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No.	TITLE OF THE MATERIAL	AUTHOR(S)	COUNTRY	LANGUAGE	LINK (IF APPLICABLE)	OTHER BIBLIOGRAPHY DATA	TERMS OF USE*	DESCRIPTION OF CONTENTS
1.	Computational Thinking	Motoa, Sandra Patricia	Colombia	Spanish	https://dialnet.unirioja.es/servlet/articulo?codigo=7178254	Revista de educación y pensamiento, ISSN 1692-2697, Nº. 26, 2019 (Ejemplar dedicado a: REVISTA EDUCACIÓN Y PENSAMIENTO V26), págs. 107-111	Free	The need to be simple consumers of technology to be producers of technology, It is a big challenge of the current educational system; the development of computational thinking responds to this need, it enhances competences and skills in students, allowing the development of critical and creative thinking to solve problems in the real context making use of computer concepts, applicable even to other fields, thus developing a competent citizen to take on the technological challenges of today's society; the leading countries in technology have been developing enormous efforts in this sense, including computational thinking in their curricula; Colombia is taking the first steps from the MEN, therefore, the challenge is to efficiently adapt the computational thinking to the curricula, what is involved in evaluating pedagogical practices with the aim of designing teaching strategies, that promote skills in computational thinking aimed at future generations as producers of technology in our society.
2.	Computational Thinking in Primary education: a systematic revision.	Ortuño-Meseguer, Gema; Serrano-Sánchez, José Luis	Spain	Spanish	https://dialnet.unirioja.es/servlet/articulo?codigo=7832723	La tecnología como eje del cambio metodológico / coord. por Ernesto Colomo Magaña, Enrique Sánchez Rivas, Julio Ruiz Palmero, José Sánchez Rodríguez, 2020, ISBN 978-84-1335-052-3, págs. 1188-1191	Free	Systematic revision on computational thinking experiments in Primary education, its results and challenges.

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3.	Computational Thinking: analysis of a key competence	Zapata-Ros, Miguel; pérez Paredes, Pascual	Spain	Spanish	https://www.amazon.es/pensamiento-computacional-analisis-competenciaclave/dp/1718987730/ref=sr_1_1	Pérez-Paredes, P. & Zapata-Ros, M. (2018). El pensamiento computacional, análisis de una competencia clave. Scotts Valley, CA, USA: Createspace Independent Publishing Platform. P.63. .	Book	Reference manual on Computational Thinking for education at every level. * Both authors have kept publishing about Computational Thinking on education successfully.
4.	Computational Thinking Unplugged	Zapata-Ros, Miguel	Spain	Spanish	https://dialnet.unirioja.es/servlet/articulo?codigo=7077359	Education in the knowledge society (EKS), ISSN-e 2444-8729, ISSN 1138-9737, Nº. 20, 2019	Free	The idea of computational thinking unplugged refers to a set of activities that are developed to encourage children skills that can be recalled later, to promote computational thinking. These activities are designed to be included in the early stages of cognitive development (early childhood education, the first stage of primary education, games at home with parents and friends, etc.). The skills are designed so that they can be evoked in other stages. In secondary education, in technical training, in professional or even higher education. The activities are usually done without computers and mobile screens, with cards, cards, classroom games or playground games, mechanical toys, etc. In this paper, it is highlighted that there is a series of data, ideas and circumstances that make it possible now, and not before, that unplugged computational thinking is implemented. Finally, we describe activities, initiatives and experiences that are already being developed, and we make proposals for activities and their guides for preschool teachers and caregivers.

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No.	TITLE OF THE MATERIAL	AUTHOR(S)	COUNTRY	LANGUAGE	LINK (IF APPLICABLE)	OTHER BIBLIOGRAPHY DATA	TERMS OF USE*	DESCRIPTION OF CONTENTS
5.	Computational thinking and problem resolution	Ortega Ruipérez, Beatriz	Spain	Spanish	https://repositorio.uam.es/handle/10486/683810	Ortega Ruipérez, Beatriz (2018). *Pensamiento Computacional y resolucion de problemas*. Universidad Autónoma de Madrid.	Free	PhD on Psychology about the Computational Thinking approach for complex problem solution in an educational context. * She has kept working on the field successfully
6.	Computational Thinking on initial teacher training for Preschool and Primary Education	Adell, Jordi; Esteve, Francesc; Llopis, Mº Ángeles; Valdeolivas, Gracia.	Spain	Spanish	https://www.researchgate.net/publication/322580788_El_pensamiento_computacional_en_la_formacion_inicial_del_profesorado_de_Infantil_y_Primaria	Conference: XXV Jornadas Universitarias de Tecnología Educativa (JUTE)	Free	Discussion on Computational Thinking didactics, its development and evaluation
7.	TRACK methodology for teacher training on computational education	Sánchez Rivas, Enrique; Ruiz-Roso Vázquez, Coral	Spain	Spanish	https://dialnet.unirioja.es/servlet/articulo?codigo=7787814	Tecnologías educativas y estrategias didácticas / coord. por Enrique Sánchez Rivas, Ernesto Colomo Magaña, Julio Ruiz Palmero, José Sánchez Rodríguez, 2020, ISBN 978-84-1335-063-9, págs. 810-817	Free	Design of a virtual continuous teacher training activity based on TRACK model.
8.	Computational Thinking and constructivism from intercultural contexts	Terceros, Ivan	Ecuador	Spanish	https://studiahumanitatis.eu/ojs/index.php/analysis/article/view/67/59	ANALYSIS 22 (2019),121–125|© UNIVERSIDAD TÉCNICA PARTICULAR DE LOJA 2019	Free	Programming languages experience on educational environments for intercultural context promotion.

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9.	Computational Thinking and Artificial Intelligence School project	Education and VET Ministry	Spain	Spanish	https://intef.es/tecnologia-educativa/pensamiento-computacional/.	-	Free	The Computational Thinking and Artificial Intelligence School is an Education and VET Ministry´s project carried out together with the Education Departments of Spain´s Autonomous Communities. The School´s aim is to offer open educative courses and training that help Spanish teachers to add these skills to their pedagogical approach by the incorporation of programming and robotics related activities.
10.	CS Unplugged	University of Cambridge, Google, Microsoft	UK	EN, DE, ES, maorí, CH	https://www.csunplugged.org/es/	-	Free	CS Unplugged is a collection of free teaching material that teaches Computer Science through engaging games and puzzles that use cards, string, crayons and lots of running around.
11.	Computational Thinking Digital Notebooks	University of La Laguna	Spain	Spanish	https://campusvirtual.ull.es/ocw/course/view.php?id=153	-	Free	This material has been elaborated to raise awareness about Computational Thinking among the pre-university students, as it has not been included on their Educational Curriculum. The aim of the project is to promote Computational Thinking with activities that allows its development, specially on girls.
12.	Introduction to Computational Thinking for every education	ISTE.	USA	English, Spanish	https://www.iste.org/professional-development/iste-u/computational-thinking	-	Free	Developed with support from Google, Introduction to Computational Thinking for Every Educator unpacks how CT can be integrated throughout subject areas and grade levels. Through this course, you'll increase your awareness of CT, experiment with CT-integrated activities for the subject areas you teach, and create a plan to incorporate CT into your curricula. This is a 15-hour, self-paced course with ongoing instructor support
13.	Digital Technologies Hub	Education Service Australia	Australia	English	https://www.digitaltechnologieshub.edu.au	-	Free	Resources to help teachers, students and families learn about Digital Technologies.

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14.	Computational Thinking Lessons	This work was funded by the Paul G. Allen Family Foundation and Green Dot Public Schools.	USA	English	https://www.ctlessons.org/		Free	Computational thinking means solving hard problems of all kinds using ideas from computer science. These include algorithmic thinking, decomposition, pattern recognition and abstraction, as well as confidence in the face of ambiguity and tenacity to persist through challenges requiring iteration and experimentation. My computational thinking curriculum is freely provided here for you to incorporate within your own classrooms. You'll find lessons divided into disciplines along the top of this and every other page. With these lessons and projects, I hope you will encourage your students to grow and flourish as computational thinkers, ready to face the real-world challenges of their generation!
15.	Computational Thinking in Humanities	Copyright © 2018 Rob-Bot Resources. All Rights Reserved.	Online	English	https://robbotresources.com/blog/2019/6/3/computational-thinking-in-humanities		Cost	Although computational thinking begun as a problem solving technique used specifically within computer science, educators across the world are quickly realising its potential in a whole range of diverse subjects. Within this blog post I thought I would share some practical applications of the use of computational thinking within humanities subjects such as History, Geography and Philosophy & Religious Education ... subjects you may not instantly associate with logical thinking!
16.	Computer Science, Computational Thinking and Educational Robotics	Aris Paliouras	Online	Greek	https://www.alfavita.gr/ekpaideysi/185191_i-ypologistiki-epistimi-i-ypologistiki-skepsi-kai-i-ekpaideytiki-rompotiki		Free	This is an article for disseminating CT in Greek public

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17.	The 5th 'C' of 21st Century Skills? Try Computational Thinking (Not Coding)	Shuchi Grover	Online	English	https://www.edsurge.com/news/2018-02-25-the-5th-c-of-21st-century-skills-try-computational-thinking-not-coding		Free	Simply put, CT is "thinking (or problem solving) like a computer scientist." It is the thought processes involved in understanding a problem and expressing its solutions in such a way that a computer can potentially carry out the solution. CT is fundamentally about using analytic and algorithmic concepts and strategies most closely related to computer science to formulate, analyze and solve problems.
18.	Promoting computational thinking of both sciences- and humanities-oriented students: an instructional and motivational design perspective	Zoltan Katai	USA	English	https://link.springer.com/article/10.1007/s11423-020-09766-5		Free	A scientific paper about designing an course on CT topic
19.	Computational Thinking Across the Curriculum	Eli Sheldon	USA	English	https://www.edutopia.org/blog/computational-thinking-across-the-curriculum-eli-sheldon		Free	Four of the skills used to solve computer science problems can be applied in other classes as well.
20.	Introduction to Computational Thinking for Every Educator	Mike Karlin, Ph.D. & Heidi Williams	USA	English	https://www.iste.org/professional-development/iste-u/computational-thinking		75$	This is a 15-hour, self-paced course with ongoing instructor support.

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21.	CodeIt	Erasmus_ project Consortium	Greece	English/Greek	https://www.codeit-project.eu/el/application-of-computational-thinking-in-educational-practice/		Free	Training material for teachers, Handbook for teachers
22.	Bebras in Greece	Bebras Support team	Greece	Greek	shorturl.at/dxILR		Free	Computational Thinking preparatory courses
23.	Computational Thinking for Problem Solving	Susan Davidson	USA	English	https://www.coursera.org/learn/computational-thinking-problem-solving		Free	Online courses on coursera.org that leads to certification on successful exams
24.	Introduction to Computational Thinking	Tim "Dr. T" Chamillard	USA	English	shorturl.at/mozJ6		14,99$	Online courses on udemy.com that leads to certification on successful exams

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25.	The Nordic approach to introducing computational thinking and programming in compulsory education	Bocconi, S., Chioccariello, A. and Earp, J.	International initiative	ENG		Published in January 2018, Available at: http://www.itd.cnr.it/doc/CompuThinkNordic.pdf.	Creative Commons Attribution 4.0 International License (CC BY 4.0)	This report is an inspiring contribution to our understanding of computational thinking, providing a wealth of detail on its place in Nordic curricula as well as on its essential accompaniment: well-prepared teachers, pedagogically competent in both algorithmic thinking and programming (Marc Durando).
26.	Scratch and computational thinking: a computer programming initiative in a girls primary school	Claire Carroll and Aisling Leavy	Ireland	ENG		October 11th and 12th, 2019	*Not specified*	The aim of this research is to assess what benefits, particularly in relation to computational thinking, can be gained from the use of a visual programming language, Scratch, in a girls primary school.
27.	Computational Thinking in Secondary Education: Where does it fit? A systematic literary review	James Lockwood Aidan Mooney	Ireland	ENG		International Journal of Computer Science Education in Schools, Jan 2018, Vol. 2, No. 1	Open Access	The aim of this systematic literary review is to give second-level educators ideas and options on how to incorporate Computational Thinking into their classrooms. Secondly, we aim to give education researchers an overview of what work has been done to include Computational Thinking in educational process.
28.	Promoting computational thinking through project-based learning	Namsoo Shin, Jonathan Bowers, Joseph Krajcik, Daniel Demelin	USA	ENG		Published: 02 August 2021	Open Access	This paper introduces project-based learning (PBL) features for developing technological, curricular, and pedagogical supports to engage students in computational thinking (CT) through modeling.

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29.	Computational Thinking for Youth and Adults Education: Towards a Socially Aware Model	Júlia dos Santos Bathke Ortiz, Roberto Pereira	Spain	ENG		IX Congresso Brasileiro de Informática na Educação (CBIE 2020). Anais dos Workshops do IX Congresso Brasileiro de Informática na Educação (WCBIE 2020) DOI: 10.5753/	Open Access	This research investigates Computational Thinking as a way to promote digital literacy and proposes a model to plan and conduct initiatives for YAE (Youth and Adults Education).
30.	Integrating Computational Thinking into Swedish Compulsory Education with Block-Based Programming	Lechen Zhang	Sweden	EN G		DSV Report Series No. 20-014, Stockholm University, 2020	Open Access	This dissertation is dedicated to investigating the integration process of Computational Thinking and programming into Swedish compulsory education from the perspective of teachers. More specifically, it scrutinizes two essential aspects of integration: the CT skills that are taught and assessed by the teachers using a BBPL block-based programming languages, and the teachers' CT competence.
31.	Computational Thinking for Youth	Walt Allan, Bob Coulter, Jill Denner, Jeri Erickson, Irene Lee, Joyce Malyn-Smith, Fred Martin	USA	ENG		The ITEST Small Group on Computational Thinking White Paper Working Group	Open Access	This paper addresses two essential two questions: What does computational thinking for youth look like in practice? How can educators support growth in computational thinking? The authors focus on describing how computational thinking ideas have value for pre-college youth, in and out of school.
32.	Going beyond digital literacy to develop computational thinking in K-12 education,	Divya Menon, Sowmya Bp, Margarida Romero, Thierry Viéville	France	ENG		Smart Pedagogy of Digital Learning, Taylor&Francis (Routledge), 2019	Open Access	This chapter will provide a literature review on studies conducted to teach computer programming and computational concepts to K-12 students using visual programming tools, unplugged activities and educational robotics while evaluating how it can also help improve CT skills.

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33.	Computational thinking education: Issues and challenges	Charoula Angeli, University of Cyprus Michail Giannakos, Norwegian University of Science and Technology	Cyprus	English	https://www.researchgate.net/publication/336992874_Computational_thinking_education_Issues_and_challenges	November 2019, Computers in Human Behaviour 105:106185 DOI:10.1016/j.chb.2019.106185	Free	Computational Thinking is a term applied to describe the increasing attention on students' knowledge development about designing computational solutions to problems, algorithmic thinking, and coding. It focuses on skills children develop from practicing programming and algorithms, and enables the development of qualities such as abstract thinking, problem solving, pattern recognition, and logical reasoning
34.	Development of computational thinking, digital competence and 21st century skills when learning programming in K-9	Jalal Nouri, Lechen Zhang,Linda Mannila, Eva Norén	Sweden	English	https://www.tandfonline.com/doi/epub/10.1080/20004508.2019.1627844?needAccess=true	EDUCATION INQUIRY 2020, VOL. 11, NO. 1, 1-17 https://doi.org/10.1080/20004508.2019.1627844	Free	Teachers around the world have started teaching programming at the K-9 level, some due to the formal introduction of programming in the national curriculum, others without such pressure and on their own initiative. In this study, we attempted to understand which skills – both CT-related and general – are developed among pupils in the process of working with programming in schools.
35.	The Present and Future of Computational Thinking	O Astrachan, S Hambrusch, J Peckham, A Settle	USA	English	https://scholar.google.bg/scholar?q=The+Present+and+Future+of+Computational+Thinking&hl=bg&as_sdt=0&as_vis=1&oi=scholart	SIGCSE'09, March 3–7, 2009, Chattanooga, Tennessee, USA. ACM 978-1-60558-183-5/09/03. Einstein, A., B. Podolsky, and N. Rosen, 1935, "Can quantum-mechanical description of physical reality be considered complete?", Phys. Rev. 47, 777-780.	Free	Intellectual constructs and tools that are widely used to solve the problems of society have been woven into educational programs. For example, the three R's (reading, writing & arithmetic) are core to a strong fundamental education, and practitioners and researchers routinely apply these tools to their daily work. Computing has become an essential and pervasive problem solving toolset. This development has fostered much discussion about the role of computing in a modern education, the broadening nature of computing majors and concentrations and their place in post-secondary institutions.

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36.	Computational Thinking: A Digital Age Skill for Everyone	D Barr, J Harrison, L Conery Leslie	USA	English	https://scholar.google.bg/scholar?hl=bg&as_sdt=0%2C5&as_vis=1&q=Computational+Thinking%3A+A+Digital+Age&btnG=	Learning & Leading with Technology, v38 n6 p20-23 Mar-Apr 2011	Free	In a seminal article published in 2006, Jeanette Wing described computational thinking (CT) as a way of "solving problems, designing systems, and understanding human behavior by drawing on the concepts fundamental to computer science." Wing's article gave rise to an often controversial discussion and debate among computer scientists, cognitive researchers, and educators regarding the nature, definition, and application of CT. In 2009, the National Science Foundation (NSF) funded a project titled Leveraging Thought Leadership for Computational Thinking in PK-12. Led jointly by ISTE and the Computer Science Teachers Association (CSTA), the project is intended to make the concepts of computational thinking accessible to educators by providing an operational definition, a shared vocabulary, and relevant, age-appropriate examples of computational thinking tied to current educational objectives and classroom practices.
37.	On Computational Thinking and STEM Education	Yeping Li ,Alan H. Schoenfeld , Andrea A. ,C. Graesser , Lisa C. Benson ,Lyn D. English , Richard A. Duschl	Switzerland	English	https://link.springer.com/article/10.1007/s41979-020-00044-w	Journal for STEM Education Research volume 3, pages s147–166 (2020)	Free	The recognized importance of computational thinking has helped to propel the rapid development of related educational efforts and programs over the past decade. Given the multi-faceted nature of computational thinking, which goes beyond programming and computer science, however, approaches and practices for developing students' computational thinking are not always self-explanatory in terms of their foci and feasibility in diverse educational contexts. In this editorial, we first examine relevant publications in computational thinking to identify a trend of integrating computational thinking into disciplinary education. We subsequently build on recent discussions about the concept of computational thinking to frame a review of educational efforts in developing students' computational thinking, discuss opportunities and challenges to further such educational efforts through not only programming and computer science but also other disciplines, and articulate needed research and scholarship to support educational

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38.	Computational thinking: the developing definition	C Selby, J Woollard	UK	English	https://scholar.google.bg/scholar?hl=bg&as_sdt=0%2C5&as_vis=1&q=Computational+Thinking%3A+The+Developing+Definition&btnG=	https://eprints.soton.ac.uk/356481/1/Selby_Woollard_bg_soton_eprints.pdf	Free	Since Jeanette Wing's use of the term computational thinking in 2006, various discussions have arisen seeking a robust definition of the phrase. With little consensus having been found in the intervening years, there are even suggestions that a definition is not important. Perhaps focus should be on how computational thinking is taught and how its acquisition might be observed. However, in order to facilitate consistent curriculum design and appropriate assessment, it is argued that a definition should still be sought.
39.	Computational Thinking Education	Siu-Cheung Kong, Harold Abelson	Singapore	English	https://link.springer.com/book/10.1007/978-981-13-6528-7	ISBN 978-981-13-6527-0 ISBN 978-981-13-6528-7 (eBook) https://doi.org/10.1007/978-981-13-6528-7	Free/ book	Over the past few decades, Computational Thinking (CT) has gained widespread attention and been regarded as one of the essential skills required by those growing up in the digital era. To nurture the next generation to become creative problem-solvers, there is a growing need to implement CT education into the school curriculum. This book is an edited volume with a specific focus on CT education. The chapters were contributed by a group of world-renowned scholars and researchers, who pioneer research on CT education. To enable readers with various interests to advance their knowledge in this fresh yet important field, this book covers sub-themes that will be of interest to academics and educators, school teachers, policymakers and other readers. The sub-themes include CT and tool development, student competency and assessment, CT and programming education in K-12, CT in K-12 STEM education and non-formal learning, teacher and mentor development in K-12 education, and CT in educational policy and implementation. School teachers will be particularly interested in chapters in K-12 and K-12 STEM education; educators and academics will be interested in chapters in CT and tool development, student competency and assessment, and teacher and mentor development; policymakers will be particularly interested in chapters in policy and implementation; and readers, in general, will be interested in chapters in all sub-themes.

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40.	Computational Thinking and Educational Technology: A Scoping Review of the Literature	Jesús Acevedo-Borrega , Jesús Valverde-Berrocoso and María del Carmen Garrido-Arroyo	Spain	English	https://www.mdpi.com/journal/education	Educ. Sci. 2022, 12, 39. https://doi.org/10.3390/educsci12010039	Free	Interest in computational thinking (CT) in the scientific community has increased significantly in the last 4 years, as evidenced by the numerous systematic reviews carried out. However, there is a lack of reviews that update the emerging conceptualization of CT and which also examine the roles of the school curriculum and teachers in the face of CT. A systematic literature review (SLR) consists of a collection of research conducted according to previous criteria with the aim of answering research questions with validity and quality. For this reason, the PRISMA-ScR statement was followed. Articles published in scientific journals, from Scopus and WoS, between January 2018 and August 2021 were included, in the English or Spanish language. The initial search resulted in 492 articles, to which the inclusion-exclusion criteria were applied. The final sample of texts for the present systematic review was n = 145. The texts were analyzed from three perspectives: conceptual, documentary and pedagogical. Thus, a renewal of previous literature reviews was carried out, updating the situation with research from recent years and new data, obtained to contribute to the collective intelligence on methodological strategies (80% of the sample was divided into “plugged” and “unplugged”); educational (more than 50% studied CT evaluation); and resources, including a collection of more than 119 educational resources.

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41.	Education in the Pandemic & the Potential for Computational Thinking	Jena Barchas-Lichtenstein, Joanna Laursen Brucker, Kathryn Nock, Rupu Gupta, & Kate Flinner	USA	English	https://www.datocms-assets.com/15254/1601924291-ct-pandemic-white-paperinfact2020-10-05.pdf	Knology Publication # EDU.051.602.01	Free	Research can help school administrators and educators navigate the complex topics involved in education. Key research areas include tracking school district and state policies related to the pandemic;4 COVID-19 transmission among children;5 the unequitable obstacles faced by low-income students and families, especially Latin and Black families; 6 and the disproportionate negative impact of distance learning on special education students.7 Overall, researchers largely agree that student engagement and massively unequal access to online education present two of the overarching barriers when planning for the continuation of education under COVID-19.
42.	Employing Computational Thinking in General Teacher Education	Stefan SEEGERER* , Ralf ROMEIKE	Germany	English	https://computingeducation.de/pub/2019_Seegerer-Romeike_CTE19.pdf	Kong, S.C., Andone, D., Biswas, G., Hoppe, H.U., Hsu, T.C., Huang, R.H., Kuo, B.C., Li, K.Y., Looi, C.K., Milrad, M., Sheldon, J., Shih, J.L., Sin, K.F., Song, K.S., & Vahrenhold, J. (Eds.). (2019). Proceedings of International Conference on Computational Thinking Education 2019. Hong Kong: The Education University of Hong Kong.	Free	The current political discussion about the digital transformation in Germany's educational context is primarily concerned with the use of digital media in schools. However, all disciplines and their related school subjects are significantly affected by digitalization – as can be seen e.g. with the effects of simulation or data analysis. This results in new topics, methods or strategies that schools must also deal with in the future. In consequence, teachers of any subject require Computational Thinking competencies and Computer Science knowledge, not only for the efficient and effective use of digital technology but also to understand and apply the new topics, methods, and approaches. In this paper, the design and implementation of a new course for teacher education in Germany is presented. With a theme revolving around digital transformation, this course aims at preparing pre-service teachers for teaching in the 21st century. Design principles and content selection are based on an analysis of similar courses and requirements arising from digitalization and its effect on the disciplines. First results show that students have gained a clearer understanding of how digitalization influences their subjects and teaching in general. Additionally, they report feeling more confident in employing aspects of digital education.

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43.	Computational thinking is more about humans than computers	TIM BELL,JOSIE ROBERTS	New Zealand	English	https://www.nzcer.org.nz/system/files/journals/set/downloads/2016_1_003.pdf	DOI: http://dx.doi.org/10.18296/set.0030 Journal issue: set 2016: no. 1	Free	Set interviews computer scientist Professor Tim Bell to figure out how computational thinking differs from digital literacy, and why both might be important for today's society. Tim explains his mission to introduce teachers and students to computational thinking, even without a computer in sight. His work with schools—from junior primary to senior secondary—shows that computational thinking augments a range of learning areas and competencies.

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