You Cannot Find the Calm Without the Storm: Creating Spaces for Embracing Change

Sakina Rizvi and Aleesha Noreen

Abstract

Educators need to provide students with opportunities for experiential learning, inquiry-based exploration, and collaborative discussion. Students bring an amalgam of diverse ideas to the classroom; knowledge-building principles provide a framework for inclusive learning experiences that strengthen engagement, content retention, and positive well-being. In this article, we explore how educators can use knowledge building and holistic pedagogy to create scintillating learning spaces. Such environments help students develop a deep sense of personal and social accountability. To illustrate our reflections, we accompany our conclusions with vivid collage art that captures the beauty of complex human experiences.

Introduction

As I (Aleesha) stared at the assignment on my computer screen, I knew my student had plagiarized. I felt no anger or frustration; I recognized that their choice to use an AI software was a product of their perceived inability to complete the task. This student was talented and intelligent but feared the possibility of receiving a low mark. When I shared the experience with Sakina, she mentioned that she had seen a rise in such incidents in her classroom as well. When we reflected on why these students misrepresented their work, we recognized that such choices were a result of complex lived experiences. There are no "bad" children; students are products of the conditions they are socialized in. When a child makes a mistake, it is important for teachers to ensure that the mistake does not define the child's identity. Labels like "bad" or "difficult" overshadow opportunities for improvement. These labels imply that students' choices are a result of their identity, and the education system needs to take no accountability for them. As teachers, we should reconceptualize the cultures, norms, and practices that lead our students to such decisions.

Teaching is learning; it is an endeavor that demands continuous reflection and growth. Our efforts as researchers have emerged from our learning and teaching experiences. Children possess a natural passion, excitement, and eagerness toward learning new concepts. Seeing a child have a "light-bulb moment" is one of the most fulfilling experiences for a teacher to witness. We became teachers because of the transformative power of these interactions. We propose the integration of holistic pedagogy and knowledge building to create classrooms that are conscious of students' lived experiences, relationships, and self-perceptions. Holistic pedagogy and knowledge building tap into the inherent goodness present within every child as they create spaces that inculcate students with a self-driven desire for learning. When students have an intrinsic motivation for their education, they develop a deeper sense of personal and social accountability.

With the rise of AI software and technological advancements, it is becoming increasingly difficult for students to find purpose and meaning in producing authentic work. Our classrooms should produce conscientious individuals who are confident in their unique abilities to contribute to society. The individuals that make up our world and impact its present and future are the students who sit in the classrooms we teach in. Change and complexity are an inherent part of human experience; embracing these states helps educators and students accept the messiness of being as a natural step toward growth and progression. In this article, our experiences as teachers inform the narratives and visual stories we present. We hope this work will help researchers and educators create learning spaces that celebrate transitions and transformations as exciting opportunities for student empowerment.

> Teaching is a wonderful way to learn. (Dweck, 2006, p. 201)

Holistic Education: Mind, Body, & Soul

Holistic education is about nurturing human potential to create the most suitable space for growth. Seeds grow when they are cultivated with care and provided with adequate food, water, and sunlight. A combination of parts must come together to form a whole. Similarly, for students, an amalgamation of approaches needs to be integrated to cater to the various spheres that structure mental well-being (D'Intino & Wang, 2021; Gaitas et al., 2024; Shareefa, 2021). Holistic learning is anchored in educative environments that help students find meaning in their lives and the world they operate within (Lauricella & MacAskill, 2015). Nava (2001) explains this paradigm as follows:

> The student is not seen as a brain to be programmed, but as a human being with unlimited inner potential, a sensitive being oriented toward learning, a spiritual being in search of meaning, an aesthetic being capable of recognizing life's inherent beauty, who embodies multiple dimensions of the human experience. (p. 44)

Holistic pedagogy considers the entirety of human experience and the various aspects that influence these experiences in the intellectual, spiritual, physical, emotional, and social realms of life.

Learning involves a myriad of cognitive processes; as educators, we must develop a multi-dimensional view of intelligence to facilitate spaces that are inclusive of diverse learning styles. When teachers engage in an interdisciplinary approach to education, they create a nurturing space for students to explore their identity, interests, and capacity. Every child can actualize their full potential if they are provided with adequate guidance and support. Unfortunately, many learning spaces have become environments that stifle creativity, curiosity, and critical thinking. As a result, students do not feel motivated to learn, and educators struggle to address challenges related to class engagement and content retention (Legault et al., 2006).

Some educators may feel that prioritizing well-being is impractical in the presence of other pressing responsibilities. However, mental well-being is a prerequisite for academic success. In other words, if educators invest in students' mental well-being, strong academic performance will follow. However, if they neglect to prioritize well-being, it becomes much harder to sustain academic growth, engagement, and motivation (Gholam, 2019). Considering well-being does not necessitate a complete replacement of

all assessments and pedagogical strategies. Rather, it simply requires a shift in mindset that can begin with small exercises that help students gain opportunities for leadership and initiative. Relinquishing power to students and repositioning their role within a teaching capacity opens opportunities for meaningful discussion and growth in the academic and socioemotional spheres of their lives. The collage below (Figure 1) encapsulates the juxtaposition of children who receive support when they ask for it in comparison to those who are unable to find spaces of warmth and belonging.
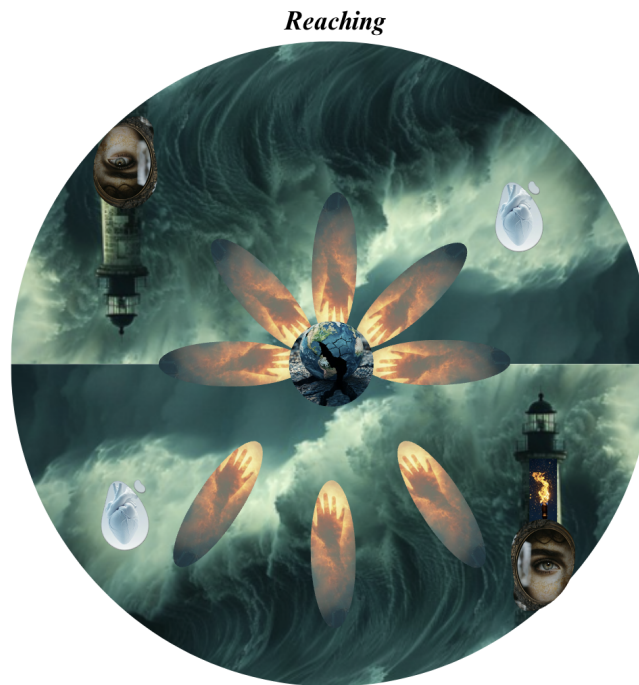
Reaching

Fig. 1: Reaching. A collage that depicts the inner turmoil that students experience when they do not feel welcome or valued in a learning environment. Collage by Sakina Rizvi.

Standardized teaching approaches do not celebrate the individuality of every learner or allow for students to participate as active knowledge contributors. Such models position learners as dependent passive beings in the process of knowledge formation, and it is with this understanding that educators are traditionally conditioned to adopt an authoritarian role in the classroom (Patton, 2015). This paradigm encourages conformity to standards that homogenize individual learning needs and differences. Students who can meet these expectations are labeled as "high achieving," "gifted," and "smart," while those who do not fit a standardized mold are excluded from being categorized as "intelligent." Learners form perceptions of themselves based on these labels and compare their efforts to their peers. Nava (2001) mentions the following in this regard:

> Comparison is a practice that destroys the love of learning. It instills shame in children over their performance, makes them afraid to participate, and crushes their dignity. Comparison in education must always imply the rejection of one human being over another and promote the idea that one person is better than the next. Holistic education, on the other hand, proposes education free of comparison, in order to create a culture where everyone is a winner. (p. 28)

Comparing students on the basis of a fixed standard can be likened to fitting different shapes within a single mold. It is not fair to punish students for not conforming to a mold that they were not designed to fit. To empower students with the life skills that are critical for success in the professional world, we must relinquish power processes that structure hierarchical forms of knowledge creation. Students naturally look up to their teachers for support and will only learn to challenge ideas and form new experiences when they are given the space to explore—*the space to be the teacher*. Educators need to provide students with opportunities for facilitating discussions, guiding inquiries, and forming innovative ways for assessing achievement (Kemp et al., 2002; Lee & Johnston-Wilder, 2013; Lyons & Brasof, 2020). Relational teaching approaches create a class community where students feel confident in taking on leadership roles. In addition, such an environment welcomes questioning and critical analysis for a more engaging and involved learning experience.

Immersive educational environments should provide learners with pragmatic experiences grounded in the values of community and collective growth. John Dewey was a social reformer and philosopher who advocated this view: he strongly believed that classrooms should be spaces that prepare students for the real world (Dewey, 1966). De-contextualized academic content is outdated and difficult for learners to internalize due to the lack of relevance (Williams, 2017). When teachers design immersive hands-on projects, students are challenged to tap into their intellectual, social, emotional, and physical abilities for a more holistic learning experience. Moving a step forward, knowledge-building pedagogy recenters all classroom practices around the learner.

Knowledge Building: Students Chart the Course of Their Learning

Knowledge building is when a group of learners collectively take on the responsibility to advance the state of knowledge in their community, ultimately producing knowledge for public good (Hmelo-Silver & Barrows, 2008; Scardamalia, 2002; Scardamalia & Bereiter, 2003; Tarchi et al., 2013). This is an approach guided by 12 principles and is centered around constructing knowledge through inquiry (Bereiter & Scardamalia, 2014; Scardamalia & Bereiter, 2021). The principles that drive knowledge building allow students to curate their own learning experiences with *epistemic agency* at the center of knowledge building activity. Epistemic agency in knowledge building allows students to choose the direction of their learning, define their learning objectives, chart the course of achieving these objectives, and re-assess, redefine, and re-evaluate their work as they move through their inquiry (Bereiter & Scardamalia, 2014; Zhang et al., 2022; Zhu, Chai, & Ding). This empowers learners with the confidence to lead and shape their own educational experiences.

As students curate their learning, their lived experiences inform the direction of their explorations. The knowledge-building principle of *real ideas and authentic problems* states that the inquiries that learners desire to explore are often those authentic to their own experiences (Hong et al., 2015; Scardamalia, 2002; Zhang et al., 2022). When learning in the classroom is based on authentic problems, realities, and ideas, students engage in knowledge work that is anchored in their subjective experiences of reality. Such knowledge work is the same work that is undertaken by professionals to solve the real, authentic

issues present in society. In this way, knowledge building prepares students for the professional world. The principle of *pervasive knowledge building* states that knowledge work can explore relevant problems across a varied range of subject areas (Hong et al., 2015; Ma & Scardamalia, 2022; Scardamalia & Bereiter, 2021). Thus, engaging in knowledge work teaches students to employ an interdisciplinary skill set to address issues in a holistic manner. This also teaches them that collaboration is crucial for knowledge work because the diverse strengths of a group provide a larger toolkit that learners can use to comprehensively tackle any issue.

Students' sense of belonging to the classroom community impacts how well they can navigate academic challenges (Abdollahi & Noltemeyer, 2018; Chiu et al., 2016). Positive classroom norms foster this sense of belonging. In knowledge building, the principle of *democratizing knowledge* fosters such norms: the contributions and differences of all learners are valued, and the ownership of collective progress and community achievements is shared by all members of the community (Cacciamani et al., 2021; Scardamalia, 2002; Zhu, Chai, & Ding, 2023). As students engage in knowledge building, they need to move from viewing their work in isolation to viewing it as part of the collective community effort. Low-achieving students may feel a sense of isolation and detachment from their community, but this principle integrates their efforts with those of their peers to help them see themselves as part of the collective. These are the positive norms that create an inclusive and safe classroom space.

Knowledge building challenges the perceptions of educators and learners. Educators typically believe that low-achieving students will have difficulty operating in pedagogical models such as knowledge building because it requires high-order thinking skills (Chan & Lee, 2007; Yang et al., 2020). However, research shows that knowledge building benefits these learners and helps them form deeper understandings of the content under study (Chan & Lee, 2007; Yang et al., 2016). Thus, it is important for educators to self-reflect and identify ability-based biases in their decision-making.

Reconceptualizing Valuable Work

Perceptions of success in learning are typically based on a student's ability to replicate existing knowledge (Ahmad et al., 2020; Scardamalia & Bereiter, 2005). However, in knowledge building, the principle of *collective cognitive responsibility* states that student work is valuable when it contributes to advancing the state of community knowledge (Scardamalia & Bereiter, 2016; Tan et al., 2006; Yang et al., 2020). The kind of work that advances the state of community knowledge is a comprehensive exploration of the inquiry at hand. The principle of *idea diversity* states that to understand an idea comprehensively, all accurate, opposing, and contrasting explanations need to be considered (Chen et al., 2015; Scardamalia, 2002; Tan et al., 2006). Thus, knowledge building redefines valuable work. Inaccurate hypotheses are important as they open new avenues of exploration; eliminating irrelevant and incorrect explanations is as important as recognizing correct ones, as they can become stepping stones for moving the work forward. Additionally, this process teaches learners the 21st-century competency skill of effective collaboration (Chalkiadaki, 2018; Geisinger, 2016; Pinto et al., 2016). Knowledge-building research shows that learning from inaccurate explanations strengthens the collective skill set of the group and is crucial to propel the problem-solving process forward (Chai & Zhu, 2021;

Chan et al., 1997; Zhu, Khanlari, & Resendes, 2023). This is an especially empowering and encouraging move for learners who are on the low-achieving side of the spectrum. They will see that their contributions, irrelevant of accuracy, are as important to the collective effort as those of their high-achieving peers.

Collaborative work, agency, creativity, and metacognition are some of the most essential 21st-century skills for intellectual growth (Geisinger, 2016; Gut, 2011; Van Laar et al., 2017). These skills can also accelerate the academic progress of low-achieving students (Yang et al., 2020; Zohar & Dori, 2003). In the case of such learners, teachers usually focus on their ability to regurgitate information, thus losing the chance to develop critical competencies that are needed in contemporary professional spaces (Kaufman, 2013; Kim et al., 2019; Silva, 2009). In knowledge building, all ideas, accurate or not, can always be revised, edited, improved, and built on under the principle of *improvable ideas* (Chai & Zhu, 2021; Zhang et al., 2009). Whereas improvements are traditionally provided for the work of low-achieving students, within knowledge building, all ideas are improvable no matter how promising they are. Low-achieving students often experience negative emotions because they struggle to acquire the skills they need (Woolf et al., 2010; Yang et al., 2022). A collective culture of group feedback can help educators create a positive learning environment where students do not feel singled out when their work is critiqued. Improvement is the driving force of knowledge-building work, and it is not a sign of low competency or achievement. Such environments may be challenging at first, but they create safe spaces that help all students excel.

It is in these spaces that students have the opportunity to think critically and reflect deeply on their learning and experiences. I (Aleesha) learned about knowledge building three years ago, during my Master of Education, and implemented it in a Grade 10 Careers class. Students used knowledge-building principles to interact with their weekly readings. They were asked to build on each other's contributions, and the student-centered nature of knowledge building challenged them to find harmony amongst ideas that initially appeared to exist in a state of chaos. In their efforts to make sense of their individual and collective work, they not only embraced the challenge of this transition but used it as an opportunity to embrace diverse viewpoints. When knowledge building immerses students in these experiences, it becomes a reflection of how problem-solving happens in the real world. The collage below (Figure 2) depicts students' efforts to harmonize their ideas and experiences for the emergence of valuable connections.

Searching

Fig. 2. Searching. This collage shows learners walking through the messiness and chaos of ideas that emerge from their unique experiences, knowledge, and skills in order to focus on the value they have to offer to their classroom and society. Collage by Sakina Rizvi.

New Directions: Holistic Pedagogy, Knowledge Building, and Plagiarism

Holistic pedagogy empowers educators with the tools to reconceptualize policies, pedagogies, and practices that structure exclusionary learning spaces. Our education system is composed of students from a diverse range of backgrounds. Equity in education necessitates a consideration of individual learning needs, as opposed to a homogenized one-size-fits-all approach (Levinson & Brighouse, 2022). When education systems and classrooms are not able to offer inclusive opportunities for growth, disadvantaged students develop learning gaps, while students who have access to external resources propel forward (Darling-Hammond, 2007; Vavrus, 2008). If students' needs are not addressed and the gaps persist over their years of schooling, learners will likely develop self-debilitating beliefs about their capacity and academic potential. As a result, they may turn to plagiarism (Akbari & Sahibzada, 2020; Lodge et al., 2018).

Plagiarism is to present someone else's work as your own without giving any credit to the original source (Helgesson & Eriksson, 2015; Maurer et al., 2006). Research highlights that most students resort to plagiarism because of burdensome expectations, procrastination, low motivation, and skill deficiencies (Cebrián Robles et al., 2020; Park, 2017; Roberts, 2007). AI models are not the first tools that have been used for inauthentic knowledge production, and they will not be the last. Thus, it is critical for educators to develop a long-term sustainable solution to this issue. As the world continues to advance with new technologies, we suggest that holistic pedagogy and knowledge building can be used to help teachers develop innovative approaches to support student learning and engagement.

Holistic pedagogy recenters the student as the focus of all learning activity. With this approach, every child is an essential member of the class community. As discussed previously, this is also present in the knowledge-building framework, as the principle of *idea diversity* highlights the criticality of valuing all student contributions (Scardamalia & Bereiter, 2021; Zhang et al., 2011). Thus, when class norms and policies are anchored in holistic pedagogy and knowledge building, all ideas are valuable regardless of accuracy. This encourages learners to pose original questions, provide experience-based responses, and explore new directions. Whereas in traditional classroom settings, students may aim to replicate a specific standard of work to attain a better grade (Cebrián Robles et al., 2020), knowledge building and holistic pedagogy encourages learners to be their own standard of achievement. Progress is not homogenous, but rather it is present in the authentic effort of every individual to advance the community's state of knowledge. In our experience, students are less likely to feel the need to use AI to generate specific responses when educators create a culture where their unique contributions are valued.

As knowledge building empowers students with the skills to direct their learning, they experience a heightened sense of responsibility for their work (Bereiter & Scardamalia, 2014). Research has shown that a sense of personal responsibility can increase learners' motivation levels and self-esteem (Ayish & Deveci, 2019; Caprara et al., 2008; Humphrey et al., 2007). When students believe in their own abilities to succeed, they will not feel that they lack the skills required for the work they must engage in. Additionally, holistic pedagogy is centered around inquiries that are authentic to students' lived experiences (Lauricella & MacAskill, 2015). This acts as a motivator to keep students engaged and interested in the work they are doing. The desire to explore the subject authentically deters students from resorting to plagiarism for their work. When teachers structure inquiries that emerge from learners' experiences, students cannot rely on the work of others; they must tap into their own intellectual and socioemotional capacity. In this context, original work is of value because it is authentic to learners' personal experiences.

We started our journey into exploring the integration of holistic pedagogy and knowledge building because of our observations of increased instances of plagiarisms and student disengagement. I (Aleesha) decided to use this integrated approach in my class and was surprised to see that when I introduced the framework, my students had an instinctual reaction of fear. They were anxious to take on a more active role in their work and felt vulnerable. However, when *real ideas and authentic problems* were incorporated, they became passionate about contributing their ideas toward issues they had encountered in the real world. I continued to introduce holistic learning exercises using a range of knowledge-building principles, and in a matter of a few weeks, the culture of the class had completely changed. Students found the transition difficult, as this approach was unfamiliar and outside of their comfort zone. However, as I read through their contributions week after week, I saw the principle of *democratizing knowledge* at work: the expertise and knowledge of the classroom members began to be distributed and resulted in every student benefiting from them. Over the course of the class, my students contributed valuable original work, and I encountered fewer cases of plagiarism.

Knowledge building and holistic pedagogy foster classroom norms that value authenticity, originality, diverse contributions, lived experiences, and the ability to produce something of value to the community. These norms intrinsically combat the causes of plagiarism and beyond that, they work to support students who will advance the frontiers of knowledge globally. They can also help students use AI positively. As teachers, if someone asked us to introduce AI software to our students, a major inhibition would be whether the students would use AI in an ethical manner. Placing this responsibility on their shoulders seems unrealistic and one can't help but think that the result would likely be plagiarism. The key to the conundrum lies in addressing our difficulty in trusting students to hold such responsibility.

When educators engage in holistic pedagogy, the classroom becomes a space that empowers students to create authentic knowledge. Thus, we do not need to prohibit students from using AI. Rather, we should integrate it into our classrooms to model how it can be used as a positive tool for conceiving new ideas. AI models can be used to generate powerful visuals that can become springboards for insightful discussions. Incorporating visuals can also help educators support learners who benefit from pictorial forms of instruction (Bobek & Tversky, 2016; Cronin & Myers, 1997; Khaydarova & Yokubjon, 2023). Figure 3 shows some activity ideas where students can use AI to strengthen their understanding on a range of topics. Students can write detailed answers to the activity questions and use AI models to see an imagery-based representation of their ideas. The more accurate their descriptions are, the more accurate the AI output will be. Thus, this exercise would provide students with a holistic understanding of a topic supplemented by text and graphics. Figure 3 includes sample outputs from Microsoft's Copilot AI based on example answers to the activities. Visualizing can help students make deeper connections and ask questions that further their inquiry work. These AI-generated visuals are also powerful in helping students critically analyze real-world problems from a variety of viewpoints.

Fig. 3. Sample activities with AI-generated visuals based on sample prompts.

AI, like any other tool, is neither inherently negative nor positive. Its impact on our lives is based on the ways we choose to use it. This is an important lesson for students to learn as it will teach them to make the best use of their tools and resources in order to address the issues present in our world. This is possible only if we become open to and accepting of change as educators. The introduction and integration of two unique pedagogies is not an easy transition but is a valuable one. The change that AI brings to the sphere of education is unexpected, but our proposed integration gives educators and learners the confidence to accept new tools as opportunities for finding new meanings and understandings of reality.

Conclusion

Learning is a powerful intellectual and socioemotional process that is essential for continued self-development. It is not a process that begins or ends within schools; rather, it is an integral part of human nature—the essence of *being*. Humans are inquisitive creatures designed to question, explore, and discover new ideas; it is this nature and these fundamental inclinations that have helped society progress over time. Academic institutions must provide learners with the agency to lead inquiries and investigations, approach concepts with innovative methodologies, and form understandings from experiences that provide meaning in their lives. Such an approach requires an ideological shift and re-conception of the purpose of academic institutions. Academic spaces maintain no purpose if they do not serve those who they were created for. In other words, when practitioners and researchers neglect to recognize the role of learners as active knowledge contributors and mobilizers, they facilitate the development of exclusionary spaces that limit students' academic and socioemotional growth. Holistic pedagogy offers researchers a collection of tools for re-humanizing the learning process to be more inclusive of students' well-being outside of their academic responsibilities. Every child is unique, and their individuality is their strength. This reality needs to be at the center of the learning that happens within the classroom because it is the basis for the innovative work that happens in professional spaces.

As students take collective responsibility for their work with authentic inquiries (Scardamalia, 2002), in essence they are building something from scratch that has the potential to positively impact their lives. Knowledge-building principles give students the confidence to be agents of change in their circles of influence. As they work to address their inquiries, every step is of extreme value because it is their work. Plagiarism would be a low-value contribution because it does not move the community's work in a meaningful direction. Thus, the norms of knowledge building and holistic pedagogy instill the idea that to plagiarize is to devalue one's own efforts as well as those of your classroom community.

Holistic pedagogy and knowledge building create classroom spaces with motivated learners who are excited by the opportunities that bring their worlds into the classroom. By engaging in these inclusive pedagogies, educators invite all student voices to the table, such that every student feels valued no matter their background or level of academic achievement. When classrooms provide positive support structures in this manner, students feel empowered to address any challenges that come their way. New tools no longer become a means for students to replicate what they may deem to be ideal work; instead, these tools become useful resources that help them pursue authentic inquiries.

Embracing change through transformative pedagogies means teaching our students to cherish the uniqueness of their experiences. This makes the classroom a space that brings learners together in a joint effort to advance the state of knowledge in their communities. When we as teachers take the first step towards walking through the messiness of transitions to accept change, we empower our students with the confidence to step forth on the same path.

Fig. 4. Stepping. A collage that portrays how holistic pedagogy and knowledge building prepare students to step into the real world and leave an ever-lasting footprint. Collage by Sakina Rizvi.

To our students who are always teaching us and giving us the privilege to be a part of their journeys:

> Footsteps fade with time
>
> Except for the paths we traverse together,
>
> Your journey interlaced with mine
>
> United, every storm we will weather.
>
> (Poem by Aleesha Noreen.)

References

Abdollahi, A., & Noltemeyer, A. (2018). Academic hardiness: Mediator between sense of belonging to school and academic achievement? *The Journal of Educational Research, 111*(3), 345–351. https://doi.org/10.1080/00220671.2016.1261075

Ahmad, S., Sultana, N., & Jamil, S. (2020). Behaviorism vs constructivism: A paradigm shift from traditional to alternative assessment techniques. *Journal of Applied Linguistics and Language Research, 7*(2), 19–33.

Akbari, O., & Sahibzada, J. (2020). Students' self-confidence and its impacts on their learning process. *American International Journal of Social Science Research, 5*(1), 1–15.

Ayish, N., & Deveci, T. (2019). Student perceptions of responsibility for their own learning and for supporting peers' learning in a project-based learning environment. *International Journal of Teaching and Learning in Higher Education, 31*(2), 224–237.

Bereiter, C., & Scardamalia, M. (2014). Knowledge building and knowledge creation: One concept, two hills to climb. In S. C. Tan, H. J. So, & J. Yeo (Eds.), *Knowledge creation in education* (pp. 35–52). Springer Singapore. https://doi.org/10.1007/978-981-287-047-6_3

Bobek, E., & Tversky, B. (2016). Creating visual explanations improves learning. *Cognitive Research: Principles and Implications, 1*(1), 27–27. https://doi.org/10.1186/s41235-016-0031-6

Cacciamani, S., Perrucci, V., & Fujita, N. (2021). Promoting students' collective cognitive responsibility through concurrent, embedded and transformative assessment in blended higher education courses. *Technology, Knowledge and Learning*, *26*(4), 1169–1194. https://doi.org/10.1007/s10758-021-09535-0

Caprara, G. V., Fida, R., Vecchione, M., Del Bove, G., Vecchio, G. M., Barbaranelli, C., & Bandura, A. (2008). Longitudinal analysis of the role of perceived self-efficacy for self-regulated learning in academic continuance and achievement. *Journal of Educational Psychology*, *100*(3), 525–534. https://doi.org/10.1037/0022-0663.100.3.525

Cebrián Robles, V., Raposo Rivas, M., & Sarmiento Campos, J. A. (2020). Study of the reasons for and measures to avoid plagiarism in young students of education. *Profesorado, Revista de Currículum y Formación Del Profesorado*, *24*(1), 50–74. https://doi.org/10.30827/profesorado.v24i1.8572

Chai, S., & Zhu, G. (2021). The relationship between group adoption of knowledge building principles and performance in creating artifacts. *Educational Technology Research and Development, 69*(2), 787–808. https://doi.org/10.1007/s11423-021-09986-3

Chalkiadaki, A. (2018). A systematic literature review of 21st century skills and competencies in primary education. *International Journal of Instruction, 11*(3), 1–16. https://doi.org/10.12973/iji.2018.1131a

Chan, C., Burtis, J., & Bereiter, C. (1997). Knowledge building as a mediator of conflict in conceptual change. *Cognition and Instruction*, *15*(1), 1-40.

Chan, C. K. K., & Lee, E. Y. C. (2007). Fostering knowledge building using concurrent, embedded and transformative assessment for high- and low-achieving students. *Proceedings of the 8th International Conference on Computer Supported Collaborative Learning—CSCL'07*, 108–117. https://doi.org/10.3115/1599600.1599620

Chen, B., Scardamalia, M., & Bereiter, C. (2015). Advancing knowledge-building discourse through judgments of promising ideas. *International Journal of Computer-Supported Collaborative Learning, 10*(4), 345–366. https://doi.org/10.1007/s11412-015-9225-z

Chiu, M. M., Chow, B. W. Y., McBride, C., & Mol, S. T. (2016). Students' sense of belonging at school in 41 countries: Cross-cultural variability. *Journal of Cross-Cultural Psychology*, *47*(2), 175–196.

Cronin, M. W., & Myers, S. L. (1997). The effects of visuals versus no visuals on learning outcomes from interactive multimedia instruction. *Journal of Computing in Higher Education, 8*, 46–71.

Darling-Hammond, L. (2007). Race, inequality and educational accountability: The irony of "No Child Left Behind." *Race Ethnicity and Education, 10*(3), 245–260.

Dewey, J. (1966). *Democracy and education: An introduction to the philosophy of education* (First Free Press paperback edition). The Free Press; Collier-Macmillan.

D'Intino, J. S., & Wang, L. (2021). Differentiated instruction: A review of teacher education practices for Canadian pre-service elementary school teachers. *Journal of Education for Teaching: International Research and Pedagogy*, *47*(5), 668–681.

Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random House.

Gaitas, S., Carêto, C., Peixoto, F., & Castro Silva, J. (2024). Differentiated instruction: "To be, or not to be, that is the question." *International Journal of Inclusive Education*, *28*(11), 2607–2623. https://doi.org/10.1080/13603116.2022.2119290

Geisinger, K. F. (2016). 21st century skills: What are they and how do we assess them? *Applied Measurement in Education, 29*(4), 245–249. https://doi.org/10.1080/08957347.2016.1209207

Gholam, A. (2019). Inquiry-based learning: Student teachers' challenges and perceptions. *Journal of Inquiry and Action in Education*, *10*(2), 112–133.

Gut, D. M. (2011). Integrating 21st century skills into the curriculum. In G. Wan & D. M. Gut (Eds.), *Bringing schools into the 21st century* (pp. 137–157). Springer Netherlands. https://doi.org/10.1007/978-94-007-0268-4_7

Helgesson, G., & Eriksson, S. (2015). Plagiarism in research. *Medicine, Health Care and Philosophy*, *18*(1), 91–101. https://doi.org/10.1007/s11019-014-9583-8

Hong, H.-Y., Scardamalia, M., Messina, R., & Teo, C. L. (2015). Fostering sustained idea improvement with principle-based knowledge building analytic tools. *Computers & Education*, *89*, 91–102. https://doi.org/10.1016/j.compedu.2015.08.012

Hmelo-Silver, C. E., & Barrows, H. S. (2008). Facilitating collaborative knowledge building. *Cognition and Instruction*, *26*(1), 48–94. https://doi.org/10.1080/07370000701798495

Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: A meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, *92*(5), 1332–1356. https://doi.org/10.1037/0021-9010.92.5.1332

Kaufman, K. J. (2013). 21 ways to 21st century skills: Why students need them and ideas for practical implementation. *Kappa Delta Pi Record*, *49*(2), 78–83. https://doi.org/10.1080/00228958.2013.786594

Kemp, R. H., Stewart, T., Fung, I. P. W., & Orban, B. (2002). Learning by creating: Letting the student do the work. *Interactive Learning Environments*, *10*(2), 121–138.

Kim, S., Raza, M., & Seidman, E. (2019). Improving 21st-century teaching skills: The key to effective 21st-century learners. *Research in Comparative and International Education*, *14*(1), 99–117.

Khaydarova, S., & Yokubjon, M. (2023). Enhancing learning: The power of visual aids in teaching idioms. *Journal of Academic Research and Trends in Educational Sciences*, *2*(2), 288–292.

Lauricella, S., & MacAskill, S. (2015). Exploring the potential benefits of holistic education: A formative analysis. *Other Education: The Journal of Educational Alternatives*, *4*(2), 54–78.

Lee, C., & Johnston-Wilder, S. (2013). Learning mathematics—letting the pupils have their say. *Educational Studies in Mathematics: An International Journal*, *83*(2), 163–180. https://doi.org/10.1007/s10649-012-9445-3

Legault, L., Green-Demers, I., & Pelletier, L. (2006). Why do high school students lack motivation in the classroom? Toward an understanding of academic amotivation and the role of social support. *Journal of Educational Psychology*, *98*(3), 567–582. https://doi.org/10.1037/0022-0663.98.3.567

Levinson, M., Geron, T., & Brighouse, H. (2022). Conceptions of educational equity. *AERA Open, 8*. https://doi.org/10.1177/23328584221121344

Lodge, J. M., Kennedy, G., Lockyer, L., Arguel, A., & Pachman, M. (2018, June). Understanding difficulties and resulting confusion in learning: An integrative review. In *Frontiers in Education* (Vol. 3, p. 49). Frontiers Media SA.

Lyons, L., & Brasof, M. (2020). Building the capacity for student leadership in high school: A review of organizational mechanisms from the field of student voice. *Journal of Educational Administration*, *58*(3), 357–372. https://doi.org/10.1108/JEA-05-2019-0077

Ma, L., & Scardamalia, M. (2022). Teachers as designers in knowledge building innovation networks. In M.-C. Shanahan, B. Kim, M. A. Takeuchi, K. Koh, A. P. Preciado-Babb, & P. Sengupta, *The learning sciences in conversation* (1st ed., pp. 107–120). Routledge. https://doi.org/10.4324/9781003089728-13

Maurer, H. A., Kappe, F., & Zaka, B. (2006). Plagiarism—A survey. *Journal of Universal Computer Science*, *12*(8), 1050–1084.

Nava, R, G. (2001). *Holistic education: Pedagogy of universal love*. Brandon: Holistic education press.

Park, C. (2017). In other (people's) words: Plagiarism by university students—literature and lessons. *Academic Ethics*, 525–542.

Patton, C. M. (2015). Employing active learning strategies to become the facilitator, not the authoritarian: A literature review. *Journal of Instructional Research*, *4*, 134–141. https://doi.org/10.9743/JIR.2015.17

Pinto, M., Caramelo, J., Coimbra, S., Terrasêca, M., & Agrusti, G. (2016). Defining the key competences and skills for young low achievers' in lifelong learning by the voices of students, trainers and teachers. *JSSE – Journal of Social Science Education*, *15*(1), 53–62. https://doi.org/10.4119/jsse-783

Roberts, T. S. (2007). Student plagiarism in an online world: An introduction. In *Student plagiarism in an online world* (pp. 1–9). IGI Global. https://doi.org/10.4018/978-1-59904-801-7.ch001

Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. *Liberal Education in a Knowledge Society*, 67–98.

Scardamalia, M., & Bereiter, C. (2016). Creating, crisscrossing, and rising above idea landscapes. In R. Huang, Kinshuk, & J. K. Price (Eds.), *ICT in education in global context* (pp. 3–16). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-662-47956-8_1

Scardamalia, M., & Bereiter, C. (2003). Knowledge building. In *Encyclopedia of education* (2nd ed., pp. 1370–1373). Macmillan Reference.

Scardamalia, M., & Bereiter, C. (2005). Knowledge building: Theory, pedagogy, and technology. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (1st ed., pp. 97–116). Cambridge University Press. https://doi.org/10.1017/CBO9780511816833.008

Scardamalia, M., & Bereiter, C. (2021). Knowledge building: Advancing the state of community knowledge. In U. Cress, C. Rosé, A. F. Wise, & J. Oshima (Eds.), *International handbook of computer-supported collaborative learning* (pp. 261–279). Springer International Publishing. https://doi.org/10.1007/978-3-030-65291-3_14

Shareefa, M. (2021). Using differentiated instruction in multigrade classes: A case of a small school. *Asia Pacific Journal of Education*, *41*(1), 167–181. https://doi.org/10.1080/02188791.2020.1749559

Silva, E. (2009). Measuring skills for 21st-century learning. *Phi Delta Kappan*, *90*(9), 630–634. https://doi.org/10.1177/003172170909000905

Tan, S. C., Hung, D., & Scardamalia, M. (2006). Education in the knowledge age—Engaging learners through knowledge building. In D. Hung & M. S. Khine (Eds.), *Engaged learning with emerging technologies* (pp. 91–106). Springer-Verlag. https://doi.org/10.1007/1-4020-3669-8_5

Tarchi, C., Chuy, M., Donoahue, Z., Stephenson, C., Messina, R., & Scardamalia, M. (2013). Knowledge building and knowledge forum: Getting started with pedagogy and technology. *LEARNing Landscapes*, *6*(2), 385–407. https://doi.org/10.36510/learnland.v6i2.623

Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & De Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, *72*, 577–588. https://doi.org/10.1016/j.chb.2017.03.010

Vavrus, M. (2008). Culturally responsive teaching. *21st century education: A reference handbook*, *2*(49–57).

Williams, M. (2017). John Dewey in the 21st century. *Journal of Inquiry and Action in Education*, *9*, 91–102.

Woolf, B. P., Arroyo, I., Muldner, K., Burleson, W., Cooper, D. G., Dolan, R., & Christopherson, R. M. (2010). The effect of motivational learning companions on low achieving students and students with disabilities. In *Intelligent Tutoring Systems: 10th International Conference, ITS 2010, Pittsburgh, PA, USA, June 14–18, 2010, Proceedings, Part I* (pp. 327–337). Springer Berlin Heidelberg.

Yang, Y., Van Aalst, J., & Chan, C. K. K. (2020). Dynamics of reflective assessment and knowledge building for academically low-achieving students. *American Educational Research Journal*, *57*(3), 1241–1289. https://doi.org/10.3102/0002831219872444

Yang, Y., van Aalst, J., Chan, C. K., & Tian, W. (2016). Reflective assessment in knowledge building by students with low academic achievement. *International Journal of Computer-Supported Collaborative Learning*, *11*, 281–311.

Yang, Y., Zhu, G., & Chan, C. K. K. (2022). Evolution of the academic emotions of academically low-achieving students in knowledge building. *International Journal of Computer-Supported Collaborative Learning*, *17*(4), 539–571. https://doi.org/10.1007/s11412-022-09380-y

Zhang, J., Hong, H.-Y., Scardamalia, M., Teo, C. L., & Morley, E. A. (2011). Sustaining knowledge building as a principle-based innovation at an elementary school. *Journal of the Learning Sciences*, *20*(2), 262–307. https://doi.org/10.1080/10508406.2011.528317

Zhang, J., Scardamalia, M., Reeve, R., & Messina, R. (2009). Designs for collective cognitive responsibility in knowledge-building communities. *Journal of the Learning Sciences*, *18*(1), 7–44. https://doi.org/10.1080/10508400802581676

Zhang, J., Tian, Y., Yuan, G., & Tao, D. (2022). Epistemic agency for costructuring expansive knowledge-building practices. *Science Education, 106*(4), 890–923. https://doi.org/10.1002/sce.21717

Zhu, G., Chai, S., & Ding, M. (2023). Exploring pre-service teachers' democratizing knowledge in a knowledge building community: Indicators and results. *The Asia–Pacific Education Researcher*, *32*(3), 401–415. https://doi.org/10.1007/s40299-022-00662-5

Zhu, G., Khanlari, A., & Resendes, M. (2023). Student-generated questions fostering sustainable and productive knowledge building discourse. *Canadian Journal of Learning and Technology*, *48*(2). https://doi.org/10.21432/cjlt27978

Zhu, G., Scardamalia, M., Nazeem, R., Donoahue, Z., Ma, L., & Lai, Z. (2024). Metadiscourse, knowledge advancement, and emotions in primary school students' knowledge building. *Instructional Science*, *52*(1), 1–40. https://doi.org/10.1007/s11251-023-09636-6

Zohar, A., & Dori, Y. J. (2003). Higher order thinking skills and low-achieving students: Are they mutually exclusive? *Journal of the Learning Sciences*, *12*(2), 145–181. https://doi.org/10.1207/S15327809JLS1202_1

Sakina Rizvi is a PhD candidate in the Department of Integrated Studies in Education at McGill University. Her doctoral research focuses on exploring the connection between self-development and accelerated learning pathways. As a dedicated educator, she has served as a course lecturer and teaching assistant. Additionally, she has contributed to various events organized by McGill's Teaching and Learning Services. She is also a volunteer teacher who is passionate about giving back to her community.

Aleesha Noreen is currently pursuing a PhD in the Department of Curriculum, Teaching, and Learning at the Ontario Institute for Studies in Education. Her research focuses on investigating how formative assessments contribute to the development of epistemic agency among students within knowledge-building communities. In addition to being an enthusiastic educator, she also serves as a school coordinator. She is currently fulfilling the role of a graduate assistant in her department as well.