From Knowledge to Understanding: Significance of Conceptual Teaching and Learning

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Abstract

This article evaluates the scope and viability of Concept-based Teaching and Learning (CBTL), a cutting-edge teaching practice. As a reference, the older teaching models of rote learning and content-based learning (which are focused on learning by heart) are contrasted with Concept-based Teaching, which focuses on the meaning of concepts, their transfer, and the use of thinking skills. Conceptually taught students can transfer their learning and understanding to new, complex situations across different disciplines by identifying key concepts rather than memorising unrelated facts. Using both international literature and classroom examples, the article focuses on CBTL-specific teaching practices, including, but not limited to, the inquiry method, teaching across multiple disciplines, differentiated learning, and deep and surface learning and assessment. It also focuses on the difficulties faced by most teachers, including insufficient and poorly designed teacher-training programs, a lack of active policies, leadership, and teachers' professional development, and the negative effects of standardised testing on teaching and learning. Simultaneously, the article analyses the global perspectives of the International Baccalaureate and the OECD's Education 2030, which emphasise learning to learn, lifelong learning, and learning how to learn. It explores the different contextual factors that CBTL embraces.

Keywords: *Concept-Based Teaching and Learning, Critical Thinking; Transferable Learning, Inquiry-Based Teaching, Primary Education*

1. Introduction

Education has many interpretations based on historical and cultural contexts. In the last couple of centuries, especially after the Industrial Revolution, formal schooling and mass education systems were popularised globally. Education was framed primarily as a means of transmitting essential knowledge, skills and moral values needed for societal or economic advancement (Dewey,

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1938; Illich, 1971; Freire, 1972). In postcolonial developing countries, education became associated with schooling for national economic development, resulting in a pedagogical emphasis on rote learning and knowledge retention rather than on application and understanding (Altbach, 1971; Carnoy, 1974).

Globalisation, new technologies, and the rapid spread of information increasingly shape education's purposes and practices. Education practices must now move beyond rote learning towards understanding, problem-solving, and critical assessment of complex issues (Hattie, 2012; Trilling & Fadel, 2009; McKinsey, 2012). The current focus of education is on developing flexibility, creativity, and the capacity to innovate, which are needed as 21st-century skills. (OECD, 2018; Darling-Hammond, 2020; OECD, 2024; OECD, 2025). According to Erickson et al. (2017), integrating theory and practice, and adopting Concept-based Teaching and Learning (CBTL), innovates interdisciplinary inquiry and meaningful learning. Built on constructivist and sociocultural theories, such as Vygotsky's (1978) concept-based teaching and learning, promotes collaborative, integrative, and applied problem-solving and critical thinking (Bransford et al., 2000; Fullan, 2007; Darling-Hammond et al., 2017). This type of learning encourages complex problem-solving and the application of knowledge and skills in diverse, real-world situations. This article addresses the theory of CBTL, its interdisciplinary applications, and the necessary educational changes for its successful global implementation across modern education systems.

This article examines the significance of Concept-Based Teaching and Learning (CBTL) in restructuring education. CBTL shifts the focus of education away from memorising disconnected facts and teaches students to think critically, conduct inquiry and exercises, and learn concepts that can be applied to other subjects, lessons, and experiences. Rather than the results of a primary empirical study, this article draws on theoretical, pedagogical, and policy studies to describe how CBTL works and how it can be utilised across disciplines and within the structures of different education systems to achieve significant learning.

1.1 Objectives of the Study

The review aims to achieve the following objectives to;

1. analyse the foundational theories and major concepts of CBTL.
2. identify the differences between CBTL and rote learning, as well as CBTL and content transmission-based learning.
3. identify the significant concepts of CBTL, such as inquiry and interdisciplinary learning, critical thinking, metacognition, and the transfer of understanding.

4. Determine the factors, such as teaching, leadership, learning, and policies, that support the CBTL.
5. Identify the major barriers, especially in the systems characterised by the dominance of standardised testing and rigid curricula, as well as the lack of teacher training that CBTL may face.

1.2 Research Questions

This review focuses on the following research questions:

1. What are some pivotal theories and methods behind Concept-Based Teaching and Learning? What distinguishes it from traditional methods of memorisation and teaching by content?
2. What does Concept-Based Teaching and Learning promote? What must be present for it to be effective?

2. Literature Review

According to Erickson et al. (2017), CBTL defines meaningful education as one in which learners appreciate and internalise enduring concepts rather than mere facts. In contrast to traditional methods of knowledge transfer, CBTL identifies patterns, connections, and principles that transcend individual disciplines. It deals with knowledge actively generated by the learner through involvement and reflection, rather than knowledge passively received (Piaget, 1973; Vygotsky, 1978). CBTL emphasises the learning environment, the teaching process and its scaffolding, and the teacher's role in learners' conceptualisation (Vygotsky, 1978).

Likewise, Bruner (1960) suggested that a learner's understanding of a concept can and should be revisited to construct and reinforce foundational knowledge, a principle reflected in the spiral curriculum, which holds that concepts should be revisited and deepened over time. These theoretical foundations underscore inquiry driven by learners themselves and thoughtful engagement, in which learners articulate their own questions, frame the context through multiple lenses, and engage with a myriad of concepts abstracted from real situations (Bruner, 1960; Bransford et al., 2000).

In applied contexts, the CBTL framework revolves around pivotal questioning techniques, conceptual generalisations, and interdisciplinary links. These aspects of the framework require students to "go beyond the facts" and engage in higher-level cognitive activities such as analysis, synthesis, and evaluation (Anderson & Krathwohl, 2001). Situated learning allows CBTL to treat students as active knowledge builders and, as a result, they are primed to demonstrate the transference of understanding across different subjects and wider contexts (Wiggins & McTighe, 2005; Hattie, 2012).

Lessons that adopt the CBTL approach focus learning on interdisciplinary "big ideas" and essential questions that cross subject boundaries (Wiggins & McTighe, 2005). The teacher guides students' understanding of inquiry through concept maps, thematic units, and other real-world problems that synthesise knowledge (Marzano, 2003; Lanning & French, 2020). Students look for and identify patterns, construct conceptual relationships, and engage in and reflect on critical thinking. These processes allow students to build awareness of interconnected concepts across various subjects. Activities such as questioning, discussing, concept mapping, collaborative inquiry, and problem-solving facilitate learners' realisation that knowledge is not isolated facts but rather interconnected, transferable, universally applicable concepts. (Tweedie et al., 2025). This awareness cultivates students' ability to analyse information, defend their reasoning, and draw educated connections from their existing knowledge to novel information. Studies show that these self-reflective exercises deepen understanding but also strengthen the ability to use learning strategies, also known as metacognitive skills (Schraw et al., 2006). Instructional strategies, including case studies and project-based learning, have been shown to foster conceptual transfer and critical thinking (Thomas, 2000; Bell, 2010).

Within CBTL classrooms, assessment practices also undergo a shift from measuring the ability to recall facts to evaluating and grading levels of understanding. Performance-based assessments, portfolios, and reflective journals foster the ability to create innovative solutions, apply conceptual understanding, and solve problems by allowing students to showcase what they have mastered. (Darling-Hammond & Adamson, 2014). These methods disengage and foster deeper-level thinking, cognitive flexibility, and learner autonomy (Bransford et al., 2000; Hattie, 2012). The most important point is that these pedagogical changes have redefined the teacher's role as a co-inquirer rather than a source of information. Teachers establish an environment that fosters curiosity and dialogue, and assists learners in co-constructing meaning and acquiring the essential cognitive skills for continuous growth (Fullan, 2007; OECD, 2018).

In professional practice, implementing Concept-based Teaching and Learning (CBTL) is often seen as a significant challenge. Teachers with limited instructional time tend to revert to more traditional pedagogical approaches that emphasise direct instruction and content delivery—what Avalos (2011) and Opfer and Pedder (2011) describe as teacher-centred or transmission-oriented models of teaching. Using this model, the teacher becomes the "sage on the stage." The teacher becomes the primary source of information, while the students receive it. This model of teaching relies on extremely didactic approaches. This results in

limited conceptual exploration, questioning, and learning agency not only among teachers but also among students.

Many developing nations in Africa and South Asia have underdeveloped education systems. Many of these teacher training and education systems lack a sufficient focus on providing metacognitive skills and on using interdisciplinary, inquiry-based pedagogy (Moon, 2013). Also, due to external factors such as insufficient infrastructure, overcrowded classrooms, and a rigid, inflexible curriculum, teachers are unable to sustain innovative instructional methods. (Schweisfurth, 2011).

3. Research Methodology

3.1 Research Design

This article utilised qualitative narratives and a conceptual literature review. This methodology was suitable, given that this article aimed to consolidate the theoretical, pedagogical, empirical, and policy literature, with no intention of collecting primary empirical data. Other studies have focused on the conceptual underpinnings of CBTL. This review distinguished CBTL from rote and content-transmission models. The review also outlined the pedagogical and systemic conditions that enable CBTL.

The review was also guided by the two research questions described earlier. The research questions were used to construct an analytical framework for identifying, selecting, and categorising the literature. The first question addressed the theories and pedagogical frameworks of CBTL and how it differs from rote and content-transmission models of teaching. The second question addressed the teaching conditions and supports necessary to facilitate the transfer of learning, critical thinking, and interdisciplinary learning within the CBTL framework.

3.2 Data Sources

To find relevant literature, academic databases and scholarly literature were searched, including Google Scholar, ERIC, JSTOR, and Scopus. Literature was sourced from educational journals and from policy and framework documents of international educational organisations, including the OECD and the International Baccalaureate. The following terms were searched: “concept-based teaching and learning, concept-based curriculum, conceptual understanding, inquiry-based learning, interdisciplinary learning, critical thinking, transfer of learning, teacher professional development, assessment for understanding, and 21st-century skills.”

This review targeted theoretical works, peer-reviewed journal articles, books, empirical studies, and international policy documents pertinent to CBTL, inquiry-based pedagogy, conceptual learning, assessment, teacher development,

and educational reform. Earlier, foundational, and theoretical literature was included when it offered critical conceptual framing on topics such as constructivism, sociocultural learning, and curriculum theory. Contemporary, empirical, and policy literature was added to discuss the understanding and positioning of CBTL within current classroom and systemic frameworks.

3.3 Inclusion Criteria

The process for selecting literature involved three steps. Step one involved reviewing titles and abstracts to find literature relevant to CBTL, conceptual understanding, inquiry-based teaching, curriculum reform, and other topics. Full texts of studies that met step one was reviewed in step two to assess their relevance to the article's conceptual focus. The last step involved organising literature based on major themes that emerged from the research questions and from the texts during the review process.

The review assessed foundational theories that conceptualised CBTL and aligned closely with critical theories of constructivist learning, sociocultural theory, curriculum theory, and learning transfer. Contemporary empirical studies, reviews, and policy literature were also considered if they addressed classroom practices, teacher learning, assessment, and systemic educational changes.

Literature was considered if it defined the theory and/or the elements of concept-based teaching and learning; compared concept-based learning with rote and content-based learning; described inquiry, interdisciplinary learning, critical thinking, metacognition, and transfer of learning; addressed assessment that promotes understanding; and/or discussed teacher and curriculum reform, and the leadership and policy requirements for pedagogical reform.

Literature that addressed only teaching strategies was excluded if it showed no evident linkage to conceptual understanding, inquiry, interdisciplinary learning, or transferable learning. Likewise, literature that did not directly address the research questions or construct the CBTL framework as a pedagogical and systemic shift was also excluded.

3.4 Data Analysis

Thematic synthesis was the method used to analyse the reviewed literature. The analysis was based on a repetitive process of reading, coding, and grouping, followed by interpretation. Initially, the literature was examined to present arguments and evidence regarding CBTL, as well as recurring ideas, constructs, and frameworks related to them. Some of the constructs used to generate the preliminary codes were research-based conceptual understanding, inquiry-based learning, interdisciplinary learning, transfer of learning, teacher capacity, different types of assessments, leadership, policy alignment, and barriers to implementation.

Both inductive and deductive coding were used. While some of the research questions and the main ideas of the articles oriented the analysis in a deductive manner, coding was inductive, and was done on the basis of the literature as many times as necessary. For example, the themes "teacher professional development" and "assessment for understanding" were expected, but even more so, the literature highlighted concerns such as curriculum inelasticity, high-stakes testing, limited time for teaching, and instructional leadership.

The grouping of the ideas was followed by identifying major themes which included the (a) the theoretical basis for CBTL, (b) pedagogies which facilitate and value deeper understanding, (c) interdisciplinary learning and transfer of learning, (d) professional development and preparation of teachers, (e) leadership and culture within the school community, (f) policy and curriculum and their alignment, and (g) implementation challenges. By mapping the themes to the different research questions, it was ensured that the themes advanced the article's core argument.

Thematic analysis supports the development of patterns in the literature across theory, evidence, and policy, going beyond a descriptive summary. It showed that CBTL needs to be understood as a pedagogical and systemic shift beyond the classroom. This perspective offered useful insights for the discussion and recommendations, particularly in linking classroom practice to teaching, assessment, and curriculum practices, as well as to school leadership and policy frameworks.

4. Discussion and Conclusion

Rigid systems limit new ideas and innovations, and are just as important to address as the issues in education. A content-based system of schooling discourages boundary-crossing, sustained inquiry, and in-depth examination of ideas, particularly when innovation is not adequately rewarded (Fullan, 2007; Sahlberg, 2011). In many contexts, teachers have limited control over curriculum development and little time for planning, reflection, and peer learning, all of which are considered crucial for learning in CBTL (Darling-Hammond et al., 2017). In contrast, targeted professional development focused on capacity building in unit planning, inquiry-based learning, and assessment for learning increases the likelihood of successful CBTL implementation (Avalos, 2011; Darling-Hammond et al., 2017). Sustained, practice-based professional learning is more effective, especially when teachers are organised into communities of practice (Timperley et al., 2007; De Vries et al., 2024). Positive school cultures and strong instructional leadership are equally important, as they create the conditions for teachers to take

risks, work together, and engage in collegial collaboration without fear of being penalised (Leithwood et al., 2020).

The International Baccalaureate (IB), the Cambridge Curriculum, and Competency-Based Education (CBE) are examples of global initiatives that have begun to successfully integrate models of interdisciplinary teaching, critical thinking, and conceptual transfer (Lanning & French, 2020; OECD, 2018). These programs exemplify an interaction among curriculum, pedagogy, and assessment that is complementary to and illustrative of the core concepts of Concept-Based Teaching and Learning (CBTL). The adoption of CBTL practices is enhanced through peer collaboration and increased planning and reflection time, given the practices' sustainability and overall effect (Hargreaves & Fullan, 2012). Under such conditions, the system can become robust enough to support teachers and students in advancing a culture of inquiry, innovation, and collective responsibility for deeper learning.

As Concept-Based Teaching and Learning (CBTL) continues to gain traction internationally (Fogarty & Pete, 2017), the success of its implementation depends on multiple aspects of the education sector. All educators involved in CBTL must know the content and understand how to teach for application, manage inquiry, and support understanding of concepts (Hattie, 2012; Erickson et al., 2017). Teacher education programs should pivot towards the CBTL approach and focus attention on inquiry-based teaching, developmental evaluation, and student-driven learning (Darling-Hammond et al., 2017). Teachers need support from professional learning communities and mentors. Additionally, they should have access to examples of best practices and performance assessments to shift from traditional teaching to build confidence and competency in active learning (Darling-Hammond et al., 2020; Opfer & Pedder, 2011).

Teachers also need opportunities to engage in collaborative curriculum design, interdisciplinary planning, and reflective practice (Avalos, 2011). Studies reveal that educators who belong to aligned professional communities that support trial-and-error learning and collaborative teaching are more willing to initiate and sustain change in their teaching practices (Hargreaves & Fullan, 2012; Timperley et al., 2007). This demonstrates the necessity of organisational management that enables each teacher to take risks, reflect on their strategies, and refine their teaching methods.

Incorporating a framework of conceptual understanding into every layer of the curriculum and regional accreditation standards, as well as formulating the educator preparation and policy guidelines, will depend on the involvement of the government decision-makers. They must continue to develop CBTL-friendly

policies and support the development of national and regional curricula that allow teachers the freedom to organise content around enduring understandings, essential questions, and conceptual generalisations, rather than fixating on a predetermined order of content. Assessment systems must achieve a proper balance between assessing pupils' knowledge and evaluating their understanding of concepts, ingenuity, and problem-solving abilities. These recommendations, and indeed any sensible recommendations, require systemic policy reform. Without such reform, teachers will continue to practise the 'teach to test' model.

Moreover, educational systems can best support CBTL by encouraging innovation in teaching methods and by providing leadership training that fosters a culture of profound learning (OECD, 2018; Leithwood et al., 2020). Governments ought to focus on empowering school leaders, who provide a framing vision, mobilise resources, and sustain cultures of inquiry, all of which are critical to maintaining an environment conducive to conceptual learning (Harris & Jones, 2018). Models for integrating curriculum, assessment, and teacher development to achieve deep learning outcomes are also available in global frameworks, including the OECD's Education 2030 initiative and the International Baccalaureate (OECD, 2018). It is self-evident that coherent integration of CBTL is developed strategically through systemic unity, streamlined integration of classroom practices, teacher professional development, and policy frameworks to support meaningful, retention-based learning.

Concept-based Teaching and Learning (CBTL) is an innovative model that centres on understanding concepts rather than memorising information. The strength of CBTL is its ability to ensure that learners are actively engaged with the material conceptually and to enable them to transfer their learning and make connections (Erickson et al., 2017). CBTL assists learners in developing higher-order thinking abilities that are critical to the knowledge economy of the 21st century viz., analyse, synthesise, and apply knowledge to unfamiliar situations (Trilling & Fadel, 2009; OECD, 2018).

Despite persistent systemic barriers, such as high-stakes testing, inflexible curricula, and inadequate teacher preparation (Au, 2007; Avalos, 2011), there is growing global interest in teaching and learning systems that emphasise deep learning and transferable skills. The European Union's Education 2030 and the International Baccalaureate are examples of CBTL models that can be adapted to many pedagogical contexts and demonstrate their value (OECD, 2018; Sahlberg, 2011).

For CBTL to be adopted, extensive collaboration will be required among the staff of an educational institution, as well as the leadership and management.

There needs to be a strong commitment to the design and delivery of professional development programmes for staff, and alignment of systems, such as curriculum, policies, and training, with the teaching standards and conceptual understanding (Darling-Hammond et al., 2020; Fullan, 2007). CBTL will produce significant improvements in learning that also positively impact learners' ability to think critically and flexibly throughout their lives (Hattie, 2012; Bransford et al., 2000).

Concept-Based Teaching and Learning is not merely an innovative method of teaching. It is an explanation of how the purpose of an education system has transformed. This research advanced the understanding of Concept-Based Teaching and Learning and located it within the constructionist and sociocultural paradigms of learning. These paradigms encourage learners to engage in goal-setting and meaning-making by connecting concepts beyond the confines of isolated lessons and subjects.

The constructionist and sociocultural paradigms of learning place Concept-Based Teaching and Learning within teaching and learning systems that foster thinking, problem-solving, and adaptability to the complex realities of the world. These are systems for which traditional methods of teaching, such as memorisation and rote learning, are inadequate.

The successful use of CBTL cannot be achieved with only one classroom at a time. It would require the preparation of supportive teachers, further continuing training sessions, strong instructional leadership, flexible curricula, and testing and assessment systems that focus on understanding rather than rote memorisation. In the absence of these conditions, teachers would likely continue to use transmission-based methods, especially in systems characterised by high-stakes testing, inflexible curriculum orders, and little time for planning. For this reason alone, it would take the entire system to implement such methods of Policy, Curriculum Ordering, Teacher Training, Classroom Practices, and Evaluation.

The broader perspective of this review shows that CBTL is a valuable direction for modernising education in the 21st century. Educational reformers and policymakers focus on students' ability to adapt to the unpredictable, rapid changes in the world. Those frameworks are important for cultivating learners reflect and think creatively and flexibly, and who can position themselves to apply knowledge across diverse frameworks. CBTL is a valuable framework for education reform because learning cannot be limited to the mere acquisition of knowledge. Instead, it can become a process of developing understanding, making meaning, and growing intellectually throughout the learner's entire life.

This review seeks to address existing debates in education. Moving away from merely transmitting knowledge, it focuses on understanding, adaptability,

and a lifelong commitment to learning. A review of the CBTL and related literature on pedagogy, teaching interdisciplinary assessment, and the professional development of educators' places conceptual CBTL teaching tools and frameworks within the context of global education reform. CBTL focuses on integrating teaching methods and approaches in educational systems where teaching is primarily driven by examinations, content delivery, and methods that limit deep exploration of concepts. This review focuses on providing teachers and learners with the theoretical and conceptual tools to improve their ability to adapt and innovate while emphasising the importance of addressing teaching methods that promote critical thinking and problem-solving.

References

Altbach, P. G. (1971). Education and Neocolonialism. *Comparative Education Review*, *15*(2), 237–239.

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

Au, W. (2007). High-stakes testing and curricular control: A qualitative metasynthesis. *Educational Researcher, 36*(5), 258–267. https://doi.org/10.3102/0013189X07306523

Avalos, B. (2011). Teacher professional development in teaching and teacher education for over ten years. *Teaching and Teacher Education, 27*(1), 10–20. https://doi.org/10.1016/j.tate.2010.08.007

Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83*(2), 39–43. https://doi.org/10.1080/00098650903505415

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (2000). *How people learn: Brain, mind, experience, and school* (Expanded ed.). National Academy Press.

Bruner, J. S. (1960). *The Process of Education*. Harvard University Press.

Carnoy, M. (1974). Education as cultural imperialism. David McKay.

Darling-Hammond, L., & Adamson, F. (2014). *Beyond the bubble test: How performance assessments support 21st century learning*. Jossey-Bass.

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science, 24*(2), 97–140. https://doi.org/10.1080/10888691.2018.1537791

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute.

De Vries, J. A., Visscher, A. J., & Schildkamp, K. (2024). A learning theory-based exploratory analysis of teacher professional development interventions for formative assessment. *Review of Education, 12*, e70009. https://doi.org/10.1002/rev3.70009

Dewey, J. (1938). *Experience and education*. Kappa Delta Pi.

Erickson, H. L., Lanning, L. A., & French, R. (2017). *Concept-based curriculum and instruction for the thinking classroom* (2nd ed.). Corwin Press.

Freire, P. (1972). *Pedagogy of the oppressed* (M. B. Ramos, Trans.). Penguin Books

Fogarty, R., & Pete, B. M. (2017). *The everyday classroom: Integrating the best of concept-based instruction*. Corwin Press.

Fullan, M. (2007). *The new meaning of educational change* (4th ed.). Teachers College Press.

Hargreaves, A., & Fullan, M. (2012). *Professional capital: Transforming teaching in every school*. Teachers College Press.

Harris, A., & Jones, M. (2018). Why leadership matters: Perspectives from international research. *School Leadership & Management, 38*(1), 1–4. https://doi.org/10.1080/13632434.2017.1411907

Hattie, J. (2012). *Visible learning for teachers: Maximising Impact on Learning*. Routledge.

Lanning, L. A., & French, R. (2020). *Concept-based curriculum and instruction for the thinking classroom: Teaching beyond the facts*. Corwin Press.

Leithwood, K., Harris, A., & Hopkins, D. (2020). Seven strong claims about successful school leadership revisited. *School Leadership & Management, 40*(1), 5–22. https://doi.org/10.1080/13632434.2019.1596077

Lingard, B. (2011). Policy as numbers: Ac/counting for educational research. *The Australian Educational Researcher, 38*(4), 355–382. https://doi.org/10.1007/s13384-011-0041-9

Marzano, R. J. (2003). *What works in schools: Translating Research into Action*. ASCD.

McKinsey & Company. (2012). *Education to employment: Designing a system that works*. McKinsey & Company.

Moon, B. (2013). The global dimension in teacher education: The contribution of international programmes. *European Journal of Education, 48*(1), 48–65. https://doi.org/10.1111/ejed.12004

OECD. (2018). *The future of education and skills: Education 2030*. OECD Publishing.

OECD. (2024). *PISA 2022 results (Volume III): Creative minds, creative schools*. OECD Publishing. https://doi.org/10.1787/765ee8c2-en

OECD. (2025). *Creative minds in action: Students' imagination and ideas in storytelling, design and problem-solving tasks on the PISA test*. OECD Publishing.

Opfer, V. D., & Pedder, D. (2011). Conceptualising teacher professional learning. *Review of Educational Research, 81*(3), 376–407. https://doi.org/10.3102/0034654311413609

Piaget, J. (1973). *To understand is to invent: The future of education*. Grossman Publishers.

Sahlberg, P. (2011). *Finnish lessons: What can the world learn from educational change in Finland?* Teachers College Press.

Schraw, G., Crippen, K. J., & Hartley, K. (2006). Promoting self-regulation in science education: Metacognition as part of a broader perspective on learning. *Research in Science Education, 36*(1–2), 111–139. https://doi.org/10.1007/s11165-005-3917-8

Schweisfurth, M. (2011). Learner-centred education in developing country contexts: From solution to problem? *International Journal of Educational Development*, *31*(5), 425–432. https://doi.org/10.1016/j.ijedudev.2011.03.005

Thomas, J. W. (2000). *A review of research on project-based learning*. Autodesk Foundation.

Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development: Best evidence synthesis iteration (BES)*— Ministry of Education, New Zealand.

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. Jossey-Bass.

Tweedie, J., Pelly, F., Wright, H., & Palermo, C. (2025). Exploring the adoption of concept-based curricula: Insights from educators and implications for change. *Advances in Health Sciences Education*, *30*, 223–237. https://doi.org/10.1007/s10459-024-10346-y

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wiggins, G., & McTighe, J. (2005). *Understanding by design* (2nd ed.). ASCD.

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