitive processing would include distinctions between intuitive and analytic thinkers (Allinson & Hayes, 1996) or between activist, reflecting, or pragmatic thinkers

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Email: willingham@virginia.edu

La “sabiduría práctica” no siempre es suficiente...



Ignaz Semmelweis y el lavado de manos en el doodle de hoy.

**EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN**  
(Evidence-based education)

# EDUCACIÓN INFORMADA DESDE LAS MEJORES PRUEBAS DISPONIBLES

**EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN**  
(Evidence-based education)



¿Con quién?

¿Para qué?

¿En qué contexto?

¿Requisitos necesarios?

Photo by [Brett Jordan](#) on [Unsplash](#)

**LA LETRA PEQUEÑA EN EDUCACIÓN**  
No todo vale para todos

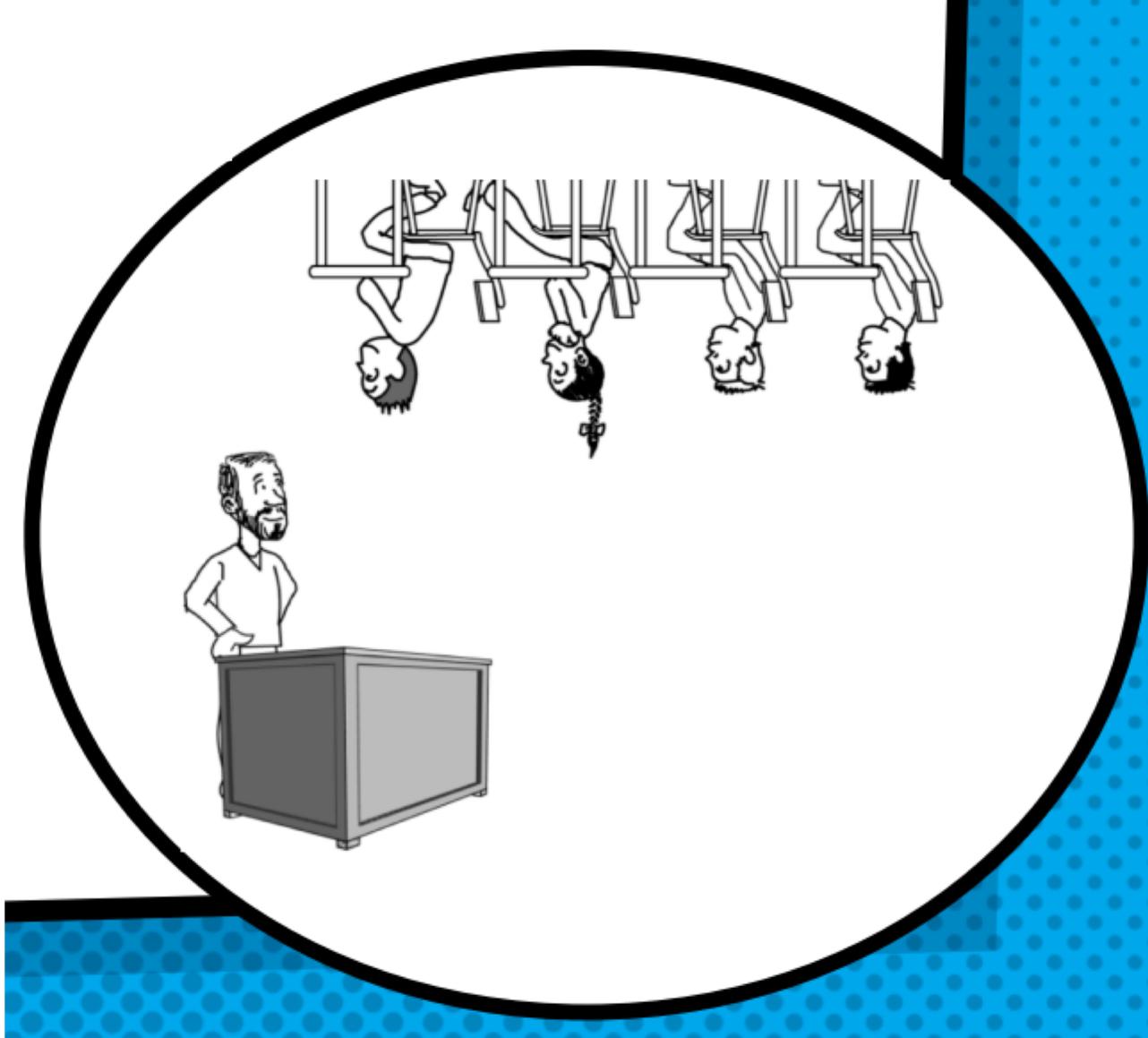


Image by [Andrés Rivera](#)

# LA LETRA PEQUEÑA EN EDUCACIÓN

Aula invertida o flipped classroom



Photo by [Jeswin Thomas](#) on [Unsplash](#)

**LA LETRA PEQUEÑA EN EDUCACIÓN**  
El aprendizaje basado en proyectos o problemas

**Retos**



Photo by [Ben Stein](#) on [Unsplash](#)

**BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVA**

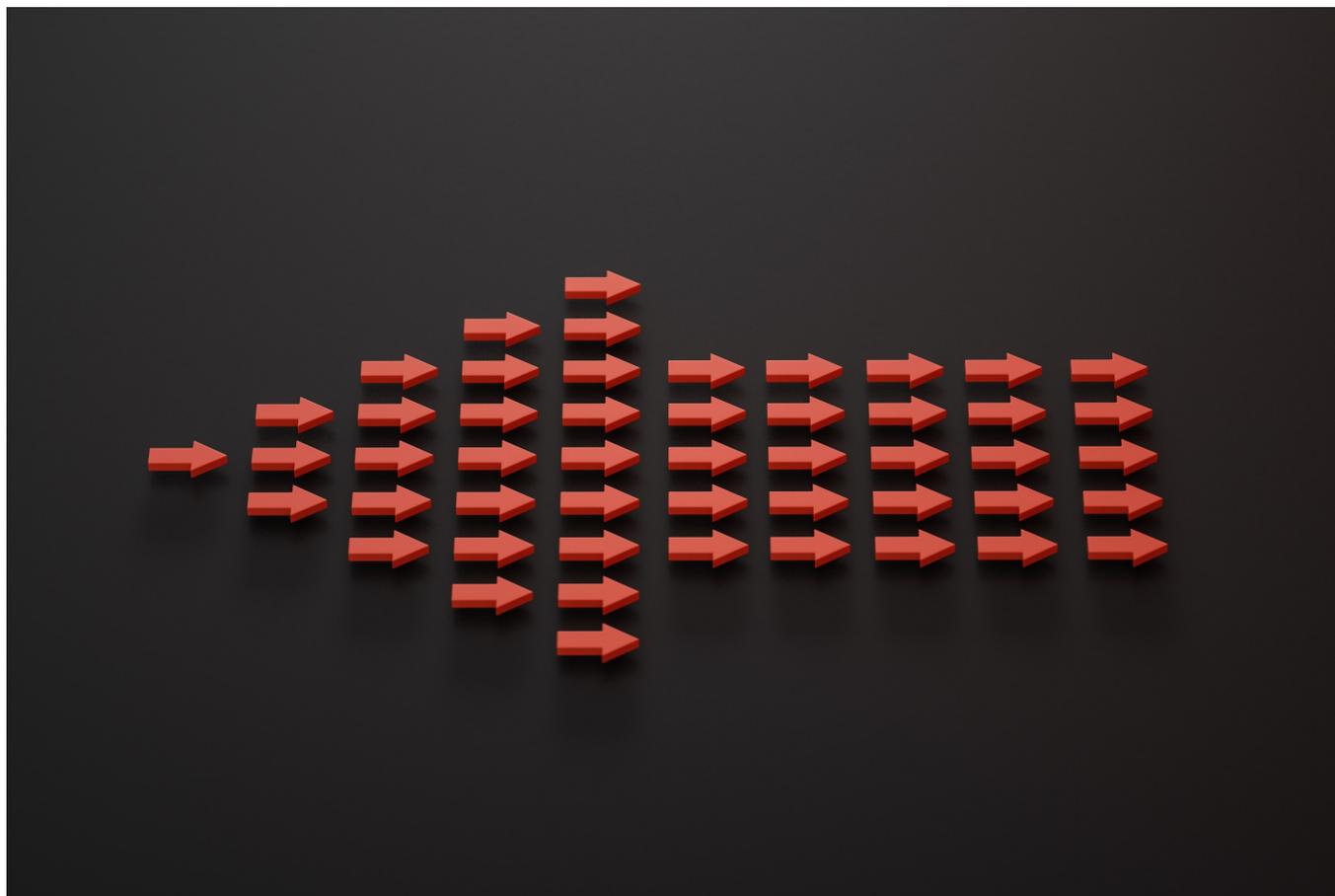
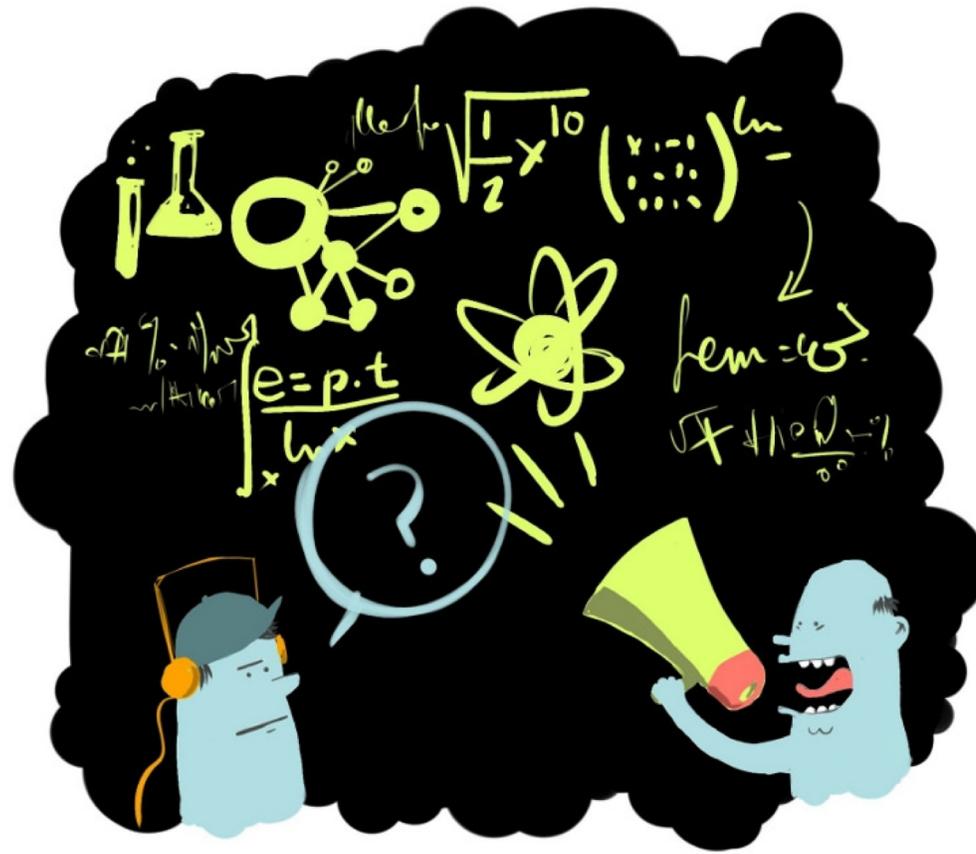


Photo by [愚木混株 cdd20](#) on [Unsplash](#)

**BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVAS**  
Los objetivos son diferentes



## BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVAS

Emplean un lenguaje diferente

Comunidad  
educativa





Educational Research Review 25 (2018) 23–38

Contents lists available at ScienceDirect

**Educational Research Review**

journal homepage: [www.elsevier.com/locate/edurev](http://www.elsevier.com/locate/edurev)

Review

Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension

Pablo Delgado<sup>a</sup>, Cristina Vargas<sup>b</sup>, Rakefet Ackerman<sup>c</sup>, Ladislao Salmerón<sup>b,\*</sup>

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<sup>b</sup>Department of Developmental and Educational Psychology - University of Valencia, Avd. Blasco Ibáñez, 21, 46110, Valencia, Spain  
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ARTICLE INFO

**Keywords:**  
 Reading comprehension  
 Reading media differences  
 Digital-based reading  
 Paper-based reading  
 Meta-analysis

**ABSTRACT**

With the increasing dominance of digital reading over paper reading, gaining understanding of the effects of the medium on reading comprehension has become critical. However, results from research comparing learning outcomes across printed and digital media are mixed, making conclusions difficult to reach. In the current meta-analysis, we examined research in recent years (2000–2017), comparing the reading of comparable texts on paper and on digital devices. We included studies with between-participants ( $n = 38$ ) and within-participants designs ( $n = 16$ ) involving 171,055 participants. Both designs yielded the same advantage of paper over digital reading (Hedge's  $g = -0.21$ ;  $d_e = -0.21$ ). Analyses revealed three significant moderators: (1) time frame: the paper-based reading advantage increased in time-constrained reading compared to self-paced reading; (2) text genre: the paper-based reading advantage was consistent across studies using informational texts, or a mix of informational and narrative texts, but not on those using only narrative texts; (3) publication year: the advantage of paper-based reading increased over the years. Theoretical and educational implications are discussed.

**1. Introduction**

There has been a gradual shift from paper-based reading to reading on digital devices, such as computers, tablets, and cell-phones. Although there are clear advantages of digital-based assessment and learning, including reduced costs and increased individualization, research indicates that there may be disadvantages as well, as described below. In addition, findings from previous reviews of studies on the effects of digital reading on comprehension have been inconclusive (Dillon, 1992; Kingston, 2008; Noyes & Garland, 2008; Singer & Alexander, 2017b; Wang, Jiao, Young, Brooks, & Olson, 2007). The current paper presents a meta-analysis of recent studies that investigated the effects of paper versus digital media on reading comprehension. In addition, we also explored the effects of several potential moderator variables whose influence may help to explain previous inconsistencies among study results.

**1.1. Text comprehension and the role of media**

Theoretical models of reading comprehension have extensively considered the interplay among reader characteristics, text content and design, and reading instructions (for a review see McNamara & Magliano, 2009). However, the factor of the medium has

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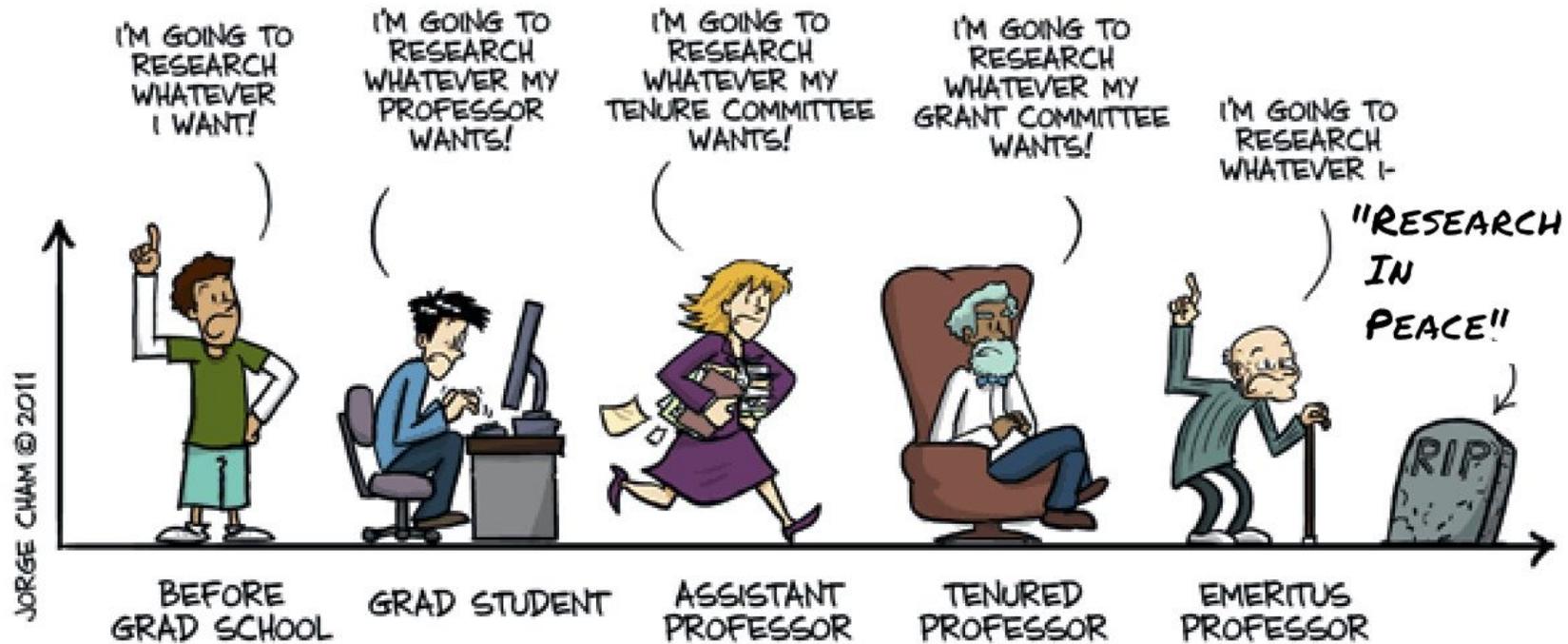
<https://doi.org/10.1016/j.edurev.2018.09.003>  
 Received 7 January 2018; Received in revised form 6 September 2018; Accepted 10 September 2018  
 Available online 15 September 2018  
 1747-938X/ © 2018 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVAS**  
 Cultura científica en los Estudios de Educación

Comunidad  
científica



# THE EVOLUTION OF INTELLECTUAL FREEDOM



**BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVAS**

Comunicar es una actividad secundaria

**DANONE**

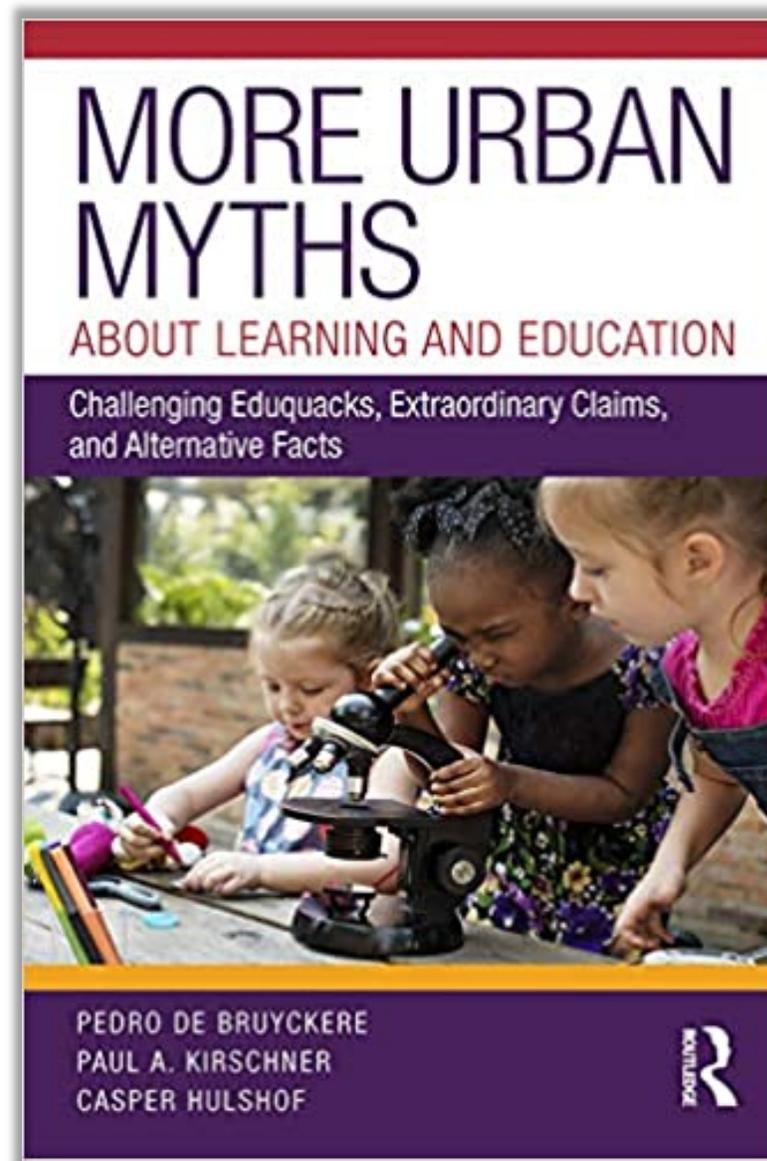
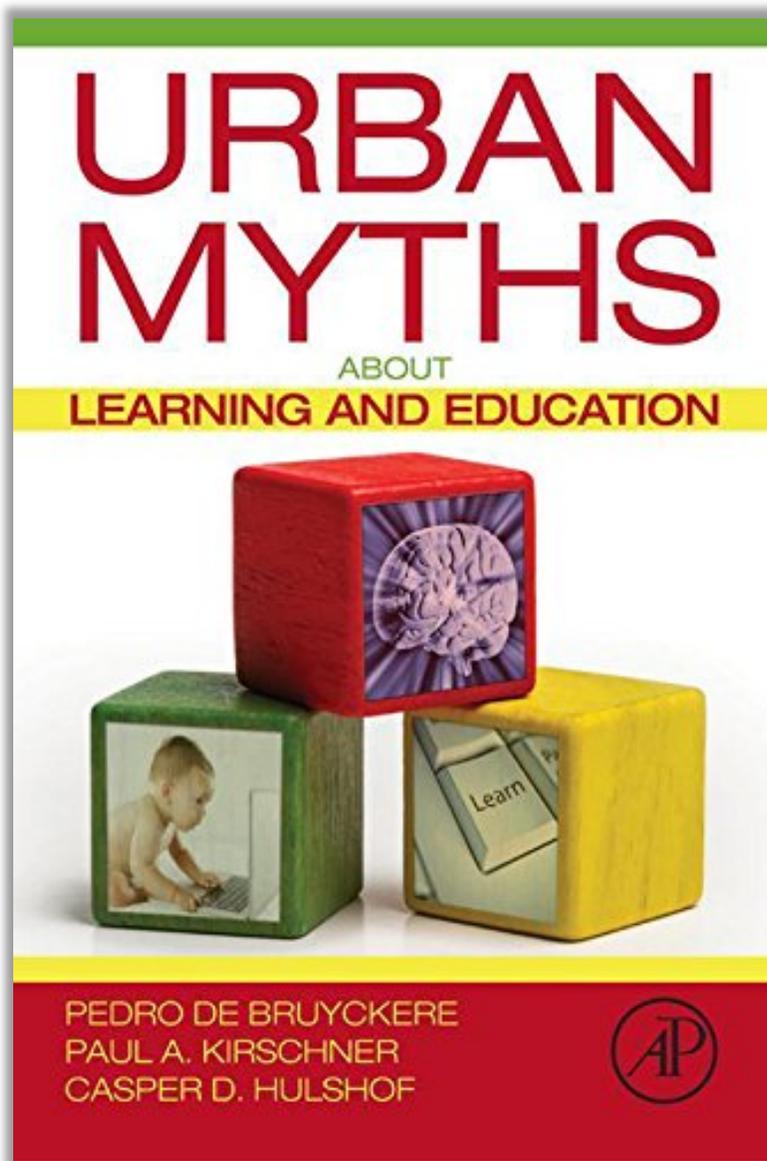
**ENERGÍAS RARAS**

**PIRINDOLO**

**MOVIDAS TOCHAS  
Y SALUDABLES**

**BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVAS**

No explican las implicaciones



**BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVAS**  
Concepciones erróneas en educación



## Retwitteado

de Miguelacg\_psico 🦅



**Marta Ferrero** @ferrero\_mar · 3 mar. ...

Queridos docentes de Twitter, estoy preparando una ponencia sobre la importancia de tender puentes entre la práctica educativa y la investigación y quiero mencionar cursos de formación permanente de "dudoso fundamento" que se estén ofertando ahora mismo, ¿me ayudáis? ¡Gracias!



88



159



463



**BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVAS**  
Propuestas educativas dudosas

## Cursos

Que el título contenga

Que el ámbito sea

Que el nivel sea

Estado

A Distancia  Toda

Código

Título (contiene **neurociencia**)

22FP43CF035	Educación Positiva y Neurociencia para el profesorado de FP
22XA63IN236	Neurociencia aplicada a la enseñanza
22SA55IN006	Aprender a Ser y la Neurociencia
22EL55EA002	Educación positiva y neurociencia para Formación de Personas Adultas
22XA66EA011	Neurociencia aplicada al aprendizaje de la Formación de Personas Adultas
22EI11EI028	La evaluación y las evidencias en Educación Infantil: una mirada desde la neurociencia
22EL66EA002	Neurociencia aplicada al aprendizaje en la Formación de Personas Adultas



22Q9919AV322

ESPACIOS CON MUCHA LUZ  
PARA LA MEJORA DEL PROCESO  
DE ENSEÑANZA-APRENDIZAJE

### 3. CONTENIDOS

- LEER = VER: Desarrollo de la Conciencia Óptica. Lectomecanismo sacádico.
  - Relajación ocular.
  - Estiramientos, barridos y escaneos de los músculos oculares.
  - Amplitud de la visión periférica.
  - Agudeza figural.
  - Fluidez sacádica.

*Neurodudexia (2ª Edición).*

- LEER = COMPRENDER: Desarrollo de la Conciencia Semántica. Lectomecanismo perceptivo.
  - Comprensión por la situación referencial: rótulos situados.
  - Comprensión por la acción corporal.
  - Comprensión por la ilustración.
  - Comprensión por los rasgos suprasegmentales prosódicos.
  - Comprensión por los rasgos logográficos y diseño tipográfico.
  - Comprensión por la significatividad de las realidades leídas.
- LEER = DESCIFRAR. Desarrollo de la Conciencia Fonológica. Lectomecanismo combinatorio.
  - Imprentas corporales y manipulativas de construcción de la palabra.
  - Tratamiento respiratorio, fonoarticulatorio, audiovisodiscriminativo y grafodireccional de cada letra.
- LEER = TEXTUALIZAR. Desarrollo de la Conciencia Sintáctica. Lectomecanismo narrativo.
  - Mecanotaxis de la frase y el texto.
  - Scriptogéneros administrativos, dialógicos, intimistas, herméticos, operativos, líricos, informativos, descriptivos, narrativos y de trabajo intelectual.

**BRECHA ENTRE LA PRÁCTICA Y LA INVESTIGACIÓN EDUCATIVAS**  
Propuestas educativas dudosas

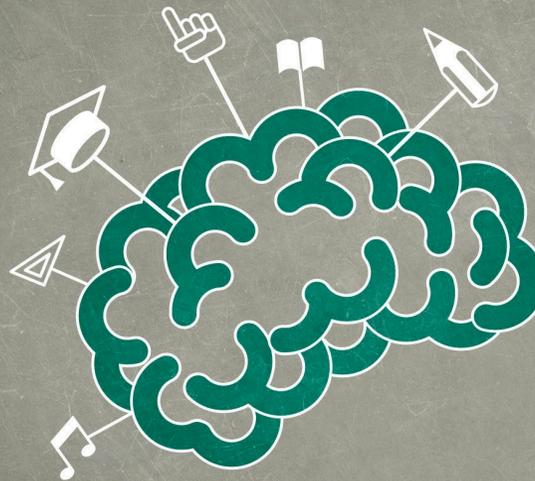
**Oportunidades**



# LAS PRUEBAS DE LA EDUCACIÓN

2 DE FEBRERO BIZKAIA ARETOA BILBAO

09:00 ENTRADA  
 09:10 PRESENTACIÓN  
 09:20 AUTISMO Y EDUCACIÓN  
 José Ramón Alor  
 09:50 LA EVALUACIÓN DE LOS  
 ENEMIGOS PUNTO A PUNTO  
 Marta Ferrero  
 10:20 EFICACIA Y MEJORA  
 ESTUDIOS DE CASO  
 Beronika Azpillaga  
 10:50 DESCANSO  
 11:20 LA INTERVENCIÓN  
 CIENTÍFICA A LA PRÁCTICA  
 Joana Acha

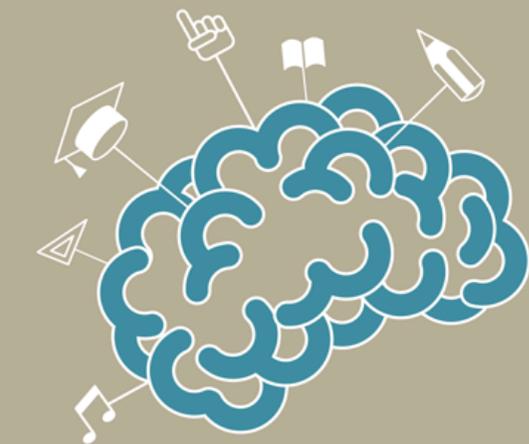


# LAS PRUEBAS DE LA EDUCACIÓN

2 DE ABRIL CAIXAFORUM MADRID

17:30-17:45 RECEPCIÓN  
 17:45-18:00 PRESENTACIÓN  
 18:00-18:20 ¿QUÉ PUEDE APORTAR (Y QUÉ NO) LA NEUROCIENCIA A LA EDUCACIÓN?  
 Juan Lupiáñez  
 18:20-18:40 ¿HACIA DÓNDE CAMINA LA EDUCACIÓN BILINGÜE?  
 Yolanda Ruiz  
 18:40-19:00 LUCES Y SOMBRAS DEL USO DE LA TECNOLOGÍA EN CLASE  
 Pablo Garalzar  
 19:00-19:20 DESCANSO  
 19:20-19:40 MOTIVAR A LOS ALUMNOS: EL "SANTO GRIAL" DE LA EDUCACIÓN  
 Juan Pedro Nuñez  
 19:40-20:00 INGREDIENTES CLAVE A LA HORA DE ENSEÑAR A LEER  
 Marta Ferrero  
 20:00-20:30 COLOQUIO

COLABORA EduCaixa Universidad del País Vasco Euzko Herriko Unibertsitatea Kultura Zientifikoko Katedra Cátedra Cultura Científica Fundación PROMAESTRO

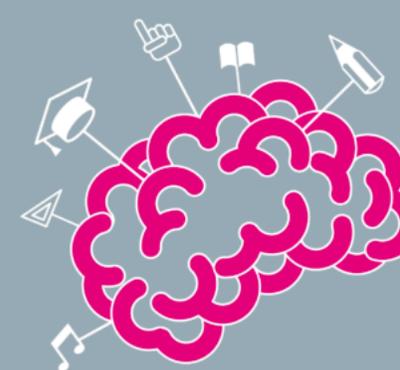


# LAS PRUEBAS DE LA EDUCACIÓN

9 DE NOVIEMBRE UPV/EHU CENTRO CARLOS SANTAMARÍA DONOSTIA - SAN SEBASTIÁN

09:00 ENTRADA  
 09:30 PRESENTACIÓN  
 09:30 CRITERIOS DE EFICACIA ESCOLAR Y FACTORES ASOCIADOS A LA MISMA  
 Luis López  
 09:50 EDUCACIÓN BASADA EN LA EVIDENCIA: RETOS Y PROPUESTAS DE MEJORA  
 Marta Ferrero  
 10:30 LAS PRIMERAS MANIFESTACIONES DE LAS FUNCIONES EJECUTIVAS Y LA ACCIÓN EDUCATIVA EN EL AULA 0-3: IMPLICACIONES PARA LA EDUCACIÓN INFANTIL  
 Cintia Rodríguez  
 11:00 DESCANSO  
 11:20 LA ADQUISICIÓN DE LA LECTURA DESDE LA EVIDENCIA CIENTÍFICA: UNA HOJA DE RUTA PARA EDUCADORES  
 Joana Acha  
 11:50 EL ERROR COMO OCASIÓN DE APRENDIZAJE  
 Góngora Lavi  
 12:30 COLOQUIO

COLABORA Euzko Herriko Unibertsitatea Kultura Zientifikoko Katedra Cátedra Cultura Científica



# LAS PRUEBAS DE LA EDUCACIÓN

17 DE MARZO BIZKAIA ARETOA BILBAO

09:00 ENTRADA  
 09:30 PRESENTACIÓN  
 09:30 ESTUDIO DE EFICACIA ESCOLAR EN EL PAÍS VASCO  
 Benito Gómez y Luis López  
 10:00 LA CIENCIA PENSADA: LOS PRODIGOS CASOS DE LOS PROTOCOLOS DE TRAM Y DE LEE-LES  
 Juan Cruz Rodríguez  
 10:30 DEL MITO AL HECHO: HEMISPESOS, GIMNASIA CEREBRAL Y ESTILOS DE APRENDIZAJE  
 Albert Rovitell  
 11:00 DESCANSO  
 11:30 LAS IDEAS ERRÓNEAS SOBRE EDUCACIÓN ENTRE EL PROFESORADO: PREVALENCIA, CAUSAS Y SOLUCIONES  
 Marta Ferrero  
 11:50 A FAVOR DE LA EVALUACIÓN ESCOLAR OBJETIVA  
 Góngora Lavi  
 12:30 COLOQUIO

COLABORA EduCaixa Universidad del País Vasco Euzko Herriko Unibertsitatea Kultura Zientifikoko Katedra Cátedra Cultura Científica Fundación PROMAESTRO

EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN  
 Iniciativas en marcha



Español / English

Buscar



La Fundación

Ciencia para todos

Participa

Investigadores

Inicio » Ciencia para todos » Educación científica » Educación guiada por la evidencia

Inicio

Cultura científica

Educación científica

Unidades de cultura científica

Estudios e informes

## Educación guiada por la evidencia

**EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN**  
Iniciativas en marcha

Explora [Formación de profesores](#), [Evaluación de competencias](#), [Revolución educativa](#), [Programa educativo](#), [Evidencias educativas](#), [Todas las etiquetas](#)

¿Qué te gustaría descubrir hoy?

EduCaixa > Evidencias > Listado evidencias

### Repositorio de evidencias educativas

Evidencias educativas resumidas

### Education Endowment Foundation



La Plataforma de Prácticas Educativas Efectivas es una herramienta en línea que sintetiza la evidencia académica de alta calidad de nivel internacional. Con esta plataforma queremos ayudar a docentes y equipos directivos a promover la toma de decisiones fundamentadas y el uso de las evidencias educativas como un elemento clave para el progreso pedagógico y la mejora de la calidad educativa.

Ordena por: **Fecha más reciente**

Borrar todos los filtros

Buscar por palabra clave



Evidencia

### Ampliación del tiempo lectivo

Coste 0 5 10 | Eficacia 0 5 10 | Impacto + 2 meses

Ver



Evidencia

### Aprendizaje colaborativo

Coste 0 5 10 | Eficacia 0 5 10 | Impacto + 5 meses

Ver



Evidencia

### Intervenciones en la expresión oral

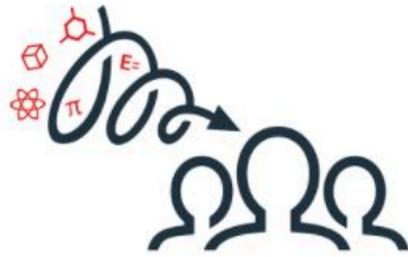
Coste 0 5 10 | Eficacia 0 5 10 | Impacto + 5 meses

Ver

**EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN**  
Iniciativas en marcha

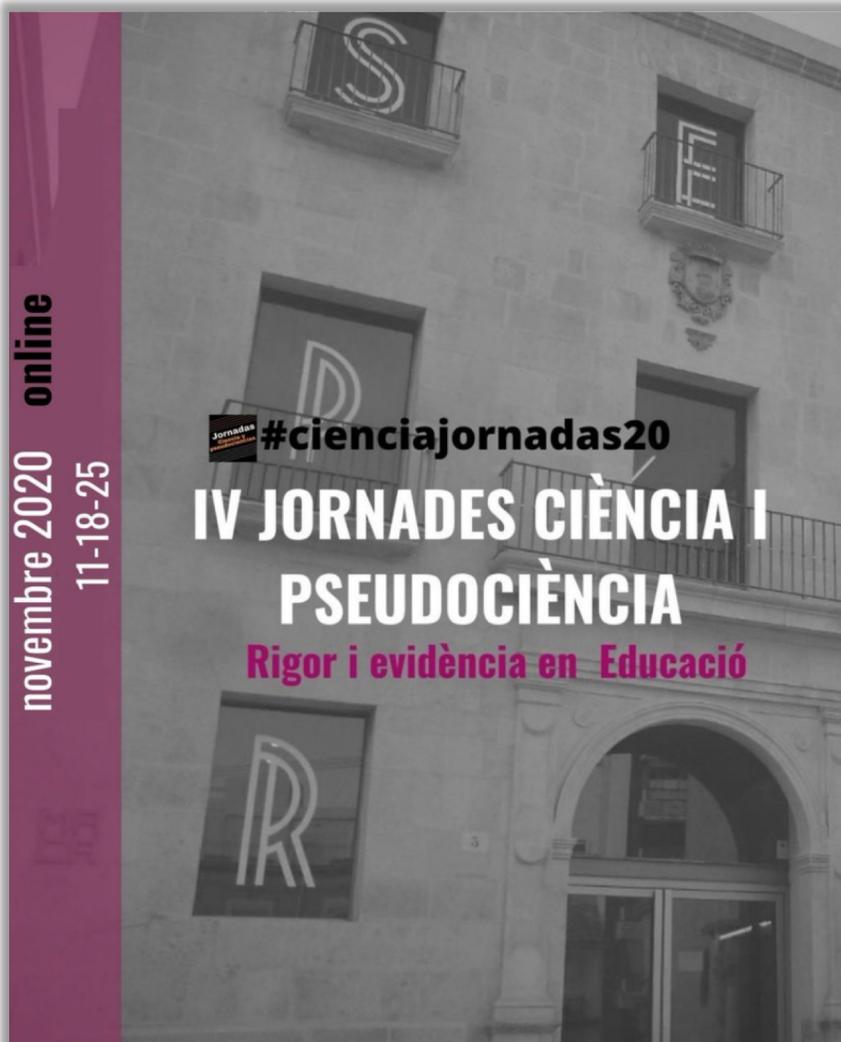


**EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN**  
Iniciativas en marcha



#CienciaLaRioja20

**SEMANA ONLINE  
DE LA CIENCIA  
Y LA INNOVACIÓN**



novembre 2020 online  
11-18-25

**#cienciajornadas20**

**IV JORNADES CIÈNCIA I  
PSEUDOCIÈNCIA**

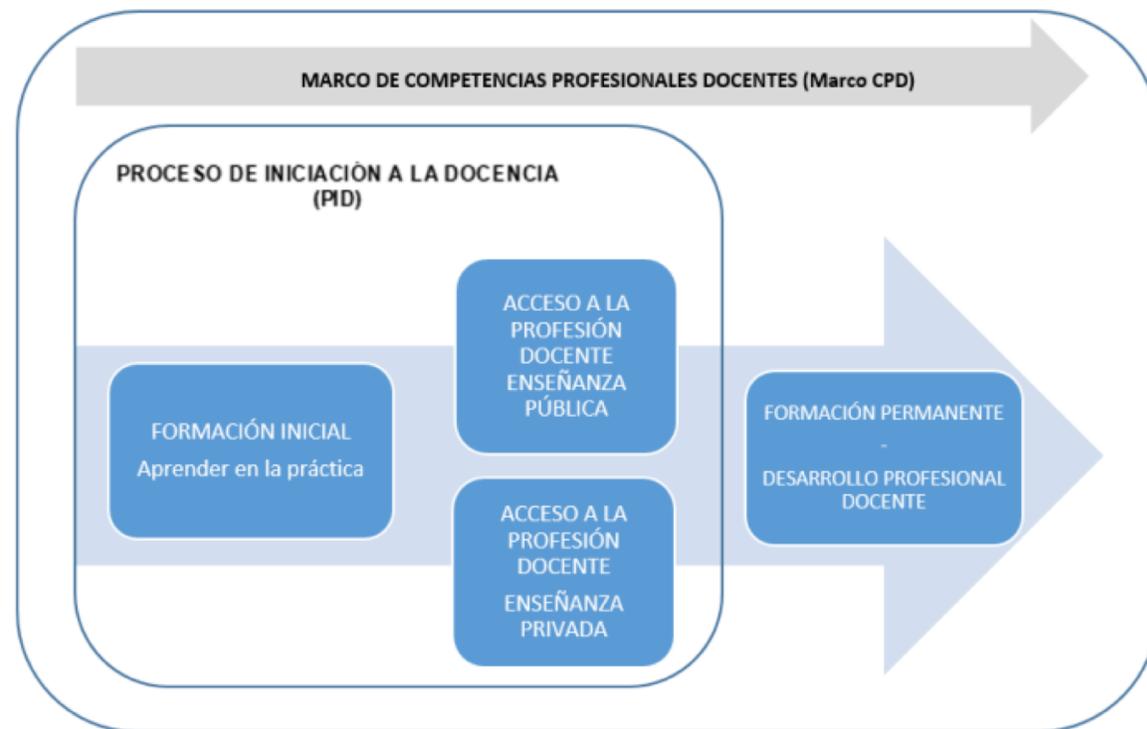
Rigor i evidència en Educació

**EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN**  
Iniciativas en marcha

## Documento para debate

24 propuestas de reforma para la mejora de la profesión docente

Enero 2022



**EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN**  
Iniciativas en marcha

■ Programas de Cooperación Territorial

▣ Agrupaciones de centros educativos

▣ **Agrupaciones de centros educativos 2022**

▣ Agrupaciones de centros educativos 2021

■ Federación Española de Municipios y Provincias

## Agrupaciones de centros educativos

Volver

Agrupaciones de centros educativos 2022

Agrupaciones de centros educativos 2021

### Próxima convocatoria de ayudas destinada a promover agrupaciones de centros educativos para la realización y puesta en práctica de proyectos comunes que favorezcan la educación inclusiva y la innovación educativa



El programa promueve la creación de agrupaciones de centros educativos, todos ellos de diferentes comunidades o ciudades autónomas, mediante la realización y puesta en práctica de proyectos comunes que favorezcan la educación inclusiva y la innovación educativa. Se desarrollará durante los cursos escolares 2022-2023 y 2023-2024.

Pretende potenciar la equidad y la inclusión educativa, reducir la segregación escolar, fomentar iniciativas de innovación e investigación, consolidar redes educativas de colaboración, contribuir al desarrollo de las competencias clave para el aprendizaje permanente, desarrollar la capacidad de trabajar en equipo, formar a los estudiantes en entornos digitales y virtuales de aprendizaje, así como abrir los sistemas educativos al exterior, todo ello en aras de una mejora en la calidad de la educación.

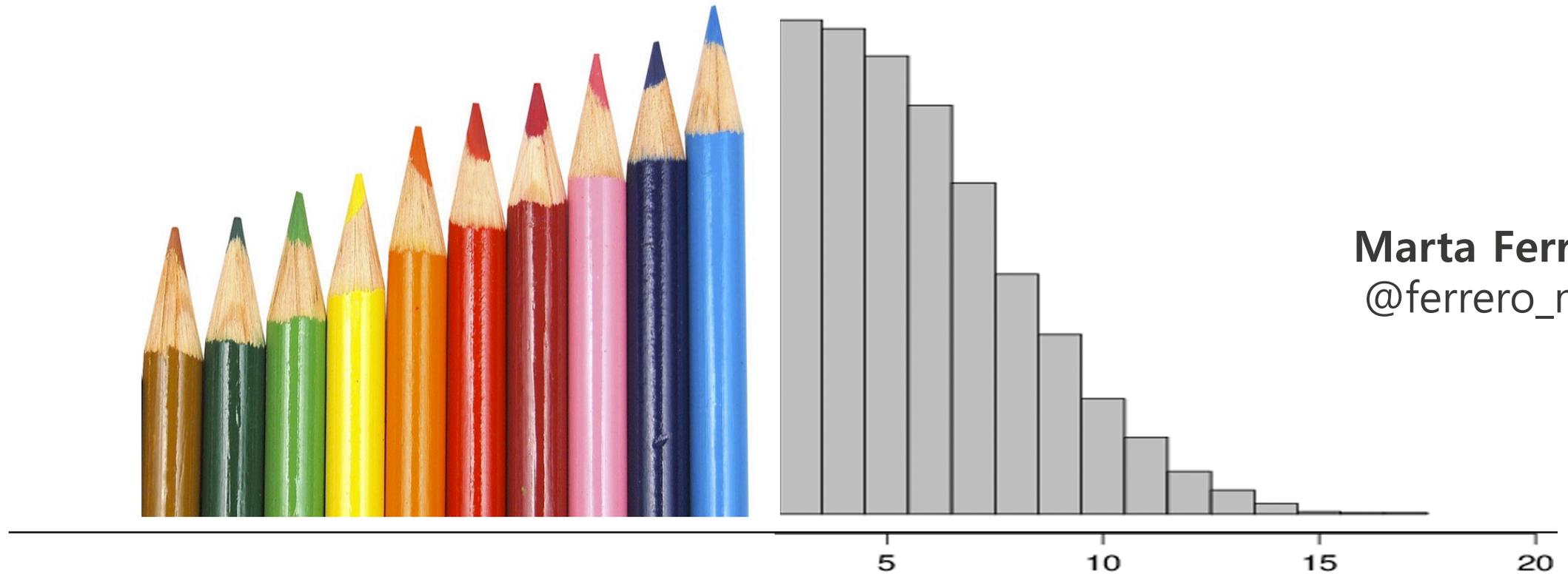
Para su realización se contará con una dotación presupuestaria de al menos 1.763.284,62 euros, destinados de forma exclusiva a los centros educativos.

Esta Subdirección General, órgano instructor del procedimiento de las ayudas, ha habilitado un entorno de colaboración con un doble objetivo. Por un lado, poner en contacto a los centros educativos entre sí para consensuar intereses comunes y, por otro, ser una plataforma de encuentro de los centros con las universidades y otras entidades del ámbito de la investigación que deseen participar, contribuyendo así a la validación científica de los proyectos que se presenten y a la innovación educativa, participativa y basada en el conocimiento.

**EDUCACIÓN INFORMADA DESDE LA INVESTIGACIÓN**  
Iniciativas en marcha

**Gràcies**

# Trazando puentes entre la **práctica educativa** y la **investigación**: Retos y oportunidades



Marta Ferrero  
@ferrero\_mar



**Irie**  
UIB - GOIB

Institut de Recerca  
i Innovació Educativa



**Universitat**  
de les Illes Balears