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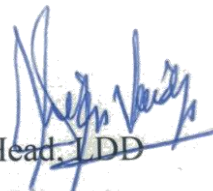
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The Library and Documentation Division (LDD) of NIE, NCERT is pleased to bring out “**Indexing & Abstracting Service of Periodicals**” for the month of **January, 2023**. This information product of LDD is the collection of Articles in the area of Educational Research, Elementary Education, Inclusive Education, ICT in Education, Educational Psychology, Science Education and Teacher Education.

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Title Index

AMERICAN JOURNAL OF PHYSICS

1. Roitberg, V., & Drory, A. (2022). Graphical analysis of an oscillator with constant magnitude sliding friction. *American Journal of Physics*, 90(12), 889–894. <https://doi.org/10.1119/5.0073812>

Abstract: We treat a horizontal oscillator damped by constant-magnitude sliding friction by extending the analogy between the simple harmonic motion of a mass on a spring and the uniform circular motion of a mass attached to the end of a string. In the presence of sliding friction, the motion of the mass on a spring becomes the horizontal projection of the path of a mass attached to a string winding around two nails separated by a well-defined distance; this path is a spiral consisting of connected semi-circles of diminishing radii. This graphical analysis is very simple and pedagogically useful. It can also be generalized to any oscillation affected by other forces of constant magnitude but not necessarily constant direction.

2. Storms, M. L., & Trees, B. R. (2022). Charging a supercapacitor through a lamp: A power-law RC decay. *American Journal of Physics*, 90(12), 895–902. <https://doi.org/10.1119/5.0065500>

Abstract: A circuit involving a charging supercapacitor in series with a non-Ohmic tungsten lamp displays a wealth of interesting behavior. Most notably, the current through the lamp decreases in time according to a power-law function as opposed to the exponential time dependence observed in RC circuits with Ohmic resistors. We use a combination of computational and analytical techniques to model this power-law behavior as well as the behavior of the filament's temperature and resistance as the supercapacitor charges. Our results agree well with experiment, and the experiment described here can be modified to be appropriate for physics courses at a wide range of levels.

3. Paulson, J. G., & Ray, M. W. (2022). Exploration of the Q factor for a parallel RLC circuit. *American Journal of Physics*, 90(12), 903–907. <https://doi.org/10.1119/5.0074843>

Abstract: An important property of oscillating systems like RLC circuits is the Q factor, which quantifies the strength of damping in the system. The Q factor is inversely proportional to the resistance for a series RLC circuit but increases with the resistance in a parallel RLC circuit. The surprising behavior of the parallel RLC circuit makes building and modeling this circuit an interesting project for a student laboratory. We describe an experiment that has been performed to explore this topic, share an example of the results that can be obtained, and suggest analyses that students might perform.

4. Deo, I., & Khare, K. (2022). A simple electronic circuit demonstrating Hopf bifurcation for an advanced undergraduate laboratory. *American Journal of Physics*, 90(12), 908–913. <https://doi.org/10.1119/5.0062969>

Abstract: A nonlinear electronic circuit comprising of three nodes with a feedback loop is analyzed. The system has two stable states, a uniform state and a sinusoidal oscillating state, and it transitions from one to another by means of a Hopf bifurcation.

The stability of this system is analyzed with nonlinear equations derived from a repressilator-like transistor circuit. The apparatus is simple and inexpensive, and the experiment demonstrates aspects of nonlinear dynamical systems in an advanced undergraduate laboratory setting.

5. Fardin, M. A., & Hautefeuille, M. (2022). The size of the Sun. *American Journal of Physics*, 90(12), 914–920. <https://doi.org/10.1119/5.0081964>

Abstract: Why does the Sun have a radius around 696 000 km? We will see in this article that dimensional arguments can be used to understand the size of the Sun and of a few other things along the way. These arguments are not new and can be found scattered in textbooks. They are presented here in a succinct way in order to better confront the kinematic and mechanical viewpoints on size. We derive and compare a number of expressions for the size of the Sun and relate large and small scales. We hope that such presentation will be useful to students, instructors, and researchers alike.

6. Wang, W. (2022). An introduction to the Markov chain Monte Carlo method. *American Journal of Physics*, 90(12), 921–934. <https://doi.org/10.1119/5.0122488>

Abstract: We present an intuitive, conceptual, and semi-rigorous introduction to the Markov Chain Monte Carlo method using a simple model of population dynamics and focusing on a few elementary distributions. We start from two states, then three states, and finally generalize to many states with both discrete and continuous distributions. Despite the mathematical simplicity, our examples include the essential concepts of the Markov Chain Monte Carlo method, including ergodicity, global balance and detailed balance, proposal or selection probability, acceptance probability, the underlying stochastic matrix, and error analysis. Our experience suggests that most senior undergraduate students in physics can follow these materials without much difficulty.

7. Aljalal, A. M. (2022). Speed of light measurement with a picosecond diode laser and a voltage-controlled oscillator. *American Journal of Physics*, 90(12), 935–939. <https://doi.org/10.1119/5.0104758>

Abstract: This work describes an experimental method for measuring the speed of light in air. It uses optical feedback from a visible picosecond diode laser operated below the threshold and a voltage-controlled oscillator to determine the time required for a pulse to travel a known distance. The experimental setup is compact, fitting into a space of $1 \times 0.5 \text{ m}^2$, and at the same time, can determine the speed of light with an uncertainty of 0.03%. The method does not require fast detectors or oscilloscopes.

8. Kuusela, T. A. (2022). Data transmission in a multimode optical fiber using a neural network. *American Journal of Physics*, 90(12), 940–947. <https://doi.org/10.1119/5.0102369>

Abstract: In digital data transmission, single mode optical fibers are commonly used since they can carry very short optical pulses without any significant distortions. In contrast, multimode fibers support many propagation modes that travel with different

speeds; thus, they cannot maintain the shape of a light pulse. This feature of multiple propagation modes can be a benefit since it makes possible the transmission of data through several channels simultaneously. We demonstrate how multimode fibers can be used to transmit images. Because of the different propagation constants of the modes, the transmitted image is scrambled to apparently random speckle patterns. A simple neural network can be used to model the transmission through the multimode fiber. We show how the neural network can be trained to recognize a set of patterns with high accuracy.

9. Mhaske, A. A., Bagchi, J., Joshi, B. C., Jacob, J., & K. T., P. (2022). A Bose horn antenna radio telescope (BHARAT) design for 21 cm hydrogen line experiments for radio astronomy teaching. *American Journal of Physics*, 90(12), 948–960. <https://doi.org/10.1119/5.0065381>

Abstract: We have designed a low-cost radio telescope system named the Bose Horn Antenna Radio Telescope (BHARAT) to detect the 21 cm hydrogen line emission from our Galaxy. The system is being used at the Radio Physics Laboratory (RPL) (Radio Physics Lab, IUCAA NCRA-TIFR, <<http://www.iucaa.in/~rpl/>>, <<http://www.ncra.tifr.res.in/ncra/rpl/>>), Inter-University Centre for Astronomy and Astrophysics (IUCAA), India, for laboratory sessions and training students and teachers. It is also a part of the laboratory curriculum at several universities and colleges. Here, we present the design of a highly efficient, easy to build, and cost-effective dual-mode conical horn used as a radio telescope and describe the calibration procedure. We also present some model observation data acquired using the telescope for facilitating easy incorporation of this experiment in the laboratory curriculum of undergraduate or post-graduate programs. We have named the antenna after *Acharya* (teacher or an influential mentor) Jagadish Chandra Bose, honoring a pioneer in radio-wave science and an outstanding teacher, who inspired several world renowned scientists.

BIOCHEMISTRY AND MOLECULAR BIOLOGY EDUCATION

1. Chen, Y., Ding, W., Xu, Y., Li, S., & Zhang, W. (2022). Exploratory application of an integrated topic-based curriculum in biochemistry experimental teaching. *Biochemistry and Molecular Biology Education*, 50(6), 561–570. <https://doi.org/10.1002/bmb.21564>

Abstract: Biochemistry, a complicated basic course in health sciences, plays a fundamental role in describing pathogenic mechanism of illness in molecular terms, and is required to be learned for all medical students. Due to various obstacles to biochemistry learning and teaching, there is a pressing issue of curriculum reform to arouse the student's enthusiasm in biochemistry learning. In this study, an integrated topic-based biochemistry training program (TBBTP) combining the traditional lectures, question-based learning and experimental practices, was introduced in biochemistry teaching. Its effectiveness was evaluated through examination and questionnaire analyses. Consequently, we found that TBBTP promoted the dissemination of biochemical knowledge via traditional lecture, designated learning issues and experimental practices, and acquisition of various skills through practical operation, presentation, and independent learning. It motivated students to study biochemistry with intense interest and enthusiasm. This study explored the feasibility of the topic-based biochemistry teaching as a supplement to biochemistry curriculum in medical education and as a mainstream pedagogy in biochemistry lab.

Keywords: Biochemistry, curriculum, experimental practices, topic-based teaching approach, traditional lectures.

2. Ren, G., Zeng, J., Guan, X., Zhuang, P., Zhang, P., Liu, Z., & Tian, K. (2022). Assessment of blended biochemistry classes based on massive open online courses and a “semi-flipped” learning environment. *Biochemistry and Molecular Biology Education*, 50(6), 571–579. <https://doi.org/10.1002/bmb.21660>

Abstract: Flipped classroom based on active learning is becoming an increasingly popular pedagogical method in higher education capable of increasing student performance in higher-order learning outcomes including application, analysis, evaluation, and creation. However, the success of a flipped classroom model relies on various supporting elements such as the accessibility of technology, and it may not be appropriate for all students and courses. In this study, a new blended biochemistry classroom model based on massive open online courses and a “semi-flipped” environment was applied to the students enrolled in three majors (stomatology, pharmacy, and preventive medicine) at Cheeloo College of Medicine, Shandong University, China. To assess the improvement of the students' perception of self-cognition in the blended biochemistry classes, surveys were conducted before and after undertaking the biochemistry course. Survey responses and total (final) score for the biochemistry course were analyzed using appropriate statistical methods. Compared to students who received traditional classroom instruction, students who participated in the blended classroom model achieved higher academic performance ($p < 0.01$) and reported a significant improvement in their perception of self-cognition ($p < 0.01$, or $p < 0.05$). More than 80% of participants preferred the blended classroom model to that of traditional classroom instruction.

Keywords: Biochemistry, blended class, MOOC, semi-flipped

3. Johnson, K. C., Sabel, J. L., Cole, J., Pruett, C. L., Plymale, R., & Reyna, N. S. (2022). From genetics to biotechnology: Synthetic biology as a flexible course-embedded research experience. *Biochemistry and Molecular Biology Education*, 50(6), 580–591. <https://doi.org/10.1002/bmb.21662>

Abstract: The need for changing how science is taught and the expansion of undergraduate research experiences is essential to foster critical thinking in the Natural Sciences. Most faculty research programs only involve a small number of upper-level undergraduate students each semester. The course-based undergraduate research experience (CURE) model enables more students to take ownership over an independent project and experience authentic research. Further, by creating projects that fit into a curriculum's learning goals and student-oriented outcomes, departments help strengthen critical thinking skills in the classroom. Here, we report on the incorporation of a synthetic biology CURE into a mid-level cellular biology course and two advanced level genetics/molecular biology courses. Synthetic biology involves systematic engineering of novel organisms, such as bacteria and plants, to work as functional devices to solve problems in medicine, agriculture, and manufacturing. The value of synthetic biology and its ultimate utility as a teaching tool relies on reusable, standard genetic parts that can be interchanged using common genetic engineering principles. This Synthetic biology CURE effectively achieves five essential goals: (1) a sense of project ownership; (2) self-efficacy: mastery of a manageable number of techniques; (3) increased tolerance for obstacles through challenging research; (4) increased communication skills; and (5) a sense of belonging in a larger scientific community. Based upon our student assessment data, we demonstrate that this course-based synthetic biology laboratory engages students directly in an authentic research experience and models important elements of collaboration, discovery, iteration, and critical thinking.

Keywords: course-based undergraduate research experience, CURE, synthetic biology

4. Koumpena, V. E., & Stasinakis, P. K. (2022). Demonstrate and evaluate lab activity about antimicrobial sensitivity. *Biochemistry and Molecular Biology Education*, 50(6), 592–599. <https://doi.org/10.1002/bmb.21666>

Abstract: Lab activities in primary and secondary education are essential to promote students' scientific skills. In this article, we propose a lab activity where different antimicrobial agents are used to the microorganisms' susceptibility to them. Moreover, we produce a rubric, a scoring tool, to quantify students' replies and evaluate the whole activity. We concluded that using the scoring rubric, we have been able to evaluate students' replies and students' benefit.

Keywords: biology, disk diffusion test, lab activity, rubric, secondary education

5. Li, Y., Liu, X., Du, X., & Shen, J. (2022). Improvement of students' enthusiasm by introduction of barrage into online teaching during COVID -19 pandemic. *Biochemistry and Molecular Biology Education*, 50(6), 600–604. <https://doi.org/10.1002/bmb.21668>

Abstract: The outbreak of the COVID-19 pandemic results in the turning from offline teaching to online teaching. Students enjoy short videos and like barrage during the pandemic. We found that the introduction of barrage into online teaching is of great help to improve the students' attention and enthusiasm. In order to verify the correctness of this conjecture, we launched a questionnaire survey. According to the preliminary conclusions, we found that student's think that such adaption is not only interesting, but also can promote the interaction, and therefore improve the learning effect. It should conform to the trend of teaching development in the new era.

Keywords: barrage, COVID-19, interactive, online teaching, student education

6. Thulluru, A., Saad, L., Nagah Abdou, Y., Martin, A., & Kee, H. L. (2022). CRISPR in butterflies: An undergraduate lab experience to inactivate wing patterning genes during development. *Biochemistry and Molecular Biology Education*, 50(6), 605–619. <https://doi.org/10.1002/bmb.21669>

Abstract: CRISPR is a technique increasingly used in the laboratory for both fundamental and applied research. We designed and implemented a lab experience for undergraduates to carry out CRISPR technology in the lab, and knockout the wing patterning genes *optix* and *WntA* in *Vanessa cardui* butterflies. Students obtained spectacular phenotypic mutants of butterfly wings color and patterns, awakening curiosity about how genomes encode morphology. In addition, students successfully used molecular techniques to genotype and screen wild-type caterpillar larvae and butterflies for CRISPR edits in genes. Student feedback suggests that they experienced a meaningful process of scientific inquiry by carrying out the whole CRISPR workflow process, from the design and delivery of CRISPR components through microinjection of butterfly eggs, the rearing of live animals through their complete life cycle, and molecular and phenotypic analyses of the resulting mutants. We discuss our experience using CRISP genome editing experiments in butterflies to expose students to hands-on research experiences probing gene-to-phenotype relationships in a charismatic and live organism.

Keywords: butterflies, CRISPR technology, gene-editing, optix

7. Khasawneh, R. R., & Rub, E. A. (2022). Undergraduate medical students' perceptions regarding stem cells: Is there a need for incorporating a stem cells elective course in the academic curriculum? *Biochemistry and Molecular Biology Education*, 50(6), 620–626. <https://doi.org/10.1002/bmb.21672>

Abstract: Stem cell therapy has recently progressed from the preclinical to the early clinical trial arena for a variety of diseases. Moreover, the medical students lack the deep and full understanding of its significance and potential as the promising future cure for diverse diseases worldwide. This study aims at evaluating the knowledge, awareness, and perception of medical students as far as stem cells applications are related in the medical field. A cross-sectional survey was carried out using online questionnaires, which were distributed via e-mail to cover all medical faculties in Jordan. The data show that medical students are supportive of using stem cells and their therapeutic applications, and most of them are willing and enthusiastically want to improve their knowledge about stem cells; however, due to the tight schedule and the lack of an elective course about stem cells in the curriculum, many of them are not

ready to undergo further training in regenerative medicine unless it becomes part of the assigned training and part of the learning objectives for medical students. These findings indicated the need to update the medical school curriculum with new hits in medicine and expand the range of courses offered for medical students so they can be up-to-date with the quick advances in different medical disciplines.

Keywords: Jordan, medical, students, perceptions, stem cells

8. Roberts, K., Hoyer, G., & Harvey, P. (2022). An opportunity for remote professional networking to support undergraduate career goals. *Biochemistry and Molecular Biology Education*, 50(6), 627–630. <https://doi.org/10.1002/bmb.21661>

Abstract: Engagement in research as an undergraduate and the availability of mentorship from peers and professionals are effective strategies for improving retention of students in STEM fields. Undergraduates in Molecular, Cellular, and Developmental Biology at the University of Colorado Boulder enroll in one of two large introductory course-based undergraduate research experiences (CUREs) as a requirement of the degree. However, more diverse efforts toward formally supporting students seeking to refine their career goals is needed. We designed a networking-based workshop series aimed at providing access to the current and former students who have been recently successful in achieving relevant educational and career goals. This 5-week series focused on (1) how to convert a resume to a *curriculum vitae*, (2) careers that are accessible with a bachelor's degree in the life sciences, (3) types of research opportunities as an undergraduate and as a post-graduate, (4) the application process and strategies for successful candidacy in medical school applications, and (5) PhD programs and approaches to producing a competitive application. The workshop connected 52 undergraduates with mentors; the majority of participants requested contact information for continued mentoring. Here, we describe the structure of this remote workshop series and highlight results that emphasized the need for such support that may extend beyond pandemic times.

Keywords: mentoring, retention, undergraduate

9. Balinado, L. O., & Dapula, K. J. C. (2022). Inclusion of COVID -19 as a topic in an undergraduate biotechnology course. *Biochemistry and Molecular Biology Education*, 50(6), 631–632. <https://doi.org/10.1002/bmb.21670>

Abstract: The novelty of the COVID-19 disease has paved the way to numerous scientific studies that aim to further understand its biology, and to different strategies that disseminate this information to promote public awareness. One of the strategies that the academe can employ is the inclusion of COVID-19 as a topic in a basic biotechnology course. This not just helps students better understand this disease, but it also makes them an effective medium in the dissemination of relevant COVID-19 knowledge.

Keywords: biology education, biotechnology education, COVID-19 pandemic, online teaching

10. Chen, S. H. (2022). Learning lab skills online: Lessons from implementing video-based instruction for a remote biotechnology lab. *Biochemistry and Molecular Biology Education*, 50(6), 633–640. <https://doi.org/10.1002/bmb.21667>

Abstract: The COVID-19 pandemic forced many courses to move online, presenting a particular challenge for hands-on laboratory courses. One such course in our Biotechnology track is an advanced Protein Interactions lecture/laboratory course. This 8-week course typically meets for 5 h a week in the laboratory space. For the Fall 2020 version of the course, first-person videos were produced for each of the laboratory experiments, and the corresponding experimental data produced by students in previous semesters were provided for the current students to analyze in their electronic lab notebooks and lab reports. Student perspectives and assessments were collected on course participants from Fall 2019 (in-person laboratories) and Fall 2020 (online laboratories) to compare experiences and outcomes. Analysis of the data shows that the online students appreciated the videos and gained self-confidence in the procedures, but maintained more misconceptions about the material. In addition to being unable to perform the hands-on experiments, other factors such as anxiety could also be interfering with the learning process under the pandemic conditions. The implementation process for the remote labs, student reactions, and lessons learned are discussed.

Keywords: biochemistry, COVID-19, teaching online, virtual labs

11. Shen, J., Jin, W., & Chen, C. (2022). Metabolic minimap of anaerobic digestion for undergraduate biochemistry courses. *Biochemistry and Molecular Biology Education*, 50(6), 641–648. <https://doi.org/10.1002/bmb.21671>

Abstract: As a representative catabolic reaction that widely exists in nature, anaerobic digestion (AD) exhibits great value regarding the global carbon cycle, renewable energy development, and environmental protection. Such an important biochemical reaction was ignored before and should be introduced into the teaching and textbooks of undergraduate biochemistry courses. However, students may face obstructions when learning AD theories since the metabolic pathways in AD are very complex. To solve these problems, an instructive metabolic minimap of the AD reaction was designed, including its reaction stages, reaction pathways, substrates, and enzymes. Furthermore, the interrelationships between aerobic catabolism (AEC) and anaerobic catabolism (ANC) were also summarized by combining the catabolic pathways of typical biological macromolecules. In this paper, AD theories were first replenished into undergraduate biochemistry courses by metabolic minimap, which not only provided valuable supports for the practical teaching of AD in undergraduate biochemistry courses, but also acted as an important reference for students in biology-related majors and biochemistry teachers.

Keywords: anaerobic digestion, biochemistry, enzyme, metabolic minimap, metabolism

12. Ross, P. M., Mercer-Mapstone, L., Pozza, L. E., Poronnik, P., Hinton, T., & Field, D. J. (2022). An idea to explore: Interdisciplinary capstone courses in biomedical and life science education. *Biochemistry and Molecular Biology Education*, 50(6), 649–660. <https://doi.org/10.1002/bmb.21673>

Abstract: While biomedical and life science research have embraced interdisciplinarity as the means to solving pressing 21st century complex challenges, interdisciplinarity in undergraduate education has been more difficult to implement. As a consequence, disciplinary rather than interdisciplinary capstones have become ubiquitous. Disciplinary capstones are valuable for students because they enable them to integrate knowledge and skills within the discipline, but they are also limiting because the integration is within rather than across disciplines. In contrast to a capstone, which involves a single discipline, interdisciplinary capstones require two or more disciplines to combine and integrate across disciplinary boundaries. Interdisciplinarity, where two or more disciplines come together, is difficult to implement in the biomedical and life science curricula because student majors and finances are administered in ways, which reinforce institutional organization of schools and faculties and prevent collaboration. Here in this “idea to explore” we provide an interdisciplinary capstone model where students enroll in disciplinary courses, but then these disciplinary courses and students collaborate on interdisciplinary real-world problems. This interdisciplinary capstone model was implemented across two diverse and large biomedical and life science schools within two faculties in a research intensive, metropolitan university. This approach allows for integration of the biomedical, social and ethical perspectives required when solving problems in the real world, such as COVID-19. Interdisciplinary learning also better prepares students for higher degree research and future careers. Overcoming disciplinary curriculum silos and faculty barriers is critical if we are to meet expectations of acquiring interdisciplinarity as a key competency.

Keywords: biomedical and life sciences, capstone, curriculum design, interdisciplinary capstone.

CAMBRIDGE JOURNAL OF EDUCATION

1. Amri, M., & Sert, O. (2022b). Establishing understanding during student-initiated between-desk instructions in project work. *Cambridge Journal of Education*, 52(6), 667–689. <https://doi.org/10.1080/0305764x.2022.2047890>

Abstract: This study investigates how shared understanding is established during a rarely researched instructional and interactional context, namely teacher–student interactions during between-desk instructions (BDIs). Specifically, the authors focus on instructional interactions initiated by students during project-based language teaching in an upper-secondary Swedish classroom and probe into how students’ formulations of understanding of a teacher’s prior responses shape the subsequent interactional trajectories. Their conversation analytic investigation reveals that the teacher produces either confirming or disconfirming actions following students’ formulations of understanding. These response types accomplish two distinct forms of interactional work: (a) when the teacher confirms the students’ formulations, she expands the sequence with instruction-related elaborations; and (b) when the teacher does not confirm the formulations, she accounts for that, prompting students to reformulate their understanding. Overall, this study contributes to the body of research on BDIs as a recurring yet under-investigated lesson practice during project work.

Keywords: Student-initiated sequences, between-desk instructions, formulations, classroom interaction, conversation analysis.

2. Qian, H., & Walker, A. (2022). Becoming a teacher leader: capital acquisition and accumulation. *Cambridge Journal of Education*, 52(6), 691–714. <https://doi.org/10.1080/0305764x.2022.2047891>

Abstract: As an acknowledged example of a carefully structured teacher learning system, Shanghai has a long tradition of using expert teachers to drive teacher learning both within and across schools. This article tracks the work voyages of eight expert teachers in Shanghai using three forms of capital. The purpose of the paper is to explore how these teachers obtained and accumulated their human, social and symbolic capital from when they entered the profession as novice teachers to their present standing as influential expert teachers. The article identifies the significant people and critical events that facilitated capital accumulation throughout their professional voyages. Conditions conducive for teacher leaders to emerge and exert leadership are unravelled and delineated. These conditions include a centralised and policy-driven structure and the dominant societal culture with high regard for education and seniority. More research is needed to know if the study’s findings hold currency across different contexts.

Keywords: China, expert teachers, capital, teacher leaders, cross-school

3. Ellis, E., Reupert, A., & Hammer, M. (2022). ‘We’re just touching the surface’: Australian university lecturers’ experiences of teaching theories of child development in early childhood teacher education programs. *Cambridge Journal of Education*, 52(6), 715–733. <https://doi.org/10.1080/0305764x.2022.2047892>

Abstract: Three Australian Government reports released between 2011 and 2017 highlight a child development theory–practice gap in Australian early childhood initial teacher education. This qualitative study explores what informs university lecturers’ teaching of child development theory in tertiary programmes. Grounded in Interpretative Phenomenological Analysis, four themes are discussed from a Freirean inspired perspective. According to those interviewed, institutional culture and the practice focus of regulatory bodies strongly informs the teaching of child development with systemic practices often experienced as oppressive. The minimisation of early childhood content in combined early childhood/primary degrees also informed practice, but fostered a sense of marginalisation for many. Liberation was also evident as participants indicated that, despite many challenges, professional values, including commitment, tenacity and respect, informed their teaching practice. Implications for Australian universities and regulatory bodies are discussed with findings serving as a case example with international applicability to tertiary education policy and practice review.

Keywords: Initial teacher education, early childhood education, child development, theory and practice, developmental psychology

4. Prendeville, P., & Kinsella, W. (2022). Ethics, values and Values Based Practice in educational psychology. *Cambridge Journal of Education*, 52(6), 735–757. <https://doi.org/10.1080/0305764x.2022.2047893>

Abstract: This paper examines the theoretical foundations of educational psychology from a meta-theoretical critical realist perspective focusing on ethics and values. This examination is considered in light of the increasingly complex educational contexts that require the support of educational psychologists (EPs). It reviews ethics frameworks that have informed ethical practice to date, and reframes this practice within critical realism. This paper presents Fulford’s Values Based Practice to strengthen theory and practice to support EPs to resolve ethical issues that can arise. Values Based Practice is presented as a laminated system within critical realism to inform this practice. As a framework, it allows for interdisciplinary practice and the integration of ethical practice, values and the centrality of the child or young person in shared decision making facilitated by an EP in collaboration with other professionals. An overview that demonstrates the applicability of this framework to the applied work of EPs is also presented.

Keywords: Ethics, values, Values Based Practice, ethical practice, educational psychology, shared decision making, critical realism

5. Jo, H. (2022). Market-based parental involvement: impact of networks of middle-class mothers in the education marketplace. *Cambridge Journal of Education*, 52(6), 759–774. <https://doi.org/10.1080/0305764x.2022.2049209>

Abstract: Despite the growing importance of shadow education, literature on middle-class parental involvement has focused on the significance of family–school partnerships, and has neglected to examine the influence of parental involvement in terms of shadow education. Drawing on narratives of middle-class Korean mothers, this study explores their strategies and practices for shadow education to provide their children with a meaningful advantage in academic competition. It applies Bourdieu’s

social capital theory to understand their struggle for high-quality shadow education, and finds a strong impact of networks of mothers for effective interaction with the education marketplace. In this regard, the author suggests a concept of ‘market-based parental involvement’, which is distinguished from the traditional form of middle-class parental involvement based on family–school partnerships.

Keywords: Parental involvement, shadow education, social capital, middle-class, parental networks

6. Wong, Y. L., & Liao, Q. (2022). Cultural capital and habitus in the field of higher education: academic and social adaptation of rural students in four elite universities in Shanghai, China. *Cambridge Journal of Education*, 52(6), 775–793. <https://doi.org/10.1080/0305764x.2022.2056142>

Abstract: Referring to Bourdieu’s three-level analysis and trio concepts, the authors offer a third-level analysis of the academic and social adaptation of 32 rural students in four elite universities in Shanghai, China. Respondents with rural habitus and cultural capital had difficulties in adapting to the field of an elite university in an urban city and were disadvantaged in making themselves a competitive portfolio. But many respondents changed habitus and acquired new cultural capital, so that they looked urbane, survived academic crises and got prepared for the labour market. Nevertheless, some were not confident of securing a well-paid professional job in competitive Shanghai, and few chose to disengage from social competition. Amid a structural explanation of social reproduction, this analysis demonstrates room for agency and possibilities for social change by addressing a characteristic of the field of higher education overlooked in many Bourdieusian analyses: the transformative nature of university education.

Keywords: Adaptation, cultural capital, field, habitus, rural university students, China

COMPUTER AND EDUCATION

1. Liu, C. C., Liao, M. G., Chang, C. H., & Lin, H. M. (2022). An analysis of children's interaction with an AI chatbot and its impact on their interest in reading. *Computers & Education, 189*, 104576. <https://doi.org/10.1016/j.compedu.2022.104576>

Abstract: Educators have indicated that social approaches to reading such as book talk activities are helpful for promoting students' interest in reading. However, it is not possible for teachers to interact with all students to talk about the books they have read as they have different language proficiency levels and different topics of interest. This study thus aimed to understand the affordances of a chatbot built with artificial intelligence techniques as a book talk companion, and to explore the role of the interaction in students' engagement and interest in reading. Adopting AI techniques, the chatbot in this study had basic understanding of 157 books. While students could choose any of the books to read and interact with the chatbot, the chatbot provided book talk and social affective cues to facilitate the book talk. Multiple data sources from 68 students participating in a 6-week reading activity were collected and analyzed. It was found that students perceived a high level of social connection with the chatbot. In particular, students talking with the chatbot maintained a stable level of situational interest in the value dimension, while the interest of those who did not participate in the book talk with the chatbot faded significantly. Students' perceptions of the social connection with the chatbot were closely related to their engagement in the reading activity and correlated with both their triggered-situational interest and maintained situational interest. The results provide insights into how a chatbot with AI techniques can create a positive reading experience to sustain students' interest in learning.

2. Xiong, Z., Liu, Q., & Huang, X. (2022). The influence of digital educational games on preschool Children's creative thinking. *Computers & Education, 189*, 104578. <https://doi.org/10.1016/j.compedu.2022.104578>

Abstract: Age is an important factor affecting the development of creative thinking, and digital educational games have great potential in the training of creative thinking for preschool children. However, the effect of digital educational games on the creative thinking of preschool children of different ages is still unclear. In this study, a digital educational game "Thinking Paradise" was specially developed as a training method for preschool children's creative thinking. Including 11 different types of mini-games from 5 different creative thinking forms to train preschool children's creative thinking. 102 children aged 3–6 were divided into 3 groups according to their age, G1 (3–4 years old, N = 34), G2 (4–5 years old, N = 34), G3 (5–6 years old, N = 34). All children were asked to complete the training in the classroom, using a pre-post test design to examine the effects of this digital educational game training on creative thinking. The digital Torrance test is used for pre-test and post-test measurement and is evaluated by five indicators: fluency score, detail score, original score, anti-block score, and title score. The results showed that all indicators of the children after training were significantly improved, and the experiment proved that this digital educational game training could effectively improve the creative thinking of preschool children. Training had different effects on preschool children of different ages, and there were significant differences in the improvement of fluency scores, title scores, and anti-block scores in different age groups. The fluency score of the 3-4-

year-old group was significantly improved, and the total score improvement score was close to the maximum value. At the same time, the training significantly improved the title score and anti-block score of the 5-6-year-old children. This study expands on existing knowledge about creative thinking in preschool children, highlighting the need to focus on age differences when using digital educational games to train preschool children's creative thinking. This study can also provide valid evidence for the development of digital educational games in preschool children.

3. Saqr, M., & López-Pernas, S. (2022). How CSCL roles emerge, persist, transition, and evolve over time: A four-year longitudinal study. *Computers & Education, 189*, 104581. <https://doi.org/10.1016/j.compedu.2022.104581>

Abstract: A prevailing trend in CSCL literature has been the study of students' participatory roles. The majority of existing studies examine a single collaborative task or, at most, a complete course. This study aims to investigate the presence—or the lack thereof—of a more enduring disposition that drives student participation patterns across courses. Based on data from a 4-year program where 329 students used CSCL to collaborate in 10 successive courses (amounting up to 84,597 interactions), we identify the emerging roles using centrality measures and latent profile analysis (LPA) and trace the unfolding of roles over the entire duration of the program. Thereafter, we use Mixture Hidden Markov Models (MHMM)—methods that are particularly useful in detecting “latent traits” in longitudinal data—to identify how students' roles, transition, persist or evolve over time. Relevant covariates were also examined to explain students' membership of different trajectories. We identified three different roles (*leader, mediator, isolate*) at the course level. At the program level, we found three distinct trajectories: an *intense* trajectory with mostly leaders, a *fluctuating* trajectory with mostly mediators, and a *wallowing-in-the-mire* trajectory with mostly isolates. Our results show that roles re-emerge consistently regardless of the task or the course over extended periods of time and in a predictable manner. For instance, isolates “assumed” such a role in almost all of their courses over four years.

4. Huang, B., Siu-Yung Jong, M., Tu, Y. F., Hwang, G. J., Chai, C. S., & Yi-Chao Jiang, M. (2022). Trends and exemplary practices of STEM teacher professional development programs in K-12 contexts: A systematic review of empirical studies. *Computers & Education, 189*, 104577. <https://doi.org/10.1016/j.compedu.2022.104577>

Abstract: STEM teachers are critical mediators of knowledge, and their performance can directly impact students' learning experiences and knowledge acquisition. To ensure the quality of STEM instruction, countries worldwide have launched STEM teacher professional development (TPD) programs. It is paramount to know how these programs have been implemented and what lessons can be learned from them. In this study, to capture the trends in publications on K-12 STEM TPD, we systematically reviewed relevant journal papers published in the Web of Science database from 2006 to 2020. We analyzed the (1) knowledge foci, (2) professional development approaches, (3) outcome measurements, as well as (4) data sources of the STEM TPDs. In addition, to inform future professional development designs, we selected and developed narrative descriptions of three exemplary cases. These cases showcased high-quality TPD and covered pre-service and in-service teachers in formal and informal settings. We reviewed the knowledge foci of the STEM TPDs using the technological pedagogical content knowledge (TPACK) framework. The

results showed that the types of knowledge delivered in the STEM TPD programs were mostly pedagogical knowledge and pedagogical content knowledge, while a certain number of programs focused on technological content knowledge and technological pedagogical content knowledge. Most of the studies adopted mixed professional development approaches, featuring activities like learning by design, learning by doing, reflective learning, and group work. These approaches emphasized the active participation of teachers in the process, built links between content and classroom practices, and encouraged collective participation in developing expertise. However, the data were mostly collected through interviews or survey instruments. Future research should move beyond analyzing data on teachers' perceptions to explore processes (e.g., online participation logs, teacher-peer interactions) and products of performance (e.g., lesson plans, handmade crafts) to further examine the effects of STEM TPD activities. It would also be desirable to establish greater consistency in data collection approaches, such as by using validated interview or observation protocols that are generalizable to different school settings.

5. Hu, J., & Wang, Y. (2022). Influence of students' perceptions of instruction quality on their digital reading performance in 29 OECD countries: A multilevel analysis. *Computers & Education*, 189, 104591. <https://doi.org/10.1016/j.compedu.2022.104591>

Abstract: Students' perceptions of instruction quality have long been considered a core element of the effectiveness of education. In particular, perceived high-quality instruction in classrooms might motivate students to gain better digital reading performance, which helps them become well-prepared in the era of information and communication technology (ICT). Thus, this study investigated the correlation between students' perceptions of instruction quality features and their digital reading performance from the aspects of perceived instructional approaches, classroom management, and supportive climate. Data on 223,807 15-year-old students in 29 Organization for Economic Co-operation and Development (OECD) countries were extracted from the latest Programme for International Student Assessment (PISA) 2018 database and the study adopted three-level hierarchical linear modeling (HLM). The findings demonstrated the positive influence of students' perceived adaptation of instruction, stimulation of reading engagement, disciplinary climate, teacher interest, and teacher support. However, students' perceived teacher-directed instruction, reading skills exercises, teaching of digital skills, language instruction time, and teacher feedback were unexpectedly negatively correlated with their digital reading performance. Finally, the study concludes by discussing its implications for improving reading instruction quality.

6. Xia, Q., Chiu, T. K., Lee, M., Sanusi, I. T., Dai, Y., & Chai, C. S. (2022). A self-determination theory (SDT) design approach for inclusive and diverse artificial intelligence (AI) education. *Computers & Education*, 189, 104582. <https://doi.org/10.1016/j.compedu.2022.104582>

Abstract: The introduction of artificial intelligence (AI) as a subject in K-12 education is a new and important global strategic initiative, but there is a serious lack of studies in relation to this initiative that address inclusion and diversity of education. Self-determination theory (SDT) can explain student engagement from the needs satisfaction perspective. Therefore, this project aimed to investigate how SDT-based

needs support by teachers and student attributes (gender and achievement level) affect AI learning at secondary school level. It adopted a two-study design, with each study using a 2×2 between-subjects factorial design with student needs support from teachers as one factor and one of the student attributes as the other: gender in Study 1 and achievement level in Study 2. In both studies, there were two groups – SDT-based (teacher needs support) and control (without). The analyses revealed that in the SDT-based program, (1) the students had a more positive perception of AI learning and felt that their needs were satisfied, and (2) there were non-significant differences in AI learning between boys and girls and between high and low achievers. The findings suggest that a focus on needs satisfaction could engage boys and girls, and high and low achievers in AI learning. As they become more engaged, they are likely to gain more confidence, feel that the content is more relevant, and become intrinsically motivated to pursue further AI learning.

7. Huang, H., Hwang, G. J., & Jong, M. S. Y. (2022). Technological solutions for promoting employees' knowledge levels and practical skills: An SVVR-based blended learning approach for professional training. *Computers & Education, 189*, 104593. <https://doi.org/10.1016/j.compedu.2022.104593>

Abstract: In professional training programs, how to help learners fully understand the contexts and problem-solving procedure in the workplace is a crucial and challenging issue. Due to the advancements of computer and multimedia technology, many professional training programs have applied technology to provide richer learning content. Blended learning is a learning approach combining online and physical courses. In the blended learning mode, learners can not only learn through multimedia teaching materials, but also interact and practice with teachers and students in online and physical classrooms. However, the conventional blended learning (C-BL) mode mainly presents teaching content through online videos and physical courses. In such a learning environment with one-way information transmission and without experience, it is not easy for most learners to experience the actual situations encountered in the professional training process, which affects their judgment and actual handling performance. In order to tackle this problem, this research adopted spherical video-based virtual reality (SVVR) technology and applied it in a general registered nurse (RN) training program via a blended learning mode. To verify the effects of this teaching approach, a quasi-experimental study was conducted in a RN training program in a large-scale hospital. The experimental group employed the SVVR-BL mode while the control group employed the C-BL mode. The results indicated that the SVVR-BL mode could not only improve learners' learning achievement, but also enhance their problem-solving tendency, meta-cognition tendency, and classroom engagement. The practical skills test results in the workplace further implied that, compared to the learners who adopted the C-BL mode, learners who adopted the SVVR-BL mode had better judgment, analysis, and overall performance of the handling process when encountering practical problems. As a result, SVVR-BL not only helped learners gain knowledge and improve their higher order thinking, but also assisted them in applying what they had learned to solve real problems. This result can serve as an important reference for SVVR-BL studies and the design of professional training programs in the future.

8. Bautista, P., Cano-Escoriaza, J., Sánchez, E. V., Cebollero-Salinas, A., & Orejudo, S. (2022). Improving adolescent moral reasoning versus cyberbullying: An online big group experiment by means of collective intelligence. *Computers & Education*, 189, 104594. <https://doi.org/10.1016/j.compedu.2022.104594>

Abstract: Collective Intelligence (CI) is identified as the group capacity to come up with responses to complex tasks that are not accomplished or are of worse quality if performed cooperatively or individually. Based on this premise, we considered knowing if adolescents' moral reasoning would increase when a big group faces a topical moral dilemma: a sexting-centered cyberbullying case. To do so, the CI platform Thinkhub was used with an online group of 793 simultaneously connected year-1 Higher Secondary Education students. This platform contemplates an initial individual work phase, and another dynamic work group phase in which responses gradually appear. The system finally presents the most valued responses to the participants. The obtained results revealed a significant rise in the individual moral development levels that emerged during the interaction process when the participants engaged in one of the three posed questions, for which the response rate was also higher. The promising potential of the CI generated during online interaction processes followed to solve complex tasks, their weak points and future research in this field, are discussed.

9. Jones, L., Smith, S. L., & Durham, C. (2022). Teachers as digital composers: Designing digital jumpstarts to scaffold for emerging bilingual learners. *Computers & Education*, 189, 104592. <https://doi.org/10.1016/j.compedu.2022.104592>

Abstract: This study contributes to scholarship about effective technology use for emerging bi/multilingual students who are learning English as an additional language. Prior research on digital storytelling has largely examined student created products, but this study examines how teachers purposefully planned differentiated instruction through their use of a specific type of digital storytelling: digital jumpstarts. Participants included 17 pre- and in-service teachers enrolled in graduate courses focused on teaching English to speakers of other languages. Analysis of digital jumpstart projects that the teachers created, their lesson plans, and their written reflections revealed that digital jumpstarts can effectively provide students with planned scaffolds that support language and content development through the incorporation of multiple modes, key terms and definitions, translations, and connections to students' lived experiences. We provide implications for how teachers can create and use digital jumpstarts in their classrooms with bi/multilingual students.

10. Weise, J. J., Greiff, S., & Sparfeldt, J. R. (2022). Focusing on eigendynamic effects promotes students' performance in complex problem solving: A log-file analysis of strategic behavior. *Computers & Education*, 189, 104579. <https://doi.org/10.1016/j.compedu.2022.104579>

Abstract: Human beings are frequently confronted with complex systems that change dynamically over time. Correspondingly, so called *eigendynamic effects* are an important feature in complex problem solving (CPS) tasks. Eigendynamic effects describe increases or decreases in outcome variables over time without the individual's intervention. Identifying the eigendynamic effects from the start while

exploring the system is reasonably an effective strategic behavior when systems are comprised of different effect types (i.e., eigendynamic effects alongside other effects). In this study, we hypothesized that the strategic behavior to identify eigendynamic effects early when exploring the system was related to CPS performance and mediated the relationship between intelligence and CPS performance. In a sample of $N = 262$ German high school students, the investigated strategic behavior predicted CPS performance when exploring the system (knowledge acquisition phase) and when controlling the system (knowledge application phase) in single CPS tasks and in a set of CPS tasks comprising of different effect types. In mediation models the strategic behavior to identify eigendynamic effects early mediated the intelligence-CPS performance relation in the knowledge acquisition phase, but not in the knowledge application phase. We discuss these findings in the light of how students interact with complex and dynamic systems, pointing to the importance of this strategic behavior for the relationship between intelligence and CPS.

11. Li, Q., Bañuelos, M., Liu, Y., & Xu, D. (2022). Online instruction for a humanized learning experience: Techniques used by college instructors. *Computers & Education*, 189, 104595. <https://doi.org/10.1016/j.compedu.2022.104595>

Abstract: The online learning literature converges to suggest that a “humanized” learning experience is critical to student engagement, where student agency, instructor presence, and peer presence have been nominated across a number of studies as key elements of a humanized online learning experience. Despite theoretical support, description of specific implementation techniques used by instructors to enhance these elements is limited. Based on an extensive review of the literature, this study developed a coding scheme of humanization practices and conducted content analysis of 244 excerpts of teaching practices from 17 online courses that demonstrated high levels of humanized instruction out of 100 randomly selected online courses at a large community college. The results reveal eight techniques that instructors used to humanize their online courses. These techniques indicate that to offer students a humanized learning experience, it is critical for instructors to make consistent and regular efforts throughout the course, promote social and academic presence in an integrated way, and proactively guide student social-emotional communication. These techniques, along with the concrete examples, lay groundwork for future research about the relationship between humanization techniques and student outcomes in virtual environments and provide actionable guidance on how to humanize an online course.

12. Keynan, O., Brandel, N., & Slakmon, B. (2022). Students’ knowledge on emotion expression and recognition in computer-mediated communication: A comparative case study. *Computers & Education*, 189, 104597. <https://doi.org/10.1016/j.compedu.2022.104597>

Abstract: In this study, we explore processes of emotion expression and recognition in computer-mediated civic discussions in small groups. We ask what generates processes of emotion expression and recognition in digital discussions, what constitutes the emotion expression and recognition practices used in such contexts, and in what ways these practices are affected by medium. Ninety-eight participants took part in both written and video discussions and filled out questionnaires concerning their emotional experiences. Some of these participants were interviewed.

A two-tiered thematic and linguistic analysis was applied to the data collected from the discussions and the interviews (totaling 7139 utterances). Findings reveal four generators giving rise to discussants' emotion expression and recognition processes, including firmness of the discussants' opinions and their cultural and religious background. Practices of emotion expression and recognition appear to vary substantially between written and face-to-face settings. For example, in the latter, participants rely heavily on tone of voice and facial expressions when recognizing others' emotions, while in the former, because of the lack of non-verbal cues, discussants assign more weight to their *own* emotions, experiences, and background. Moreover, participants choose their words more carefully, and are more likely to delay their response or to remain silent when expressing their emotions in writing.

13. Sjølie, E., Espenes, T. C., & Buø, R. (2022). Social interaction and agency in self-organizing student teams during their transition from face-to-face to online learning. *Computers & Education*, 189, 104580. <https://doi.org/10.1016/j.compedu.2022.104580>

Abstract: Online collaboration is becoming increasingly more common in work life and education, a development that is accentuated by the Covid-19 pandemic. It is thus imperative that students learn to work in and as teams in online settings, and that teachers and educational researchers and policymakers understand how online environments enable and constrain student collaboration. However, what has been missing in research on online student collaboration is a focus on students as *agents* rather than passive learners as well as a lack of focus on student teams as *self-organizing* teams. This paper reports on a study that investigated the experiences of 1611 graduate students in 315 teams enrolled in an interdisciplinary project-based course during their (forced) transition from face-to-face to online collaboration due to the COVID-19 pandemic. We explored how the transition to online learning affected social interaction and how teams changed their practices to support and sustain social interaction in the online environment. The findings show that the changed conditions of the learning environment influenced social interaction in negative ways, but also that team reflection seemed to enable the students to reverse some of the adverse effects and develop practices that supported both the cognitive and socio-emotional dimensions of social interaction. Theoretically, this study suggests possible causes for why social interaction was reduced and provides in-depth knowledge about the relationships between social interaction, social presence, and social space. The study also provides support for theories of learning that emphasize the need to consider students as active agents rather than merely users of the affordances of a virtual learning environment or guided by the teacher's interventions. It makes a unique contribution to the scarce empirical literature on virtual self-organizing student teams in higher education and provides practical implications for teachers and educational researchers and policy makers.

14. Xianhan, H., Chun, L., Mingyao, S., & Caixia, S. (2022). Associations of different types of informal teacher learning with teachers' technology integration intention. *Computers & Education*, 190, 104604. <https://doi.org/10.1016/j.compedu.2022.104604>

Abstract: This study investigated the associations between different types of informal teacher learning (ITL) activities and teachers' technology integration. Five types of

ITL were examined: learning through media, through colleague, stakeholder, and student interactions, and through reflection. Structural equation modelling and bootstrapping were used to analyse 1,881 questionnaire responses from Chinese K-12 teachers. The results revealed that ITL activities were significantly associated with teachers' technology integration. Among the five types of ITL activities, the inner source of ITL, learning through reflection, and the non-interactive social source of ITL, learning through media, exhibited stronger associations with teacher technology integration than did the interactive social sources of ITL. Among the three interactive ITL activities, the effects of learning through student interaction and learning through colleague interaction were significantly associated with teachers' adoption of technology. The effect of learning through student interaction on technology integration was mediated in equal parts by perceived usefulness and self-efficacy beliefs, while the effect of learning through colleague interaction was mediated only by perceived usefulness. Learning through stakeholder interaction was not a significant determinant of teacher technology adoption. The findings call for greater attention to ITL activities in supporting teacher technology integration. The findings also support taking a differentiated approach to understanding the relationship between ITL activities and teacher technology integration, as well as developing ITL-centred professional development initiatives.

15. Barthakur, A., Joksimovic, S., Kovanovic, V., Richey, M., & Pardo, A. (2022). Aligning objectives with assessment in online courses: Integrating learning analytics and measurement theory. *Computers & Education*, 190, 104603. <https://doi.org/10.1016/j.compedu.2022.104603>

Abstract: Well-designed online courses enhance learning experiences and allow effective development of learners' skills and knowledge. A critical factor contributing to the design of online courses in the higher education settings are well-defined learning objectives that align with course assessments and learning activities. While there are several introspective instruments to evaluate course designs, with the broader adoption of educational technologies and digital tools, there is a wealth of data that offers insights on the alignment of learning objectives to assessments. Such data has paved the way for evidence-based methods of investigating course effectiveness within higher education. This study outlines a methodology for designing and evaluating the alignment between course learning objectives and assessment activities at scale, utilising a combination of learning analytics and measurement theory approaches, more specifically exploratory multi-dimensional item response theory (MIRT) models. We demonstrate the proposed methodology within a professional development MOOC on leadership skills development, where we evaluate the alignment between course objectives and reflective writing assessments activities. Our results suggested that the alignment of the existing course objectives to assessment activities can be improved, showing the practical value of the proposed approach. The theoretical and practical implications of this research are further illustrated.

16. Kong, S. C., & Lin, T. (2022). High achievers' attitudes, flow experience, programming intentions and perceived teacher support in primary school: A moderated mediation analysis. *Computers & Education*, 190, 104598. <https://doi.org/10.1016/j.compedu.2022.104598>

Abstract: To improve programming performance for a larger student population, this study shed light on the commonalities of high achievers in programming classes. To the best of our knowledge, few studies have investigated high achievers in primary school programming classes. This study adapted the hedonic-motivation system adoption model to identify high achievers' perceived attitudes, flow experience, programming intentions and perceived teacher support. With a response rate of 72%, 54 primary schools participated in the study. A survey was conducted and four hundred and thirty-two students were included in the moderated mediation analysis. The results showed that high achievers' attitudes towards programming positively related to their flow experience, which further positively associated with their programming intentions. In addition, teacher support moderated the relationship between high achievers' attitudes and their flow experience; such that when teacher support increased, the flow experience was weaker for those with comparatively higher positive attitudes. The practical implications of the findings and future research directions are discussed.

17. Halamish, V., & Elias, D. (2022). Digital versus paper-based foreign-language vocabulary learning and testing: A study-test medium congruency effect. *Computers & Education, 190*, 104606. <https://doi.org/10.1016/j.compedu.2022.104606>

Abstract: There is an ongoing transition in education from paper-based learning and testing to digital learning and testing. The purpose of the present research was to examine whether the relative effectiveness of digital and paper-based learning depends on the medium of testing in the context of foreign-language vocabulary learning. In a controlled experiment, young adults ($N = 79$) studied and practiced novel foreign-language vocabulary words using two study methods (restudying or retrieval practice) and were then tested on their memory for these words to assess learning. The study medium and the test medium were either congruent (i.e., paper-based learning and testing; digital learning and testing) or incongruent (paper-based learning and digital testing; digital learning and paper-based testing). The results revealed a study-test medium congruency effect: Paper-based learning yielded better test performance than digital learning when the test was conducted on paper, but this effect was eliminated when the test was digital. This effect may have important practical educational implications as it challenges common practices for vocabulary learning such as using digital tools to study vocabulary for on-paper memory tests.

18. Rahimi, S., Shute, V. J., Fulwider, C., Bainbridge, K., Kuba, R., Yang, X., Smith, G., Baker, R. S., & D'Mello, S. K. (2022). Timing of learning supports in educational games can impact students' outcomes. *Computers & Education, 190*, 104600. <https://doi.org/10.1016/j.compedu.2022.104600>

Abstract: Learning does not automatically occur by playing educational games; instead, learning opportunities should be carefully designed in such games. For instance, research has indicated the importance of embedding learning supports within educational games to promote learning and other outcomes (e.g., enjoyment). However, more research is needed to determine when it is best to provide the supports—before or after attempting a game level? We investigated this question in a game called *Physics Playground* where we randomly assigned 149 students ($M_{age} = 14$, $SD = 0.96$) to receive learning supports—short videos—either immediately *Before* ($n = 50$) or *After* ($n = 46$) students worked on solving game

levels. We also included a no-support *Control* ($n = 53$) condition. We found that students assigned to the two treatment conditions visited fewer game levels, but spent more time per level, and reported lower frustration levels than those assigned to the *Control* condition. And although students in the *After* condition had lower in-game performance measures than those in the *Control* condition, they achieved higher near- and far-transfer scores on the posttest after controlling for gameplay success and pretest scores. Thus, there appears to be some tradeoffs with respect to the inclusion and timing of learning supports. There were no major differences between the treatment conditions regarding learning and subjective measures. The findings of this study can help advance the design of educational games that are intended to enhance students' learning.

19. Lennon, M., Pila, S., Flynn, R., & Wartella, E. A. (2022). Young children's social and independent behavior during play with a coding app: Digital game features matter in a 1:1 child to tablet setting. *Computers & Education, 190*, 104608. <https://doi.org/10.1016/j.compedu.2022.104608>

Abstract: The overarching aim of this study was to explore young children's ($N = 25$, $M_{\text{age}} = 5.16$ years) play with two coding games (*Daisy the Dinosaur* and *Kodable*) in a 1:1 child to tablet setting. We had three research questions focused on children's game play: 1) How does the structure of each game influence children's play? 2) Do children play more or less independently depending on the game they play? 3) Do children who play the games more independently learn more coding skills? Three researchers coded more than 6 h of video data showing children's play with digital coding games. Findings include, that the type of game did influence the different ways that children behaved while playing. However, during both games, children had the same amount of independent play. Children who played more independently during *Daisy the Dinosaur* learned more coding skills. This may be because these children were focusing more on the game than their peers as we did not find a similar effect for the game *Kodable*. We discuss the ways that children play structured vs. open structured (i.e., sandbox) digital games with a particular focus on how game play may influence learning. As opportunities for individual device ownership in classrooms increase, future work should continue to explore how game features influence learning.

20. Jeon, J., Lee, S., & Choe, H. (2022). Enhancing EFL pre-service teachers' affordance noticing and utilizing with the Synthesis of Qualitative Evidence strategies: An exploratory study of a customizable virtual environment platform. *Computers & Education, 190*, 104620. <https://doi.org/10.1016/j.compedu.2022.104620>

Abstract: Although numerous studies have reported educational benefits of virtual environment (VE), little is known about whether the design-based learning project of developing VEs contributes to pre-service EFL teachers' noticing and utilizing of its pedagogical affordances. Drawing on the affordance theory and the synthesis of qualitative evidence (SQD), this study first aimed to explore the pedagogical affordances of VEs noticed by 78 Korean EFL pre-service teachers. It further investigated how the participants gained benefits in noticing and using these affordances from the SQD-based VE development project. We adopted a qualitative-dominant mixed research approach with multiple data sources, such as interviews, group discussions, reflective journals, and a survey. The findings reported four pedagogical affordances, including communication, engaging learning environment,

constructability, and multimodal sharing. The findings also showed that the participants positively evaluated the SQD strategies for noticing and utilizing those affordances in their projects by activating their teacher agency. The study suggests the SQD strategies for the interactive learning environment in which EFL pre-service students can be trained to activate their agency in noticing and using ICT affordances. Academic and practical implications for pre-service teacher training and future research are suggested.

21. Philpott, A., & Son, J. B. (2022). Leaderboards in an EFL course: Student performance and motivation. *Computers & Education*, 190, 104605. <https://doi.org/10.1016/j.compedu.2022.104605>

Abstract: The study reported in this article investigated the use of leaderboards in an English as a foreign language (EFL) course at a Japanese university. The study used self-determination theory as the theoretical foundation to explore how leaderboards affect student performance (i.e., amount of work completed) and foreign language (FL) motivation. It was conducted over a 14-week period with two intact classes of participants; while both classes (i.e., Class 1 and Class 2) were aware of the point system, a leaderboard was used only in Class 1. A quasi-experimental mixed methods research design was utilised to answer two research questions about student performance and motivation. Data showed that a greater number of the participants in Class 2 completed more homework than the weekly point target required, compared to the participants in Class 1. The results of the study suggest that the participants' focus on the extrinsic rewards used by the leaderboard encouraged performance up to the reward threshold but once the threshold had been achieved, performance ceased. They also suggest that the leaderboard's use of points, rank, and forced social comparison to control behaviour resulted in the participants' internally leaning extrinsic motivation shifting to externally grounded extrinsic motivation, undermining intrinsic FL motivation more than supporting it.

22. Moore, R. L., & Blackmon, S. J. (2022). From the learner's perspective: A systematic review of MOOC learner experiences (2008–2021). *Computers & Education*, 190, 104596. <https://doi.org/10.1016/j.compedu.2022.104596>

Abstract: We report the results of a systematic review of learners' experiences and perspectives in massive open online courses (MOOCs). This systematic review includes 51 articles published between 2008 and 2021 that appeared in top educational technology journals. Each article provides insight into the MOOC learner experience, and our analysis identified three themes: motivation, course engagement, and satisfaction and achievement. Our study identifies three implications for MOOC course design – clear course structure, engagement among learners, and learner-centered. Understanding the differences in learner motivations to enroll in a course necessitates careful consideration of learner experiences within MOOCs. This systematic review provides valuable insight into how learners' experiences are captured and used to influence course design and evaluation.

23. Dai, L., Jung, M. M., Postma, M., & Louwse, M. M. (2022). A systematic review of pedagogical agent research: Similarities, differences and unexplored aspects. *Computers & Education*, 190, 104607. <https://doi.org/10.1016/j.compedu.2022.104607>

Abstract: Technological advancements have recently enabled researchers to build increasingly human-like agents with many of these agents being used for educational purposes. Despite the reported successes of these agents, research findings offer a rather inconclusive picture to what extent agent design features contribute to an effective learning experience. This can at least in part be explained by differences in research methods and instruments used to examine the effect of pedagogical agents. The current systematic review provides a comprehensive overview of pedagogical agent research conducted over the last decade (2010–2021), with a focus on experimental design and instrumentation. We systematically reviewed journal articles extracted from five electronic databases. Seventy-five studies were included for evaluation after a three-phase selection procedure. For the analysis, three main directions were investigated: (1) design features and implementations of agents; (2) moderating variables in agent research; (3) instruments utilized to evaluate the effectiveness of agents. The review reveals some shortcomings in the field, including areas to which pedagogical research has not paid much attention to, such as the human-likeness of the agent and the underrepresentation of the K12 population. Furthermore, agents have seldomly been used in virtual reality environments, despite the fact that such environments have long been used in education and have demonstrated their potential to promote learning. Even though pedagogical agents have shown their effectiveness in assisting student learning, further research in new rather unexplored directions is recommended to assess the full potential pedagogical agents in education.

24. Zha, S., Jin, Y., Wheeler, R., & Bosarge, E. (2022). A mixed-method cluster analysis of physical computing and robotics integration in middle-grade math lesson plans. *Computers & Education*, 190, 104623. <https://doi.org/10.1016/j.compedu.2022.104623>

Abstract: This study analyzed 281 lesson plans collected from the producers' websites of 12 educational physical computing and robotics (ePCR) devices. We extracted and coded five variables from each lesson. They were ePCR functionality, coding skills, computational thinking skills, math knowledge, and activity design. First, a two-step cluster analysis was administered to find how three ePCR-related knowledge: ePCR functionality, coding skills, and computational thinking skills, were integrated to teach students ePCR technology in middle-grade math lessons. Results showed three types of lesson plans, including lessons to use basic ePCR functionality to teach students lower-level CT skills, lessons to teach students basic to intermediate coding skills, and lessons to use the technology at the advanced level. Next, we applied the Technological Pedagogical Content Knowledge (TPACK) framework and conducted a second two-step cluster analysis to identify how the technology (ePCR technology), content (math knowledge), and pedagogy (activity design) were integrated into those lesson plans. Results suggested ten clusters of lesson plans with distinct features. We summarized those ten lesson clusters into five categories: 1) ePCR technology lessons, 2) transdisciplinary problem-based learning lessons, 3) technology-assisted lessons, 4) lessons without real-world connections, and 5) lessons integrating middle-grade math learning into ePCR projects. Implications for educators and researchers were discussed at the end of the article.

25. Sumuer, E., & Kaşıkçı, D. N. (2022). The role of smartphones in college students' mind-wandering during learning. *Computers & Education, 190*, 104616. <https://doi.org/10.1016/j.compedu.2022.104616>

Abstract: The purpose of this sequential explanatory mixed-methods research study was to investigate the role of smartphones in college students' mind-wandering during learning. In the quantitative phase of the study, data were collected from 402 college students in order to examine the extent to which college students' smartphone addiction predicts their level of mind-wandering. The result of a simple linear regression analysis indicated that college students' smartphone addiction explained 26% of variance in their level of mind-wandering. In the qualitative phase of the study, semi-structured interviews were conducted with 14 college students in order to explain this relationship by exploring how smartphones influence college students' mind-wandering during learning. The analysis of these interviews revealed that messages, incoming calls, social media, and smartphone functions played a prominent role in college students' smartphone-related mind-wandering during lectures or whilst studying. The implications of these findings were discussed and some suggestions for future studies put forth.

26. Herder, T., & Rau, M. A. (2022). Representational-competency supports in the context of an educational video game for undergraduate astronomy. *Computers & Education, 190*, 104602. <https://doi.org/10.1016/j.compedu.2022.104602>

Abstract: Educational video games can engage students in authentic STEM practices, which often involve visual representations. Specifically, because most interactions within video games are mediated through visual representations, video games provide opportunities for students to experience disciplinary practices with visuals. Research demonstrates, however, that learning from multiple visuals is complex. Prior research in structured environments has demonstrated that providing supports for representational competencies in terms of sense-making competencies and perceptual fluency can support learners, but such research has not been conducted in game environments. To address this gap, we investigated whether supports for representational competencies enhanced students' learning with an astronomy video game. We conducted an experiment with 115 students to investigate the effects of sense-making support (yes vs. no) and perceptual-fluency support (yes vs. no) within an astronomy game. Results showed that sense-making supports did not enhance students' content learning. Further, perceptual-fluency supports enhanced students' content learning outcomes only when they had high content pre-test scores. Hence, interventions that support representational competencies in non-game environments may work differently in the context of educational video games. This suggests that designers may need to develop new strategies to support students' learning with disciplinary visuals in educational games.

27. Yang, D., Xia, C., Collins, P., & Warschauer, M. (2022). The role of bilingual discussion prompts in shared E-book reading. *Computers & Education, 190*, 104622. <https://doi.org/10.1016/j.compedu.2022.104622>

Abstract: This randomized controlled trial study examined the effects of bilingual discussion prompts with feedback within a multimedia interactive e-book on parent-child shared reading for young English language learners aged 3–7 in China. Sixty-

four parent-child pairs read a multimedia English storybook with bilingual discussion prompts in the treatment condition, and forty-three pairs read the same multimedia storybook without discussion prompts. After reading the storybook twice, children in the discussion-prompt group outperformed the control group on story comprehension and retelling measures. However, children in both groups showed comparable gains in English vocabulary. According to our qualitative analysis of parent-child responses on discussion pages, when parents follow the question-response-evaluate-feedback flow of the discussion sessions, they tend to practice dialogic reading strategies and scaffold children's learning naturally and effectively without explicit training. With the learning facilitation from both the storybook and parents, children received more comprehensible input, produced more English output, and became active storytellers instead of passive learners. Moreover, the e-book with a built-in questioning avatar established children's parasocial relationship with the story characters. These findings suggest an exciting potential for multimedia interactive e-books, powered by bilingual discussion prompts, as an effective educational tool for families from diverse linguistic backgrounds.

28. Richter, E., Hußner, I., Huang, Y., Richter, D., & Lazarides, R. (2022). Video-based reflection in teacher education: Comparing virtual reality and real classroom videos. *Computers & Education*, 190, 104601. <https://doi.org/10.1016/j.compedu.2022.104601>

Abstract: While previous studies have examined the use of real-world classroom videos to support the development of student teachers' reflective skills, there has been little research to date on the use of virtual reality (VR) videos in teacher education to provide opportunities for authentic reflection. This mixed-methods study investigated changes in reflection-related self-efficacy and differences in written reflection processes using a quasi-experimental design with two types of reflection stimuli. One group of 46 student teachers used a VR-based video to reflect on instruction while another group of 23 student teachers used a real classroom video. We found an increase in reflection-related self-efficacy over time among participants in the VR group only. We also found that VR videos triggered similar reflection processes to real classroom videos. This study shows, for the first time, that video-based reflection on VR classroom videos produced comparable results to reflection on real classroom videos. This indicates that VR can be used successfully in teacher education and that it offers a useful learning tool for teacher education programs.

29. Liao, C. H., & Wu, J. Y. (2022). Deploying multimodal learning analytics models to explore the impact of digital distraction and peer learning on student performance. *Computers & Education*, 190, 104599. <https://doi.org/10.1016/j.compedu.2022.104599>

Abstract: Social media have been extensively incorporated in higher education as an indispensable tool for learning. Nevertheless, research has conflicting findings about its effectiveness due to the highly reported digital distraction and poor peer learning engagement on social media. This study employed an innovative problem-based learning (PBL) pedagogy incorporating Learning Analytics to identify digital distraction, quantify the quality of peer learning engagement, and predict learning performance. Participants were 51 Taiwanese graduate students in blended Statistics courses under the PBL pedagogy. The multimodal Learning Analytics (LA) model

contained data from learner discourse on Facebook groups and questionnaires, including learner characteristics, perceived digital distraction, subjective peer learning orientation, and objective peer learning engagement endorsed by machine learning (ML) models. Results showed that students reporting more digital distraction problems obtained lower final course grades, and those reporting stronger peer learning orientation received higher final course grades. Moreover, peer learning engagement objectively recognized by ML models has better predictive validity on academic performance than self-perceived peer learning orientation. The results of the multimodal LA models addressed the scarcity of studies involving learners' process data in PBL and informed instructional practices and strategies to scaffold students' statistics learning upon detecting those at risk of distracted attention problems and poor peer learning engagement.

30. Richter, E., Carpenter, J. P., Meyer, A., & Richter, D. (2022). Instagram as a platform for teacher collaboration and digital social support. *Computers & Education, 190*, 104624. <https://doi.org/10.1016/j.compedu.2022.104624>

Abstract: Social media platforms can be sites for professional collaboration and the provision of digital social support among teachers. Instagram is one such platform that is widely used but that has received only limited attention from education researchers. To date, little is known about which teachers use Instagram for collaboration, the ways in which they collaborate, and how this collaboration contributes to their perceptions of digital social support. Using questionnaire data from 249 teachers from Germany, we identified three collaboration activities among teachers on Instagram: information seeking, information sharing, and co-creating. While teachers with higher levels of enthusiasm for teaching in particular are more likely to use Instagram to seek information, teachers with higher self-efficacy levels are more likely to share content. In addition, seeking and sharing information as well as co-creating are each positively associated with various forms of perceived digital social support. These findings point to the potential of social media use contributing to teacher professional development and indicate that it deserves more attention in both teacher education and research.

CONTEMPORARY EDUCATIONAL PSYCHOLOGY

1. Kiuru, N., Malmberg, L. E., Eklund, K., Penttonen, M., Ahonen, T., & Hirvonen, R. (2022). How are learning experiences and task properties associated with adolescents' emotions and psychophysiological states? *Contemporary Educational Psychology, 71*, 102095. <https://doi.org/10.1016/j.cedpsych.2022.102095>

Abstract: We examined whether learning experiences (value of success, mastery experience) and task properties (challenge) are related to early adolescents' ($n = 190$, median age = 12) emotional responses and psychophysiological states (autonomic nervous system, ANS) in achievement situations in an ambulatory laboratory. They completed four achievement tasks (two math and two reading) at different challenge levels in randomized order, and reported their learning and task perceptions for each task. The proportion of errors indicated the objective demandingness of each task. As indices of sympathetic nervous system activity, we recorded skin conductance response (SCR) and heart rate (HR), and, as parasympathetic nervous system activity, their heart rate variability (HRV). Following control-value and flow theories, we proposed hypotheses for main and interaction effects and specified multilevel models (tasks nested in persons). Novel findings emerged. Aside from the anticipated main effects, Challenge \times Mastery interaction also was related to adolescents' emotions and SCR at the within-person (task) level. Furthermore, Value \times Mastery Experience interaction was related to SCR and HRV at the task level, whereas Value \times Errors interaction contributed to experienced anger and anxiety at the between-person (individual) level. The findings provide novel understanding of situational interplay between the value of success, challenge, and mastery experience in adolescents' experienced emotions and psychophysiological states.

2. Patall, E. A., Kennedy, A. A., Yates, N., Zambrano, J., Lee, D., & Vite, A. (2022). The relations between urban high school science students' agentic mindset, agentic engagement, and perceived teacher autonomy support and control. *Contemporary Educational Psychology, 71*, 102097. <https://doi.org/10.1016/j.cedpsych.2022.102097>

Abstract: Students' agentic engagement and teachers' autonomy support represent powerful reciprocal factors that can influence academic outcomes. However, little is known about the extent to which students' agentic mindset reciprocally relates to agentic engagement and teachers' practice or the parallel role of teacher control, particularly among ethnically diverse urban students. The current investigation examined reciprocal relations between urban U.S. high school science students' agentic mindset, agentic engagement, and perceived teacher autonomy support and control over time. Cross-lagged structural equation models indicated that agentic mindset, agentic engagement, and perceived teacher practice reciprocally relate. Agentic engagement predicted increases in agentic mindset. Perceived teacher autonomy support predicted increases in agentic mindset and agentic engagement. Agentic mindset predicted decreases in perceived teacher control and vice versa. Moderator analyses suggested that relations varied depending on prior achievement and stereotype vulnerability, but not gender. Specifically, perceived support increased the agentic engagement more for low versus high stereotype vulnerable students. Predicted relations were also stronger and more adaptive for higher achieving compared to lower achieving students, with adaptive relationships from mindset to engagement and from engagement to perceived teacher practice emerging only for

high achieving students. Implications for theory, future research, and practice are discussed.

3. Troia, G. A., Wang, H., & Lawrence, F. R. (2022). Latent profiles of writing-related skills, knowledge, and motivation for elementary students and their relations to writing performance across multiple genres. *Contemporary Educational Psychology*, 71, 102100. <https://doi.org/10.1016/j.cedpsych.2022.102100>

Abstract: Our goal in this study is to expand the limited research on writer profile using the advantageous model-based approach of latent profile analysis and independent tasks to evaluate aspects of individual knowledge, motivation, and cognitive processes that align with Hayes' (1996) writing framework, which has received empirical support. We address three research questions. First, what latent profile are observed for late elementary writers using measures aligned with an empirically validated model of writing? Second, do student sociodemographic characteristics—namely grade, gender, race, English learner status, and special education status—influence latent profile membership? Third, how does student performance on narrative, opinion, and informative writing tasks, determined by quality of writing, vary by latent profile? A five-profile model had the best fit statistics and classified student writers as Globally Weak, At Risk, Average Motivated, Average Unmotivated, and Globally Proficient. Overall, fifth graders, female students, White students, native English speakers, and students without disabilities had greater odds of being in the Globally Proficient group of writers. For all three genres, other latent profile were significantly inversely related to the average quality of papers written by students who were classified as Globally Proficient; however, the Globally Weak and At Risk writers were not significantly different in their writing quality, and the Average Motivated and Average Unmotivated writers did not significantly differ from each other with respect to quality. These findings indicate upper elementary students exhibit distinct patterns of writing-related strengths and weaknesses that necessitate comprehensive yet differentiated instruction to address skills, knowledge, and motivation to yield desirable outcomes.

4. Nießen, D., Wicht, A., Schoon, I., & Lechner, C. M. (2022). “You can’t always get what you want”: Prevalence, magnitude, and predictors of the aspiration–attainment gap after the school-to-work transition. *Contemporary Educational Psychology*, 71, 102091. <https://doi.org/10.1016/j.cedpsych.2022.102091>

Abstract: This study examined the prevalence, magnitude, and predictors of the *aspiration–attainment gap* (AAG) after the school-to-work transition. We operationalized the AAG as the discrepancy between the socioeconomic status (SES) of young people’s *realistic* occupational aspirations and that of the position they actually attained. As a case in point, we investigated non-college-bound students transitioning into a vocational education and training (VET) position in Germany. Our aims were twofold: first, to establish how many students experience an AAG of what size; second, to identify characteristics that predict whether students experience an AAG. We considered sociostructural characteristics, cognitive ability and school grades, and Big Five personality traits as predictors (i.e., potential determinants) of the AAG. Analyses in a representative sample ($N = 2,478$) of intermediate secondary school (*Realschule*) students/graduates from the German National Educational Panel Study (NEPS; Starting Cohort 4) revealed that 45.9% of students experienced an

AAG. Two-part regression models showed that the level of aspirations was the strongest predictor of the experience and size of an AAG, followed by school grades. Aspirations also mediated the effects of several other predictors, most importantly parental SES and school grades. Parental SES, female gender, and Emotional Stability had contradictory effects: They indirectly increased the risk of experiencing an AAG by raising aspirations, but at the same time they lowered this risk by directly increasing attainment. Overall, our results suggest that the AAG during the transition from school to VET is a widespread experience among students in Germany that is worthy of further investigation.

5. Karen Murphy, P., Greene, J. A., Firetto, C. M., M. V. Croninger, R., Duke, R. F., Li, M., & Lobczowski, N. G. (2022). Examining the effects of quality talk discussions on 4th- and 5th-grade students' high-level comprehension of text. *Contemporary Educational Psychology, 71*, 102099. <https://doi.org/10.1016/j.cedpsych.2022.102099>

Abstract: Given the rapid pace of technological change, access to unlimited information, and diverse forms of complex text, the importance and demand for enhanced literacy skills is greater than ever. Accordingly, researchers have begun developing integrated, multifaceted interventions that dynamically support enhanced literacy competence. The purpose of this year-long quasi-experimental study was to compare the effects of a multifaceted, rigorous discussion intensive literacy intervention called Quality Talk (QT) to a comparison intervention. Fourth- and fifth-grade students (QT treatment, $n = 133$; comparison, $n = 155$) from two public schools participated in a district-wide literacy program with half also participating in QT within their language arts class. Spanning baseline and two subsequent time points, findings revealed that, on average, students evidenced statistically significant increases on one form of basic-level comprehension performance over time with no statistically significant difference between QT and comparison classrooms. Given that treatment and comparison classrooms engaged in a district-wide literacy initiative with supplemental daily literacy instruction, these results are not altogether unexpected. However, despite the enhanced literacy instruction across all classes, from Time 2 to Time 3, growth in QT students' high-level comprehension, as measured via written argumentation essay performance, was statistically significantly greater than their comparison peers' growth. This study informs the future of education research and practice regarding the feasibility and utility of relevant and rigorous multifaceted literacy interventions focused upon small-group discussion.

6. Wong, A. Y., Smith, S. L., McGrath, C. A., Flynn, L. E., & Mills, C. (2022). Task-unrelated thought during educational activities: A meta-analysis of its occurrence and relationship with learning. *Contemporary Educational Psychology, 71*, 102098. <https://doi.org/10.1016/j.cedpsych.2022.102098>

Abstract: The “costs” of task-unrelated thought (often referred to as mind-wandering) on performance in educational contexts have received growing theoretical and empirical attention in the last decade. Published articles on task-unrelated thought in educational contexts usually point out two important claims: 1) that task-unrelated thought occurs often during learning and 2) that task-unrelated thought shares a negative relationship with learning outcomes. However, the corresponding rates and effect sizes reported in the literature have been quite variable to date. We thus adopted a multi-level meta-analytic approach in order to provide baseline metrics for the

frequency of task-unrelated thought in educational contexts and its relationship with learning outcomes across different learning tasks and assessments. Our analysis suggests that students are off-task about 30% of the time during educationally relevant activities, and the average relationship between task-unrelated thought and learning outcomes was in line with a small-to-medium practical effect, -0.27 . No differences were observed between learning tasks and various moderators. The average rates and correlation values reported in this meta-analysis can be used as a benchmark for future research aiming to assess task-unrelated thought in education.

7. Gehlbach, H., Mu, N., Arcot, R. R., Chuter, C., Cornwall, K. J., Nehring, L., Robinson, C. D., & Calderon Vriesema, C. (2022). Addressing the vexing educational challenges of biodiversity loss: A photo-based intervention. *Contemporary Educational Psychology, 71*, 102096. <https://doi.org/10.1016/j.cedpsych.2022.102096>

Abstract: As an educational problem, the accelerating loss of biodiversity—one of the planet’s most pressing issues—represents a particularly intriguing challenge. First, although biodiversity loss unfolds around us on a daily basis, many individuals struggle to see, comprehend, and care about it. In addition, educators addressing biodiversity loss must attend to multiple outcomes simultaneously—i.e., students’ emotions, motivation, and behaviors as well as their understanding of key concepts. Focusing on the valuing component of expectancy-value theory, we evaluated the potential of photographs to affect participants’ emotional reactions, valuing of biodiversity, pro-environmental behaviors, and content-relevant learning. Through a preliminary, exploratory experiment ($N = 399$ adults) and a preregistered, confirmatory experiment ($N = 1870$ secondary school students), we found broadly consistent evidence that strategically selected photographs induced negative emotions, increased participants’ valuing of biodiversity, and motivated pro-environmental behavior. Meanwhile, we saw no evidence of deleterious (or positive) effects on participants’ learning when the photographs accompanied an informational text. We conclude by discussing how costs are conceptualized within expectancy-value theory, as well as the potential of photographs as a useful pedagogical strategy for a range of environmental educators.

8. Tam, Y. P., & Chan, W. W. L. (2022). The differential relations between sub-domains of spatial abilities and mathematical performance in children. *Contemporary Educational Psychology, 71*, 102101. <https://doi.org/10.1016/j.cedpsych.2022.102101>

Abstract: Spatial abilities are closely connected to mathematical performance. However, previous work do not determine whether sub-domains of spatial abilities are equally important for different mathematics tasks. This study addressed this gap by adopting Uttal et al.’s (2013) typology of spatial abilities along the intrinsic/extrinsic and static/dynamic dimensions. Three hundred twenty-four Chinese first graders were tested on a battery of spatial and mathematics tasks, including hidden figures, mental rotation, spatial scaling, perspective taking, mental number line representation, place-value understanding, calculation, word problems, geometry, measurement, and algebra. Hierarchical regression models showed that after controlling for age and gender, spatial abilities explained 12.6% to 25.7% of the variance across seven measures of mathematical performance. Sub-domains of spatial abilities were found to have varying roles in explaining mathematical performance. Among them, hidden figures and perspective taking were significant predictors of all mathematics

measures. The findings offer new insights into developing spatial training to support children's mathematical learning.

9. Bae, C. L., Sealy, M. A., Cabrera, L., Gladstone, J. R., & Mills, D. (2022). Hybrid discourse spaces: A mixed methods study of student engagement in U.S. science classrooms. *Contemporary Educational Psychology*, *71*, 102108. <https://doi.org/10.1016/j.cedpsych.2022.102108>

Abstract: In this mixed methods study, we applied engagement and sociocultural (hybridity) frameworks to understand the nature of historically underserved students' participation in science discourse. We analyzed videos from seven U.S. urban middle school science classrooms to examine features of hybrid discourse spaces (where students' everyday and academic discourses are integrated) as students engaged in science talk. We also examined the relationships among instructional practices and science engagement ($N = 101$ students) using bifactor exploratory structural equation modeling (bESEM). Findings showed that science discourse occurred primarily in traditional spaces and was largely directed by the teacher. Within the smaller subset of hybrid spaces, small group discourse formats and shared or student-directed agency were more prevalent compared to traditional and everyday spaces. Qualitative themes displayed student agency, identities, and knowledge bases across lived worlds co-existing in hybrid discourse spaces. The bESEM showed that instructional practices associated with high quality and equity-focused instruction relate differentially to specific dimensions of engagement, demonstrating most consistent relationships with affective engagement. The variable representing funds of knowledge connections was only related to cognitive engagement. The integrated findings demonstrate the potential of hybrid discourse spaces for supporting equitable student engagement in science talk. Implications for practice and lines for future research are discussed.

10. Marchante, M., Alexandre Coelho, V., & Maria Romão, A. (2022). The influence of school climate in bullying and victimization behaviors during middle school transition. *Contemporary Educational Psychology*, *71*, 102111. <https://doi.org/10.1016/j.cedpsych.2022.102111>

Abstract: This study analyses how perceived school climate variables (teacher–student relationships, student–student relationships, fairness of rules, school safety, and liking of school) influenced bullying and victimization behaviors during middle school transition in Portugal (fourth to fifth grade). A total of 671 middle school students participated in the study, of which 52.2% were boys. Bullying and victimization behaviors were assessed in three different time points (twice before middle school transition and once after) and perceptions of school climate were assessed twice (before and after middle school transition). Results showed that a more positive trajectory in students' perceptions of teacher-student relationships, student–student relationships, school safety, and liking of school between fourth and fifth grade was associated with a more positive trajectory in victimization behaviors, and a more positive trajectory in students' perceptions of fairness of rules in the same period was associated with a more positive trajectory in bullying behaviors. Additionally, regarding gender, boys showed a larger increase in victimization behaviors, but there were no differences due to classroom size. These results highlighted the importance of creating a positive school climate in middle school to reduce bullying and victimization behaviors during middle school transition.

11. Lin, S., & Muenks, K. (2022). Perfectionism profiles among college students: A person-centered approach to motivation, behavior, and emotion. *Contemporary Educational Psychology*, 71, 102110. <https://doi.org/10.1016/j.cedpsych.2022.102110>

Abstract: Perfectionism among college students has increased in the past three decades, yet studies of perfectionism in academic contexts are relatively scarce. This study used a person-centered approach to investigate associations between perfectionism profiles and academic indicators (i.e., motivation, behavior, and emotion), whether there are any gender or racial/ethnic differences in perfectionism profiles, and whether growth mindsets moderated associations between perfectionism profiles and academic indicators. Data were collected from 516 college students enrolled in math-related courses. Latent profile analysis revealed four distinct types of perfectionism characterized as *Ambitious*, *Concerned*, *Perfectionist* and *Non-perfectionist*. The *Ambitious* group was associated with the best academic indicators overall, whereas the *Concerned* group had the worst indicators. Students in the *Perfectionist* and *Non-perfectionist* groups exhibited more complex patterns across academic indicators, with those in the *Perfectionist* group having generally more positive motivational/behavioral indicators but more negative emotional indicators, and those in the *Non-perfectionist* group demonstrating the opposite pattern. Asian American students were over-represented in the *Ambitious* and *Perfectionist* groups. Additionally, growth mindset served as a protective factor for the *Concerned* and *Non-perfectionist* groups on motivational indicators (task value and perceived cost, respectively). Overall, this study highlights the importance of person-centered approaches and the inclusion of multiple academic indicators (i.e., motivational, behavioral, and emotional) to reveal the complex nature of perfectionism.

12. Wong, D., Allen, K. A., & Gallo Cordoba, B. (2022). Examining the relationship between student attributional style, perceived teacher fairness, and sense of school belonging. *Contemporary Educational Psychology*, 71, 102113. <https://doi.org/10.1016/j.cedpsych.2022.102113>

Abstract: Teacher fairness is a major concern for secondary students and significantly influences their sense of school belonging. This study investigated the relationship between Australian secondary students' perception of teacher fairness and school belonging, and the indirect effects of student attributional style on that relationship. A sample of 269 students was collected from online surveys, which used the Psychological Sense of School Membership, Teacher Justice Scale, and Adolescent Cognitive Style Questionnaire to measure the key variables. Correlational analysis (two-tailed) revealed a positive relationship between perceived teacher fairness and school belonging, $r(269) = 0.47, p < .001$, and a negative relationship between maladaptive student attributional style with perceived teacher fairness, $r(269) = -0.18, p < .001$, and school belonging, $r(269) = -0.28, p < .001$. Additionally, a multiple regression analysis found that the variability in both student attributional style and perceived teacher fairness jointly explained around 26% of the variability in school belonging. Moreover, student attributional style partly mediated the relationship between perceived teacher fairness and school belonging, with an estimated statistically significant indirect effect of 0.03 units and a dominant direct effect of 0.31 units. These results confirm perceived teacher fairness as an essential ingredient for a positive teacher-student relationship and sense of school belonging.

Findings from this study provide implications for classroom justice research and highlight the potential for applying framing interventions to students' perceptions of teacher fairness to improve teacher-student relationships and enhance students' sense of school belonging.

13. Wilke, M., Depaepe, F., & Van Nieuwenhuysse, K. (2022). Fostering historical thinking and democratic citizenship? A cluster randomized controlled intervention study. *Contemporary Educational Psychology*, *71*, 102115. <https://doi.org/10.1016/j.cedpsych.2022.102115>

Abstract: Historical thinking has gradually become a central goal for history education. Its complexity, however, makes it difficult to foster among students and little is known about the role of students' epistemological beliefs. At the same time, several history education scholars have argued that historical thinking may not only contribute to disciplinary goals, but also to civic ones. They assume students to spontaneously transfer historical skills, knowledge and dispositions to contemporary contexts. Although there is some evidence to support such a spontaneous transfer, general educational literature indicates that a transfer of learning is difficult to obtain. This study examines the disciplinary effects of a lesson series aimed at fostering students' historical inquiry competence via a cluster randomized controlled intervention study in Flemish history education (control: $n = 266$; intervention: $n = 402$). It also examines whether a spontaneous transfer to contemporary topics occurs. To this end, a pre- and posttest examines (1) changes in students' historical inquiry competences and epistemological beliefs about history and (2) the transfer to democratic skills and dispositions. Multilevel and linear regression models showed that the lesson series was effective in enhancing students' historical inquiry skills and procedural knowledge; no effect was found on their epistemological beliefs. The lesson series did not directly improve students' democratic skills and dispositions. However, changes in students' historical inquiry competence did significantly predict their democratic skills at posttest, although in a limited way. These results caution for an excessive optimism regarding the idea that historical thinking automatically contributes to democratic citizenship.

14. Fréchette-Simard, C., Plante, I., Duchesne, S., & Chaffee, K. E. (2022). The mediating role of test anxiety in the evolution of motivation and achievement of students transitioning from elementary to high school. *Contemporary Educational Psychology*, *71*, 102116. <https://doi.org/10.1016/j.cedpsych.2022.102116>

Abstract: The transition to secondary school involves a host of new challenges that often lead to declines in students' motivation and achievement. This study examined whether test anxiety contributes to the changes in academic self-concept, expectations of success, task values and achievement in the two core domains of mathematics and language arts among 478 students (247 girls, $Mean\ age_{T1} = 12.15$) as they transition to secondary school. To evaluate the generalizability of the results to male and female students, gender differences were also examined. The results of path analyses revealed that for both genders, test anxiety played a mediational role in the changes in academic self-concept before and after the transition. In addition, test anxiety partially mediated the changes between prior and later expectations of success and achievement, but only for girls in mathematics. These findings highlight that students with lower levels of motivation and achievement at the end of elementary school,

especially girls in the domain of mathematics, are more at risk to face a difficult transition to secondary school.

15. Chan, J. Y. C., Ottmar, E. R., Smith, H., & Closser, A. H. (2022). Variables versus numbers: Effects of symbols and algebraic knowledge on students' problem-solving strategies. *Contemporary Educational Psychology*, *71*, 102114. <https://doi.org/10.1016/j.cedpsych.2022.102114>

Abstract: To efficiently solve mathematical expressions and equations, students need to notice the systemic structure of mathematical expressions (e.g., inverse relation between 3 and -3 in $3 + 5 - 3$). We examined how symbols—specifically variables versus numbers—and students' algebraic knowledge impacted seventh graders' problem-solving strategies and use of systemic structures within an online algebra game where students could dynamically transform expressions. We found that on simple problems, symbols did not impact students' strategy efficiency, although students with higher vs lower algebraic knowledge were more efficient at solving these problems. On complex problems, students with higher algebraic knowledge were *more* efficient at solving variable vs numerical problems, whereas students with lower algebraic knowledge were *less* efficient at solving variable vs numerical problems. The visualizations and examination of first steps further revealed that whether students leveraged systemic structures during their problem-solving varied across problems. The findings have implications for research on cognitive processes of symbols and practices on teaching mathematics.

16. Wei, J., Pomerantz, E. M., Ng, F. F. Y., Yu, Y., Wang, M., & Wang, Q. (2022). Do the effects of parents' involvement in youth's academic adjustment vary with youth's developmental phase? A longitudinal investigation in China. *Contemporary Educational Psychology*, *71*, 102118. <https://doi.org/10.1016/j.cedpsych.2022.102118>

Abstract: This research tested the idea that the role of parents' homework assistance and academic socialization in youth's academic adjustment is modulated by youth's developmental phase. Chinese youth ($N = 1863$) in elementary, middle and high school and their parents reported on parents' homework assistance and academic socialization, and youth reported on their academic adjustment as manifest in their beliefs, motivational orientation, and engagement twice over a year. Over time, parents' assistance with homework generally had positive effects on youth's academic adjustment in elementary school, but no effects or negative effects by high school. In contrast, parents' academic socialization had positive effects, regardless of youth's developmental phase, with these effects sometimes being stronger in middle and high school.

17. Raufelder, D., Hoferichter, F., Hirvonen, R., & Kiuru, N. (2022). How students' motivational profiles change during the transition from primary to lower secondary school. *Contemporary Educational Psychology*, *71*, 102117. <https://doi.org/10.1016/j.cedpsych.2022.102117>

Abstract: Following the situated expectancy-value model of achievement motivation, this 3-wave study examines the stability and change of motivational patterns of students (M_{age} at the outset = 12.33 years; $SD = 0.37$ years; 54.5 % female) transferring from primary to lower secondary school. Four task values (attainment,

cost, intrinsic, utility value) and success expectancies (self-concept) in the domains of mathematics and literacy were assessed three times with questionnaires. Latent transition analysis for task values and success expectations with gender and parental education as control variables and test scores of fluid intelligence, math and literacy as outcomes was performed. The results reveal four different motivational patterns: (1) “disengaged strained”, 27–31 % (low motivation and high cost), (2) “disengaged relaxed”, 19–25 % (low motivation and low cost), (3) “positively engaged”, 14–20 % (high motivation and low cost), (4) “struggling ambitious”, 31–34 % (high motivation and high cost). Except for the “positively engaged” profile, probabilities of staying in the same profile were relatively high. During the transition to lower secondary school the groups characterized by high motivation combined with either low (“positively engaged”) or high (“struggling ambitious”) cost became smaller, whereas the two other groups characterized by low motivation combined with either low (“disengaged relaxed”) or high (“disengaged strained”) cost became bigger. Particularly, students with a “positively engaged” profile have a higher probability to change to one of the disengaged profiles over time. Students with a “struggling ambitious” profile had the highest test scores in fluid intelligence, math, and literacy.

18. López, F., González, N., Hutchings, R., Delcid, G., Raygoza, C., & López, L. (2022). Race-reimagined self-determination theory: Elucidating how ethnic studies promotes student identity and learning outcomes using mixed-methods. *Contemporary Educational Psychology*, 71, 102119. <https://doi.org/10.1016/j.cedpsych.2022.102119>

Abstract: Latinx students often experience a lifetime of deficit-based pedagogy. These deficit views are perpetuated in instruction that ignores the depth of their insight and intellect, essentially pushing them out of school. In contrast to assimilationist approaches to instruction that omit and disparage minoritized students through the formal and informal curriculum, ethnic studies is a pedagogical approach centered on affirming students’ identities and nurturing critical consciousness. Recent large scale empirical analyses across various contexts demonstrate important educational benefits of ethnic studies courses for students but have not included the examination of identity, the very mechanism that underlies the theorized effectiveness of ethnic studies. By applying a race-reimagined Self-Determination Theory using a qualitative-dominant sequential explanatory mixed methods design, we elucidate the ways ethnic studies informs learning via students’ motivation and identity. Quantitative findings confirm prior research on SDT, but the qualitative findings extend a race-reimagining of SDT. Students expressed the ways rigorous courses focused on developing an understanding of systems of oppression through critical dialogic engagement with teachers and peers (and materials) can promote critical curiosity, affirm relatedness that considers race/ethnicity explicitly, as well as competence and autonomy.

19. Granziera, H., Collie, R. J., & Martin, A. J. (2022). Teacher well-being: A complementary variable- and person-centered approach harnessing Job Demands-Resources theory. *Contemporary Educational Psychology*, 71, 102121. <https://doi.org/10.1016/j.cedpsych.2022.102121>

Abstract: Teachers and the provision of quality education are widely recognised as being key foundations for a successful society (Schleicher, 2019). However, teachers are leaving the profession at disproportionately high rates (Organization for Economic

Cooperation and Development [OECD], 2021), which bears significant implications for broader school and student outcomes. Recent work has highlighted the need to focus on teachers' positive psychological functioning as a means to these concerns. Accordingly, we applied Job Demands-Resources theory (Demerouti et al., 2001) to a sample of Australian elementary teachers. In Phase 1 (variable-centered), we adopted structural equation modeling to examine how job demands and job and personal resources were associated with well-being and retention-related outcomes. In Phase 2 (person-centered), we identified profiles of demands and resources, and the association between these profiles and the outcomes. Phase 1 results revealed significant predictive paths among the substantive factors and evidence of a buffering process. In Phase 2, four unique profiles were identified. Taken together, the findings yield important implications for conceptualizing and fostering teachers' well-being.

20. Bråten, I., Brandmo, C., Ferguson, L. E., & Strømsø, H. I. (2022). Epistemic justification in multiple document literacy: A refutation text intervention. *Contemporary Educational Psychology, 71*, 102122. <https://doi.org/10.1016/j.cedpsych.2022.102122>

Abstract: This study investigated the effects of a refutation text intervention on Norwegian teacher education students' ($n=150$) beliefs about justification for knowing and their subsequent performance on a multiple document literacy task. Participants were randomly assigned to one of three conditions in which they read a refutation text that promoted the conception that an appropriate way to judge the trustworthiness of information about educational topics is to rely on personal understanding and practical experience, the expertise of the author, or comparison of multiple sources. Results showed that participants' beliefs about epistemic justification were strongly influenced by the intervention. Beyond effects on self-reported justification beliefs, effects on participants' selection of documents varying in terms of the expertise of the author and the stance toward the issue discussed across the documents were observed, as well as effects on how participants justified their document selections, processed the selected documents, and finally used them in their written task products. As such, the effects of the intervention targeting beliefs about epistemic justification transferred to various stages of the multiple document task.

21. Jaekel, A. K., Wagner, W., Trautwein, U., & Göllner, R. (2022). "The Teacher Motivates Us – Or Me?" – The Role of the Addressee in Student Ratings of Teacher Support. *Contemporary Educational Psychology, 71*, 102120. <https://doi.org/10.1016/j.cedpsych.2022.102120>

Abstract: Student ratings have become a standard way to assess teaching quality. However, little is known about whether using a we/us-addressee ("The teacher motivates us") or an I/me-addressee ("The teacher motivates me") makes a difference for the information that is obtained. In this study, we experimentally varied the addressee in teaching-quality items capturing six dimensions of teacher support in two school subjects. We investigated differences between the two addressee versions in mean levels, level of agreement, associations between dimensions using the same versus different addressees, and correlations with a variety of student outcome variables. We found that the item addressee was relevant for most psychometric properties in question, and differences were more pronounced for mathematics than for German language arts.

22. Zou, X., Zhang, X., & Ouyang, X. (2022). The interplay between father–child and mother–child numeracy activities and preschool children’s mathematical skills. *Contemporary Educational Psychology*, *71*, 102123. <https://doi.org/10.1016/j.cedpsych.2022.102123>

Abstract: The present study investigated the interplay between children’s mathematical skills and their mothers’ and fathers’ engagement in numeracy activities. One hundred and five Hong Kong Chinese children and their fathers and mothers were assessed at two time points, first in their second year of preschool, then one year later in their third year. At both time points, all of the fathers and mothers independently reported how frequently they engaged in numeracy activities with children, and all of the children were tested individually to evaluate their symbolic and non-symbolic mathematical skills. The results showed that mothers’ application activities positively predicted children’s later non-symbolic mathematical skills. Children’s non-symbolic mathematical skills negatively predicted their mothers’ later number skill activities, and their symbolic mathematical skills negatively predicted their fathers’ later number skill activities. Finally, mothers’ number book activities positively predicted fathers’ later number book activities, and mothers’ number skill activities positively predicted fathers’ later number skill activities. These findings highlight the importance of mothers’ application activities to children’s number learning and the potential role of children’s weak mathematical skills in eliciting parental engagement in number skill activities. They also underscore the positive effect of mothers’ engagement in numeracy activities on fathers’ engagement.

CURRICULUM INQUIRY

1. Okello, W. K. (2022). "What are you pretending not to know?": Un/doing internalized carcerality through pedagogies of the flesh. *Curriculum Inquiry*, 52(4), 405–425. <https://doi.org/10.1080/03626784.2022.2047579>

Abstract: Carcerality is more than a physical occurrence, but a lasting psychological, spiritual, and emotional state of being that gets in the body and directs how one may move in and through the world. As a contour of whiteness, carcerality normalizes ways of being that are consistent with rationality and reason privileging mind over body; intellectual over experiential ways of knowing; and mental abstractions over passions, bodily sensations, and tactile understandings. Employing poetics, reflexivity, and Black letters, Black feminist narrative methods steer these analyses to explore how whiteness, as carcerality, is germane to Black being in a western, United States context. To pursue this inquiry, I juxtapose storytelling analysis with a Black feminist literary analysis of Toni Cade Bambara's "The Education of the Storyteller," asking, how might educators name, critique, and pedagogically extract whiteness (carcerality) and its pervasive curriculum from the bodies of Black subjects by keying into histories of Blackness, rationality, and the body? Ultimately, I am interested in what the historical and racialized politics of the body demand with regard to pedagogy. Three themes emerged as considerations for a pedagogy of the flesh: epistemic confrontation, corporeal visibility, and legitimizing affect. Findings advance scholarship on how educators might engage Black students in ways that honour the full Black body-mind as a living, moving entity deserving of humanity, in a western, United States context that expects Black stillness.

Keywords: Blackness, embodiment, carcerality, pedagogy, whiteness, narrative methods

2. Karmiris, M. (2022). Cripistemologies and resisting the calls to return to normal. *Curriculum Inquiry*, 52(4), 426–442. <https://doi.org/10.1080/03626784.2022.2089005>

Abstract: The purpose of this article is to engage crip theory in a critical analysis of the calls within elementary education for a return to normalcy. I seek to question the ways Covid-19 has reinforced orientations towards normalcy by asking where normalcy went and how the calls for its return reveal the fundamental limits of inclusion within schools. Uses of the terms normalcy, normal, and normative within the context of this article refer to the mythical white, male, able-bodied, middle-class, heteronormative figure that remains hegemonic as well as widely resisted, questioned, and critiqued within critical disability studies. Through the application of crip theory and cripistemologies, I contend in this article that calls to return to normalcy engage in a persistent effort to erase and exclude disabled children and youth from a potentially transformative and necessary conversation about how we might pursue conceptualizations and enactments of inclusion outside of its current adherence to normative neoliberal aims and objectives. Rather than accepting the conditions of inclusion (i.e., the sustaining of normalcy) in its current neoliberal iteration, in this article I invite educators to crip calls for inclusion and crip calls for a return to normal.

Keywords: Social distancing, disability, inclusion, normalcy

3. Vanermen, L., Vlieghe, J., & Decuypere, M. (2022). Curriculum meets platform: A reconceptualisation of flexible pathways in open and higher education. *Curriculum Inquiry*, 52(4), 443–468. <https://doi.org/10.1080/03626784.2022.2120347>

Abstract: In open and higher education, digital technologies are increasingly used to enable flexible learning pathways and unbundle programs into separate courses. Whereas technologies have been praised for enhancing the flexibility of curricula, the implications of going digital have yet to be fully explored in curriculum studies. This article aims to critically investigate how an open education platform, OpenLearn, describes, prescribes, and enacts a particular form of curriculum. Rather than understanding platforms as passive tools for facilitating education, the article draws on theoretical and methodological ideas from science and technology studies (STS) to approach “curriculum” as a collection of socio-technical practices in which platforms play an active role. The findings of our analysis detail how networks of human and other-than-human actors are situated in a wider ecology and enact five curricular practices: prescribing, mobilising, enrolling, evaluating, and rebundling. We propose “platform curriculum” as a sensitising concept to investigate how technologies enable and constrain these practices instead of simply flexibilising them. With this article, we argue for the further adoption of STS in curriculum studies to disentangle the specific ways in which technologies, too, shape education.

Keywords: Curriculum, flexibility, platform, STS, open education

4. Desai, C., & Shahwan, R. (2022). Preserving Palestine: Visual archives, erased curriculum, and counter-archiving amid archival violence in the post-Oslo period. *Curriculum Inquiry*, 52(4), 469–489. <https://doi.org/10.1080/03626784.2022.2114778>

Abstract: This article tells the story of Palestinian visual archives in the post-Oslo period, specifically the archives of the Palestinian Liberation Organization (PLO) and their whereabouts following the PLO’s departure from Tunisia in the 1990s. It also narrates the story of the Palestinian Broadcasting Corporation (PBC) in the West Bank and Gaza and the challenges it encountered in preserving its visual archive. The article posits that the displacement, loss, and seizure of Palestinian visual archives did not result from the perceived threat they posed to Zionism alone. It underscores that the politics surrounding archives are imbricated in the broader social relations of settler colonialism, neoliberalism, and the neoliberal agendas that bourgeois national interests have produced in Palestine, as well as in the ideological differences between Palestinian political factions. The article then shifts to a discussion of the ways that archival violence maintains Israeli hegemony by erasing and silencing the anti-colonial curriculum and historiography of Palestinians to produce the settler state’s ideology, public memory, and discourses of state formation. The article uses Palestine as a case study to also tell the story of what we conceptualize as an erased curriculum. While Zionism undoubtedly produces both curricular erasures and historical silencing, we underscore how the vested interests of Palestinian political factions, specifically in the post-Oslo period, have contributed to archival violence and silencing as well. We show that despite archival violence, individuals and civil society organizations are enacting a politics of reclamation to trace, preserve, claim, and repatriate Palestinian archives, effectively practising a form of counter-archiving.

Keywords: Palestinian visual archives, erased curriculum, settler colonialism, post-Oslo, archival reclamation, archival violence

EDUCATIONAL ASSESSMENT EVALUATION AND ACCOUNTABILITY

1. Lee, J., Lee, J. S., & Lawton, J. (2022). Cognitive mechanisms for the formation of public perception about national testing: A case of NAPLAN in Australia. *Educational Assessment, Evaluation and Accountability*, 34(4), 427–457. <https://doi.org/10.1007/s11092-022-09398-8>

Abstract: Although there has been intense criticism of NAPLAN in educational policy debates in Australia, little scholarly efforts have been made to understand the underlying cognitive mechanisms that contribute to the public narrative about the national testing program. We aim to provide tentative evidence about the way public perceptions about NAPLAN may be formed. Our results show empirical support for the incentive, interpretative, and institutional effects, which suggest ways that national testing program can be improved. That is, it needs to (a) provide a diverse range of incentives to promote people’s self-interest (incentive effect); (b) demonstrate good alignment with the core values, social norms, and attitudes of the given society (interpretative effect); and (c) build a consensus about the institutional use of the test results (institutional effect). We conclude with practical implications and recommendations about seeking public support for the seemingly unpopular national educational policy.

2. Tóth, E., & Csapó, B. (2022). Teachers’ beliefs about assessment and accountability. *Educational Assessment, Evaluation and Accountability*, 34(4), 459–481. <https://doi.org/10.1007/s11092-022-09396-w>

Abstract: One of the main aims of national assessment programmes is to improve the efficacy of education systems; realizing this aim often takes the form of implementing a variety of accountability measures. Using assessment results for accountability purposes is highly controversial, while one of its undesirable impacts is that it generates negative attitudes towards educational assessments among teachers. The aim of this study is to examine lower and upper secondary teachers’ ($N=1552$) opinions and beliefs about testing and, more specifically, about the national assessment programme in Hungary. A questionnaire was used to explore teachers’ beliefs about the effects of the assessment system on how they teach, perceived pressure from stakeholders, teachers’ acceptance of assessment programmes and the relationship between these beliefs. Results show that assessment programmes compel teachers to revise their teaching practices — some change to make meaningful gains in student learning, while others turn to practices that are not conducive to a genuine improvement in students’ knowledge, focussing instead on assessment scores. Pressure from inside the school (colleagues and school leaders) and teachers’ attitude towards assessments bring about changes in instruction, such as the reallocation of coaching and improvement in teaching. Sources of pressure outside school (local government and the media) have an indirect effect on changes in teaching because their pressure influences in-school motivators. Pressure from parents and students is felt directly by teachers, but only in limited areas. The results demonstrate that a national assessment programme has a more significant impact on teaching in lower than in upper secondary schools.

3. König, J., Hanke, P., Glutsch, N., Jäger-Biela, D., Pohl, T., Becker-Mrotzek, M., Schabmann, A., & Waschewski, T. (2022). Teachers' professional knowledge for teaching early literacy: conceptualization, measurement, and validation. *Educational Assessment, Evaluation and Accountability*, 34(4), 483–507. <https://doi.org/10.1007/s11092-022-09393-z>

Abstract: This study suggests a comprehensive conceptualization of teacher knowledge for teaching early literacy in primary schools. Following the discourse on the professional knowledge of teachers, we argue that teachers' knowledge relevant to support reading and writing at the beginning of primary school education is multidimensional by nature: Teachers need content knowledge (CK), pedagogical content knowledge (PCK), and general pedagogical knowledge (GPK). Although research on teacher knowledge has made remarkable progress over the last decade, and in particular in domains such as mathematics, relevant empirical research using standardized assessment that would allow in-depth analyses of how teacher knowledge is acquired by pre-service teachers during teacher education and how teacher knowledge influences instructional quality and student learning in early literacy is very scarce. The following research questions are focused on: (1) Can teachers' professional knowledge for teaching early literacy be conceptualized in terms of CK, PCK, and GPK allowing empirical measurement? (2) How do teachers acquire such knowledge during initial teacher education? (3) Is teachers' professional knowledge a premise for instructional quality in teaching early literacy to students? We present the conceptualization of teacher knowledge for teaching early literacy in primary schools in Germany as the country of our study and specific measurement instruments recently developed by our research group. Assessment data of 386 pre-service teachers at different teacher education stages is used to analyze our research questions. Findings show (1) construct validity of the standardized tests related to the hypothesized structure, (2) curricular validity related to teacher education, and (3) predictive validity related to instructional quality. Implications for teacher education and the professional development of teachers are discussed.

4. Veronica Santelices, M., & Wilson, M. (2022). Aligning teacher assessments and teacher learning through a teacher learning progression. *Educational Assessment, Evaluation and Accountability*, 34(4), 509–532. <https://doi.org/10.1007/s11092-022-09388-w>

Abstract: This theoretical piece discusses the concept of a *teacher learning progression* in an attempt to integrate teacher learning and assessment. From the authors' perspective, the main features of the *teacher learning progression* are the longitudinal understanding of teacher knowledge and practice, and the opportunity to align teacher evaluations' formative and summative purposes. Criteria to assess existing *teacher learning progressions* are proposed and used to examine examples of teacher assessment systems implemented in different parts of the world. The concept of *teacher learning progression* has national and international implications for teacher training, for teaching assessment and for the design and implementation of educational policies.

5. Kötter, T., Schulz, J. C., & Pohontsch, N. J. (2022). Empathy as a selection criterion for medical students: is a valid assessment possible during personal interviews? A mixed-methods study. *Educational Assessment, Evaluation and Accountability*, 34(4), 533–552. <https://doi.org/10.1007/s11092-022-09387-x>

Abstract: Places to study at medical schools are scarce, which makes well-designed selection procedures employing criteria with predictive validity for good students and doctors necessary. In Germany, the pre-university grade point average (pu-GPA) is the main selection criterion for medical school application. However, this is criticised. According to a decision by the Federal Constitutional Court, selection must be supplemented with a criterion other than the pu-GPA. Empathy is a core competency in medical care. Therefore, it seems to be an appropriate criterion. This study evaluates the feasibility of an empathy questionnaire and empathy appraisal by a panel for applicant selection. We employed a sequential explanatory mixed-methods design. Results of self- and external assessments of empathy were compared in a quantitative analysis. Thereafter, the concept of empathy and the approach to empathy appraisal by the selection panel members were explored qualitatively in six focus groups with 19 selection panel members using a semi-structured guideline. Transcripts were content analysed using both deductive and inductive coding. We found no significant correlation of self- and external empathy assessment ($\rho(212) = -.031, p > .05$). The results of the focus groups showed that, while panel members judged the external empathy assessment to be useful, they had neither a homogenous concept of empathy nor an implicit basis for this assessment. This diversity in panel members' concepts of empathy and differences in the concepts underlying the Davis Interpersonal Reactivity Index seem to be the main reasons for the lack of correlation between self- and external empathy assessments. While empathy is a possible amendment to established selection criteria for medical education in Germany, its external assessment should not be employed without training panel members based on an established theoretical concept of empathy and an objective self-assessment measure.

EDUCATIONAL PSYCHOLOGIST

1. Williams-Johnson, M., & Gonzalez-DeHass, A. R. (2022). Parental role construction leading to parental involvement in culturally distinct communities. *Educational Psychologist*, 57(4), 231–237. <https://doi.org/10.1080/00461520.2022.2131554>

Abstract: The home environment, especially parental involvement in the learning process, plays a substantial role in cultivating beneficial student learning outcomes. As a special issue on parental involvement, the articles herein share new insights on parental role construction and parental involvement within diverse contexts. The central focus spotlights the Hoover-Dempsey and Sandler (HDS) model of parental involvement and more specifically the psychological construct of parental role construction. Special attention is given to sociodemographic and cultural differences that influence parent involvement in an increasingly diverse school population that offers a collective counter narrative to deficit approaches of parental involvement. The ideas and methods shared within the articles are also situated within other trends in parent involvement practices that include parents' role in supporting students' positive development, self-sufficiency in their academic learning and future decision-making, as well as how parents view their role amidst the increasing use of digital tools for at-home learning. Each article within the special issue considers the complexities of the context, alignment to parental role construction and involvement, and new trends and directions for research on parental involvement.

2. McWayne, C. M., Melzi, G., & Mistry, J. (2022). A home-to-school approach for promoting culturally inclusive family–school partnership research and practice. *Educational Psychologist*, 57(4), 238–251. <https://doi.org/10.1080/00461520.2022.2070752>

Abstract: In this article, parental role construction is framed from a sociocultural perspective. Applying this perspective foregrounds the need for researchers and practitioners to gain an insider's understanding of how families themselves construct their roles in supporting children's education. By doing so, the field can reimagine family–school partnerships that are inclusive of normative family practices across ethnoculturally diverse families and develop interventions that build on cultural heritage, community strengths, and families' funds of knowledge. In this article, a *home-to-school*, strengths-based conceptualization of family engagement that challenges deficit-based and school-centric orientations toward families is described. Evidence from three innovative research projects will be discussed that shows by being curious about how parents construct their roles and support their children at home (both directly and indirectly), researchers and practitioners can gain useful information to co-create more culturally inclusive and welcoming school environments, as well as more meaningful home–school connections.

3. Williams-Johnson, M., & Fields-Smith, C. (2022). Homeschooling among Black families as a form of parental involvement: A focus on parental role construction, efficacy, and emotions. *Educational Psychologist*, 57(4), 252–266. <https://doi.org/10.1080/00461520.2022.2129648>

Abstract: Experiences with racism and other emotionally laden encounters are intricately entangled with parents' motivations to take direct action that can lead to voluntary separation from school or homeschooling. Using the Hoover-Dempsey and Sandler (HDS) model, this article expands parental involvement by including homeschooling and examines the usefulness of including emotion as a discernible motivator of parental involvement. Research on Black homeschooling is used as an example to explore the psychological and socio-emotional dilemmas parents face when preparing their children to become self-sufficient in an anti-Black lived context. Particular focus is given to parental role construction and efficacy beliefs to describe the intersection of emotions leading to parental actions toward involvement. Marchand et al.'s process of critical action is detailed to further illustrate the complexities of Black parents who actively engage in activities to combat discrimination. New insights on theory adaptation and pathways to inform practice, and recommendations for future research on parental involvement and Black homeschooling are also provided.

4. Yamamoto, Y., Li, J., & Bempechat, J. (2022). Reconceptualizing parental involvement: A sociocultural model explaining Chinese immigrant parents' school-based and home-based involvement. *Educational Psychologist*, 57(4), 267–280. <https://doi.org/10.1080/00461520.2022.2094383>

Abstract: Despite growing recognition of diverse forms of parental involvement, scarce research exists on the critical influence of sociocultural contexts on parental involvement in their children's education. Building on and modifying Hoover-Dempsey's parental involvement model, this article proposes a new sociocultural model to explain Chinese immigrant parents' motivations for school-based and home-based involvement. Within the discussion of the model, each component is detailed but the emphasis is directed to three general components: the Chinese cultural model of learning, parental role construction, and school-family relations, including teachers' parental involvement practices that differ from the U.S. mainstream culture's model. This review demonstrates that Chinese immigrant parents tend to be more involved in some types of school-based activities (e.g., attending parent-teacher conferences and school events) than others (e.g., volunteering in classrooms and attending PTO meetings/school council). Chinese immigrant parents' involvement processes also interact with family socioeconomic status and immigrant contexts. The article concludes with implications for research and educational practice.

5. Gonzalez-DeHass, A. R., Willems, P. P., Powers, J. R., & Musgrove, A. T. (2022). Parental involvement in supporting students' digital learning. *Educational Psychologist*, 57(4), 281–294. <https://doi.org/10.1080/00461520.2022.2129647>

Abstract: Within K-12 education, increasing numbers of children are learning via new digital learning tools while at home, raising important questions about the changing nature of parents' involvement in digital spaces. This article uses the Hoover-Dempsey and Sandler parental involvement model to discuss parents' decisions to become involved in children's K-12 learning amidst the shift to more digital and online learning, focusing specifically on how the model accounts for the innovative evolution of technology and parental support of students in digital spaces. Specific questions are posed to challenge traditional conceptions of parental role construction, efficacy, and invitations for involvement within the context of students'

digital learning. Discussion covers the importance of involvement practices that value meaningful digital learning opportunities, parental concerns over the shift to digital spaces, parental confidence using technology, and utilizing technology to foster bi-directional communication to address parents' concerns as they support their children's digital learning.

6. Dotterer, A. M. (2022). Diversity and complexity in the theoretical and empirical study of parental involvement during adolescence and emerging adulthood. *Educational Psychologist*, 57(4), 295–308. <https://doi.org/10.1080/00461520.2022.2129651>

Abstract: Trends in past research note parental involvement in education tends to decline as students get older. This targeted review draws on the bioecological model of human development and parental role construction to understand how parent involvement changes across developmental periods. Three distinct issues were identified from research on the effectiveness of parental involvement in secondary and higher education. First, in early adolescence and the middle school context, we explore whether too much involvement is possibly harmful rather than beneficial. Second, in mid- to late adolescence and the high school context, we explore racial/ethnic differences in level of involvement and the longitudinal effects of involvement on academic achievement. Third, in emerging adulthood, we reexamine the definition of parental involvement as it relates to the college context. Implications for the consideration of parental role construction in relation to these three issues and developmental periods are discussed.

7. Hill, N. E. (2022). Parental involvement in education: Toward a more inclusive understanding of parents' role construction. *Educational Psychologist*, 57(4), 309–314. <https://doi.org/10.1080/00461520.2022.2129652>

Abstract: How parents conceive of their role in their children's education and how researchers and practitioners conceptualize parental involvement are significant for understanding parental involvement in education and its impact on developmental outcomes. Parental involvement in education encompasses families' engagement at school, with teachers, at home, and with their children. Whereas schools are focused on what parents do in relation to schoolwork, parents experience their involvement as integrated into the rest of their parenting ideologies. This special issue considers a full breadth of parental involvement in education from homeschooling to involvement at school. Further, these articles focus on parents' understanding of their role through the lens of their ethnic, racial, and cultural background and how their role evolves across developmental stages—from elementary school to college. Finally, whereas most school-based conceptualizations of parental involvement in education are focused on academic outcomes, the field is challenged to consider a broader range of outcomes and emphasize nonlinear associations between parental involvement in education and developmental outcomes.

EUROPEAN JOURNAL OF SPECIAL NEED EDUCATION

1. López-de-la-Fuente, M. J., García-Foncillas, R., & Gómez-Trullén, E. M. (2021). Coaching SNAs can improve children' participation in daily living skills: A quasi-experimental pretest-posttest design study. *European Journal of Special Needs Education*, 37(6), 891–906. <https://doi.org/10.1080/08856257.2021.1963151>

Abstract: Special Needs Assistants (SNAs) serve an essential role to support children with disabilities; thus, they need efficient training. The one-on-one coaching following a workshop was compared with a control group that only received a workshop. A quasi-experimental study was conducted in two of the five public special education schools in Zaragoza (Spain); seventeen paraprofessionals and thirty-seven children participated voluntarily. The Canadian Occupational Performance Measure (COPM) was administered pre and post-intervention to evaluate changes in the participation of children with disabilities. Questionnaires for assessing competencies and needs were issued for both groups of SNAs, and the kinds of goals and the adaptations required were analysed. The intervention was guided by an occupational therapist (OT). Children in the intervention group showed significant gains in goals identified by assistant and therapist. However, both groups of SNAs indicated they had improved their skills. Through collaboration with OTs, SNAs can implement practices that enhance children' participation in activities of daily living in natural environments. SNAs' training should be carried out according to their real demands and the needs of the children they support.

Keywords: Coaching, special needs assistants, school-based occupational therapy, daily living skills

2. Simó-Pinatella, D., Goei, S. L., Carvalho, M., & Nelen, M. (2021). Special education teachers' experiences of addressing challenging behaviour during the pandemic. *European Journal of Special Needs Education*, 37(6), 907–920. <https://doi.org/10.1080/08856257.2021.1963152>

Abstract: In times such as this pandemic, where the spread of COVID-19 has resulted in school shutdowns, emergency remote learning was implemented in several countries and different educational settings. School closures made it challenging for special education teachers to support their children with special needs and families. This research aimed to identify the support provided by Spanish teachers in special education schools to children with intellectual and developmental disabilities who exhibit challenging behaviour and the support given to their families. Data were collected from 22 teachers from seven special education schools by using focus group interviews. Thematic analysis was used to identify, analyse, and report patterns within the data. The results show that teachers deployed many different interventions to provide adequate support to their students and families, such as delivering materials to families, communicating in diverse ways, providing academic or functional tasks, and working with other services. Despite these efforts, teachers also reported difficulties when providing support to students and families. Therefore, future research needs to continue exploring experiences during COVID-19 to inform more accurate educational practices, especially considering children with special needs.

Keywords: Special schools, intellectual and developmental disabilities, challenging behaviour, COVID-19

3. Loeper, M. F., Schwab, S., Lehofer, M., & Hellmich, F. (2021). The role of students' experiences in attitude formation towards peers with non-compliant classroom behaviour in inclusive primary schools. *European Journal of Special Needs Education*, 37(6), 921–935. <https://doi.org/10.1080/08856257.2021.1967295>

Abstract: Social participation is a crucial condition for successful learning in inclusive primary schools. Unfortunately, students with non-compliant classroom behaviour are at risk of being socially excluded from their class. Recently, students' attitudes have been identified as the central indicator of the social participation of students with non-compliant behaviour in the classroom. However, the determinants of students' attitudes are unclear. In accordance with the 'contact theory' and the principle of 'homophily', we investigated the relationship between students' attitudes towards peers with non-compliant behaviour, their contact experiences with peers with non-compliant behaviour, and their experiences of having behavioural difficulties or formally assessed special educational needs (SEN) themselves. 589 fourth grade primary school students completed a questionnaire on their contact experiences and attitudes towards peers with non-compliant behaviour. Additionally, teachers provided information on students' behavioural difficulties and formal SEN. Results from a multilevel regression analysis revealed that students' attitudes towards peers with non-compliant behaviour could be explained by their contact experiences. Overall, our findings emphasise the importance of students' contact experiences in relation to their attitudes towards peers with non-compliant behaviour and mark an important initial point for the implementation of future interventions (e.g. peer-mediated learning) that foster valuable contacts and positive attitudes.

Keywords: Inclusion, social participation, attitudes, experiences, non-compliant classroom behaviour, primary school

4. O'Connor Bones, U., Bates, J., Finlay, J., & Campbell, A. (2021). Parental involvement during COVID-19: experiences from the special school. *European Journal of Special Needs Education*, 37(6), 936–949. <https://doi.org/10.1080/08856257.2021.1967297>

Abstract: The closure of schools worldwide in response to the COVID-19 pandemic required parents to undertake key pedagogical roles to support their children's education and movement to a remote, often virtual world of online teaching presented many challenges for families. For the parents of children attending special schools, the loss of educational, as well as therapeutic provision, added a further layer of complexity unique to this group. This paper presents findings from a Northern Ireland-wide survey undertaken during the first lockdown period. Using Hornby and Blackwell's model of parental involvement (PI), the paper describes parents' experiences relative to their child's needs, family circumstances and societal expectations, and the intersection of these with teacher relationships and the wider school community. The findings reveal those factors that facilitated and inhibited PI and makes suggestions for improvements at school and policy levels in the short and longer term. The results have relevance and reach beyond the Northern Ireland context and should contribute to international dialogue on the synergy between PI and the special school setting.

Keywords: Special schools, COVID-19, home-schooling, parental involvement

5. Satherley, D., & Norwich, B. (2021c). Parents' experiences of choosing a special school for their children. *European Journal of Special Needs Education*, 37(6), 950–964. <https://doi.org/10.1080/08856257.2021.1967298>

Abstract: This paper is about English parents' experiences of making decisions about special school placements in the national context of rising special school placements and more parental choice and school diversity. The aim of this research was to investigate whether the current legislative focus on optimising parent choice operates as intended from the parents' perspective. More specifically, it aimed to examine the views of parents of pupils in special schools in the South West of England: their reasons for choosing special school, the extent to which they felt they had an independent choice and their views on alternative provision. Fifty seven parents with children in special schools in three local authority special schools completed an online questionnaire that collected numerical and textual data. Analysis showed that the top three factors influencing decisions were school atmosphere, caring approach to pupils and class size, a finding that connected with their concepts of inclusive education. These and other findings point to the limitations of the choice-diversity model implemented over the last few decades in England. The research illustrates distinctive parental perspectives on schooling, inclusive education and the dilemmas they experience in choosing provision for their children.

Keywords: Special educational needs, parent choice, special schools, inclusive education

6. Alallawi, B., Denne, L., Apanasionok, M. M., Grindle, C. F., & Hastings, R. P. (2021). Special educators' experiences of a numeracy intervention for autistic students. *European Journal of Special Needs Education*, 37(6), 965–978. <https://doi.org/10.1080/08856257.2021.1989128>

Abstract: Very little qualitative research has been carried out about the experiences of educators who deliver mathematics evidence-based teaching programmes to autistic students. Using a semi-structured format, we interviewed ten educators who had been delivering the Teaching Early Numeracy to Children with Developmental Disabilities (TEN-DD) programme for eight months with autistic students in a special school setting. Reflexive thematic analysis findings indicated that taking part in the numeracy intervention was a valuable experience for both the educators and their students. There was initial scepticism about the intervention, but this was transformed to conviction during the implementation period. Educators reported an increased sense of competence in their teaching skills, evident in greater satisfaction and increased self-efficacy. Furthermore, there was a strong interest in continuing to use the numeracy intervention with students. There were also implementation challenges with TEN-DD, including students' challenging behavior. The implications of these findings are discussed.

Keywords: Numeracy intervention, special educators, autism, experiences, interviews

7. Akbayrak, K., & Douglas, G. (2021). Examining specialist teachers' conceptualisations of their roles in supporting learners with vision impairment: a comparative analysis of Turkey and England using Bronfenbrenner's ecological systems theory. *European Journal of Special Needs Education*, 37(6), 979–993. <https://doi.org/10.1080/08856257.2021.1989129>

Abstract: This paper investigates how specialist teachers of learners with vision impairment (i.e. teachers who have had specific and/or additional teacher training in the area of vision impairment education) in Turkey and England conceptualise their roles in supporting learners with vision impairment (VI) using Bronfenbrenner's ecological systems theory as a conceptual lens. Through comparative analysis of the findings of interviews with thirty specialist teachers of learners with VI in Turkey (n = 17) and England (n = 13), the paper identifies similar and different aspects of the teachers' conceptualisations of their roles *with* the learner and with other agents *around* the learner. The findings mainly suggest that the concept of promoting/developing independence is commonly understood as concerning *teaching* independent living skills to learners, including mobility and self-care skills within mostly the school setting in Turkey. In contrast, that role was conceptualised in a broader context in England, such as *developing* independent living, independent learning and self-advocacy skills, involving other agents *around* the learner within and between home and school settings. Given the similarities and differences between the perspectives of specialist teachers on their multi-layered roles in two countries, the paper provides greater understanding of the specialist role of those teachers. It also offers a methodology to others who wish to explore and emphasise the distinctive roles of specialist teachers in their own settings.

Keywords: Specialist teacher, vision impairment, ecological systems theory, Bronfenbrenner's theoretical model

8. Tan, R., Lichtblau, M., Wehmeier, C., & Werning, R. (2021). Preschool teachers' attitudes towards inclusion: a comparison study between China and Germany. *European Journal of Special Needs Education*, 37(6), 994–1008. <https://doi.org/10.1080/08856257.2021.1997480>

Abstract: Using a comparative approach is a widespread method in educational research. Previous cross-cultural comparison studies on teachers' attitudes towards inclusive education show a strong lack of focus on preschool teachers' attitudes towards inclusion. Thus, this study examined 65 Chinese and 59 German preschool teachers' attitudes towards inclusion by applying the Multidimensional Attitudes towards Preschool Inclusive Education Scale (MATPIES). A comparative analysis showed Chinese and German teachers' overall attitudes towards inclusive education as positive, with German teachers' attitudes being more positive. While teachers in both countries showed the highest behavioural attitude dimension scores, Chinese teachers' affective attitude dimension scored the lowest. Guided by the 'cultural–historical framework', we discussed how individualistic and collectivistic values influence teachers' overall attitudes in the two countries, especially their different scores in affective dimension of attitude. Implications for future research examining preschool teachers' attitudes in China and Germany as well as in the international context are discussed, with an emphasis on exploring how various factors both within and beyond teacher attributes to generate a more comprehensive understanding of the

critical issue of teachers' attitude. Meanwhile, further indications for conducting international comparison studies on teachers' attitudes are also presented, including some methodological considerations for such studies.

Keywords: Inclusive education, attitudes, comparison study, preschool teachers

9. Sigstad, H. M. H., Buli-Holmberg, J., & Morken, I. (2021). Succeeding in inclusive practices in school in Norway – A qualitative study from a teacher perspective. *European Journal of Special Needs Education*, 37(6), 1009–1022. <https://doi.org/10.1080/08856257.2021.1997481>

Abstract: The present study examined inclusive practices in school by studying how teachers realise inclusion in a school for all. The study was based on ten qualitative focus group interviews with approximately 40 teachers from one selected primary school. A thematic, structural analysis was used to identify the themes. The analysis was conducted using a combination of a data-driven and a deductive process. The results indicate that inclusive practices centred around the teachers' efforts to achieve inclusion by organising teaching, establishing a sense of belonging to the community, developing social competence, and facilitating academic achievement. Differentiation in meeting students' diversity appeared to be the largest challenge to success. Despite various barriers, satisfactory inclusive practices depend on close collaboration, where teachers work to facilitate equal education and foster belongingness in an enriching learning environment in which their students have experience achieving their individual goals.

Keywords: Academic inclusion, education for all, inclusive practices, organisational inclusion, social inclusion, special educational needs

10. Firat, T., Bildiren, A., & Demiral, N. (2021). The change in reactions of preschool children to physical disability: a parent-Supported intervention. *European Journal of Special Needs Education*, 37(6), 1023–1039. <https://doi.org/10.1080/08856257.2021.2013548>

Abstract: This study aims to investigate the change in reactions to physical disability among typically developing preschool children who were informed by their parents about children with physical disabilities. 18 children (8 males and 10 females) attending the same class in a kindergarten, their parents (18) and a teacher participated in the study. During the intervention process, typically developing preschool children were informed about children with physical disabilities via videos by their parents. Data were collected via an interview form designed for attitudes of typically developing children towards children with physical disabilities (before and after the intervention), as well as follow-up parent and teacher interviews. Content analysis method was used to interpret the data. Results indicated positive changes in the attitudes of typically developing preschool children towards physical disability. The parent-teacher interviews showed that typically developing children had more awareness, empathy and sensitivity towards their peers with physical disabilities.

Keywords: Preschool children, physical disability, social acceptance, parent education

11. Passanisi, A., Buzzai, C., Romano, A., Muscarà, M., & Pace, U. (2021). Special education teachers: the role of problem-solving coping strategies in the relationship between thinking styles and distance education attitudes. *European Journal of Special Needs Education*, 37(6), 1040–1054. <https://doi.org/10.1080/08856257.2021.2013549>

Abstract: The purpose of this study was to investigate the mediating role of problem-solving coping strategies in the relationship between thinking styles (legislative, executive, and judicial) and teachers' attitudes towards distance education (difficulties related to distance education and efficacy in distance education). The study sample consisted of 556 special education teachers, 122 males (21.9%) and 434 females (78.1%), with an average age of 37.90 years ($SD = 7.12$). The results confirmed the role of problem-solving coping as a mediator for legislative thinking style on difficulties related to distance education. Furthermore, the findings indicated a positive relationship between judicial style and efficacy in distance education. The results of this study highlight the importance of developing specific special education teacher trainings to promote positive attitudes towards distance education.

Keywords: Special education teacher, distance education, problem solving, thinking styles

12. Walter, O., & Hazan-Liran, B. (2021). Mediating role of psychological capital in relations between social support and subjective wellbeing among students with learning disabilities and attention deficit hyperactivity disorder. *European Journal of Special Needs Education*, 37(6), 1055–1067. <https://doi.org/10.1080/08856257.2021.1997482>

Abstract: This study's goal was to clarify whether psychological capital (PsyCap) mediated the relations between social support and subjective wellbeing among post-secondary students during the Covid-19 pandemic and to assess whether students diagnosed with a learning disability (LD) and/or attention deficit hyperactivity disorder (ADHD) differed from others in their reliance on social support and their level of PsyCap and subjective wellbeing. Participants were 257 students, 152 diagnosed with LD/ADHD and the rest neurotypical. The study used four questionnaires: demographic and academic information; Psychological Capital Questionnaire (PCQ); Subjective Well-Being Index (International Wellbeing Group, International Wellbeing Group, 2006.); social support questionnaire. The results indicated PsyCap mediated relations between social support and subjective wellbeing. Students diagnosed with LD/ADHD differed from neurotypicals in their PsyCap and subjective wellbeing levels, but not in their social support. In addition, the relations between PsyCap and social support were stronger among students diagnosed with LD/ADHD. PsyCap was an important resource for all participants and was related to social support and subjective wellbeing, making it especially valuable for LD/ADHD students facing new and threatening situations, such as the Covid-19 pandemic.

Keywords: LD/ADHD post-secondary students, subjective wellbeing, social support, PsyCap, covid-19

INTELLECTUAL AND DEVELOPMENTAL DISABILITIES

1. Sheppard, M. E., Vitalone-Raccaro, N., & Kaari, J. M. (2022). Planting the Seeds of Collaboration: A Pilot for School/Clinic Partnerships During Pediatric Clerkship. *Intellectual and Developmental Disabilities*, 60(6), 453–464. <https://doi.org/10.1352/1934-9556-60.6.453>

Abstract: Although pediatricians and family physicians often refer children to early intervention (EI) and provide support and information to families, medical school training that provides information about special education policy and procedures is often limited. We piloted a program whereby medical students, during their pediatric clerkship, observed school classrooms that included young children with disabilities. Visit impact was measured through assessments of perceived competency and a written reflection. Students showed perceived competency growth across all areas measured. Written reflections demonstrated understanding of special education practices and collaborative opportunities. These findings suggest that incorporating experiential learning through facilitated school visits is a way to enhance the learning experience of medical students on topics essential to supporting children with disabilities and their families.

2. Acosta, E. M., Dongarwar, D., Everett, T., & Salihu, H. M. (2022). Understanding Characteristics and Predictors of Admission From the Emergency Department for Patients With Intellectual Disability. *Intellectual and Developmental Disabilities*, 60(6), 465–476. <https://doi.org/10.1352/1934-9556-60.6.465>

Abstract: The goal of this investigation is to compare rates of admission from the emergency department (ED) and the characteristics of patients with intellectual disability (ID) who get admitted from the ED. This was a retrospective study using data from the United States' Nationwide Emergency Data Sample (NEDS) to investigate the associations between the diagnosis of ID and admission to the hospital in patients ≥ 18 years during the years 2016–2017. Adults with ID were almost four times as likely to be admitted to the hospital from the ED as patients who were not identified as having ID. Identifying the major contributors to increased admission for patients with ID may help improve their care.

3. Golub-Victor, A. C., Peterson, B., Calderón, J., Lopes, A. D., & Fitzpatrick, D. F. (2022). Student Confidence in Providing Healthcare to Adults With Intellectual Disability: Implications for Health Profession Curricula. *Intellectual and Developmental Disabilities*, 60(6), 477–483. <https://doi.org/10.1352/1934-9556-60.6.477>

Abstract: Self-perceived confidence of health professions students at one university in caring for adults with intellectual disability (ID) was examined via an electronic survey using the Therapy Confidence Scale - Intellectual Disabilities (TCS-ID). A stepwise multiple regression of data collected from 232 completed surveys revealed that prior training and prior experience were predictors of TCS-ID total score. Adults with ID experience healthcare disparities due, in part, to poor provider communication and a lack of confidence. Results from this novel study suggest that opportunities for experiential learning and training with people with ID are important considerations for health professions curricula. Further research is needed for generalizability of results.

4. McMaughan, D. J. D., Jones, J. L., Mulcahy, A., Tucker, E. C., Beverly, J. G., & Perez-Patron, M. (2022). Hospitalizations Among Children and Youth With Autism in the United States: Frequency, Characteristics, and Costs. *Intellectual and Developmental Disabilities*, 60(6), 484–503. <https://doi.org/10.1352/1934-9556-60.6.484>

Abstract: National estimates of hospitalization diagnoses and costs were determined using the 2016 HCUP Kids' Inpatient Database. Children and youth with autism were hospitalized over 45,000 times at over \$560 million in costs and 260,000 inpatient days. The most frequent principal diagnoses for hospitalizations of children and youth with autism were epilepsy, mental health conditions, pneumonia, asthma, and gastrointestinal disorders, which resulted in almost \$200 million in costs and 150,000 inpatient days. Mental health diagnoses accounted for 24.8% of hospitalizations, an estimated \$82 million in costs, and approximately 94,000 inpatient days. Children and youth with autism were more likely hospitalized for epilepsy, mental health diagnoses, and gastrointestinal disorders, and less likely for pneumonia and asthma compared to other children and youth.

5. Berens, J. C., Tsami, L., Lerman, D. C., Matteucci, M., Fray, D. F., Warner, B. F., Keehan, L. A., Staggers, K. A., & Peacock, C. (2022). Preliminary Results of an Interdisciplinary Behavioral Program to Improve Access to Preventative Dental Care for Adults With Intellectual and Developmental Disabilities. *Intellectual and Developmental Disabilities*, 60(6), 504–519. <https://doi.org/10.1352/1934-9556-60.6.504>

Abstract: Adults with intellectual and developmental disabilities (AIDD) experience significant oral health disparities, partially due to perceived behavioral issues. This article describes the preliminary outcomes of a developing interdisciplinary (dental, medical, behavioral) program involving a behavioral intervention for AIDD previously receiving preventative dental care with sedation, general anesthesia, or protective stabilization (SAS). After a baseline assessment, a board-certified behavior analyst implemented increasingly complex behavioral interventions during simulated dental visits. Prior to COVID-19 pandemic-related restrictions, there were 32 active participants; 15 (46.9%) successfully completed a focused, real dental exam with simple behavioral interventions and 17 (53.1%) remain in treatment. These preliminary results suggest that many AIDD previously receiving SAS may participate in a preventative dental exam with minimal behavioral supports, if given the opportunity.

INTERNATIONAL JOURNAL OF EDUCATION RESEARCH

1. Hungerford-Kresser, H., Amaro-Jiménez, C., & White, J. W. (2022). Beyond standards: College and career readiness and culturally responsive curriculum in teacher preparation. *International Journal of Educational Research*, 116, 102049. <https://doi.org/10.1016/j.ijer.2022.102049>

Abstract: This study looks at the intersection of College and Career Readiness, Culturally Responsive Pedagogy, and teacher preparation. We sought to uncover preservice teachers' perceptions of college and career readiness as they concluded their teacher preparation coursework. Findings demonstrate how future teachers wrestled with college readiness, and the shift in perspective from a skills-based definition to an understanding of it as a partnership between student and teacher. Our findings suggest the need for teacher preparation curriculum 1) focused on College and Career Readiness as more than a set of standards, and 2) framed within Culturally Responsive Pedagogies. Our study highlights both as vital to our preservice teachers' development in content specific teaching methods as well as in their ability to thrive in an era of high-stakes testing and accountability.

2. Han, S., & Fu, H. (2022). Experimentation, policy learning, and China's education reforms. *International Journal of Educational Research*, 116, 102057. <https://doi.org/10.1016/j.ijer.2022.102057>

Abstract: Policy experimentation (PE) describes a policy process in which local actors generate and test innovative policy options, with the capacity for diffusion and injection into national policymaking for reforms. Using China's new National College Entrance Examination (*Gao Kao*) reform as a case study, the study examines how PE encourages local innovation, enhanced participation of policy networks and learning-mediated diffusion through the constructive interplay of coercive, mimetic and normative forces. It constitutes an integral part of the country's adaptive governance to effectively involve multi-level governments and actors for collaborative policy adoption, modification and implementation.

3. Pyle, A., Danniels, E., Larsen, N. E., & Martinussen, R. (2022). Supporting children's self-regulation development in play-based kindergarten classrooms. *International Journal of Educational Research*, 116, 102059. <https://doi.org/10.1016/j.ijer.2022.102059>

Abstract: Connections between play and young children's developing self-regulation have been emphasized in both research and practice. However, our knowledge of how to scaffold children's play to develop regulation in practice is limited. The current study examined strategies utilized by teachers to support self-regulation in play contexts. Observational and interview data were collected in 11 kindergarten classrooms in Canada. Results show two differing approaches to the role of play in self-regulation development. One focused on nurturing emotional aspects of self-regulation through free play. The other focused on a holistic definition of self-regulation nurtured in both free and teacher-guided play. Results underscore teachers' diverse approaches towards promoting self-regulation and provide practice-based examples for supporting multiple facets of self-regulation development in play.

4. Kahmann, R., Droop, M., & Lazonder, A. W. (2022). Meta-analysis of professional development programs in differentiated instruction. *International Journal of Educational Research*, 116, 102072. <https://doi.org/10.1016/j.ijer.2022.102072>

Abstract: Differentiated instruction is a key indicator of effective teaching, but difficult to implement. Thus, educators have called for professional development (PD) programs on the topic. Based on 27 selected studies, this meta-analysis examined the overall effectiveness of PD programs in terms of teacher and student outcomes, and assessed theoretically relevant PD program features as moderators. Our findings indicated that PD programs have a medium effect on teachers' knowledge, attitudes and practices. Furthermore, teachers improved more in their differentiation practices if a PD program was provided within a specific subject domain. As PD programs had no significant effect on students' learning, the relation between teacher development and student learning requires further scrutiny so that students will benefit from their teachers' learning.

Keywords: Professional teacher development, Differentiated instruction, Adaptive teaching, Systematic review, Meta-analysis

5. Heaysman, O., & Kramarski, B. (2022). Enhancing students' metacognition, achievement and transfer between domains: Effects of the simulative "SRL-AIDE" parallel teacher–student program. *International Journal of Educational Research*, 116, 102074. <https://doi.org/10.1016/j.ijer.2022.102074>

Abstract: Self-regulated learning (SRL) is a cyclical strategic process that helps learners achieve learning goals. It increases metacognitive awareness in different contexts, thus it can promote SRL transferability across domains: using SRL skills in different domains than the learned context. We examined the effects of a parallel SRL teacher–student program based on *authentic, interactive, and dynamic experiences* (AIDE) on metacognition, achievement, and transference between domains (language to math) among 313 students (ages 8–10), in two groups. The experimental group demonstrated higher gains than the control group (exposed to effective learning) in metacognition and academic achievement. Metacognition was found to mediated the association between group and academic achievement including transfer effect between domains. Implications for teacher–student parallel programs are discussed.

6. Puustinen, M., Sääntti, J., & Simola, H. (2022). Five decades of persistent decontextualisation of academic teacher education in Finland. *International Journal of Educational Research*, 116, 102053. <https://doi.org/10.1016/j.ijer.2022.102053>

Abstract: Aiming at constructive criticism, this article analyses the historical development of Finnish teacher education from the perspective of decontextualisation. The article suggests that essential contexts for teacher education are daily schooling, the historically constructed structures of school, and finally the whole society. The results indicate that as an unintended consequence of the academisation of Finnish teacher education, the socio-historical context of teaching and learning has narrowed, and ties between educational theory and practical schooling have loosened. This may hinder the good intentions underpinning the Finnish teacher education system and produce a discourse that unreflectively silences the complexity of education.

Keywords: Teacher education, Decontextualisation, Foundations of education, Theory and practice

7. Saal, L. K., Perry, K. H., Yamashita, T., Punksungka, W., & Shaw, D. (2022). Literacy proficiency and political information seeking in the U.S. *International Journal of Educational Research*, 116, 102071. <https://doi.org/10.1016/j.ijer.2022.102071>

Abstract: This quantitative exploratory study is the first to investigate the literacy skills and political efficacy-related information seeking behavior with a secondary analysis of a nationally representative sample of older youth and adults in the United States (U.S), ages 16–74 across two PIAAC data collection cycles (2012/2014 and 2017). Over time, newspapers, magazines, TV, and books use declined, while internet use as a source for political efficacy-related information increased. Associations of literacy skill proficiency with the internet and TV were reliable between two time-points and cycles of data; however, the direction of these associations varied. Older youth and adults with greater literacy skills were more likely to seek political efficacy-related information from the internet, while those with less literacy proficiency preferred T.V.

8. Kim, H. Y. (2022). CALL teacher training and knowledge development. *International Journal of Educational Research*, 116, 102077. <https://doi.org/10.1016/j.ijer.2022.102077>

Abstract: To understand what helps or hinders teacher knowledge development in CALL, this study examined how 15 EFL teachers incorporated newly gained technological knowledge to make connections with their beliefs and practices about teaching and learning in a CALL training course. Grounded in Activity Theory, the analysis of multiple sources of data, including interviews, journals, class observations, and relevant materials, identified contradictions and sources of obstacles that hinder or motivate teacher's successful integration of technological tools. Findings suggest that CALL training can bring positive changes when teachers achieve autonomy for a creative engagement with material and conceptual tools involving a transformation in teacher and student roles, class rules, and objects.

9. Martinho, M. T., Booth, N., Attard, N., & Dillenburger, K. (2022). A systematic review of the impact of precision teaching and fluency-building on teaching children diagnosed with autism. *International Journal of Educational Research*, 116, 102076. <https://doi.org/10.1016/j.ijer.2022.102076>

Abstract: Precision teaching (PT) is a holistic system that allows the monitoring of behaviour change on a specially designed Standard Celeration Chart (SCC). In instructional settings, precision teachers aim for fluent responding (i.e., accuracy and speed) from their learners. Thus PT, in these settings, includes fluency-building (FB) strategies. FB strategies can be used without graphing the learner's performance on the SCC. Behavioural fluency is linked to high skills retention, endurance, stability, and generalisation to other skills and environments. A systematic literature review was carried out of PT methodology for skill acquisition of children diagnosed with autism. A systematic literature review of fluency-building procedures used in the process of skill acquisition of children diagnosed with autism was also performed. Reichow, Volkmar, and Cicchetti's (2008) assessment tool was used to establish the

empirical validity of the 13 studies identified in this review. Results suggest that while there is emerging evidence for the positive outcomes, the evidence base is rather small. The implications for the use of PT and fluency-building procedures to support individuals diagnosed with autism are discussed.

Keywords: Autism, Education, Fluency, Instruction, Precision Teaching

10. Turhan, D., Schnettler, T., Scheunemann, A., Gadosey, C. K., Kegel, L. S., Bäumke, L., Thies, D. O., Thomas, L., Buhlmann, U., Dresel, M., Fries, S., Leutner, D., Wirth, J., & Grunschel, C. (2022). University students' profiles of burnout symptoms amid the COVID-19 pandemic in Germany and their relation to concurrent study behavior and experiences. *International Journal of Educational Research*, 116, 102081. <https://doi.org/10.1016/j.ijer.2022.102081>

Abstract: Burnout symptoms are prevalent among university students. This study examined students' understudied profiles of burnout symptoms and their relation to procrastination, dropout intentions, and study- and life satisfaction. We used cross-sectional data from two online-studies conducted in Germany in April 2020 amid the COVID-19 pandemic ($N_{\text{study1}} = 597$, $N_{\text{study2}} = 857$). Latent profile analyses indicated three profiles in both studies: (1) *well-functioning*, (2) *moderately exhausted-inefficient*, and (3) *burned-out*. Most students belonged to Profiles 1 and 2 with low to moderate burnout symptoms. Students in Profile 3 reported the highest symptoms, most procrastination, strongest dropout intentions, and lowest study- and life satisfaction. The distinct profiles broaden knowledge about intra-individual differences in students' burnout experiences and underpin the need for tailored interventions.

Keywords: University student burnout, Latent profiles, Academic procrastination, University dropout intentions, Study satisfaction, Life satisfaction

11. Kahraman, N. (2022). Investigating linear and curvilinear relationships between cognitive activation strategies and student achievement in science. *International Journal of Educational Research*, 116, 102083. <https://doi.org/10.1016/j.ijer.2022.102083>

Abstract: This study aimed to investigate the cognitive activation strategy (CAS) usage of teachers and achievement of students through a multilevel approach with TIMSS 2019 data. The current study considered not only a linear but also a curvilinear form of the relation. The multilevel models were performed for both fifth and eighth grade levels separately. According to the results, there was no linear effect of either general or inquiry-based CAS on the science achievement of students in fifth grade. On the other hand, the curvilinear relation of inquiry-based strategies was significant for eighth-grade students. This means that, even among kids in the same stage of education, the nature of the relationship between CAS and achievement can vary according to the grade.

12. Sheldrake, R., Mujtaba, T., & Reiss, M. J. (2022). Implications of under-confidence and over-confidence in mathematics at secondary school. *International Journal of Educational Research*, 116, 102085. <https://doi.org/10.1016/j.ijer.2022.102085>

Abstract: Confidence is theorised to be motivational and beneficial within education, although it remains unclear how calibration bias (the extent of under-confidence to over-confidence) might arise and what the implications may be. In order to gain new insights, a longitudinal sample of 3203 secondary school students in Germany was considered at Grade 5 and Grade 9. Predictive modelling explored what factors predicted calibration bias, and whether/how calibration bias predicted other outcomes. The results offered many new insights including that, at Grade 9, calibration bias (i.e. higher over-confidence) negatively predicted mathematics grades but positively predicted mathematics self-concept (subject-level confidence), school self-concept (general educational confidence), and self-esteem (an indicator of well-being), accounting for students' background characteristics and an array of other predictors.

13. Lee, J. (2022). "I always tell my children to learn from me": Parental engagement in social and emotional learning in Malawi. *International Journal of Educational Research*, 116, 102090. <https://doi.org/10.1016/j.ijer.2022.102090>

Abstract: Parental involvement is increasingly becoming an integral part of children's education globally. This article presents parents' beliefs and strategies to contextualize relevant discourse in social and emotional learning (SEL) in Malawi. I interviewed 21 parents of primary school-aged children discussing (a) issues affecting children socially and emotionally, (b) parents' role in supporting SEL, and (c) strategies used in the process. This revealed various parental knowledge and strategies of SEL in the homes as well as socio-cultural networks and resources in the communities that complemented within-family SEL. Policy implications for the creation of system-wide SEL beyond school settings are discussed.

14. Chapman, A., & Miller, L. (2022). Awakened schools: The burning imperative of pedagogical relational culture. *International Journal of Educational Research*, 116, 102089. <https://doi.org/10.1016/j.ijer.2022.102089>

Abstract: Although the purpose of education in the United States has long been preparing an active, moral citizenry, in recent decades civic education has ceded this purpose to knowledge acquisition. Young people are insufficiently supported in school in developing as self-knowing civic actors capable of fulfilling Dewey's vision of the moral and spiritual democracy. This paper presents an empirically driven difference between spirituality and religion, clarifying what has obfuscated discussion of Constitutional separation of church-state in education; presents findings of a three-year study on K-12 spiritually supportive schools, identifying the pedagogical method undergirding those whose culture is spiritually nurturing; and argues that a spiritually supportive school culture is imperative for the formation of students who are prepared to inherit democracy.

15. Adhikary, R. W., & Lingard, B. (2022). Following performative imaginations: Social enterprises, policy networks, and reforming primary education in Bangladesh. *International Journal of Educational Research*, 116, 102086. <https://doi.org/10.1016/j.ijer.2022.102086>

Abstract: Drawing upon research in Bangladesh, we highlight the role of "imagination" in the way policy networks pursued social entrepreneurial reforms within primary education and NGO sectors. Applying a cultural globalisation lens to

network ethnography as method, we found such pre-emptive “imagination” to be performative insofar as key network actors mentally constructed locally governable worlds of policy as a part of their day-to-day work. These actors worked in and after their imaginations by mentally scripting policy problems and reform solutions in terms of imagined governable communities, reform aspirations, and dedicated discourses. Exemplifying and institutionalising reforms even partially, these actors mentally navigated webs of actions, practices, logics, relationships, resources, and other actors. Analysing interview data and documents we investigated three policy networks.

16. Shin, H. (2022). Decolonizing indigenous-newcomer relations in the teaching of English in education. *International Journal of Educational Research*, 116, 102091. <https://doi.org/10.1016/j.ijer.2022.102091>

Abstract: In 2008, the Canadian government convened a Truth and Reconciliation Commission to investigate the impact of the Indian Residential schools that removed Indigenous children from their traditional territories/families/cultures, and to begin repairing settler-Indigenous relationships. Yet, research on how to rebuild Indigenous-newcomer relationships regarding distinct local manifestations of Truth and Reconciliation and settler colonialism in Canada is scarce. Drawing from recent scholarship in applied linguistics/sociolinguistics on the meta theoretical dimension of thinking about language from the global South/political economic perspectives, this paper presents a conceptual/auto ethnographical analysis of contemporary intertwining of capitalism and colonialism as a key producing mechanism of language-related inequalities, as well as challenges experienced in my efforts to create meaningful learning space for both Indigenous and newcomer students.

17. Wong, M. Y. C. (2022). The physical education pedagogical approaches in nurturing physical literacy among primary and secondary school students: A scoping review. *International Journal of Educational Research*, 116, 102080. <https://doi.org/10.1016/j.ijer.2022.102080>

Abstract: Physical education discourse has increasingly discussed the importance of physical literacy, but this discourse has not been fully incorporated into physical education programs around the world. Together with the emphasis from the Future Education 2030 Physical Education Development Report, the inclusion of physical literacy should be upheld. Hence, how the physical education pedagogy is applied to achieve physical literacy effectively should be discussed. Using a scoping review, the current study aimed to investigate the pedagogical approaches adopted in enhancing students’ physical literacy and its association with physical literacy. The review ($N = 21$) has summarized the definition of physical literacy, mainly defined by the International Physical Literacy Association and Whitehead (2007). It has also captured various pedagogical approaches, including Teaching Games for Understanding, Non-linear Pedagogy, Integrated Approach going beyond physical education lessons, and other student-centered methods. The results indicated that Non-linear Pedagogy showed a better effect on students’ physical literacy compared to Linear Pedagogy and Performance-based Pedagogy. It is highly recommended that a student-centered with autonomy-supportive pedagogical approach was considered as the most effective form of pedagogy for promoting and enhancing children's physical literacy. In addition, the curriculum and assessment of physical education must also

be reviewed in order to align and expand the role of pedagogy in delivering physical literacy. Moreover, more evidence-based research utilizing lesson observation and randomized control trials should be conducted to demonstrate the effectiveness of different pedagogies, thereby raising the level of awareness and utilization of pedagogy in classrooms.

18. Rowston, K., Bower, M., & Woodcock, S. (2022). Career-changers' technology integration beliefs and practice in initial teacher education: A summative cross-case analysis. *International Journal of Educational Research*, 116, 102079. <https://doi.org/10.1016/j.ijer.2022.102079>

Abstract: Fundamental to career-changers' successful transition into teaching is the design and delivery of post-graduate initial teacher education (ITE) programs. Career-changers enter teaching eager to share applied knowledge from prior occupations; however, support during ITE to facilitate the inclusion of these skills into teaching is often lacking. This study explored this phenomenon from a technology perspective and presents the outcomes of a cross-case analysis of four pre-service career-changers from an Australian university during ITE. Results indicated career-changers perceived their capacity to link existing technology skills to curricula depended on modelling and mentoring of technology integration during ITE subjects and school placements. School cultures combined with IT infrastructures also reportedly impacted technology practice. Recommendations to better support career-changers during ITE are discussed.

19. Jones, B. M., & Bradbury, A. (2022). Policy disruptors or entrepreneurs? The tensions emerging from a network of philosophy educators. *International Journal of Educational Research*, 116, 102087. <https://doi.org/10.1016/j.ijer.2022.102087>

Abstract: In this article we examine a network of philosophical and critical thinking 'policy entrepreneurs' (Ball and Junemann, 2012) and consider to what extent they operate as conduits of or challenges to a neoliberal discourse of education. The neoliberalization of education has brought about a new mode of heterarchical network governance in education where the traditional hierarchical power of the state and local authorities has dissipated, and new policy actors have emerged. We ask whether it is possible for alternative 'grass roots' networks to operate within this quintessentially neoliberal framework of heterarchical network governance to challenge neoliberal discourses of education (Ball and Junemann, 2012). In considering the space that network governance potentially opens up for challenges to neoliberal orthodoxies, we are trying to take the study of network governance in a new and different direction. We draw on Foucault's notion of the *dispositif* to probe the tensions that exist as members of this 'philosophers' network' operate as both advocates of an alternative progressive pedagogy disrupting key tenets of neoliberal thinking on education and neoliberal entrepreneurial subjects who embrace and benefit from a system of heterarchical networks and justify their alternative approach in distinctly neoliberal terms. This research points to the complexity of the relationship between network governance and wider forms of neoliberal governance.

20. Elek, C., Page, J., & Eadie, P. (2022b). Does coaching for early childhood educators unfold as planned? Comparing observed coaching practice to coaches' and educators' perceptions. *International Journal of Educational Research*, 116, 102088. <https://doi.org/10.1016/j.ijer.2022.102088>

Abstract: Coaching is a promising form of professional development for early childhood educators. Yet, little is known about what happens during coaching and how it is perceived. This study examined the coaching practices of two coaches in Australia over several months and used a typology of coaching or mentoring 'roles' to analyse the degree to which the coaches promoted a sense of autonomy for educators. We found that coaches led the coaching more than they intended, and their perceived coaching practices differed from their intended approaches, their observed practices and the perceptions of educators. This study underlines the value of collecting information from a range of perspectives to understand what happens during coaching.

21. McKenzie, M., & Stahelin, N. (2022). The global inter-network governance of UN policy programs on climate change education. *International Journal of Educational Research*, 116, 102093. <https://doi.org/10.1016/j.ijer.2022.102093>

Abstract: This paper examines the hows and whys of the global inter-network governance of two United Nations intergovernmental organizations with a policy focus on climate change education. Study data include web-audits, social media analyses, and interviews with policy actors involved in the network governance of these policy programs. The research suggests how each organization is functioning via UN-specific forms of semi-structured network governance, in which non-state actors have increasingly played key roles, but alongside the continued influences of state actors and the hierarchical structures of the intergovernmental organizations. We also found that the two organizations under study are engaged in forms of 'inter-network governance,' including via joint reports, meeting collaboration, and intermediary policy actors. The drivers of this inter-network governance are also discussed, including historical siloing of education and environment in different national ministries, macro and micro forms of institutionalization of the collaboration between the two organizations, and the greater mainstreaming enabled by the prominence of the United Nations Sustainable Development Goals. The study suggests the positive outcomes of the network and inter-network governance at play in the UN organizations, and how that has been key to the global development and mobilities of climate change in education policy. The study has implications for international organizational theory, network governance studies, and understanding the global governance of climate change in education policy.

JOURNAL OF SCHOOL PSYCHOLOGY

1. Zabek, F., Meyers, J. D., Rice, K., Ashby, J. S., & Kruger, A. C. (2022). Can a school climate survey accurately and equitably measure school quality? Examining the multilevel structure and invariance of the Georgia School Climate Scale. *Journal of School Psychology, 95*, 1–24. <https://doi.org/10.1016/j.jsp.2022.08.005>

Abstract: School climate measures are increasingly utilized as one indicator of school quality within educational accountability systems. However, concerns have been raised about the accuracy of these indicators given that school climate surveys are often not validated using multilevel methods. Further, cross-school comparisons in climate may not be trustworthy because the school-level invariance of climate surveys has not been investigated. There is a need to examine the validity of school-level climate constructs and to determine if surveys measure climate equitably for schools that serve underrepresented populations. The aim of the current study was to examine the multilevel factor structure of a statewide school climate survey to determine whether it measured climate equitably for students of different races/ethnicities and across schools with varying racial/ethnic and socioeconomic compositions. Participants included 259,778 students from 427 middle schools throughout a southeastern U.S. state. Cross-level invariance analyses revealed that the climate constructs were measured differently across levels of analysis, and school-level climate could not be interpreted as merely the aggregate of individual-level climate. Student- and school-level factorial invariance was tested using multilevel modeling procedures. Results revealed item bias with respect to student and school characteristics, and the relationships between school climate and student and school demographics changed after accounting for identified bias. As more educational agencies consider including school climate surveys in their accountability systems, these findings suggest that multilevel validation procedures and school-level invariance analyses are necessary to ensure accurate and equitable measurement.

2. Andoni, L., Hamsho, N. F., Blacher, J., & Eisenhower, A. (2022). Psychometric properties of a parent- and teacher-report measure for autistic children: Parent-Teacher Relationship Quality Scale (PTRQS). *Journal of School Psychology, 95*, 25–42. <https://doi.org/10.1016/j.jsp.2022.08.004>

Abstract: Parent-teacher relationship (PTR) quality is linked to child and family-school functioning and may be especially important in the school adjustment of autistic children. However, measurement of PTR quality has been limited by inconsistency in the use of measures, a paucity of two-informant measurement, and limited psychometric consideration. We examined the psychometric properties of the Parent-Teacher Relationship Quality Scale (PTRQS), a parent- and teacher-report measure of PTR quality derived from multiple sources. Specifically, we examined the factor structure, reliability, and convergent validity of the PTRQS among parents and teachers of 192 autistic children in preschool to 2nd grade. Results supported a three-factor model, including (1) parent-perceived relationship quality, (2) teacher-perceived comfort with parent(s), and (3) teacher perceptions of parent abilities. Scores exhibited high internal consistency. As evidence of convergent validity, all three factors of PTR quality, as well as the total PTRQS score, were strongly associated with parent interview-based PTR quality, parent perceptions of teacher effectiveness, and teacher-rated parental school involvement. The two teacher-rated

PTR quality factors were also associated with student-teacher relationship quality. Results indicated that (a) the measure can validly capture PTR quality in the context of preschool and early elementary-age autistic children, (b) early PTR quality is linked to parental involvement, and (c) teacher-rated PTR factors are linked to autistic students' own relationships with their teachers. The results have implications for researchers and school psychologists measuring PTR quality in their practice.

Keywords: Autism Spectrum Disorder (ASD), Autistic children, Parent-teacher relationship quality, Early childhood, Psychometrics, Measurement

3. Alamos, P., Corbin, C. M., Klotz, M., Lowenstein, A. E., Downer, J. T., & Brown, J. L. (2022). Bidirectional associations among teachers' burnout and classroom relational climate across an academic year. *Journal of School Psychology, 95*, 43–57. <https://doi.org/10.1016/j.jsp.2022.09.001>

Abstract: In the present study, we examined bidirectional associations between two components of teachers' burnout (personal accomplishment and emotional exhaustion) and classroom relational climate (closeness and conflict) across two time points within an academic year. Participants included 330 elementary school teachers (third and fourth grade) and 5081 students in a large, urban city in the northeastern United States. Students were primarily Hispanic/Latino (66%) or Black/African American (22%), and most were from low-income households. Forty-seven percent of teachers were White, 25% Black, and 31% identified as Hispanic/Latino. Two modeling approaches were used for preliminary detection of bidirectional relations among burnout and classroom relational climate. First, a crossed-lagged panel model showed a clear pattern from earlier relational climate to later burnout; closeness and conflict at Time 1 predicted personal accomplishment at Time 2, and conflict at Time 1 predicted emotional exhaustion at Time 2. No evidence was found for earlier burnout predicting later relational climate. Second, a set of latent change score models indicated that increases in closeness from Time 1 to Time 2 were associated with decreases in emotional exhaustion across the academic year. Together, findings provide preliminary evidence for associations from classroom relational climate to teacher burnout, but not the other way around. Implications of these findings for teachers and school psychologists are discussed.

Keywords: Classroom relational climate, Teacher-student relationships, Teacher burnout, Teacher psychological wellbeing, Elementary school classrooms

4. Gregory, A., Huang, F., & Ward-Seidel, A. R. (2022). Evaluation of the whole school restorative practices project: One-year impact on discipline incidents. *Journal of School Psychology, 95*, 58–71. <https://doi.org/10.1016/j.jsp.2022.09.003>

Abstract: The current study addressed the need for experimental research on Restorative Practices (RP) in its evaluation of the Morningside Center for Teaching Social Responsibility's Whole School RP Project. The study was conducted in a large North-eastern city using a cluster randomized controlled design in 18 elementary, middle, and high schools. In a single year, before the COVID-19 pandemic, and with data from 5878 students, the study found that overall, students in the RP Project schools were less likely to receive a discipline incident record (11.1%) as compared to students in the comparison schools (18.2%). However, differential treatment effects

based on sex, race/ethnicity, and disability status were not found. The findings suggest prevention efforts are a cornerstone of practice/policy reforms to reduce the use of exclusionary discipline. Findings also suggest multi-year initiatives are needed to address discipline disparities.

Keywords: Restorative practices, School discipline, Randomized controlled trial, Urban schools, Social emotional learning

5. Schweder, S., & Raufelder, D. (2022). Adolescents' enjoyment and effort in class: Influenced by self-directed learning intervals. *Journal of School Psychology, 95*, 72–89. <https://doi.org/10.1016/j.jsp.2022.09.002>

Abstract: Based on the control-value theory, the present study examined the development and change of enjoyment and effort among adolescents during a school year. The study analyzed 754 adolescent students ($M_{Age} = 13.56$; $SD = 1.2$; 49.7% female) who twice participated in a 1-week intervention of self-directed learning (SDL). The results of the bivariate latent neighbor change model showed that—contrary to previous study results—a positive development of enjoyment and effort was generally recorded over the school year and that particularly the two 1-week self-directed learning interventions were beneficial for this increase. Furthermore, the results show that enjoyment and effort were reciprocally linked over time, but only when self-directed learning was experienced first. In other words, by enlarging instruction via self-directed learning intervals, it is possible to counteract the tendency of enjoyment and effort to exhibit a downward spiral. This tendency is especially pronounced during students' entry into secondary school and the onset of adolescence.

Keywords: Enjoyment, Effort, Control-value theory, Self-directed learning, Learning environment

6. Keppens, G. (2022). Who is absent from school when? An optimal matching analysis of within-year variation in the timing of school absences. *Journal of School Psychology, 95*, 90–104. <https://doi.org/10.1016/j.jsp.2022.07.003>

Abstract: Although school absenteeism trajectories can be studied through various parameters and dimensions, such as the amount of school absenteeism, sequence, and timing, most studies have only focused on changes in the amount of school absenteeism. However, when investigating the nature of school absenteeism, an analysis cannot be restricted to just changes in the amount of school absenteeism. In this article, I show how applying optimal matching on time-stamped half days of missed school ($n = 6260$) enables researchers, policy makers, and school professionals to uncover socio-temporal regularities in trajectories of non-attendance (i.e., the degree to which groups of pupils are absent at the same time and in the same rhythm within a given school year). Results indicated that students fall into five types of trajectories, and that these are highly predictive of student's examination results at the end of the school year. In the Discussion, I elaborate on the implications of these findings.

Keywords: School absenteeism, Optimal matching analysis, Secondary education, Academic achievement

7. Becker, S. P., Epstein, J. N., Burns, G. L., Mossing, K. W., Schmitt, A. P., Fershtman, C. E., Vaughn, A. J., Zoromski, A. K., Peugh, J. L., Simon, J. O., & Tamm, L. (2022). Academic functioning in children with and without sluggish cognitive tempo. *Journal of School Psychology, 95*, 105–120. <https://doi.org/10.1016/j.jsp.2022.10.001>

Abstract: Sluggish cognitive tempo (SCT) is increasingly conceptualized as a transdiagnostic set of symptoms associated with poorer functional outcomes, although the extent to which SCT is associated with academic functioning remains unclear. This study recruited children based on the presence or absence of clinically elevated SCT symptoms, using a multi-informant and multi-method design to provide a comprehensive examination of academic functioning in children with and without clinically elevated SCT symptoms. Participants were 207 children in Grades 2–5 (ages 7–11 years; 63.3% male), including 103 with clinically elevated teacher-reported SCT symptoms and 104 without elevated SCT, closely matched on grade and sex. A multi-informant, multi-method design that included standardized achievement testing, curriculum-based measurement (CBM), grades, classroom and laboratory observations, and parent and teacher rating scales was used. Children with elevated SCT symptoms had poorer academic functioning than their peers across most domains examined. Specifically, compared to children without SCT, children with elevated SCT had significantly lower grade point average ($d = 0.42$) and standardized achievement scores ($ds = 0.40–0.77$), poorer CBM performance including lower productivity ($ds = 0.39–0.51$), poorer homework performance and organizational skills ($ds = 0.58–0.85$), and lower teacher-reported academic skills ($ds = 0.63–0.74$) and academic enablers ($ds = 0.66–0.74$). The groups did not significantly differ on percentage of time on task during classroom observations or academic enabler interpersonal skills. Most effects were robust to control of family income, medication use, and attention-deficit/hyperactivity disorder inattentive symptoms, although effects for motivation and study skills academic enablers were reduced. This study demonstrates that children with clinically elevated SCT symptoms have wide-ranging academic difficulties compared to their peers without SCT. Findings point to the potential importance of assessing and treating SCT to improve academic outcomes.

Keywords: Achievement, ADHD, Cognitive disengagement syndrome, Sluggish cognitive tempo

8. Shernoff, E. S., Lekwa, A. L., Delmarre, A., Gabbard, J., Stokes-Tyler, D., Lisetti, C., & Frazier, S. L. (2022). Bridging simulation technology with positive behavioral supports to promote student engagement and behavior. *Journal of School Psychology, 95*, 121–138. <https://doi.org/10.1016/j.jsp.2022.10.002>

Abstract: Simulation technology provides opportunities for teachers to engage in extended practice using positive behavioral supports to promote student engagement and behavior. These training models are rapidly emerging and if effective, create an infrastructure for scaling up positive behavioral supports in classrooms and schools. However, there is limited research examining teacher skill transfer or student outcomes. This study examined the incremental benefits of Interactive Virtual Training for Teachers (IVT-T) in combination with professional learning communities (PLCs) in one high poverty school district. Using a quasi-experimental design, teachers ($N = 90$; $n = 52$ IVT-T + PLC condition; $n = 38$ PLC condition) and

students ($N = 100$; $n = 60$ IVT-T + PLC condition; $n = 40$ PLC only) participated across six K–8 schools. Both training conditions were rated as moderately acceptable. One and two-level generalized linear models indicated teachers who used IVT-T increased their use of praise ($b = 0.75, p = .03$) and decreased their use of behavioral corrective feedback ($b = -0.32, p = .02$). Their students were also more passively engaged ($b = 0.42, p = .05$) and showed fewer inappropriate physical behaviors ($b = -0.87, p = .002$). IVT-T hours predicted increases in praise statements ($b = 0.07, p < .001$) and decreases in vague directives ($b = -0.07, p = .006$) whereas PLC hours predicted increases in teachers' use of vague directives ($b = 0.07, p = .05$). There was a significant positive effect of IVT-T hours on student passive engagement ($b = 0.04, p = .01$) and a negative effect of PLC hours on rates of inappropriate physical behaviors ($b = 0.1, p = .04$). Study limitations and future directions for research and practice are discussed.

Keywords: Technology, Positive behavioural supports, Teacher training, high poverty schools, deliberate practice, underrepresented communities

LANGUAGE ASSESSMENT QUARTERLY

1. Cai, Y., & Chen, H. (2022). The Fluctuating Effect of Thinking on Language Performance: New Evidence for the Island Ridge Curve. *Language Assessment Quarterly*, 19(5), 465–479. <https://doi.org/10.1080/15434303.2022.2080553>

Abstract: Thinking skills play a critical role in determining language performance. Recent advancement in cognitive diagnostic modelling (CDM) provides a powerful tool for obtaining fine-grained information regarding these thinking skills during reading. Studies are scant, however, exploring the relations between thinking skills and language performance, not to mention studies examining the variation of this association with language proficiency. The current study explored this variation through the lens of the Island Ridge Curve (IRC). Drawing on an English reading test data by 2,285 students, we identified five thinking skills using CDM. Next, we followed guidelines of IRC and put students into four language proficiency groups to examine the relations of each skill identified through reading tasks to language performance across groups. Results of multi-group path analysis showed the effect of each skill identified through reading test fluctuated in the pattern of the IRC. The potential of IRC for examining the moderation of language proficiency on language factors is discussed.

2. Suzumura, N. (2022). Content Analysis of Test Taker Responses on an AP Japanese Computer-Simulated Conversation Test: A Mixed Methods Approach for a Validity Argument. *Language Assessment Quarterly*, 19(5), 480–502. <https://doi.org/10.1080/15434303.2022.2130326>

Abstract: The present study is part of a larger mixed methods project that investigated the speaking section of the Advanced Placement (AP) Japanese Language and Culture Exam. It investigated assumptions for the evaluation inference through a content analysis of test taker responses. Results of the content analysis were integrated with those of a many-facet Rasch analysis of the same speech data. This study found that most information-seeking prompts elicited a good sized ratable speech sample with relevant content, and the rating criteria seemed to fit with the nature of the interaction. Therefore, information-seeking prompts generally provided appropriate evidence of test takers' ability. In contrast, non-information-seeking prompts such as requests and expressive prompts tended to have issues with eliciting a good sized ratable speech sample with relevant content, and their response expectations realized in the rating criteria did not fit with the nature of the interaction. Thus, non-information-seeking prompts showed greater potential of becoming sources of measurement error with the current test design. This article discusses possible solutions to increase the validity of the evaluation inference. Findings from the present study would be useful for future test development of computer-based L2 tests that aim to assess interpersonal communication skills.

3. Gan, L., & Lam, R. C. K. (2022). A Review on Language Assessment Literacy: Trends, Foci and Contributions. *Language Assessment Quarterly*, 19(5), 503–525. <https://doi.org/10.1080/15434303.2022.2128802>

Abstract: Language assessment literacy (LAL), an increasingly prominent research topic, has generated substantial literature in language testing and assessment. Thus

far, there seems to be few comprehensive reviews on this research topic. The current scoping study reviewed a total of 81 papers by synthesising LAL studies published from 2008 to 2020. It addressed research questions concerning (1) the overall trend and progress, (2) the research foci and (3) characteristics of implications of LAL research for language teacher education and professional development. The review found that there was an upward trend in LAL studies, which were conducted predominantly in the Asia-Pacific region, Europe and the Middle East, and that most studies employed qualitative over quantitative and mixed-methods designs. An overwhelming majority of studies focused on language teachers, especially EFL teachers, while few were conducted from the perspectives of learners, policy makers, language testers, teacher educators and other stakeholders. The review also discovered that most studies researched stakeholders' LAL levels, needs and development, overlooking LAL developmental trajectories, localised LAL components, the development of LAL measures, perceptions of LAL and LAL impact. Three characteristics were identified from implications of LAL studies as contributions to language teacher education and professional development. Based on the findings, some guidelines were suggested for future research.

4. Pearson, W. H. (2022). Test Review: LanguageCert IESOL B1 (Achiever) SELT. *Language Assessment Quarterly*, 19(5), 526–537. <https://doi.org/10.1080/15434303.2022.2103420>

Abstract: The present article reviews LanguageCert's International English for Speakers of Other Languages (IESOL) *Achiever* Secure English Language Test (SELT). This high-stakes on-demand CEFR-linked exam has, since 2020, constituted Home Office-recognised evidence L2 English users can speak, write, and understand written and verbal English at B1 level. Passing the test facilitates enrolment onto a foundation or pre-sessional English course at a UK higher education institution, although some institutions set higher standards. As a neophyte SELT, there have been few descriptions and evaluations of the test beyond a range of sponsored studies. The current review indicated the *Achiever* test measures candidates' general abilities to understand, interact, and produce tasks that mirror real life. However, a lack of 'academicness' and validity concerns in listening raise questions over its suitability for predicting readiness for tertiary study. The test offers the benefits of efficiency in registration and communicating results, remote proctoring and invigilation, and numerous sample materials in the public domain. The provision of an innovative re-sit option may prove favourable to candidates, although could encourage repeat test taking and attempts to pass by a narrow margin, rather than investments in language learning.

5. De Costa, P. I., & Leung, C. (2022). Looking Back and Forward: Language Assessment Insights from Constant Leung. *Language Assessment Quarterly*, 19(5), 538–546. <https://doi.org/10.1080/15434303.2022.2104722>

Abstract: In this interview piece, Peter De Costa and Matt Coss invite Constant Leung, *LAQ* co-editor (2017–2021) and active member of the *LAQ* editorial team since its inception in 2004, to highlight key milestones within the field of language assessment in general, and as they relate to major accomplishments of the journal. In addition, readers will also gain insight into anticipated developments within language

assessment that extend contemporary trends, and thus advance the language assessment research agenda.

在这篇访谈文章中, Peter De Costa 和 Matt Coss邀请LAQ编辑 (2017至2021年)及创刊编委会成员(2004起)的Constant Leung (梁匡)重点介绍语言评估研究领域的重要里程碑及其与*Language Assessment Quarterly*这一期刊的主要成果之间的关系。此外, 梁教授在访谈中深入介绍了他对语言评估领域的发展趋向的预期与期望, 以及这些发展将会如何基于学界已有的成就及如今的研究趋势进一步解决未来的问题。

En esta entrevista, Peter De Costa y Matt Coss invitan a Constant Leung, co-editor (2017-2021) y miembro activo del equipo editorial de *LAQ* desde la fundación de la misma en 2004, a destacar los principales hitos en el campo de la evaluación lingüística, tanto en general como en relación con los logros de *LAQ* en particular. Además, al leer la presente entrevista, los lectores podrán conocer los desarrollos previstos en el campo de la evaluación lingüística que amplían las tendencias contemporáneas y, por lo tanto, seguirán avanzando la agenda de investigación en este campo investigador.

PSYCHOLOGICAL REVIEW

1. Salet, J., Kruijne, W., & Rijn, V. S. (2022). FMTP: A unifying computational framework of temporal preparation across time scales. *Psychological Review*, 129(5), 911–948. <https://doi.org/10.1037/rev0000356>

Abstract: Temporal preparation is the cognitive function that takes place when anticipating future events. This is commonly considered to involve a process that maximizes preparation at time points that yield a high hazard. However, despite their prominence in the literature, hazard-based theories fail to explain the full range of empirical preparation phenomena. Here, we present the *formalized* multiple trace theory of temporal preparation (fMTP), an integrative model which develops the alternative perspective that temporal preparation results from associative learning. fMTP builds on established computational principles from the domains of interval timing, motor planning, and associative memory. In fMTP, temporal preparation results from associative learning between a representation of time on the one hand and inhibitory and activating motor units on the other hand. Simulations demonstrate that fMTP can explain phenomena across a range of time scales, from sequential effects operating on a time scale of seconds to long-term memory effects occurring over weeks. We contrast fMTP with models that rely on the hazard function and show that fMTP's learning mechanisms are essential to capture the full range of empirical effects. In a critical experiment using a Gaussian distribution of foreperiods, we show the data to be consistent with fMTP's predictions and to deviate from the hazard function. Additionally, we demonstrate how changing fMTP's parameters can account for participant-to-participant variations in preparation. In sum, with fMTP we put forward a unifying computational framework that explains a family of phenomena in temporal preparation that cannot be jointly explained by conventional theoretical frameworks.

2. Zilker, V., & Pachur, T. (2021). Nonlinear probability weighting can reflect attentional biases in sequential sampling. *Psychological Review*, 129(5), 949–975. <https://doi.org/10.1037/rev0000304>

Abstract: Nonlinear probability weighting allows cumulative prospect theory (CPT) to account for key phenomena in decision making under risk (e.g., certainty effect, fourfold pattern of risk attitudes). It describes the impact of risky outcomes on preferences in terms of a rank-dependent nonlinear transformation of their objective probabilities. The attentional Drift Diffusion Model (aDDM) formalizes the finding that attentional biases toward an option can shape preferences within a sequential sampling process. Here we link these two influential frameworks. We used the aDDM to simulate choices between two options while systematically varying the strength of attentional biases to either option. The resulting choices were modeled with CPT. Changes in preference due to attentional biases in the aDDM were reflected in highly systematic signatures in the parameters of CPT's weighting function (curvature, elevation). In a re-analysis of a large set of previously published data, we demonstrate that attentional biases are also empirically linked to patterns in probability weighting as suggested by the simulations. Our analyses also revealed a previously overlooked link between patterns in probability weighting and response times. These findings highlight that distortions in probability weighting can arise from simple option-specific attentional biases in information search, and suggest an alternative to

common interpretations of weighting-function parameters in terms of probability sensitivity and optimism. They also point to novel, attention-based explanations for empirical phenomena associated with characteristic shapes of CPT's probability-weighting function (e.g., certainty effect, description–experience gap). The results advance the integration of two prominent computational frameworks for decision making.

3. Mamassian, P., & De Gardelle, V. (2021). Modeling perceptual confidence and the confidence forced-choice paradigm. *Psychological Review*, 129(5), 976–998. <https://doi.org/10.1037/rev0000312>

Abstract: Perceptual confidence is an evaluation of the validity of our perceptual decisions. We present here a complete generative model that describes how confidence judgments result from some confidence evidence. The model that generates confidence evidence has two main parameters, confidence noise and confidence boost. Confidence noise reduces the sensitivity to the confidence evidence, and confidence boost accounts for information used for confidence judgment which was not used for the perceptual decision. The opposite effect of these two parameters creates a problem of confidence parameters indeterminacy, where the confidence in a perceptual decision is the same in spite of differences in confidence noise and confidence boost. When confidence is estimated for multiple stimulus strengths, both of these parameters can be recovered, thus allowing us to estimate whether confidence is generated using the same primary information that was used for the perceptual decision or some secondary information. We also describe a novel measure of confidence efficiency relative to the ideal confidence observer, as well as the estimate of one type of confidence bias. Finally, we apply the model to the confidence forced-choice paradigm, a paradigm that provides objective estimates of confidence, and we discuss how each parameter of the model can be recovered using this paradigm.

4. Binz, M., Gershman, S. J., Schulz, E., & Endres, D. (2022). Heuristics from bounded meta-learned inference. *Psychological Review*, 129(5), 1042–1077. <https://doi.org/10.1037/rev0000330>

Abstract: Numerous researchers have put forward heuristics as models of human decision-making. However, where such heuristics come from is still a topic of ongoing debate. In this work, we propose a novel computational model that advances our understanding of heuristic decision-making by explaining how different heuristics are discovered and how they are selected. This model—called bounded meta-learned inference (BMI)—is based on the idea that people make environment-specific inferences about which strategies to use while being efficient in terms of how they use computational resources. We show that our approach discovers two previously suggested types of heuristics—one reason decision-making and equal weighting—in specific environments. Furthermore, the model provides clear and precise predictions about when each heuristic should be applied: Knowing the correct ranking of attributes leads to one reason decision-making, knowing the directions of the attributes leads to equal weighting, and not knowing about either leads to strategies that use weighted combinations of multiple attributes. In three empirical paired comparison studies with continuous features, we verify predictions of our theory and show that it captures several characteristics of human decision-making not explained by alternative theories.

5. Lu, H., Ichien, N., & Holyoak, K. J. (2022). Probabilistic analogical mapping with semantic relation networks. *Psychological Review*, *129*(5), 1078–1103. <https://doi.org/10.1037/rev0000358>

Abstract: The human ability to flexibly reason using analogies with domain-general content depends on mechanisms for identifying relations between concepts, and for mapping concepts and their relations across analogs. Building on a recent model of how semantic relations can be learned from non relational word embeddings, we present a new computational model of mapping between two analogs. The model adopts a Bayesian framework for probabilistic graph matching, operating on semantic relation networks constructed from distributed representations of individual concepts and of relations between concepts. Through comparisons of model predictions with human performance in a novel mapping task requiring integration of multiple relations, as well as in several classic studies, we demonstrate that the model accounts for a broad range of phenomena involving analogical mapping by both adults and children. We also show the potential for extending the model to deal with analog retrieval. Our approach demonstrates that human-like analogical mapping can emerge from comparison mechanisms applied to rich semantic representations of individual concepts and relations.

6. Weichart, E. R., Galdo, M., Sloutsky, V. M., & Turner, B. M. (2022). As within, so without, as above, so below: Common mechanisms can support between- and within-trial category learning dynamics. *Psychological Review*, *129*(5), 1104–1143. <https://doi.org/10.1037/rev0000381>

Abstract: Two fundamental difficulties when learning novel categories are deciding (a) what information is relevant and (b) when to use that information. Although previous theories have specified how observers learn to attend to relevant dimensions over time, those theories have largely remained silent about how attention should be allocated on a within-trial basis, which dimensions of information should be sampled, and how the temporal order of information sampling influences learning. Here, we use the adaptive attention representation model (AARM) to demonstrate that a common set of mechanisms can be used to specify: (a) How the distribution of attention is updated between trials over the course of learning and (b) how attention dynamically shifts among dimensions within a trial. We validate our proposed set of mechanisms by comparing AARM’s predictions to observed behavior in four case studies, which collectively encompass different theoretical aspects of selective attention. We use both eye-tracking and choice response data to provide a stringent test of how attention and decision processes dynamically interact during category learning. Specifically, how does attention to selected stimulus dimensions gives rise to decision dynamics, and in turn, how do decision dynamics influence which dimensions are attended to via gaze fixations?

7. Cox, G. R., Palmeri, T. J., Logan, G. D., Smith, P. L., & Schall, J. D. (2022). Saliency by competitive and recurrent interactions: Bridging neural spiking and computation in visual attention. *Psychological Review*, *129*(5), 1144–1182. <https://doi.org/10.1037/rev0000366>

Abstract: Decisions about where to move the eyes depend on neurons in frontal eye field (FEF). Movement neurons in FEF accumulate saliency evidence derived from

FEF visual neurons to select the location of a saccade target among distractors. How visual neurons achieve this salience representation is unknown. We present a neuro-computational model of target selection called salience by competitive and recurrent interactions (SCRI), based on the competitive interaction model of attentional selection and decision-making (Smith & Sewell, 2013). SCRI selects targets by synthesizing localization and identification information to yield a dynamically evolving representation of salience across the visual field. SCRI accounts for neural spiking of individual FEF visual neurons, explaining idiosyncratic differences in neural dynamics with specific parameters. Many visual neurons resolve the competition between search items through feedforward inhibition between signals representing different search items, some also require lateral inhibition, and many act as recurrent gates to modulate the incoming flow of information about stimulus identity. SCRI was tested further by using simulated spiking representations of visual salience as input to the gated accumulator model of FEF movement neurons (Purcell et al., 2010, 2012). Predicted saccade response times fit those observed for search arrays of different set sizes and different target-distractor similarities, and accumulator trajectories replicated movement neuron discharge rates. These findings offer new insights into visual decision-making through converging neuro-computational constraints and provide a novel computational account of the diversity of FEF visual neurons.

8. Evans, N. J., & Servant, M. (2022). A model-based approach to disentangling facilitation and interference effects in conflict tasks. *Psychological Review*, 129(5), 1183–1209. <https://doi.org/10.1037/rev0000357>

Abstract: Conflict tasks have become one of the most dominant paradigms within cognitive psychology, with their key finding being the conflict effect: That participants are slower and less accurate when task-irrelevant information conflicts with task-relevant information (i.e., incompatible trials), compared to when these sources of information are consistent (i.e., compatible trials). However, the conflict effect can consist of two separate effects: Facilitation effects, which is the amount of benefit provided by consistent task-irrelevant information, and interference effects, which is the amount of impairment caused by conflicting task-irrelevant information. While previous studies have attempted to disentangle these effects using neutral trials, which contrast compatible and incompatible trials to trials that are designed to have neutral task-irrelevant information, these analyses rely on the assumptions of Donder’s subtractive method, which are difficult to verify and may be violated in some circumstances. Here, we develop a model-based approach for disentangling facilitation and interference effects, which extends the existing diffusion model for conflict tasks (DMC) framework to allow for different levels of automatic activation in compatible and incompatible trials. Comprehensive parameter recovery assessments display the robust measurement properties of our model-based approach, which we apply to nine previous data sets from the flanker (6) and Simon (3) tasks. Our findings suggest asymmetric facilitation and interference effects, where interference effects appear to be present for most participants across most studies, whereas facilitation effects appear to be small or nonexistent. We believe that our novel model-based approach provides an important step forward for understanding how information processing operates in conflict tasks, allowing researchers to assess the convergence or divergence between experimental-based (i.e., neutral trials) and model-based approaches when investigating facilitation and interference effects.

9. Dumas, L. a. A., Puebla, G., Martin, A. E., & Hummel, J. D. (2022). A theory of relation learning and cross-domain generalization. *Psychological Review*, 129(5), 999–1041. <https://doi.org/10.1037/rev0000346>

Abstract: People readily generalize knowledge to novel domains and stimuli. We present a theory, instantiated in a computational model, based on the idea that cross-domain generalization in humans is a case of analogical inference over structured (i.e., symbolic) relational representations. The model is an extension of the Learning and Inference with Schemas and Analogy (LISA; Hummel & Holyoak, 1997, 2003) and Discovery of Relations by Analogy (DORA; Dumas et al., 2008) models of relational inference and learning. The resulting model learns both the content and format (i.e., structure) of relational representations from nonrelational inputs without supervision, when augmented with the capacity for reinforcement learning it leverages these representations to learn about individual domains, and then generalizes to new domains on the first exposure (i.e., zero-shot learning) via analogical inference. We demonstrate the capacity of the model to learn structured relational representations from a variety of simple visual stimuli, and to perform cross-domain generalization between video games (Breakout and Pong) and between several psychological tasks. We demonstrate that the model’s trajectory closely mirrors the trajectory of children as they learn about relations, accounting for phenomena from the literature on the development of children’s reasoning and analogy making. The model’s ability to generalize between domains demonstrates the flexibility afforded by representing domains in terms of their underlying relational structure, rather than simply in terms of the statistical relations between their inputs and outputs.

PSYCHOLOGY IN THE SCHOOLS

1. Gaias, L. M., Jones, J. M., Exner-Cortens, D., Splett, J. W., & Walker, W. V. (2022). Embedding equity into school mental health theory: Introduction to Part 2 of the special issue series. *Psychology in the Schools*, 59(12), 2383–2386. <https://doi.org/10.1002/pits.22806>

Abstract: In this article, we present an introduction to the second part of a two-part special series focused on embedding equity into school mental health. In the previous part, we focused on measurement and practice, and in this second part, we focus on theory.

2. Campbell, S. (2021). Expanding notions of equity: Body diversity and social justice. *Psychology in the Schools*, 59(12), 2387–2404. <https://doi.org/10.1002/pits.22586>

Abstract: Despite their negative effects on the emotional, physical, and social wellbeing of students, weight stigma and anti-fat attitudes are rarely systematically addressed in schools or within school psychology. Weight-based oppression is regarded differently than other domains of prejudice. Therefore, implicit and explicit bias continue unimpeded, even when practitioners are attentive to other areas of social injustice. Mental health providers serving schools must acknowledge the prevalence of weight stigma and fatphobia to reduce their deleterious and oppressive effects. This conceptual paper outlines the underpinnings of weight stigma, overviews the necessity of addressing it and body image in educational settings, incorporates interdisciplinary perspectives, and proposes a justice-oriented shift in the conceptualization of weight status within school psychological service delivery.

3. Cohen, D., Lindsey, M. A., & Lochman, J. E. (2021). Applying an ecosocial framework to address racial disparities in suicide risk among black youth. *Psychology in the Schools*, 59(12), 2405–2421. <https://doi.org/10.1002/pits.22588>

Abstract: Suicide in Black youth is a major public health crisis. Given that racism is a core aspect of the lived experience of Black students in educational settings, efforts to reduce racial disparities in suicide risk must identify and address sources of racism in school contexts and facilitate culturally relevant coping strategies. This article highlights patterns associated with the emergence of risk in Black children and adolescents, applies the Ecosocial Theory of Disease Distribution to conceptualize a strategic approach to reducing racial disparities in suicide, and integrates empirical literature on the relations between racism and suicidality. Extant research findings are applied to conceptualize strategies specifically oriented towards reducing the incidence of suicidal behaviors in Black youth through treatment utilization and engagement strategies for school mental health services, the application of culturally relevant factors within school-based prevention and treatment programs, culturally relevant risk assessment, and universal prevention using antiracist practices in schools.

4. Crooks, C. V., Kubishyn, N., Noyes, A., & Kayssi, G. (2021). Engaging peers to promote well-being and inclusion of newcomer students: A call for equity-informed peer interventions. *Psychology in the Schools*, 59(12), 2422–2437. <https://doi.org/10.1002/pits.22623>

Abstract: Although newcomer youth demonstrate high levels of resiliency, many experience challenges in emotional, linguistic, academic, and social functioning. Over the past decade, some promising school-based psychosocial interventions for newcomer youth have been developed. These interventions are necessary, but not sufficient to promote well-being. Without attention to the larger context, focusing solely on the skills and adjustment of newcomer youth could potentially stigmatize students further. There is a need to engage non-newcomer peers for two reasons. First, peer relationships and inclusion are important predictors of well-being. Second, from an equity lens, there is a need to create environments that promote youth well-being; at the very least, these environments must engage non-newcomer youth in recognizing and combatting discrimination. This study outlines the need for peer-focused programming to support newcomers and describes existing research on interventions developed to promote peer relationships (e.g., mentoring) or reduce discrimination (e.g., teacher-led discrimination reduction approaches). We identify other intervention models that could inform how to add an equity lens to school mental health intervention, including how a gender-sexuality alliance model could be adapted, and how equity considerations could be integrated into bystander approaches. We conclude with specific implications and recommendations for embedding equity into school mental health.

5. Malone, C. M., Wycoff, K., & Turner, E. A. (2021). Applying a MTSS framework to address racism and promote mental health for racial/ethnic minoritized youth. *Psychology in the Schools*, 59(12), 2438–2452. <https://doi.org/10.1002/pits.22606>

Abstract: Ample evidence suggests that PK-12 students experience racism and other forms of discrimination in school and that these experiences have a deleterious impact on their mental health. Several studies have shown a consistent and strong relationship between racism and negative mental health outcomes including increased depression and anxiety, decreased self-worth and self-esteem, as well as psychological maladjustment. School-based mental health services can ensure that racial and ethnic minoritized (REM) students gain access to mental health services. Because schools are one place where REM students experience structural and individual discrimination, it is critical that school-based mental health providers utilize strategies to promote school climates that are safe and affirming for these students. Using a multitiered system of support framework, we describe the tier 1 interventions to promote positive school racial climate and the elements of culturally responsive practices to be integrated into tier 2 and tier 3 interventions to improve mental health outcomes for REM youth.

6. Davis, W., Petrovic, L., Whalen, K., Danna, L., Zeigler, K., Brewton, A., Joseph, M., Baker, C., & Overstreet, S. (2022). Centering trauma-informed approaches in schools within a social justice framework. *Psychology in the Schools*, 59(12), 2453–2470. <https://doi.org/10.1002/pits.22664>

Abstract: Growing evidence establishing the prevalence and educational consequences of childhood trauma has led to a national focus on equipping schools to support the specific needs of students who have experienced trauma. Despite clear evidence of disproportionate trauma exposure among students of color, most models of trauma-informed schools do not explicitly address the intersection of race and trauma within their system-level efforts to help staff realize the prevalence and impact

of trauma, recognize the signs of trauma exposure, or respond in ways to avoid retraumatization. This manuscript will review existing efforts to integrate a social justice focus within our ongoing work as part of the Safe Schools NOLA project. We present our conceptual framework and describe how principles relevant to social justice are intentionally integrated into strategies that support the adoption and implementation of trauma-informed approaches in schools. We also discuss limitations in our current approach and offer suggestions to support the development of trauma-informed schools that can advance a social justice agenda.

7. Gaias, L. M., Arnold, K. T., Liu, F. F., Pullmann, M. D., Duong, M. T., & Lyon, A. R. (2021). Adapting strategies to promote implementation reach and equity (ASPIRE) in school mental health services. *Psychology in the Schools*, 59(12), 2471–2485. <https://doi.org/10.1002/pits.22515>

Abstract: Despite evidence that school mental health can enhance access to care for students from marginalized racial/ethnic groups, disparities remain in the appropriateness, quality, effectiveness, and outcomes of school mental health services. Implementation strategies hold some promise for addressing the disparities that emerge as result of inequitable implementation of mental health services. However, without explicitly examining implementation strategies through an equity lens, it is unclear the extent to which they will promote equitable implementation or student outcomes. Thus, the goal of the current paper is to describe the Adapting Strategies to Promote Implementation Reach and Equity framework, a generalizable process for adapting implementation strategies to explicitly center the goal of reducing disparities in implementation and service recipient outcomes. We outline a three-step process for incorporating an equity lens into implementation strategies and provide examples of how this framework can be applied to implementation strategies in school mental health. We also discuss examples of projects where implementation strategies were intentionally paired with school mental health programs to enhance racial equity. Implications and recommendations for school mental health and implementation research and practice are discussed.

8. Pullmann, M. D., Gaias, L. M., Duong, M. T., Gill, T. L., Curry, C., Cicchetti, C., Raviv, T., Kiche, S., & Cook, C. R. (2022). Reducing racial and ethnic disproportionality in school discipline through an assessment-to-intervention process: A framework and process. *Psychology in the Schools*, 59(12), 2486–2505. <https://doi.org/10.1002/pits.22651>

Abstract: Racial and ethnic disproportionality in discipline (REDD) represents a longstanding and pervasive issue in the United States educational system. However, researchers and interventionists have not sufficiently provided educators with appropriate frameworks and feasible tools to disrupt REDD and promote equity. The goal of this paper is to present a framework of eight malleable factors associated with REDD and describe the Disproportionality in Discipline Assessment for Schools (DDAS). The DDAS is a suite of user-friendly tools based on this framework, designed to help school teams identify and address REDD. Two studies are described. Study 1 presents the results of educator feedback on a presentation of the framework and the DDAS in terms of their perception of its feasibility, usability, and validity/logical soundness. Study 2 presents the process of applying the DDAS in four real-world school settings. Results indicated that the framework and the DDAS were

useful and feasible tools to help schools increase equity and address REDD. Modifications to the framework and the DDAS were made to improve validity and appropriateness.

9. Saleem, F. T., Howard, T. C., & Langley, A. K. (2021). Understanding and addressing racial stress and trauma in schools: A pathway toward resistance and healing. *Psychology in the Schools*, 59(12), 2506–2521. <https://doi.org/10.1002/pits.22615>

Abstract: Youth of color are disproportionately impacted by stressful and traumatic life events, including race-based experiences, which are linked to negative consequences. School is a salient context where youth encounter, witness, and process racial stress and trauma (RST). However, RST is often overlooked within general school-based trauma models. Thus, we propose the School Trauma and Racial Stress (STARS) blueprint, focused on RST across three levels of the school ecology. By building upon and expanding the Substance Abuse and Mental Health Services Administration recommendations regarding trauma-informed approaches (2014), the STARS blueprint applies a multilevel approach to acknowledging and addressing RST within schools. This integrated framework is a call to action across the school ecology, with the goal to increase recognition of RST within school-based trauma-informed approaches and to build racial equity and healing for students of color in K-12 schools. Practical applications for schools are discussed.

SCIENCE EDUCATION

1. Felton, M. K., Levin, D., De La Paz, S., & Butler, C. (2022). Scientific argumentation and responsive teaching: Using dialog to teach science in three middle-school classrooms. *Science Education*, 106(6), 1354–1374. <https://doi.org/10.1002/sce.21740>

Abstract: Despite broad consensus on the value of classroom dialog for promoting scientific argumentation, tensions have emerged in the literature regarding the degree to which teachers should guide the dialogic process (dialogic stance). We use the lens of responsive teaching to examine how one teacher adjusts his instruction to foster dialog in three middle-school science classrooms. Applying grounded theory to classroom dialogs and teacher interview data, we examine the dynamic interplay of the teacher's overarching goal and moment-to-moment pedagogical aims to understand shifts in his dialogic stance. Our findings illustrate the value of foregrounding responsiveness to students' disciplinary thinking when offering guidance to teachers about when and how to support students in peer-based argumentative dialog.

2. Reinisch, B., & Fricke, K. (2022). Broadening a nature of science conceptualization: Using school biology textbooks to differentiate the family resemblance approach. *Science Education*, 106(6), 1375–1407. <https://doi.org/10.1002/sce.21729>

Abstract: Previous research about the presence of nature of science (NOS) within science textbooks has been found to be lacking in sufficient coverage. However, given the shift in how scholars conceive of NOS, the shortcomings may not be present in the textbooks but rather in the NOS frameworks used to analyze textbooks. Whereas traditional NOS has taken a more generalized approach to describing scientific practices, the family resemblance approach (FRA) to NOS recognizes variability in the scientific disciplines as reported by practicing scientists as well as philosophers and historians of science. Instead of suggesting that NOS can be applied equally in educational settings to all scientific disciplines, the FRA accounts for cognitive-epistemic and social-instructional conceptual elements which more authentically represent science. This study sought to evaluate textbooks using this more recent NOS conceptualization to explore the potential range of NOS aspects. Using the proposed FRA categories, seven German biology textbooks were analyzed with qualitative content analysis. The combination of cognitive-epistemic and social-institutional systems of science revealed that the FRA was a suitable mechanism for analyzing textbooks' coverage of NOS. Notably, FRA's distinct attention to modeling (absent from the discipline-general NOS approach) revealed its presence in textbooks that would have gone unnoticed. Another finding was that the textbooks tended to emphasize the cognitive-epistemic systems over the social-institutional. Finally, this study found that even with a broader set of categories and subcategories to the FRA, the application to analyze was reliable.

3. Watkins, J., & Manz, E. (2022). Characterizing pedagogical decision points in sense-making conversations motivated by scientific uncertainty. *Science Education*, 106(6), 1408–1441. <https://doi.org/10.1002/sce.21747>

Abstract: Science education researchers have highlighted how uncertainty can foster meaningful scientific sense-making, supporting students to re-evaluate their

understandings of scientific phenomena and pursue deeper causal accounts. However, facilitating whole-class conversations motivated by uncertainty is complex and challenging, calling for further descriptions of the pedagogical work involved for teachers. In this study, we consider recurring pedagogical decision points as a way to get a handle on how teachers orchestrate classroom conversations and improvise to respond to students' reasoning. To examine these decision points, we analyzed five classroom episodes where classroom communities transformed a student's expression of uncertainty into an episode of collective, scientific sense-making. Across these episodes, we found that teachers needed to make decisions around (1) whether to make space for an uncertainty, (2) how to transform an uncertainty into a collective problem, (3) which elements to fix and which to leave open, (4) when and how to support the class to evaluate their accounts, (5) whether to make space for and/or mark new goals. Using detailed analyses of two episodes, along with short descriptions of the others, we illustrate how these decision points emerged, the different choices teachers made, and how these decisions shaped the trajectories of the classroom conversations.

4. Nguyen, U., Russo-Tait, T., Riegle-Crumb, C., & Doerr, K. (2022). Changing the gendered status quo in engineering? The encouraging and discouraging experiences of young women with engineering aspirations. *Science Education*, 106(6), 1442–1468. <https://doi.org/10.1002/sce.21748>

Abstract: Young women remain underrepresented among engineering bachelor's degree holders. While there is a relatively large body of extant research on the many factors that curtail young women's interest in pursuing engineering, less is known about high school girls who are on an engineering pathway. Therefore, this study focuses on a select group of precollege young women who express a strong interest in engineering. Specifically, informed by theories of gender as a social system and previous empirical research, this mixed-methods study explores the constellation of significant actors within the daily lives of these young women, to understand from whom and how they are supported in pursuing this gender-atypical field, and simultaneously, from whom and how they are discouraged. To do so, the researchers analyzed survey and interview data from a sample of diverse high school girls who participate in the Society of Women Engineers' (SWE) SWENext programme. Quantitative results indicate that young women report high levels of encouragement from most sources, including parents, teachers, and other young women. However, across various peer contexts, they receive much more support from other young women than from young men. Qualitative results further reveal that parents and teachers stand out in young women's recollections of encouragement, often through advocating their participation in engineering activities or providing mentoring support. In contrast, young men in engineering spaces were recalled as particularly discouraging of their engineering participation, by socially or physically excluding them or refusing to provide recognition. Implications for future research and practice are discussed.

5. Leden, L., Hansson, L., & Thulin, S. (2022). Characteristics of book talks about *Nature of Science*. *Science Education*, 106(6), 1469–1500. <https://doi.org/10.1002/sce.21749>

Abstract: This study explores book talks as an approach to teaching Nature of Science (NOS) to young children (4–6 years old). To teach about NOS means to, in one way or another, focus on the processes, humans that build science knowledge, as well as the characteristics and limits of scientific knowledge. Previous research in this area has studied the representation of NOS in science trade books and suggested ways for teachers to highlight this content, specifically in relation to books that have been rendered “exemplary” for teaching NOS. This study focuses on the actual conversations (i.e., book talks) between teachers and children related to science trade books that are available in bookstores. The aim of the study was to contribute further knowledge about the characteristics of book talks related to such books when they are used as an approach to teaching NOS. Book talks ($N = 58$) between two teachers and their respective groups of children were audio recorded and transcribed. The results contribute by shedding light on how teachers use the book as a resource in combination with other resources to highlight various aspects of NOS during book talks. This is important since it shows how book talks as an approach to NOS teaching can be staged even if exemplary books are not available. A tentative model that can scaffold teachers' didactic analysis is presented.

6. McAlister, A. M., Lilly, S. C., & Chiu, J. L. (2022). Exploring factors that impact physical science doctoral student role identities through a multiple case study approach. *Science Education*, 106(6), 1501–1534. <https://doi.org/10.1002/sce.21754>

Abstract: We explore how physical science doctoral students navigate their role identities throughout their graduate programme. Physical science doctoral students take on many academic roles in addition to the role of scientist, including researcher, educator, and student. When social expectations of roles become internalized, they become role identities. We examined doctoral students' academic role identities as a complex system to unpack factors that constrain the behavior and define the nature of doctoral students' academic role identities. This multiple case study used open-ended reflective questions and narrative-style interviews with eight physical science doctoral students to explore how physical science doctoral students navigate their role identities throughout their graduate programme and the factors that may influence these identities. Responses to the reflective questions and narrative interview transcripts were qualitatively coded and salient themes are drawn through cross-case analysis. Themes were compared across data sources to further validate the findings. Participants ascribed the most value to researcher and student identities and the least value to an educator identity. Time spent in a role, institutional recognition, advisor relationships, community in graduate school, and interest were factors that participants perceived to influence their role identities, along with the gender identity of women. Implications highlight the ways in which institutions may be able to support doctoral students in graduate school, including increased support for time management, equitable opportunities for authentic research experiences, equitable support in advisor relationships, and the importance of intentionally fostering community within science departments.

7. Eze, E., Nwagu, E. N., & Onuoha, J. C. (2022). Nigerian teachers' self-reported climate science literacy and expressed training needs on climate change concepts: Prospects of job-embedded situative professional development. *Science Education*, 106(6), 1535–1567. <https://doi.org/10.1002/sce.21743>

Abstract: The assessment of Nigerian teachers' climate science literacy and training needs on climate change concepts (i.e., causes, impacts, and solutions) are absent. This study relates teachers' climate science literacy and their expressed training needs in other climate change concepts and places teachers in groups. Following a descriptive survey design, 410 teachers were randomly sampled from 8338 public secondary school teachers in Enugu State, southeastern Nigeria. A researcher-developed instrument passing validity and reliability tests was used for this study. We implemented frequencies, mean, *t* test, ANOVA, *k*-means cluster analyses, and Pearson's correlation for the analyses of collected data and tested all hypotheses at a $p < 0.05$ level of significance. Teachers reported low to moderate climate science literacy and expressed high training needs on climate change concepts. Lower climate science literacy was related to higher expressed training needs. Four groups of teachers ensued from our cluster analyses. Sadly, teachers who possess little or less climate science literacy and expressed less or no training needs in climate change causes, impacts, and solutions constitute over half of the respondents of this study (53.90%). These are mostly science teachers. This situation, if unreversed, may lead to the transfer of misconceptions and inaccurate information on climate change to students. Our findings support the prospects of school–university partnerships, coaching, mentoring, study groups, and co-teaching for job-embedded situative approaches to teachers' professional development (PD) to replace an endless wait for inadequate and irregular training opportunities from the government. Questions about the climate science literacy of teacher educators also arise.

8. Pattison, S. A., Montañez, S. R., & Svarovsky, G. N. (2022). Family values, parent roles, and life challenges: Parent reflections on the factors shaping long-term interest development for young children and their families participating in an early childhood engineering program. *Science Education*, 106(6), 1568–1604. <https://doi.org/10.1002/sce.21763>

Abstract: Interest is a critical motivating factor shaping how children and youth engage with science, technology, engineering, and mathematics (STEM) inside and outside of school and to what extent they continue to be STEM learners throughout their lives. Emerging evidence over the last several decades indicates that the foundation of STEM-related interests develops in early childhood, even before children enter the formal education system. Although researchers have documented the emergence of these early interests and their implications for long-term learning outcomes, there is still much that is not understood about how and why these interests develop, including the role of parents and caregivers in supporting interest development at this age. To explore the processes of early STEM-related interest development, we recruited 18 low-income Spanish- and English-speaking parents who had completed an informal engineering education program for preschool-age children and their families 1–2 years previously. Participants engaged in an in-depth home-based interview about their program experience and the subsequent impacts on their children's and families' interests. Using a family systems perspective, we analyzed the ways these families described how their interests related to the program had evolved over the years and the factors that had shaped that process. Findings highlight the diversity of interests that emerge from this type of experience and the ways that family values, parent roles, and life challenges shape the unique interest development patterns of each family.

9. Massarani, L., Aguiar, B. A., De Araújo, J. G., Scalfi, G., Kauano, R. V., & Bizerra, A. F. (2022). Is there room for science at aquariums? An analysis of family conversations and interactions during visits to AquaRio, Rio de Janeiro, Brazil. *Science Education*, 106(6), 1605–1630. <https://doi.org/10.1002/sce.21764>

Abstract: In this study, we use a mixed methods approach to analyze the conversational content and interactions constituting five family groups' visits to the Marine Aquarium of Rio de Janeiro (AquaRio), the largest marine aquarium in South America, to understand how families interact with science and construct meaning regarding science and conservation. The audiovisual records of the family groups were analyzed using categories that investigate the types of interactions and conversations that may take place in scientific-cultural venues. The results suggest that, throughout the visits, family members were driven by their observation and contemplation of the animals on exhibit to interact with each other to share information about marine biodiversity and its conservation. The adults, children, and explainers all had fundamental roles in the construction of dialogues on scientific topics. The adults adopted behaviors that facilitated learning, made associations with previous experiences, read panels, and contextualized the information to their family's reality. The children were notable for their protagonism, asking questions, giving explanations, and sharing their previous knowledge, experiences and opinions about the animals and the conservation of marine biodiversity based on scientific reasoning. Therefore, this study provides evidence of the important role that AquaRio could play in providing opportunities for families to have conversations about biodiversity and conservation while raising awareness about the impacts of human activities on the oceans.

THE SOCIAL STUIDES

1. Clabough, J., & Sheffield, C. C. (2021b). Examining the Cold War in the 1980s with Comic Books. *The Social Studies*, 1–14. <https://doi.org/10.1080/00377996.2021.2011693>

Abstract: The role of literacy in social studies education has been greatly elevated over the last decade. The National Council for the Social Studies (NCSS) models through the indicators of its C3 Framework how to strengthen K-12 students' disciplinary thinking, literacy, and argumentation skills in the four core social studies disciplines: civics, history, geography, and economics. One resource that social studies teachers can use to address the indicators within the C3 Framework is comic books. Comic books employ both visual and textual modalities to convey meaning, through text boxes, people's facial expressions, and imagery to capture the author's arguments. The various modes of communication utilized in comic books allow students to construct meaning. In this article, we discuss how to use two comic books, *Batman: Ten Nights of the Beast*, and *Suicide Squad: Trial by Fire*, to teach about the Cold War in the 1980s. We start by giving a brief historical overview of the Cold War in the 1980s. Then, the focus of the article shifts to provide an examination of the potential benefits of utilizing comic books. This section also discusses how popular culture reflects the issues, values, and beliefs of an historical era. Two activities are given that scaffold how high school social studies teachers can employ these comic books to analyze important components of the Cold War in the 1980s. The steps and resources needed to implement our activities are provided.

Keywords: Comic books, cold war, C3 Framework, historical thinking

2. An, S. (2022). Re/Presentation of Asian Americans in 50 States' K–12 U.S. History Standards. *The Social Studies*, 113(4), 171–184. <https://doi.org/10.1080/00377996.2021.2023083>

Abstract: This study is a content analysis of K–12 U.S. history curriculum standards from 50 states regarding curricular re/presentation of Asian Americans. The guiding research questions are as follows: (1) What is the frequency of Asian American content covered in K–12 U.S. history standards from 50 states? (2) How do the standards depict Asian Americans in U.S. history? I analyzed U.S. history curriculum standards from all states using AsianCrit as a theoretical lens. The findings reveal that except for Japanese incarceration and anti-Asian immigration laws, Asian Americans are largely invisible in the state standards and, when included, they are primarily depicted as victims of nativist racism with a lack of civic agency as well as new immigrants with little contribution to nation-building. Being the first work to uncover curricular messages about Asian Americans across 50 states' standards, this study presents a necessary empirical basis for disrupting curriculum violence.

Keywords: Asian Americans, U.S. history, AsianCrit, social studies curriculum

3. Moore, J. E. (2022). Art is Social Studies: Teaching the Renaissance Using Raphael's School of Athens. *The Social Studies*, 1–10. <https://doi.org/10.1080/00377996.2022.2034729>

Abstract: One of the most effective methods for teaching social studies events, concepts, and issues incorporates the fine arts into lesson plans. The fine arts, such as photography, architecture, paintings, tapestries, and sculptures reflect the core cultural values, political ideals, and religious beliefs of a civilization and offer excellent opportunities for students to engage in multicultural education. The arts allow students to develop high level thinking skills, such as symbolic and abstract thought, analysis, synthesis, and evaluation. Creating lesson plans using the fine arts allows educators to assess the didactic and reflective, and affective domains thus fusing knowledge, thinking skills, and the centrality of emotions, values, beliefs, and moral issues into a cohesive lesson. Raphael's School of Athens is an excellent painting to teach the Renaissance, one of the most influential movements in history. This painting incorporates the crucial philosophical and scientific ideals and values that undergird the Renaissance as a transformative movement into modernity.

Keywords: Renaissance, School of Athens, thinking skills, affective domain

4. Bickford, J. H. (2022). Directing and Differentiating First-Graders' Historical Reading, Thinking, and Writing about Abraham Lincoln. *The Social Studies*, 1–22. <https://doi.org/10.1080/00377996.2022.2034730>

Abstract: First-grader students engaged in a guided historical inquiry about Abraham Lincoln. The teacher carefully intertwined historical content, close reading, critical thinking, and text-based writing during Reading, Writing, and Social Studies classes. Students scrutinized secondary sources, which were largely biographies of Lincoln, to build their historical schemas. The first-graders analyzed primary sources—which were intentionally selected to mitigate historical gaps within secondary sources—in order to establish historical significance and make intertextual connections. Students formulated emerging historical understandings through extemporaneous text-based writing, which were later used to draft, revise, and resubmit expository essays. Students' verbal contributions were far more nuanced than written communications, which their budding fine-motor writing skills limited. Children exhibited critical and historical thinking during whole-class classroom dialogue, small-group discussion, and individual interactions, such as when asked to clarify their writing. Students completed an age-appropriate adaptation of informed action. Teachers and research can gain rich, nuanced understandings from close examinations of students' reading, writing, and thinking.

Keywords: Abraham Lincoln, close reading, text-based writing, differentiation

5. Ender, T., & Varga, B. A. (2022). The Use of Music to Connect the past, Present, and Future. *The Social Studies*, 113(5), 217–222. <https://doi.org/10.1080/00377996.2022.2034731>

Abstract: Artists have long addressed social injustices within popular music. As teachers consider how to deconstruct and teach the events of 2020 (and beyond) with an eye toward the future, we offer a novel pedagogical approach to incorporating music into the social studies classroom: the set-list. The set-list can be understood as containing temporal conditions insofar that *all* traditional demarcations of time (e.g., past, present, and future) are implicated in its construction. Extending the concept of the set-list into education holds excellent potential for teachers and students seeking to

develop a more complex perspective about criticality and social in/justice. Our set-list example originates from years-long conversations around our experiences as former secondary social studies teachers, current teacher educators, fathers, spouses, and individuals living in the United States. Music encourages students to recognize how the past, present, and future are intertwined in learning history. While the official social studies curriculum does not include music as an approach to learning history in the social studies classroom, using a student-generated set-list starts transforming the world within the context of social justice.

Keywords: Curriculum, set-list, music, social studies, pedagogy

6. Pickup, A., & Southall, A. B. (2022). A Critical Discourse Analysis of the 1619 Project Controversy and Its Implications for Social Studies Educators. *The Social Studies*, 113(5), 223–236. <https://doi.org/10.1080/00377996.2022.2039892>

Abstract: The protests of 2020 cast a national spotlight once again on police brutality and ongoing racial injustice in America. Within this context, many activists and even mainstream commentators have given more attention to a critical analysis of how American history has been taught, especially regarding race relations. The publication of the *1619 Project* has touched off a wave of controversy regarding some of its historical claims and its larger interpretation of American history. In this paper, we analyze some of the discourses that have emerged from the post-publication controversy over the *1619 Project* and then discuss applications of our inquiry for the preservice teacher classroom. The paper will provide an overview of the background of the topic, important theoretical frameworks, methods, and sources.

Keywords: 1619 Project, social studies methods, preservice teachers

7. Gazioglu, M., Hines-Farmer, S. M., Vega, H., & Savitz, R. S. (2022). How a First-Year Geography Teacher Adapts Instruction to Respond to Her Students. *The Social Studies*, 113(5), 237–248. <https://doi.org/10.1080/00377996.2022.2046995>

Abstract: Adaptive teaching is a pedagogical approach which encourages teachers to adapt their teaching practices to deliver custom learning experiences by addressing students' individual needs and differences. This article describes how one beginner geography teacher adapted instructional practices to meet her students' learning needs. First, we provide a brief background of adaptive teaching and its benefits. Using interview data, we then share specific examples of the teacher's adaptive teaching as well as the challenges she encountered in endeavors to support her students' learning as she purposefully adapted her teaching practices, materials, and instruction.

Keywords: Adaptive teaching, beginner teacher, instructional practices, geography teacher, student engagement

8. An, S. (2022b). Critical Juxtaposing of War and Migration: A Content Analysis of Southeast Asian Refugee Children's Literature. *The Social Studies*, 113(5), 249–263. <https://doi.org/10.1080/00377996.2022.2046996>

Abstract: Using critical refugee studies as a theoretical lens, I analyzed Southeast Asian refugee children’s literature to identify its pedagogical values and limitations for critical teaching about the Vietnam War. The findings suggest the children’s literature can help challenge the dominant narratives of the Vietnam War as exclusively an American tragedy and of the Southeast Asian refugees as simply helpless victims by centering Southeast Asian experiences of the war. Yet the children’s literature largely remained silent about the refugees’ complex personhood and the U.S. role as a violent aggressor generating the refugee crisis in the first place. The implications for teaching practice are suggested.

Keywords: Critical refugee studies, children’s literature, Southeast Asian refugees

9. Kuhn, D., & Halpern, M. (2022). How Might Argumentation Research Inform Discourse-Based Social Studies Education? *The Social Studies*, 113(5), 264–270. <https://doi.org/10.1080/00377996.2022.2053832>

Abstract: Social studies educators who applaud discourse-based approaches may benefit by adding research on argumentation to their conceptual toolkit. We make the case here for its value, in particular emphasizing that argumentation skill needs to develop, suggesting an apprenticeship model of this development and highlighting evidence supporting it.

Keywords: Argumentation, discourse, reasoning, development

10. Callahan, C. (2022). Adding International Elements to a Social Studies Teacher Education Program. *The Social Studies*, 113(6), 271–282. <https://doi.org/10.1080/00377996.2022.2053831>

Abstract: Here the author shares his attempt to add, without financial cost, substantive and dynamic international experiences to the secondary social studies teacher education program he facilitates. He provides thick descriptions of (1) the overarching goals of a collaborative, online, international learning project, (2) the curriculum materials he helped design and the classroom experiences he orchestrated, and (3) the project’s international context. Moreover, this paper advocates for internationalization by describing a 5-week, inquiry-based project that featured university students in Japan and the US using an online video discussion platform to asynchronously introduce themselves to international peers, share their understanding of powerful social studies instruction, explore similarities in social studies education between the two nations, refine their understanding of international education, and share ideas for a wise-practice classroom activity that could be taught to secondary students in both nations. Because this article shares the project’s rationale, schedule, assignments, and assessment rubrics, it may prove helpful for teachers and teacher educators as they envision ways to further prepare students to think and act globally.

Keywords: International education, global education, social studies, teacher education

11. Walker, A., & Kettler, T. (2022). Teaching as Complex Intellectual Work: A Phenomenological Study of Social Studies Pedagogy. *The Social Studies*, 113(6), 283–299. <https://doi.org/10.1080/00377996.2022.2054923>

Abstract: High quality teaching involves deep content knowledge, understanding students and their learning processes, and complex skills of teaching and assessment. Students who experience high quality teaching tend to achieve higher annual growth rates. This study used a descriptive, qualitative research model to explore excellence in social studies teaching. Purposive sample was used to select district coordinators ($n=4$) and their highest quality social studies teachers ($n=9$). The process of phenomenological decontextualizing and recontextualizing produced five structural themes. Excellent social studies teachers have intellectual identities that focus on having deep content knowledge and a commitment to learning. They use their deep content knowledge to help students find relevancy. They view themselves as curriculum designers who find and curate their own resources. They facilitate student-centered learning experiences that engage students, encourage inquiry, and allow for student dialogue. Lastly, excellent social studies teachers design learning experiences to get students to think critically about different perspectives, synthesize multiple sources or viewpoints, and consider the lesser told stories of history. These contextualized, phenomenological structures reflect the teaching demands of common frameworks of social studies pedagogy including ambitious teaching approaches, authentic intellectual work, and the college, career, and civic life (C3) framework.

Keywords: Social studies, teaching, ambitious teaching, authentic intellectual work, C3 framework, phenomenology

12. Çopur, A., & Demirel, M. (2022). The Impact of Professional Learning Communities on Social Studies Teachers' Professional Development and Student Academic Achievement. *The Social Studies*, 113(6), 300–318. <https://doi.org/10.1080/00377996.2022.2058905>

Abstract: The main goal in this study was to explore the impact of a professional learning community (PLC) on social studies (SS) teachers' professional development (PD) and student academic achievement. With this in mind, the study was carried out using a design-based research approach with an overarching ADDIE design model. The participants of the study consisted of six SS teachers from two middle schools and 113 students. Data were collected using scales, observations, and semi-structured interviews and analyzed through qualitative techniques on teacher data as well as t -tests on student data. Findings suggest that the PLC designed in a reflective thinking cycle has had a positive impact on teacher PD and enhanced student achievement in SS. The conclusion is that there is a positive relationship between teacher participation in the PLC and student achievement. Therefore, it is recommended that the PLC be made widely available in PD of SS teachers, and PD programs be planned as long-term hands-on training activities, while also taking into account the specific needs of the field.

Keywords: Professional development, professional learning community, teacher competency, social studies, reflective thinking

13. Levine, T. H. (2022). Consensus Circle Presidential Rating: Shifting Traditional Social Studies Instruction While Preparing Students for Democracy. *The Social Studies*, 113(6), 319–329. <https://doi.org/10.1080/00377996.2022.2062273>

Abstract: Political history lends itself to traditional patterns of teaching and learning in social studies such as students memorizing facts presented in lectures or textbooks. This article presents a recurring activity structure for teaching U.S. political history—Consensus Circle Presidential Rating (CCPR)—which requires students to read across different sources, form and defend a judgment of a presidency’s impact, and engage in persuasion and consensus-seeking with peers. I juxtapose CCPR with traditional patterns of teaching and learning to suggest how CCPR can shift teachers’ and students’ roles during social studies instruction to promote critical thinking, perspective taking, and civil discussion and disagreement. Teaching political history in general—and this activity in particular—could reinforce the marginalization of women and people of color; conversely, CCPR could compliment history teaching that foregrounds the experience of diverse Americans while conveying the important roles government and social movements play in shaping American society. The article provides a student-friendly assignment sheet, a graphic organizer for note-taking, and examples of sources to help teachers consider how they might adapt this activity to their own context.

Keywords: Social studies, inquiry pedagogy, citizenship education, political history

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