Knowledge beyond colour lines

Towards repurposing
knowledge generation in
South African Higher Education

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MAKING SENSE OF ARCHITECTURAL 'LANGUAGE'

Implications for success in teaching and learning for
ECP students at CPUT

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Introduction

Overarching aspirations are relevant and noteworthy for our purpose, as outlined in one of the fundamental recommendations for investing in indigenous African languages and multilingual education, spearheaded by the Unesco Institute for Lifelong Learning (Quane & Glanz, 2010:10-11). These aspirations include these:

Increase access to learning and information, and make teaching effective by lifting the language barrier, using the languages mastered by the learners, using socio-culturally relevant curricula, further developing African languages for academic use, training teachers in dealing with multilingualism and cultural diversity as well as language and literacy development, and by providing appropriate teaching and learning materials. The combination of optimising language use and adopting relevant and high quality curricula, teaching methods and materials will result in higher achievement, lower drop-out and repeater rates throughout the education system and lead to a system of education that services individual and social development in Africa.

The aforementioned observations are central to our case study on two counts: first, the steady growth of university student numbers from a diverse linguistic and cultural background, and second, demands that universities in South Africa scrutinise the student population's language needs. In 2018, of the estimated 1,085,325 students enrolled at higher education institutions, indigenous African students comprised 820,470, white students 140,252, coloured students around 65,885, while Indian and Asian students comprised only 47,850 (Heda, 2019). From these statistics, one gathers that most students enrolled at higher education institutions are either second or third language speakers of English, the language of learning and teaching (LoLT), and of Afrikaans, in some cases.

The university of technology in this study, Cape Peninsula University of Technology (CPUT), is also grappling with this challenge; and it is apparent that the situation of numbers, insofar as the reality of a 'beehive' of languages and cultures in universities, is concerned, is not going to disappear but instead probably continue to increase in future. A

sizeable number of South African students are second-language (L2) English speakers yet have experienced most of their education through this medium. For the first time, most Afrikaans-speaking students are experiencing what speakers of other indigenous African languages have experienced through the side-lining of Afrikaans in favour of English at universities such as Stellenbosch, Potchefstroom and Pretoria. Most African students have always spoken English as an additional language, and so “their discourse knowledge is seen as deficient, and their learning is expected to conform to seemingly immutable and often implicit norms laid down by the local academy” (Ryan & Viète, 2009:303). Arguably, “these students struggle to understand [concepts] owing to, amongst other factors, poor everyday English vocabulary and a poor understanding of [architectural] discourse” (Siyepu & Ralarala, 2014:334). To acknowledge the student population’s linguistic rights and provide them with linguistic choices, CPUT has to consider setting up an appropriate infrastructure and supplying sufficient resources to support the enrolled students’ language needs and teaching and learning in that context. Further exacerbating the students’ language problem is that many of these students hail from previously disadvantaged backgrounds, both undergraduate and postgraduate, with their mother tongue languages commanding a far lesser status and usage than that of English – which is predominantly the *de facto* language of teaching and learning in South African universities.

When we consider the worldview of L2 students within the discipline of architectural technology, it is clear that they are often denied access to the meaning-making process owing to their different cultural mindset, personal world view and perspective (Underhill, 2009) when different types of buildings and building components are being considered. Underhill (2009:135) underscores Von Humboldt’s 1888 [1836] constructs of *Weltansicht* (conceptual knowledge) and *Weltanschauung* (cultural beliefs) and Piaget’s (1964) cognitive schemata by describing worldview as including both sensory perceptions (sight, hearing and taste) and mental conceptions resulting from information acquired through sensory perceptions.

According to Underhill (2009), conceptual knowledge is interrelated with the language that humans employ to gain access to sensory perceptions and mental conceptions. Therefore, language can be considered the external evidence of our meaning-making process as it accompanies our conceptual knowledge and cultural beliefs, in turn confirming the Sapir-Whorf language-worldview relationship (Blum, 2008; Perry & Mallozzi, 2015). According to Underhill (2009:17), this relationship explains why people who use the same language may have a different understanding of the world. Due to social stratification, most L2 students at CPUT were exposed to non-mainstream structures and architecture in the communities in which they grew up. Therefore, the building styles, structures and components often referenced in classrooms would, arguably, mostly be foreign to them.

Over the years, various pedagogical practices – that have embraced and harnessed diversity through multilingualism at various levels and forms of applicable modalities – have been employed in the institution. These include but are not limited to these examples:

- Integrating Content and Language (ICL);
- code-switching in the classroom; and
- multilingual team-teaching.

Although these practices seem to have been well received by the community of practitioners concerned, their impact on yielding desirable results is unknown. Quite recently, an innovative technique has been multilingual materials development in three languages, including the development of scientific terms in online multilingual glossaries. This technique is considered to have the potential to contribute to the realisation of satisfactory academic achievement levels and enhance students' communicative skills.

Firstly, potential spinoffs linked to the innovative nature of such initiatives are related to their unavoidable interface with technology. Secondly, other possible benefits connected to this developmental initiative relate to its visual communication dimension framed in audio features. These audio and visual dimensions are not only likely to appeal to students but enhance their comprehension of elements derived from world views other than their own. Accordingly, “through this [additional] process of meaning-making students have the opportunity of exploring multiple identities and various discourses” (Grey, 2002:155); and hence the prediction that appropriate use of these materials and teaching methods will result in higher achievement.

Apart from justifying the use of and integration of isiXhosa and Afrikaans into pedagogical practices for scientific development, the purpose of this chapter is specifically to explore and theorise extended curriculum programme (ECP) students' understanding of

- concepts in the discipline of architecture,
- architectural visual language, and
- coined and translated architectural terminology to develop a better understanding of the discipline.

Thus improving their access to disciplinary knowledge and their academic success insofar as teaching and learning in higher education is concerned.

Theoretical framework

Based on this study's rationale to provide bi- and multilingual ECP students with better conceptual access to the language of architecture, we used Cummins' conceptual framework (1979; 1981a; 2008) and cognitive semiotics (Zlatev, 2012).

Cummins' conceptual framework

Cummins' conceptual framework relates to language proficiency in L1 and L2 and academic performance. Such a framework's potential is that, in principle, it permits findings from many different contexts to be integrated and contribute more effectively to the development of a language proficiency theory and its cross-lingual dimensions (Cummins, 1983:134). Cummins (1981a) employs two intersecting continua in his framework: one horizontal and one vertical. These continua highlight a variety of cognitive demands and contextual support involved in specific language tasks or activities. From left to right, the horizontal continuum highlights various communicative behaviours that operate. These include informal communicative practices like participating in discussions and writing informal letters. The other end of the horizontal continuum includes formal writing and reading, for example, academic articles. Cummins accentuates multisensory cues' significance in communication contexts and asserts that social communication provides more multisensory contextual cues than communication in an academic setting. He also argues that, in many traditional academic settings, the linguistic demands involved in classroom communication, especially for academic literacy acquisition, produces a substantial decrease in the range of multisensory contextual cues. The cues found on this continuum are normally at the far right and mainly linguistic (Cummins, 1983:132).

The vertical continuum of Cummins' (1983) framework refers to the degree of active cognitive processing needed to complete cognitive tasks and activities. Appropriate performance of the tasks and activities situated in the upper part of the continuum requires little active cognitive involvement as mastery has been accomplished. Until mastery occurs or a level closer to mastery has been achieved, a high level of cognitive involvement is required (Cummins, 1983:132).

Cummins (1979, 1981a, 2008) distinguishes between two types of language proficiency:

- basic interpersonal communication skills (BICS) and
- cognitive academic language proficiency (CALP).

This conceptual BICS-CALP distinction highlights the "misconceptions about the nature of language proficiency that were contributing directly to the creation of academic failure among bilingual students" (Cummins, 1999:3). Cummins (1979, 1981a, 2008) created these terms, BICS and CALP, to sensitise educators regarding the timelines and challenges that L2 students face as they attempt to work at the same academic literacy levels, in Geisler's (1995) terms in the required academic language, as their L1 counterparts.

BICS refers to the social, conversational language used for oral communication, while CALP refers to students' ability to understand and express concepts and ideas successfully in an academic setting using both oral and written modes. Respectively, the terms 'conversational

fluency' and 'academic language proficiency' are often used interchangeably with BICS and CALP.

BICS offers many cues to listeners and is context-embedded language. It takes L2 students approximately two years to acquire BICS, depending on the richness of the acquisitional linguistic context. They would then comprehend context-embedded social language by observing non-verbal behaviour, pictures, concrete objects, and other contextual cues present, observing others' reactions, and drawing on voice cues such as phrasing, intonation, and stress (emphasis). Their comprehension is enhanced when they ask for statements to be repeated and concepts clarified.

CALP takes five to seven years for L2-students to develop as they need to become proficient in a particular academic language. They acquire CALP more slowly than BICS because

- there are no non-verbal cues;
- face-to-face interactions are limited;
- academic language is often abstract;
- academic literacy demands are high (narrative and expository text and textbooks are written beyond the language proficiency level of the students); and
- the students lack either or both the necessary cultural and linguistic knowledge required for them to comprehend fully.

BICS-CALP distinction

The original BICS-CALP distinction evolved with the inception of discrete language skills, the learning of rule-governed aspects of a language (including phonology, grammar and spelling) (Cummins, 2000). BICS-CALP can develop in isolation from academic language proficiency and results in students who can read texts fluently but have limited understanding (Cummins, Brown & Sayers, 2007). Cummins' (1983) BICS-CALP distinction is attested to by Biber's (1986) research gathered from a wide variety of oral and written communicative situations. Cummins' (1983) distinction was not proposed as an overall theory of language proficiency but rather as a conceptual distinction to guide policy and practice. A number of scholars delivered critique on this distinction because it removed constructs from their original dialogical or discursive contexts. Baker (1993) views the BICS-CALP distinction as vague, value-laden, over-generalised and misused to stereotype English language learners. Other scholars cited in Street and Hornberger (2008:77) depict this distinction as oversimplified, reflective of an 'autonomous' rather than an 'ideological' notion of literacy, and artefact of 'test-wiseness' and a 'deficit theory' that attributes bilingual students' academic difficulties to their 'low CALP'. Cummins (1984b, 2000) addressed these viewpoints by providing a theoretical framework that inserts the CALP language proficiency concept within a larger theory of common underlying proficiency.

Cummins’ common underlying proficiency model of bilingualism can be pictorially illustrated in the form of two icebergs (Baker, 1993). Each iceberg depicts a different language, and they are separate above the surface. However, beneath the surface, the icebergs overlap, implying that the two languages function collaboratively using the same central processing system.

FIGURE 5.1 Common Underlying Proficiency Model (Central Operating System)

Cummins’ conceptual framework attests that, on its own, language proficiency in an additional language such as English is not enough for L2 students to compete with their L1 counterparts in an academic setting (Cummins, 1984b, 2008). In addition, L2 students’ previous schooling, academic knowledge, and literacy skills in their L1 may contribute to their unequal footing when applying themselves in an academic world where their L2 is the main language (Baker, 1993; Cummins, 1984b). The reason for that is that students with limited proficiency in, for example, English, are often informally assessed upon their ability to comprehend and respond to the conversational English language (Cummins, 1981a, 1981b, 2000, 2003, 2008). From this estimation of students’ proficiency in conversational situations, assumptions may be drawn about their competence to engage with more complex concepts through the medium of an L2, such as English, in an academic, context-reduced and literacy contexts in mainstream classrooms (Cummins, 1980, 1981b). Such assumptions affect the academic trajectories of L2 students and reinforce the clear BICS-CALP distinction (Cummins, 1980, 1981b, 1984, 1999). Therefore, one should consider that, although BICS and CALP are distinguishable, they do not necessarily develop separately. Children create their conceptual framework (world knowledge) from social interactions, mainly in their homes, while developing their critical literacy (cognitive) skills and deeper understanding of concepts from discussions about conceptual issues.

Cognitive semiotics

Cognitive semiotics (CS) can be typified as a transdisciplinary study that facilitates meaning-making by using linguistic information and a variety of other semiotic signs (words, gestures) and emergent meanings (Zlatev, 2012). It draws particularly on methods and theories of semiotics, neuroscience, logic, linguistics, psychology, cognitive science, literary theory, computational modelling, anthropology and philosophy. CS is fundamentally engaged with conceptual and textual analysis and embarks upon experimental and ethnographic investigations. In summary, CS appears to be a field of “disciplines and methods, focused on the multifaceted phenomenon of *meaning*” (Zlatev, 2012:2). It mainly develops higher-order concepts like meaning, sign use, representation, language, and intersubjectivity, along with their inter-relations (Zlatev, 2011). However, people do not exist in separate bubbles made up of ‘representations’ but in a meaningful world developed through their perceptions and actions, such as language and basic perception layers. CS postulates that meaning results from interaction processes between oneself with other(s) and the world, rather than ‘inside’ brains, minds, groups or communities (Zlatev, 2011). In essence, CS considers all aspects of the perceived world to conceptualise meaning. Van Lier (2004:90) explains the value and essence of a CS framework that aims to redress conceptual literacy from a ‘social’ and ‘cognitive’ perspective by using multilingual practices as a resource to mediate learning in L2 contexts: certain aspects of the perceived world are experienced directly as signifying material; other aspects are mediated by a variety of tools, cognitive and social.

The transdisciplinary nature of CS highlights the valuable role it plays in sensitising our teaching and learning perspective on meaning as a comprehensive activity. It employs linguistics and other meaning-making resources of physical, social and symbolic taxonomies and employs “an array of semiotic resources with numerous cues providing potential interpretive opportunities” (Van Lier, 2004:90). Furthermore, Van Lier (2004) attests that the environment in which the linguistic action occurs is “characterized by perceptual diversity that can be brought to bear on processes of *semiosis* or meaning-making”. Semioticians commonly employ semiotic signs and emergent meanings based on what is supposed to be communicated. In other words, meaning is conveyed through codes (these could be sounds or letters people use to create words and body gestures that portray an emotional disposition; or even a diagram).

Zlatev (2009, 2011, 2012) views CS as a kind of methodological triangulation. CS suggests:

- a first-person (subjective) perspective (which refers to conceptual analysis, phenomenological methods, and systematic intuitions), usually applied to perception, mental imagery and norms in language;
- a second-person (intersubjective) perspective (which refers to empathy and imaginative projection), applied to other persons and social interactions; and

- a third-person (objective) perception (which refers to detached observation, experimentation, brain imaging), usually applied to isolated behaviours (for example, spatiotemporal utterances) and biochemical processes.

Andrn (2010) explains that triangulation, or using more than one data collection method, allows researchers to view participants' language engagement and performance in various testing situations.

Zlatev (2012:14) emphasises that the aims of methodological triangulation in CS are to

- to acknowledge the validity of all methods within their respective domain of inquiry;
- to acknowledge the epistemological priority of first- and second-person methods in the study of meaning; and
- integrate the three kinds of methods in the same project.

The relevance of CS can be seen when one considers the methods of investigating an object of study. The problem with 'classical' humanities and natural science, for example, has been a definite negation of third-person methods in cultural world study and even distorting of occurrences (Zlatev, 2011). Gould (2003) emphasises that CS can help repair the gap between science and the humanities.

Literature review

Languages in higher education: Policy and the multilingual reality

One of the challenges facing higher education is set out in the 2002 Language Policy for Higher Education: "[E]nsuring that the existing languages of instruction do not serve as a barrier to access and success" (RSA DHET, 2002:5) as they did in the past. South Africa's history had always favoured the institutionalisation of English (and especially of Afrikaans during apartheid), while African languages lagged as less institutionalised languages, specifically in areas such as academia, legislature and the judiciary (see Alexander, 2003; Braam, 2004; Heugh, 2003; Ralarala, 2019). Even with policies and legislative documents acknowledging South Africa's plurality and promoting multilingualism, where languages were concerned, the legacy of apartheid was carried over in the transition to post-democratic South Africa. In its language policy, the Department of Higher Education proposed rectifying past injustices in line with the country's constitution. However, the policy (RSA DHET, 2002) is laden with contradictory statements, such as this one:

Ministry acknowledges the current position of English and Afrikaans as languages of research and scholarship, but makes a point that it will be necessary to work within the confines of the status quo until such time as other South African languages have been developed to a level where they may be used in all higher education functions.

This further strengthens the Anglocentric mindset to the detriment of indigenous African languages. With the freedom of movement and the improved socio-economic position of most South Africans, there has been a steady move to Anglicisation due to the global dominance of English (Plüddemann, 2013), its perceived currency for upward social mobility (Braam, 2004) and its perceived flexibility for technological thought (Nomlomo, 2004:133). The economic and political “power, privilege and status” of English has always been seen as a necessary resource that gives a head start to those who have acquired competence (Robb, 1995:19). Furthermore, colonial languages’ dominance in Africa (such as English, French and Portuguese) is also rooted in the continent’s colonial and political past. South Africa has experienced a ‘tug of war’ between the British and the Afrikaners. English became a defiance tool to fight the Afrikaner rule; its position as a neutral language strengthened. It further gained prominence as a neutral language in South Africa’s pre-apartheid and post-apartheid political discourse (De Klerk, 2006; Heugh, 2003), the same as other colonial languages in many other postcolonial African countries (Qorro, 2009). Although acknowledging this reality, some scholars have challenged the homogenous view of language. Nomlomo (2004:133) argues against the popular belief that ‘national unity’ can best be achieved solely through English; and cites countries like Switzerland and Singapore that have done considerably well with heterogeneity. Cook (2007:398) also attests to the fallacy that national unity can be attained through language unity, dismissing such claims as entrenched in chauvinistic beliefs that call for abandoning one language in favour of the other.

In South Africa’s case, higher education institutions can benefit from using African languages together with English. There is a mounting body of evidence regarding the benefits of mother-tongue education (Alexander, 2000; Nomlomo, 2004; Mayaba, Ralarala & Angu, 2018). However, the notion that African languages are underdeveloped for education, especially in scientific and technological fields, often muddles the mother-tongue debate.

Against this backdrop, there have been many higher education initiatives to develop African languages terminologies, either through borrowing or coining (Nomlomo, 2004; Mojela, 2010). Several universities have been involved in producing multilingual vocabularies to affirm African languages’ role as viable teaching and learning options. The University of the Western Cape has developed terminology lists in isiXhosa for specialised study fields for disciplines such as mathematics and science, computer science, pharmacy, education and political philosophy (Dalvit, 2010; Maseko, 2011). The South African-Norway Tertiary Development Programme’s multilingualism project with the University of KwaZulu-Natal has developed isiZulu terminology in nursing and midwifery studies (Engelbrecht, Shangase, Majeke, Mthembu & Zondi, 2010). Stellenbosch University developed law concepts in isiXhosa to assist isiXhosa home-language speaking students (Sibula, 2006). The University of Cape Town has embarked on a similar project to assist second-language

English speakers access discipline-specific concepts (Madiba, 2010). These are just a few studies that demonstrate the amount of work that has produced terminologies for education in indigenous African languages. It is also worth noting that the universities of KwaZulu-Natal, North West, Nelson Mandela, among others, have gone beyond developing terminologies to using African languages as languages of instruction (Mbatha, 2009; Plüddemann, Nomlomo & Jabe, 2010; Webb, 2009). All these projects have seen improvements in their students' performance level (Wildsmith, 2013).

A barrage of factors contributes to the poor performance and success of students, such as failures of the school system, socio-economic issues, adjustment to the university environment (Van Rooy & Coetzee-Van Rooy, 2015), "political factors rooted in the educational policies of the past" (Van Dyk, Van de Poel & Van der Slik, 2013). However, language and literacy remain the biggest barriers to educational success (Van Rooy & Coetzee-Van Rooy, 2015). Students who are not adequately literate have an additional burden to master academic discourse. With all these challenges, it becomes clear that many first-year students are not ready to engage in academic discourse and are not equipped with the "higher-order language-thinking skills" needed to succeed in tertiary studies (Van Dyk, Van de Poel & Van der Slik, 2013). The introduction of extended curriculum programmes to ease students into academia is testimony to this reality (Van Rooy & Coetzee-Van Rooy, 2015).

Our society's plurality requires a change in pedagogy to make provisions for African languages in learning programmes. Maseko and Kaschula (2009) note that the current system produces professionals who cannot function or service the needs of the diverse communities that they serve. They (2009:140) point to the favourable position of universities to promote multilingual teaching and learning as their core function in research, enquiry and development:

These institutions should be at the forefront of intellectual debates concerning language and learning ... this involves implementing viable language policies that contribute positively to the tertiary learning environment and consequently the work environment.

In addition, Maseko and Kaschula (2009) focus on language learning for vocations to empower monolingual students in their professional careers to motivate monolingual speakers to embrace heterogeneity in our society. The programmes introduced at Rhodes University are rooted in facilitating "linguistic and cultural sensitivity, tolerance, and diversity ..." (Maseko & Kaschula, 2009:137). Consequently, higher education institutions should not opt for the easy way-out, favouring current teaching and learning languages but should devise ways to develop indigenous languages progressively to better the future workforce and citizenry.

Realistically speaking, the LoLT is not the only barrier to gaining access to the epistemologies of the language of architecture. Learning preferences also present some hindrance. However, inequalities in South Africa's society have meant that students whose first language is not English enter higher education with limited proficiency in LoLT, which is, in most cases, English.

Rationale for the development of multilingual glossaries

In response to calls by the government (in the Constitution and the Language Policy for Higher Education) to promote multilingualism and increase meaningful visibility of indigenous languages in education (RSA, 1996; RSA DHET, 2002), several higher education institutions have embarked on several initiatives to that effect (Rodrigues, 2017). One notable initiative that various institutions undertook is the development of discipline-specific multilingual glossaries. Ralarala, Ivala, Barris, Leach, Mkhize & Somlata (2017) hail such initiatives as these “lay a foundation for, and thus advance, language development and multilingualism”. As one of its Language Implementation Plan's imperative goals, CPUT has included collating multilingual concept glossaries (Ralarala et al., 2017; Manashe, Kabaso, Ralarala & Ivala, 2020).

Besides promoting multilingualism, the multilingual glossaries were introduced to support students with conceptual and linguistic understanding when their L1 is not English. Conceptual understanding is often a challenge at universities and is further exacerbated by using English (Madiba, 2014). However, the rationale for using multilingual resources may not be well understood: “Thus, multilingual glossaries are seen as the panacea to the EAL students' language and conceptual difficulties ...” (Madiba, 2014:68). Ralarala, Pineteh and Mchiza (2016) also draw our attention to English L2 students' struggle with grasping academic concepts, a challenge that eventually translates into poor academic performance. However, this attributes the failure to grasp concepts to limited L2 competence and adds “socio-affective deficient cognitive, background information, language skills and reading comprehension abilities” as contributing factors (Rodrigues, 2017). Nkomo and Madiba (2011:155) raise a similar point where they acknowledge that students' background could also impact their competence in specific subjects.

The reality of our diverse, multilingual society means that multilingual practices such as codeswitching or translanguaging most likely already inhabit perceived monolingual spaces; therefore, these practices should be treated as a resource to address the challenges presented by using English as L2, as the LoLT. According to Cook (2007:396), “very little attention has been given to the role of translation as either a means or an end of learning English”. Such practices are often deemed unfavourable in mainstream teaching, where the

goal may be to teach through a particular medium and guard against 'alien' forces such as multilingual practices.

Methodology

Our study was conducted with ECP students at CPUT, a South African university of technology in a large faculty's architectural programme. We employed a qualitative approach, which allows researchers to interpret the data descriptively. The researchers called on all enrolled ECP students to participate, and the 16 ECP students who volunteered to join a focus group interview became the research sample. As researchers, we purposefully opened the interviews to students from different cultural, linguistic and socio-economic backgrounds as the intention was to ensure that the sample reflected the larger student demographics on the university of technology campus, who are mostly second or third language speakers of English. Therefore, students who belonged to the Xhosa and Afrikaans cultural groups predominantly filled our sample, with few Zulu and Sotho students.

Focus group questions were semi-structured to allow flexibility for interviewers and respondents. The questions addressed a range of foci:

- students' perceptions regarding their languages;
- the LoLT;
- how they used the glossaries; and
- what they would like added to the online platform, and the hardcopy multilingual glossaries.

In addition, the focus group interviews delved into the impact of digital resources on students who experience some challenges with conventionalised practices used in learning spaces.

The researchers identified recurring themes in recorded and transcribed focus group interviews. The following theme was highlighted: the inclusion of other semiotic resources, including the students' diverse linguistic repertoires and knowledge sources.

Findings and discussion

This section analyses students' responses regarding the inclusion of isiXhosa and Afrikaans glossaries in their architectural programme. Our discussion will include excerpts from focus group interviews.

Drawing on the notion that students were socialised in hegemonic Eurocentric learning spaces, other researchers have found that students are reluctant to venture into the use of their home languages (Millar & Barris, 2017:7). The attitude of the cohort of our study

correlates with this finding. Participants expressed their preference for English as the LoLT. One respondent during the interview commented as follows:

I would prefer English but in terms of understanding ... if you want to have one-on-one ... It would be better to have somebody who could explain it in your particular language.

However, according to the cohort, English functionality is restricted to understanding the language of architecture. Participants pointed out that they would gather informally to scaffold a deeper understanding of complex concepts through their home languages or varieties. A common practice by the cohort was to use their language(s), isiXhosa, Afrikaans, isiZulu and Sesotho, as a resource to assist them with threshold concepts and in gaining access to the epistemologies of architecture, thus accentuating their (own languages) value as an additional resource in a hegemonic learning space. They would thus engage in their tongue when requiring a deeper understanding of the discipline. As learning is an active process in which people construct meaning, they would use different semiotic and knowledge sources to negotiate meaning successfully (Carstens, 2016; Van Lier, 2004b). Koda (2004:136) attests that the language students can best associate is essential to scaffold their encounters with new texts and facilitate epistemological access.

In summary, participants concurred that their home languages are essential in negotiating 'meaning'. As they entered university learning spaces with their ways of knowing (Bozalek, Gachago, Alexander, Watters, Wood, Ivala & Herrington, 2013; Hibbert & Van der Walt, 2014) – currently often negated in the mainstream education context (Hornberger & Link, 2012:262) – the cohorts experienced a disparity between their linguistic human rights and background knowledge and that of the university, as their language(s) and background knowledge were undervalued. Even though mainstream schooling does not typically embrace other languages as teaching and learning resources, the less dominant languages are still used in contact sessions among students and private spaces (Hibbert & Van der Walt, 2014).

The misconception that English fully represents the meanings needed to understand disciplinary concepts (Kress, 2010), such as those involved in architectural knowledge, is disproved when we reflect on what the cohort emphasised in the focus group interviews. Furthermore, this standpoint is attested when we consider the different architectural spaces with which L2 students are familiar. Therefore, this implies that the visual elements presented as part of the architectural knowledge body in learning material and spaces would not be aligned with students' cultural repository.

During the interviews, the respondents' general sentiment suggested that, as one respondent stated, they would require "... people for tutoring, mentorship, so that [we] could get more diversity of language"; a clear affirmation that they require a multilingual learning

environment. They voiced strong opinions that more languages would help them better understand and create an unthreatening and learner-friendly environment. According to the cohort, this could be achieved when exposed to a multilingual learning environment with consulting tutors and mentors' support.

In response to a question regarding learning factors that could affect students' academic success, participants contextualised their responses. They referred to a common occurrence in contact sessions in the classroom where they were confused until a fellow student alerted them to the multilingual glossary that could address their misunderstanding. In this regard, consider this verbal utterance:

The lecturer kept on using it [an architectural term] ... and then Linda¹ always has that glossary ... she took it out ... we were so confused ... so since that day this thing actually helps.

After they engage with the glossary, they had a sense of belonging and felt encouraged to participate in the lecture. Previously, these participants had demonstrated avoidance behaviour (Larkin & Pines, 2003) during contact sessions; but their attitude and learning practices subsequently changed when discovering this resource. Students indicated that they would congregate in smaller linguistic hubs and converse in their own tongue to make sense of English lectures. Isenberg (1991) accentuates such discursive groups' importance, as it is often through such structures that students transform into active learners. Inevitably, such practices contribute to improved class participation where the uninformed participants became more motivated and start engaging during lectures with the support of their linguistic peers; and a multilingual glossary also supports their efforts.

From the Afrikaans contingency, a remark regarding engaging with the language in the multilingual glossary was highlighted, illustrating the importance to students of accessibility of knowledge:

It was not the high-level Afrikaans; it wasn't deep that you don't know what is going on; it was very easy.

Blommaert and Rampton (2011:4) advocate a transformative approach in dealing with inaccessible language constructions. They highlight the value of a transition from standardised language towards drawing on multilingual semiotic resources. What makes a transformative approach applicable are the current circumstances where universities are still grappling with the academic literacy development of their new students' (Dyers & Antia, 2017:115), and that these students are differently literate in English as opposed to their literacy in their home language (Dyers & Antia, 2017). Therefore, it is essential that information is represented and displayed learner-friendly in teaching and learning

¹ This pseudonym is used to protect the anonymity of the respondent.

contexts, thus enhancing understanding and promoting learning (Resnick, 2001:32). These functionalities formed an integral part of the development of the glossary for the course Architectural Technology.

The aforementioned requirements (to produce a learning environment that promotes a culture of inclusivity while taking into account the semiotic resources and knowledge sources pertinent to the students) preceded the last interview question: “Which functionalities of an online multilingual glossary contribute to unpacking key concepts?” Participants highlighted that the said glossary offered them much more than they had initially anticipated. They had difficulties during previous searches for understanding. They testified that using the university of technology’s online multilingual glossary had provided them with additional and new material:

I can't find this on the Internet. I can't find this in the dictionary, so we were able to find them because they were in the glossary.

They attested that the online glossary not only provided them with appropriate descriptions for concepts to bridge conceptual gaps (Rodrigues & Abrahams, 2017), but with the additional multimodal resources: visual and auditory elements, and these reshaped their construction of meaning. This scaffolded a deeper understanding of threshold architectural technology concepts. A practical display of reshaping the meaning-making process is alluded to in this explanation of a respondent:

i-brick sisitena ... you draw it like this; I can get the words from the archi-speak ... and then I still need the picture.

The need to transform the information from one mode² to another strengthens the students’ understanding of formerly inaccessible knowledge. Using the “social and cultural resources for meaning-making” (Kress, 2010:79) provided participants with the freedom to become agents of chance or change (Blommaert & Rampton, 2011; Stroud & Kerfoot, 2013). Using and contributing to non-linguistic features in the meaning-making process added value to the students’ process of developing their appreciation of multiliteracies in the discipline (Rodrigues, 2017). Participants acknowledged the impact that the visual and auditory functions had on their learning process. The terminology in the glossary was multifunctional and promoted cross-disciplinary knowledge creation. The use of such eclectic resources creates a platform for further learning possibilities and ultimately contributes to developing an appreciation of multiliteracies (Rodrigues, 2017).

² A mode is a culturally embedded set of resources of knowledge, understanding, and representations which are organized to construct meaning (Vaniti & Towndrow, 2010:321).

Conclusion

Curriculum developers have to devise ways to accommodate and support learners whose proficiency in the LoLT is limited. In its current form, the schooling system creates an illusion that all learners, upon completion of matric, are fully proficient in English (LoLT) and that they can fully navigate academia in this language. The false sense of English proficiency cuts across most higher education institutions (Van Rooy & Coetzee-Van Rooy, 2015), as seen in the context of this study. Upon transitioning from secondary school to tertiary level, students need both academic and language support. Due to the created illusion in the schooling system and limited linguistic and cultural profiling of students at the tertiary level, educators at higher education institutions are not prepared for the students they receive. This research is important in demystifying myths about students' state of readiness upon entering tertiary education and equipping higher education institutions adequately. It is apparent that owing to this small sample of architecture students, more research needs to be conducted with students from other fields of study.

References

- Alexander, N. 2000. English unassailable but unattainable: The dilemma of language policy in South African education. *Praesa Occasional Papers No. 3*. Cape Town: University of Cape Town/ Project for the Study of Alternative Education in South Africa (Praesa). <https://marxists.catbull.com/archive/alexander/1999-english-unassailable.pdf> [Accessed 18 June 2020].
- Alexander, N. 2003. *Language education policy, national and sub-national identities in South Africa*. Strasbourg, France: Language Policy Division, Council of Europe.
- Andrén, M. 2010. Children's gestures between 18 and 30 months. PhD thesis. Lund, Sweden: Lund University.
- Baker, C. 1993. *Foundations of bilingual education and bilingualism*. Clevedon, UK: Multilingual Matters.
- Biber, D. 1986. Spoken and written textual dimensions in English: Resolving the contradictory findings. *Language*, 62(2):384-413. <https://doi.org/10.2307/414678>
- Blommaert, J. & Rampton, B. 2011. Language and superdiversity. *Diversities*, 132:1-21.
- Blum, S.D. 2008. *Making sense of language: Reading in culture and communication*. Oxford, UK: Oxford University Press.
- Bozalek, V., Gachago, D., Alexander, L., Watters, K., Wood, D., Ivala, E. & Herrington, J. 2013. The use of emerging technologies for authentic learning: A South African study in higher education. *British Journal of Educational Technology*, 44(4):629-638. <https://doi.org/10.1111/bjet.12046>
- Braam, D. 2004. *Community perception of change in a school's language policy*. PRAESA Occasional Papers 21. Rondebosch, Cape Town: Project for the study of Alternative Education in South Africa (PRAESA), University of Cape Town.
- Carstens, A. 2016. Translanguaging as a vehicle for L2 acquisition and L1 development: students' perceptions. *Language Matters*, 47(2):55-74. <https://doi.org/10.1080/10228195.2016.1153135>
- Cook, G. 2007. A thing of the future: Translation in language learning. *International Journal of Applied Linguistics*, 17(3):396-401. <https://doi.org/10.1111/j.1473-4192.2007.00160.x>

- Cummins, J. 1979. Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. *Working Papers on Bilingualism*, 19:121-129.
- Cummins, J. 1980. The construct of language proficiency in bilingual education. In: J.E. Alatis (ed). *Current Issues in Bilingual Education (Georgetown University Round Table on Languages and Linguistics)*. Washington DC: Georgetown University Press. 81-103.
- Cummins, J. 1981a. The role of primary language development in promoting educational success for language minority students. In: California State Department of Education (ed). *Schooling and language minority students: A theoretical framework*. Los Angeles, CA: Evaluation, Dissemination and Assessment Center, California State University.
- Cummins, J. 1981b. Age on arrival and immigrant second language learning in Canada: A reassessment. *Applied Linguistics*, 11(2):132-149. <https://doi.org/10.1093/applin/2.2.132>
- Cummins, J. 1983. Language proficiency, biliteracy and French immersion. *Canadian Journal of Education/Revue canadienne de l'éducation*, 8(2):117-138. <http://www.jstor.org/stable/1494722> [22 February 2016]. <https://doi.org/10.2307/1494722>
- Cummins, J. 1984a. *Bilingualism and special education: Issues in assessment and pedagogy*. Clevedon, UK: Multilingual Matters.
- Cummins, J. 1984b. Wanted: A theoretical framework for relating language proficiency to academic achievement among bilingual students. In C. Rivera (ed). *Language proficiency and academic achievement*. Clevedon, UK: Multilingual Matters.
- Cummins, J. 1991. Interdependence of first- and second-language proficiency in bilingual children. In: E. Bialystok (ed). *Language processing in bilingual children*. Cambridge: Cambridge University Press. 70-89. <http://dx.doi.org/10.1017/CBO9780511620652.006>
- Cummins, J. 1999. *BICS and CALP: Clarifying the distinction*. ERIC Document Reproduction Service No. ED438551. <https://files.eric.ed.gov/fulltext/ED438551.pdf> [23 February 2016].
- Cummins, J. 2000. *Language, power and pedagogy: Bilingual children in the crossfire*. Clevedon, UK: Multilingual Matters. <https://doi.org/10.21832/9781853596773>
- Cummins, J. 2008. BICS and CALP: Empirical and Theoretical Status of the Distinction. In: B. Street & N.H. Hornberger (eds). *Encyclopaedia of language and education, 2: Literacy*. 2nd Edition. New York: Springer Science + Business Media LLC. 71-83. http://dx.doi.org/10.1007/978-0-387-30424-3_36
- Cummins, J., Brown, K. & Sayers, D. 2007. *Literacy, technology, and diversity: Teaching for success in changing times*. Boston, MA: Allyn & Bacon.
- Dalvit, L. 2010. Multilingualism and ICT education at Rhodes University: An exploratory study. PhD thesis. Grahamstown: Rhodes University.
- De Klerk, V. 2006. Codeswitching, borrowing and mixing in a corpus of Xhosa English. *The International Journal of Bilingual Education and Bilingualism*, 9(5):597-614. <https://doi.org/10.2167/beb382.0>
- Dyers, C. & Antia, B.E. 2019. Multilingual and multimodal mediation in one university module: The people and processes involved. *Southern African Linguistics and Applied Language Studies*, 37(1):62-76. <https://doi.org/10.2989/16073614.2019.1609365>
- Engelbrecht, C., Shangase, N., Majeke, S., Mthembu, S. & Zondi, Z. 2010. IsiZulu terminology development in nursing and midwifery. *Alterations*, 17(1):249-272.
- Geisler, C. 1995. Academic literacy and the nature of expertise: reading, writing, and knowing in academic philosophy. New York: Routledge. <https://doi.org/10.2307/358283>
- Gould, S. J. 2003. *The hedgehog, the fox and the magister's pox: Mending the gap between science and the humanities*. New York: Harmony Books. <https://doi.org/10.4159/harvard.9780674063402>
- Grey, M. 2002. Drawing with difference: Challenges faced by international students in undergraduate business degree. *Teaching in Higher Education*, 7(2):153-166. <https://doi.org/10.1080/13562510220124268>

- Heda (Higher Education Data Architecture). 2019. Student Headcount Enrolments. http://www.heda.co.za/heda_proxy/sqlreporting/report.aspx?qsKey=5d78a9e8-981d-4901-93b3-620a9f233a56&userId=&objPk=c23bb754-4359-4e7d-ae02-ff25f2b12ef6&ot=4&oid=c23bb754-4359-4e7d-ae02-ff25f2b12ef6&usr=#P4bccd7bb48f24e7fa36c6e0147439ca1_11_25iTOR0x1 [25 November 2019].
- Heugh, K. 2003. Language policy and democracy in South Africa. The prospects of equality within rights-based policy and planning. PhD thesis. Stockholm: Centre for Research on Bilingualism, Stockholm University.
- Hibbert, L. & Van der Walt, C. 2014. *Multilingual universities in South Africa*. London: Multilingual Matters. <https://doi.org/10.21832/9781783091669>
- Hornberger, N.H. & Link, H. 2012. Translanguaging and transnational literacies in multilingual classrooms: a biliteracy lens. *International Journal of Bilingual Education and Bilingualism*, 15(3): 261-278. <https://doi.org/10.1080/13670050.2012.658016>
- Isenberg, J. 1991. Talking across the curriculum: Why and how. Paper presented at Princeton University, Mid-Career Fellowship Program, May.
- Koda, K. 2004. *Insights into second language reading: A cross-linguistic approach*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9781139524841>
- Kress, G. 2010. *Multimodality: A social semiotic approach to contemporary communication*. Abingdon, England: Routledge.
- Larkin, J.E. & Pines, H.A. 2003. Gender and Risk in Public Performance. *Sex Roles*, 49(5/6):197-210. <https://doi.org/10.1023/A:1024689605569>
- Madiba, M. 2010. Fast-tracking concept learning to English as an Additional Language (EAL) students through corpus-based multilingual glossaries. *Alternation*, 17(1):225-248.
- Madiba, M. 2014. Promoting concept literacy through multilingual glossaries: A translanguaging approach. In: L. Hiebert & C. Van der Walt (eds). *Multilingual universities in South Africa*. Bristol, UK: Multilingual Matters. 68-87. <https://doi.org/10.21832/9781783091669-007>
- Manashe, L., Kabaso, B., Ralarala, M. K. & Ivala, E. 2020. An impact study with reference to isiXhosa and Afrikaans multilingual glossaries for first-year law of contracts students at Cape Peninsula University of Technology. In R. H. Kaschula & E. Wolff (eds). *The transformative power of language: From postcolonial to knowledge societies in Africa*. United Kingdom: Cambridge University Press. <https://doi.org/10.1017/9781108671088.009>
- Maseko, P. 2011. Intellectualization of African languages with particular reference to isiXhosa. PhD thesis. Grahamstown: Rhodes University.
- Maseko, P. & Kaschula, R. 2009. Vocational learning and teaching at a South African university: Preparing professionals for multilingual contexts. *Stellenbosch Papers in Linguistics PLUS*, 38:130-142. <https://doi.org/10.5842/38-0-60>
- Mayaba, N.N., Ralarala, M.K. & Angu, P. 2018. Student voice: Perspectives on language and critical pedagogy in South African higher education. *Educational Research for Social Change*, 7(1):1-12. <http://dx.doi.org/10.17159/2221-4070/2018/v7i1a1>
- Mbatha, T. 2009. *Ukuqeqeshwa kothisha besiZulu bamabanga akha isisekelo* [The training of Zulu primary school teachers forms the foundation] (R-3). Paper presented at a Workshop on the training of African Language Teachers, CentRePoL, IFAS and the Faculty of Education, University of Pretoria, Pretoria, March 11-12.
- Millar, B. & Barris, K. 2017. 'To open the bright doors': Student responses to multilingual learning material. In: M.K. Ralarala, K. Barris, E. Ivala & S. Siyepu. 2017. *African languages and language practice research in the 21st century*. Cape Town: CASAS.
- Mojela, V.M. 2010. Borrowing and loan words: The lemmatizing of newly acquired lexical items in Sesotho sa Leboa. *Lexikos*, 20(1):700-707. <https://doi.org/10.4314/lex.v20i1.62746>

- Nkomo, D. & Madiba, M. 2011. The compilation of multilingual concept literary glossaries at the University of Cape Town: A lexicographical function theoretical approach. *Lexikos*, 21(1):144-168. <https://doi.org/10.5788/21-1-41>
- Nomlomo, V. 2004. The teaching and learning of Grade 4 Science through the medium of isiXhosa in the Western Cape: Preliminary findings. In: B. Brock-Utne, S. Desai & M. Qorro (eds). *Researching the language of instruction in Tanzania and South Africa*. Cape Town: African Minds. 131-150.
- Perry, K.H. & Mallozzi, C.A. 2015. Who gets to say? Political and ethical dilemmas for researchers in educational linguistics. In: M. Bigelow & J. Enns-Kananen (eds). *The Routledge handbook of educational linguistics*. New York: Routledge. 397-413.
- Piaget, J. 1964. Development and learning. In: R. Ripple & V. Rockcastle (eds). *Piaget rediscovered*. Ithaca, NY: Cornell University. 7-20.
- Plüddemann, P. 2013. Language policy from below: Bilingual education and heterogeneity in post-apartheid South Africa. PhD thesis. Centre for Research on Bilingualism, Stockholm University, Stockholm, Sweden.
- Plüddemann, P., Nomlomo, V. & Jabe, N. 2010. Using African languages for teacher education. *Alternation*, 17(1):72-91.
- Qorro, M. 2009. Parents' and Policy Makers' Insistence on foreign languages as media of education in Africa: Restricting access to quality education to – for whose benefit? In Brock-Utne, B & Skattum, I (eds). *Languages and education in Africa: a comparative and interdisciplinary analysis*. Oxford. Symposium Books. 57-82.
- Quane, A. & Glanz, C. 2010. *Why and how Africa should invest in African languages and multilingual education: An evidence-and practice-based policy brief*. Hamburg, Germany: Unesco Institute for Lifelong Learning, Association for the Development of Education in Africa (ADEA).
- Ralarala, M.K. 2019. Policy analysis as “text” in higher education: Challenging South Africa’s “Use of Official Languages Act”: A case-based approach. *South African Journal of Higher Education*, 33(4):2530279. <http://doi.org/10.20853/33-4-3030>
- Ralarala, M.K., Ivala, E., Barris, K., Leach, N., Mkhize, L. & Somlata, Z. 2017. Language development and multilingualism at the Cape Peninsula University of Technology. In: E. Wolff, P. Maseko & R. Kaschula (eds). *Multilingualism and intercultural communication: A South African perspective*. Baltimore, Maryland: Project Muse, Johannesburg: Wits University Press.
- Ralarala, M.K., Pinetah, E.A. & Mchiza, Z. 2016. A case study on the language and socio-cultural challenges experienced by international students studying at Cape Peninsula University of Technology. *South African Journal of Higher Education*, 30(4):231-255. <http://dx.doi.org/10.20853/30-4-572>
- Resnick, M. 2001. Rethinking learning in the Digital Age. Available at: <https://llk.media.mit.edu/papers/mres-wef.pdf>. (Accessed on 21 July 2017.)
- Robb, H. 1995. Multilingual preschooling. In: K. Heugh, A. Siegruhn & P. Plüddemann (eds). *Multilingual education for South Africa*. Johannesburg: Heinemann. 15-22.
- Rodrigues, T.R. 2017. Transcending solely print-based texts through blogging – A multimodal approach. *Alternation*, 24(2):167-190. <https://doi.org/10.29086/2519-5476/2017/v24n2a9>
- Rodrigues, T. & Abrahams, A. 2017. Improving reading comprehension skills of first-year electrical engineering students: A community translation approach. M. Ralarala, K. Barris, E. Ivala & S. Siyepu (eds). *Interdisciplinary Themes and Perspectives in African Languages Research in the 21st Century*. Cape Town: CASAS Publishers. 35-56
- RSA (Republic of South Africa). 1996. *Constitution of the Republic of South Africa*. Pretoria: Government Printing Works.

- RSA DHET (Republic of South Africa. Department of Higher Education and Training). 2002. *Language policy for higher education*. Pretoria: Government Printing Works. <http://www.dhet.gov.za/Management%20Support/Language%20Policy%20for%20Higher%20Education.pdf> [25 November 2019].
- Ryan, J. & Viète, R. 2009. Respectful interactions: Learning with international students in the English-speaking academy. *Teaching in Higher Education*, 14(14):303-314. <https://doi.org/10.1080/13562510902898866>
- Sibula, P.M. 2006. Furthering the aim of multilingualism through integrated terminology development. *Lexikos*, 17(1):397-406. <https://doi.org/10.5788/17-0-567>
- Siyepu, S. & Ralarala, M.K. 2014. Making sense of mathematical discourse: implications for success in the learning of differentiation in a university classroom. *Alternation*, 12(Special Edition):326-357.
- Street, B. & Hornberger, N.H. (eds). 2008. *Encyclopaedia of language and education, 2: Literacy*. 2nd Edition. New York: Springer Science + Business Media LLC.
- Stroud, C. & Kerfoot, C. 2013. Towards rethinking multilingualism and language policy for academic literacies. *Linguistics and Education*, 24(4):396-405. <https://doi.org/10.1016/j.linged.2013.09.003>
- Underhill, J.W. 2009. *Humboldt, worldview and language*. Edinburgh, Scotland: Edinburgh University Press. <https://doi.org/10.3366/edinburgh/9780748638420.001.0001>
- Van Dyk, T. Van de Poel, K. & Van der Slik, F. Reading Ability and Academic Acculturation: The case of South African students entering higher education. *Stellenbosch Papers in Linguistics Plus*, 42:353-369. <https://doi.org/10.5842/42-0-146>
- Vaniti, V. & Towndrow, P. 2010. Multimodal literacy in language classrooms. In Hornberger, N.H. & S.L. McKay (eds.): *Sociolinguistics and Language Education*. Bristol: Multilingual Matters.
- Van Lier, L. 2004a. *The ecology and semiotics of language learning: A sociocultural perspective*. New York, NY: Kluwer Academic. <https://doi.org/10.1007/1-4020-7912-5>
- Van Lier, L. 2004b. The semiotics and ecology of language learning: Perception, voice, identity and democracy. *Utbildning & Demokrati* [Education & Democracy], 13(3):79-103. <https://doi.org/10.48059/uod.v13i3.783>
- Van Rooy, B. & Coetzee-Van Rooy, S. 2015. The language issue and academic performance at a South African University. *Southern African Linguistics and Applied Language Studies*, 33(1):31-46. <https://doi.org/10.2989/16073614.2015.1012691>
- Von Humboldt, W. 1988 [1836]. *On language: The diversity of human language – Structure and its influence on the mental development of mankind*. Peter Heath (tr.). Cambridge, UK: Cambridge University Press.
- Webb, V. 2009. Multilingualism in South Africa: The challenge to below. *Language Matters*, 40(2):190-204. <https://doi.org/10.1080/10228190903188591>
- Wildsmith, R. 2013. The African languages in South African education 2009-2011. *Language Teaching*, 46(1): 120-124. <https://doi.org/10.1017/S0261444812000420>
- Zlatev, J. 2009. The semiotic hierarchy: Life, consciousness, signs and language. *Cognitive Semiotics*, 4:169-200. <https://doi.org/10.1515/cogsem.2009.4.spring2009.169>
- Zlatev, J. 2011. What is cognitive semiotics? *Semiotix – A Global Information Magazine*, XN-6. <http://www.semioticon.com/semotix/2011/10/what-is-cognitive-semiotics> [22 June 2015].
- Zlatev, J. 2012. Cognitive semiotics: An emerging field for the transdisciplinary study of meaning. *The Public Journal of Semiotics*, 4(1):2-24. <https://doi.org/10.37693/pjos.2012.4.8837>