How can Knowledge Building (KB) and Knowledge Forum® (KF) Support Plurilingualism in Secondary Science classes?

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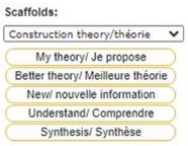

Figure 1: Bilingual Scaffolds

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The Challenge

Students of English as an Additional Language (EAL) new to UK education have to overcome academic language and learning barriers to achieve in the language of instruction. Statistics published in June 2019 by the Department for Education, indicate that a student joining in Year 11 achieves an average attainment score of 23.7, compared to the base line of 46.4 for non-EAL students (Department for Education, 2019). In science classes, EAL students have to acquire a vast specialist academic lexicon in their additional language, and develop sufficiently high levels of scientific understanding to be able to evaluate and solve complex problems collaboratively (Cummins, 2000), (Swanson et al., 2014). Equally, the barriers to participation in collaborative problem-solving they face mean that the communities of learning they join do not benefit from the ideas they could contribute.

Plurilingualism

Growing linguistic diversity worldwide has led to calls, notably from the Council of Europe, to promote plurilingualism and challenge "the squandering of classroom, personal, community, and national linguistic and intellectual resources within the mainstream classroom" (Cummins, 2005, p. 585). By recognising students' linguistic repertoires, educators can help to promote "plurilingual language practices, and the transfer of skills between languages" (Stille & Cummins, 2013, p. 613). Plurilingual pedagogy requires a learning environment which can leverage the potential of a complex yet rich linguistic landscape.

Knowledge Building and Knowledge Forum

KB leverages complex learning environments since it enables students to collaboratively "build coherent knowledge out of fragmentary information coming from multiple sources" (Scardamalia & Bereiter, 2014, p. 402) and the KF® software which supports KB has affordances which make collaborative knowledge building more accessible to linguistically-diverse students, providing an example of how "access to digital media enables teachers and students to foster plurilingualism through multiple modes of representation that extend beyond the boundaries of linear one-dimensional print" (Stille & Cummins, 2013, p. 632).

Knowledge Building Principles for Plurilingualism

GREATER DIVERSITY OF REAL IDEAS FOR COMMUNITY KNOWLEDGE

Facilitating access for EAL students to KB communities means valuing contributions from different perspectives, enriching the pool of ideas in pursuit of real-world understanding (Bereiter & Scardamalia, 2010).

FROM IMPROVABLE IDEAS TO RISE ABOVE

Access to knowledge building with authoritative sources means the ideas of all can be improved. Rise-above raises meta-cognitive and metalinguistic awareness as the community monitors how ideas evolve (Bereiter et al., 2016).

EPISTEMIC AGENCY FOR ALL DEMOCRATISES KNOWLEDGE

KF® offers linguistically-diverse students agency to build their technical knowledge in collaboration with their peers, simultaneously building linguistic knowledge and improving outcomes (Scardamalia, 2002).

SYMMETRIC KNOWLEDGE ADVANCEMENT

KF® makes individual thinking visible to the whole community, creating a virtual dialogic space for collective agency where all linguistic groups gain knowledge from each other.

My PhD Project

MY GOAL

I aim to use a design-based research (DBR) methodology to investigate how KB and KF® can provide a plurilingual dialogic space for science learning and language development in the UK where all the intellectual resources of a multilingual student can be leveraged.This project contributes to a readjustment of attitudes towards the linguistic repertoires and competences of linguistically-diverse students, strengthens recognition of dynamic plurilingual repertoires, widens participation in the creation of knowledge, and supports sustainable linguistic diversity and social justice.

WORK IN PROGRESS

My exploration of KF® has shown that, in addition to 'multilingual notes' and 'enable translation', it is possible to create bilingual scaffolds. I have created and tested a set of bilingual scaffolds (See Figure 1).

To improve my understanding of how the multilingual features of KF® are being used, I am gathering information from members of the KBI community.

I am building a map of conjectures and plan a three-cycle structure for my DBR framework.

NEXT STEPS

I will build on the information gathered, and refine my DBR framework, by running a pilot project.

The pilot project will be set in the context of an extra-curricular STEM club which includes linguistically-diverse secondary students in the UK, who will use KF® with sets of bilingual scaffolds relevant to the languages in the class. I hope to involve the students in creating the translations for the bilingual scaffolds. The goal of the pilot project will be to explore an A-level Biology topic.

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