



Open and Interdisciplinary
Journal of Technology,
Culture and Education

Special issue
Knowledge Building
as New Perspective
for Education

Edited by
Frank De Jong,
Stefano Cacciamani

Editor

M. Beatrice Ligorio (University of Bari "Aldo Moro")

Coeditors

Stefano Cacciamani (University of Valle d'Aosta)

Donatella Cesareni (University of Rome "Sapienza")

Valentina Giron (University of Padua)

Associate Editors

Carl Bereiter (University of Toronto)

Michael Cole (University of San Diego)

Kristine Lund (CNRS)

Roger Salijo (University of Gothenburg)

Marlene Scardamalia (University of Toronto)

Scientific Committee

Sanne Akkerman (University of Utrecht)

Ottavia Albanese (University of Milan – Bicocca)

Susanna Annesi (University of Bari "Aldo Moro")

Alessandro Antonietti (University of Milan – Cattolica)

Pietro Boscolo (University of Padua)

Sefa Bulut (Ibn Haldun University)

Lorenzo Cantoni (University of Lugano)

Felice Carugati (University of Bologna – Alma Mater)

Cristiano Castelfranchi (ISTC-CNR)

Montserrat Castelló Badia (University Ramon Llull, Barcelona)

Alberto Cattaneo (SFIVET, Lugano)

Graziano Cecchinato (University of Padua)

Carol Chan (University of Hong Kong)

Cesare Cornoldi (University of Padua)

Crina Damsa (University of Oslo)

Frank De Jong (Aeres Wageningen Applied University)

Ola Erstad (University of Oslo)

Paolo Ferri (University of Milan – Bicocca)

Alberto Fornasari (University of Bari "Aldo Moro")

Carlo Galimberti (University of Milan – Cattolica)

Begona Gros (University of Barcelona)

Kai Hakkarainen (University of Helsinki)

Vincent Hevern (Le Moyne College)

Jim Hewitt (University of Toronto)

Antonio Iannaccone (University of Neuchâtel)

Liisa Ilomäki (University of Helsinki)

Sanna Jarvela (University of Oulu)

Richard Joiner (University of Bath)

Kristina Kumpulainen (University of Helsinki)

Minna Lakkala (University of Helsinki)

Mary Lamon (University of Toronto)

Leila Lax (University of Toronto)

Marcia Linn (University of Berkeley)

Kristine Lund (CNRS)

Anne-Nelly Perret-Clermont (University of Neuchâtel)

Donatella Persico (ITD-CNR, Genoa)

Peter Renshaw (University of Queensland)

Giuseppe Ritella (University of Helsinki)

Nadia Sansone (Unitelma Sapienza)

Vittorio Scarano (University of Salerno)

Neil Schwartz (California State University of Chico)

Pirita Seitamaa-Hakkarainen (University of Joensuu)

Patrizia Sella (University of Bologna)

Robert-Jan Simons (IVLOS)

Andrea Smorti (University of Florence)

Luca Tateo (University of Oslo)

Jean Underwood (Nottingham Trent University)

Jaan Valsiner (University of Aalborg)

Jan van Aalst (University of Hong Kong)

Rupert Wegerif (University of Exeter)

Allan Yuen (University of Hong Kong)

Cristina Zuccheromaglio (University of Rome "Sapienza")

Editorial Staff

Nadia Sansone – head of staff

Ilaria Bortolotti – deputy head of staff

Sarah Buglass, Lorella Giannandrea,

Hanna Järvenoja, Mariella Luciani,

Louis Maritaud, Katherine Frances McLay,

Giuseppe Ritella

Web Responsible

Nadia Sansone



Publisher

Progedit, via De Cesare, 15

70122, Bari (Italy)

tel. 080.5230627

fax 080.5237648

info@progedit.com

www.progedit.com

qwerty.ckbg@gmail.com

www.ckbg.org/qwerty

Registrazione del Tribunale di Bari

n. 29 del 18/7/2005

© 2020 by Progedit

ISSN 2240-2950

Indice

Editorial

- Knowledge Building as new perspective for Education:
From belief mode to design mode and the need
for 'infrastructuring'* 5
Frank De Jong, Stefano Cacciamani

ARTICLES

- Designing Informal Knowledge Building learning spaces:
Students' Knowledge Building Design Studio* 13
Guangji Yuan, Chew Lee Teo, Alwyn Vwen Yen Lee,
Aloysius Kian Keong Ong, Jen Hui Lim
- Student reflections on the integration of Knowledge Forum
as 'equipment' for knowledge building practice* 37
Dina Soliman, Andrew Whitworth, Steven Priddis
- Real-world experts co-facilitate design-mode Knowledge Building
in a continuing medical education course in palliative care* 66
Leila Lax, James Meuser, Daphna Grossman,
Paolo Mazzotta, Merna Wassef, Anita Singh
- Meeting students halfway: Materials in an ideas-centered
classroom* 99
Richard Reeve
- Learning from the knowledge builders: Student perspectives
on the challenges of classroom Knowledge Building
communities* 122
Katerine Bielaczyc



<i>Infrastructuring for Knowledge Building: Advancing a framework for sustained innovation</i>	139
Shiri Kashi, Yotam Hod, Alwyn Vwen Yen Lee, Guangji Yuan, Etan Cohen, Katerine Bielaczyc, Bodong Chen, Jianwei Zhang	
<i>Connecting between systems for classroom-based Knowledge Building sustainability and scalability</i>	157
Thérèse Laferrière, Cesar A. A. Nunes, Niall MacKinnon, Linda Massey, Chew Lee Teo, Richard Reeve, Telma P. Vinha, Vincent Gagnon	



Editorial Knowledge Building as new perspective for Education: From belief mode to design mode and the need for 'infrastructuring'

Frank De Jong*, Stefano Cacciamani**

DOI: 10.30557/QW000062

Knowledge Building (KB) as a concept of social and societal knowledge production is meant to get away from the 'mind-as-container' based folk theory that posits learning as knowledge acquisition tested by reproduction quizzes (Bereiter, 2002). However, such a transition means thinking differently to the mainstream educational process, and is not without its frictions associated with the change process. The growing KB-community discussed these issues in an ongoing KB-dialogue during the annual KB Summer Institute (KBSI2022) at the Aeres University of Applied Sciences Wageningen in the Netherlands. This special issue mirrors this dialogue which relates to the essence of KB, e.g., moving from a 'belief mode' into a 'design mode' of individual and collective thinking; and therefore, from individual learning to an educational process that contributes to the good of the society. This change in mindset is not limited to the students' level or the teacher level. It has impact for the whole school and beyond, e.g., stakeholders in the educational system like parents, inspectors, public officials and policy, and politicians.

* Aeres University of Applied Science Wageningen and Open University Heerlen, The Netherlands,  orcid 0000-0001-8956-0757.

** University of Valle d'Aosta,  orcid 0000-0003-4455-3988.

Corresponding author: f.de.jong@aeres.nl

The recent commotion regarding ChatGPT (Generative Pre-Trained Transformer) illustrates the problems associated with change processes. It uncovers mainstream education as a routine of instruction and assessment of individuals, rarely going beyond reproducing what is known in the world already. ChatGPT highlights individual assessment as a pillar of Western individual-oriented education, one in which individual achievement is highly regarded as it is more generally in Western society. However, there is no top-sportsperson, manager, leader, or student who reaches a high level of success without being surrounded by supportive people such as teachers, workers, citizens, and parents. In contrast community-oriented cultures place value on the well-being of the community as a whole and the interconnectedness of its members. Performance is a collective effort. Moreover, the challenges facing today's global society needs education that prepares students to function in multi-disciplinary teams, improving knowledge and co-creating understanding and solutions.

Knowledge isn't created by the reasoning of a 'stand-alone' mind. Knowledge is built on the legacy of what is known by interacting with reality, engaging in dialogue with our-selves and others in the search for meaning and sense. Learners are spectators and also part of what appears. Being and appearing coincides as we are part-of-the world. Hannah Ardent sees birth, natality, as a new voice, a new possibility of the future being different from the past. It is the newcomer's amazement about why we do as we do and wondering why not otherwise. Students' voice needs to get space in education. These voices are essential in education that puts collectively idea improvement in the center by using of what is known in a design mode, instead of the instruction and reproduction of what is known.

Scardamalia and Bereiter (2014) suggest that a KB community is created around the needs, ideas, curiosities and goals that a group considers worthwhile by:

- approaching knowledge development as a collective effort;
- a discourse in which insights, comprehension and 'understanding' emerge from a collective practice of idea development using books, experts, and dissenting views from outside the community;
- environments that support the discourse of KB in the community;

- common goals, meanings and practices that emerge as the community culture develops through social consultation situations and interactions in the discourse.

KB process is not rooted in the completion of learning tasks, but in a dialogical and interactive activity with the world. The KB-dialogue concerns ‘interactivity with the world’ as the place of knowledge development that centres ‘interactively-active’ students as the knowledge-generating factor (De Jong, 2020).

A KB-dialogue give space to the ‘voice of the newcomer’ by making explicit and highlighting certain knowledge claims (views, opinions, ideas, questions). Dialogue analysis shows (De Jong, 2020) that this process over time involves the following phases:

- *Explicating and group forming*: the activity in which the insights ‘acquired’ by everyone are shared and a socio-cognitive content-based match is sought, leading to group forming through a sense of connection in relation to content;
- *Collective engagement*: a process of moving away from one’s own egocentric perspective and engaging in a collective knowledge-building dialogue. Reading information changes from seeking confirmation of one’s own ideas into looking for what helps to progress in the collective curiosity or problem solving;
- *Grounding*: a ‘dialogue’ about what exactly everyone means by seemingly clear terms in everyday use. By delving into the literature and discussing it with one another;
- *Integration and construction*: accommodation, creation of collective thought and by integrating and connecting ideas that rise above prior understanding. Simultaneously improving individual ideas.

The transition from one phase to another appears by bringing knowledge together and rising above, establishing relationships between essential concepts. Such a dialogical process is not easily supported in the current ‘belief mode’, individual oriented education. Continuous research is therefore needed to improve the transition, for instance by applying Design Based Research to the educational KB contexts (Cacciamani et al., 2021).

The articles of this special issue give an overview of some of the issues concerning the transition toward a KB education, where dia-

logical interaction is a core component in the effort to contribute to the public good.

Yuan et al.'s study on KB-design-studios gives an insight into infrastructuring and orchestration that facilitates idea flow across time and digital spaces, social planes, and artifacts; the places where students can voice their own opinions, develop understanding, and challenge each other instead of just believing what is lectured.

Soliman et al.'s study showcases Knowledge Forum, a platform where KB-dialogues are supported with analytic tools, scaffolds, user interfaces, etc., which facilitate students' collaboration, discussion, collective knowledge construction and understanding of KB principles.

Lax et al. show in the context of care-based practice that real-world experts can provide complementary value to the KB-experienced facilitator in achieving a working in design mode to add impact and improve practice.

Reeve's study shows a week-by-week discourse centred design implementation, highlighting that learning spaces are enacted by the learners and not necessarily by the teacher's intended learning design.

Bielaczyc's study gives an interesting insight from the students' perspective on the change from a belief mode to a design mode of learning. The study highlights the understanding that can be gained by giving voice to and learning from student knowledge builders themselves.

The transition from belief mode towards design mode education is not only a matter of teacher-learner or facilitator-employer level processes. Kashi et al. talk about infrastructuring to advance large scale, sustainable multi-level innovation. Key elements such as identifying participants and activities across levels, obtaining and supporting community engagement, and potential breakdowns need to be addressed. Based on worldwide cases Laferrière et al. conclude that connections within and between activity systems are needed to overcome tensions in the next steps for KB sustainability and scalability. Bringing KB in practice therefore includes cultural and organizational transformation of and within education systems, including public policy.

References

- Bereiter, C. (2002). *Education and Mind in the Knowledge Age*. Erlbaum.
- 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.
- De Jong, F. (2020). *Knowledge in-ter-action*. Aeres Applied University Wageningen/Open University The Netherlands. <https://doi.org/10.46884/2020.2>
- Scardamalia, M., & Bereiter, C. (2014). Knowledge building and knowledge creation: Theory, pedagogy, and technology. In R. K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (pp. 397-417). Cambridge University Press.

Editorial

Le Knowledge Building (KB) se concentre sur l'amélioration de la connaissance communautaire et s'éloigne de la vision de l'apprentissage comme acquisition de connaissances, basée sur la vision de bon sens de "l'esprit comme contenant" (Bereiter, 2002). Ce changement de mentalité implique de penser autrement le processus éducatif. La communauté KB a discuté de ces questions lors de l'institut d'été annuel KB (KBSI2022) à l'Aeres Applied University Wageningen (Pays-Bas). Ce numéro spécial reflète ce dialogue. Ce changement ne se limite pas aux élèves ou aux enseignants, mais impacte l'ensemble de l'école et des institutions gouvernementales.

Une communauté KB se crée autour des curiosités, des besoins et des objectifs qu'un groupe juge utiles (Scardamalia & Bereiter, 2014); dans KB, le discours est un engagement communautaire où les idées et la "compréhension" émergent de la pratique collective du développement d'idées, en utilisant des sources, des avis d'experts extérieurs à la communauté, des environnements qui soutiennent le discours. Des objectifs, des significations et des pratiques communs émergent à mesure que la culture de la communauté se développe à travers l'interaction, également avec le contexte social.

KB n'est pas enraciné dans l'accomplissement de tâches d'apprentissage, mais dans une activité dialogique avec le monde. L'analyse du dialogue (De Jong, 2020) a montré un schéma stable dans le temps: a) Explication des Idées et formation des groupes; b) Engagement collectif; c) L'enracinement des connaissances dans les sources et dans le dialogue; d) Intégration et construction; e) Synthèse supérieure. Un tel processus dialogique n'est pas facilement supporté par le "belief mode", avec une approche individualiste de l'éducation. Une recherche continue est nécessaire pour améliorer la transition vers le "design mode", par exemple à travers une expérimentation basée sur la conception de contextes éducatifs KB (Cacciamani et al., 2021).

Les articles de ce numéro offrent un aperçu des dilemmes de la transition vers une éducation KB, où l'interaction dialogique est au cœur des efforts visant à contribuer au bien public. Le studio de conception KB de Guangji et al. donne un aperçu de l'infrastructure et de l'orchestration qui facilitent le flux d'idées à travers le temps, les espaces numériques, les plans sociaux et les artefacts. L'étude de Soliman et al. montre comment le Knowledge Forum facilite la collaboration et la discussion entre étudiants, l'acquisition de connaissances collectives et la compréhension des principes de KB. Lax et al. met en évidence dans le contexte de la pratique infirmière que les experts du monde réel ont une valeur complémentaire à l'animateur expert du KB. L'étude de Reeve montre que les espaces d'apprentissage sont mis en place par les étudiants, et ne se basent pas nécessairement sur un plan d'apprentissage. L'étude de Bielaczyc fournit un aperçu intéressant du point de vue des étudiants sur la signification de la transition du belief mode au design mode. Kashi et al. analysent l'infrastructure pour faire progresser l'innovation durable à plusieurs niveaux à grande échelle. Sur la base d'études de cas dans le monde, Laferrière concluent que les connexions au sein et entre les systèmes d'activités sont nécessaires pour surmonter les tensions dans les étapes nécessaires à la pérennité et à la diffusion du KB.

Editoriale

Il Knowledge Building (KB) si focalizza sul miglioramento della conoscenza della comunità e prende le distanze dalla visione dell'apprendimento come acquisizione di conoscenza, basata sulla visione di senso comune della "mente come contenitore" (Bereiter, 2002). Tale cambiamento di mentalità implica il pensare in modo diverso il processo educativo. La comunità KB ha discusso di questi problemi durante l'annuale KB Summer Institute (KBSI2022) presso l'Aeres Applied University Wageningen (Paesi Bassi). Questo numero speciale rispecchia questo dialogo. Tale cambiamento non è limitato agli studenti o agli insegnanti, ma ha un impatto sull'intera scuola e sulle istituzioni governative.

Una comunità KB viene creata attorno alle curiosità, ai bisogni e agli obiettivi che un gruppo ritiene utili (Scardamalia & Bereiter, 2014); nel KB il discorso è un impegno comune in cui intuizioni e comprensione emergono dalla pratica collettiva di sviluppo di idee, utilizzando fonti, opinioni di esperti al di fuori della comunità, ambienti che supportano il discorso. Obiettivi, significati e pratiche comuni emergono man mano che la cultura della comunità si sviluppa attraverso l'interazione anche con il contesto sociale.

Il KB non è radicato nel completamento di compiti di apprendimento, ma in un'attività dialogica con il mondo. L'analisi del dialogo (De Jong, 2020) ha mostrato uno schema stabile nel tempo: a) Spiegazione di idee e formazione di gruppi; b) Impegno collettivo; c) Radicamento della conoscenza nelle fonti e nel dialogo; d) Integrazione e costruzione; e) Sintesi superiore. Un tale processo dialogico non è facilmente supportato dal "belief mode" con un approccio educativo di tipo individualistico. È necessaria una ricerca continua per migliorare la transizione verso il "design mode", ad esempio mediante sperimentazione basata sul design di contesti educativi KB (Cacciamani et al., 2021).

Gli articoli di questo numero offrono una panoramica sui dilemmi nella transizione verso un'educazione KB, in cui l'interazione dialogica è un elemento centrale nell'impegno a contribuire al bene pubblico. Lo studio di Yuan e colleghi sul KB-design fornisce informazioni

sull'infrastruttura e sull'orchestrazione che facilitano il flusso di idee attraverso tempo, spazi digitali, piani sociali e artefatti. Lo studio di Soliman e colleghi mostra come il Knowledge Forum faciliti la collaborazione degli studenti, la loro discussione, la costruzione della conoscenza collettiva e la comprensione dei principi KB. Lax e collaboratori evidenziano nel contesto della pratica di cura che gli esperti del mondo reale hanno un valore complementare al facilitatore esperto di KB. Lo studio di Reeve mostra che gli spazi di apprendimento sono messi in atto dagli studenti, non necessariamente sulla base di un progetto di apprendimento previsto a priori. Lo studio di Bielaczyc fornisce un'interessante visione dal punto di vista degli studenti sul senso del passaggio dal belief mode al design mode. Kashi e collaboratori analizzano l'infrastrutturazione per far avanzare un'innovazione a più livelli, sostenibile su larga scala. Sulla base di casi in diverse parti del mondo Laferrière e collaboratori concludono che le connessioni all'interno e tra i sistemi di attività sono necessarie per superare le tensioni nei passi necessari alla sostenibilità e alla diffusione del KB.