

Materials use and development: Synergetic processes and research prospects

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Introduction

Materials are a crucial element of nearly all language classrooms worldwide, and research on materials development and use is central to understanding and enhancing language pedagogy. While the topic of principled materials development for language teaching and learning has produced a robust body of publications, inquiry into materials use in actual learning environments is less well developed. As members of a burgeoning research group known as MUSE International (Materials Use in Language Classrooms: An International Research Group), we are deeply interested and invested in understanding how teachers and students actually use materials in language classrooms.

The purpose of the present article by MUSE International is twofold: we call attention to this emerging area of inquiry on language classroom materials use and seek to articulate the synergy between materials use and materials development. Regarding the first goal, while there is a long-standing and well-established literature on language teaching materials development and evaluation, very few scholars have conducted empirical research on how teachers and students actually use materials (although exceptions include, Canagarajah, 1993; Guerrettaz & Johnston, 2013; Jakonen, 2015; Opoku-Amankwa, 2010). This small yet growing body of research on materials use has been conducted within the tradition of classroom-based, discourse analytic research. Most notably, in 2014, Dr. Elaine Tarone edited a special perspectives column on the role of classroom materials in *The Modern Language Journal* which included contributions from other leading scholars of language education and applied linguistics and called for inquiry on the topic of language classroom materials use! Garton and Graves (2014) in particular identified several topics for further research, such as student engagement with teacher-adapted or teacher-created materials, the relationships between technology and language

materials, and materials' roles in the co-construction of classroom discourse.

In this article, we present our working definitions of language teaching/learning materials and materials use before reviewing the nascent body of literature on the latter. We then describe our understandings of the interrelationships between materials use and materials development through four vignettes that draw from our research or teaching contexts. Across diverse contexts of foreign, dual language and immersion, and heritage language education, we discuss the intersection of materials use and materials development by exploring issues of teacher knowledge, student perspectives, and context. These vignettes highlight the synergy between materials development and materials use and demonstrate current and future avenues for research.

Working Definitions: Language Teaching/Learning Materials and Materials Use

Defining language teaching/learning materials can be problematic due to the varying purposes to which the term is applied. In the broadest sense, materials are 'anything that can be used by language learners to facilitate their learning of the target language' (Tomlinson & Masuhara, 2018, p. 2). The term *materials* has been used in the field to demonstrate the complexity of this 'anything', but more concrete definitions have been offered by those involved in materials research.

Materials have been defined in a number of different ways. An early distinction is as *content* materials (sources of data and information) and *process* materials (guidelines and frameworks to facilitate learners' use of particular content) (Breen, Candlin, & Waters, 1979). Alternatively, others use the term materials to mean both *texts* (in the broadest sense of the term) and language-learning *tasks* (Brown, 1995; Harwood,

1. Tarone, E. (2014). Issue on: Research on Materials and their role in classroom discourse and SLA. *The Modern Language Journal*, 98(2), 652-653.

2010). In the field of Computer-Assisted Language Learning (CALL), learning environments are also considered materials (Levy & Stockwell, 2008). The inclusion of tasks and environments as materials is indicative of the broad understandings in the field, and the pragmatic concerns of practitioners defining materials in a manner suited to their own purposes.

In other ways, the importance of the learner has influenced the definition of materials with a focus on language teaching materials shifting to language learning materials (Tomlinson & Masuhara, 2018). For example, taxonomies have evolved to indicate the function of materials in relation to the learner (Tomlinson, 2001; 2012), or in an even wider vision of materials, including all use of the target language by learners and the teacher in a variety of visual and auditory forms (McGrath, 2013). Whatever the source of materials, it has been suggested that the defining characteristic that typifies materials used for language learning is the deliberate incorporation of a pedagogic purpose (Mishan & Timmis, 2015). What is apparent amid these conceptual complexities is that any definition of materials depends on the purposes and contexts of their use, as illustrated in the vignettes below.

Previous research broadly refers to materials use in relation to materials development and evaluation, though does not provide a precise definition or explicit focus on this concept. We use the term *material use* differently in this paper and aim to flesh out this concept. In our perspective, materials use most simply refers to the ways that participants in language learning environments actually employ and interact with materials. Typically, materials development occurs outside of the classroom. In contrast, materials use occurs in the moment that language teachers and/or learners engage with the materials themselves within the context of a learning environment such as the classroom. 'Broadly speaking at the root of materials use lies action associated with and influenced by materials in some way' (Grandon, 2018, p. 42). Continued research and analytic refinement of both of these key concepts—language teaching/learning materials and materials use—will help researchers, writers, and teachers better understand the complexity of materials and their use.

Literature on Materials Use

Scholars working in the area of materials development recognize the need for studies on materials use in learning settings to understand ways in which participants deploy materials. While research on materials development has been under way for over two decades, exploration into materials use has only just started to receive attention. So far, one area of attention for materials use research focuses on the adaptation of materials in language classrooms; that

is, what happens when teachers make changes to the materials (e.g. McGrath, 2013, 2016). As examples, this line of inquiry has investigated use of teaching strategies in relation to approaches to curriculum (Shawer, 2010), use of multi-level materials for a mixed-level group of learners (Nuangpolmak, 2014), and use of specific adaptation techniques by teachers (Bosompem, 2014; Miguel, 2015). The latter two studies rely on a framework of adaptation techniques proposed by McDonough, Shaw and Masuhara (2013) in literature from materials development, thus demonstrating the close relationship between materials development and materials use. Most adaptation studies highlight the use of materials from the teacher perspective, and place an emphasis on classroom participation through observational and action research. Overall, these studies have shown that teachers adapt materials not only to meet the needs of learners but also in response to factors such as instructional time constraints and their own beliefs about language teaching/learning. As such, McDonough *et al.* (2013) explain that adaptation is linked to evaluation of materials through use.

In the field of literacies, materials use has also received particular attention in recent research initiatives, including New Literacies Studies (Barton, Hamilton, & Ivanic, 2000; Street, 1998), Multiliteracies (New London Group, 1996), and multimodality studies (Kress, Jewitt, Ogborn, & Tsatsarelis, 2001; Kress & van Leeuwen, 2001). In a departure from the prevalent focus on verbal communication in the field, these research strands highlight the affordances that arise from use of various semiotic resources available in classrooms, such as texts, images, sounds, gestures, movements, and new technological tools (Flewitt, 2006; Kenner, 2004; Kress & van Leeuwen, 1996). In other areas where materials use has been studied, some CALL researchers have analyzed classroom data as related to computer software and/or videos (e.g. Cross, 2009; Gruba, 2006; Herron, York, Corrie, & Cole, 2006). Such studies often emphasize the impact of technology usage on listening skills.

In addition, in the field of TESOL and applied linguistics, there has also been an emerging interest in the role of classroom materials from an ecological perspective (Guerrettaz & Johnston, 2013; Thoms, 2014; Jakonen, 2015). This line of studies conceptualizes the classroom as an ecological system consisting of complex and interrelated sets of participants and elements ranging from learners, teachers, classroom discourse, materials, and other artifacts such as digital and online resources, shedding light upon the relationships between classroom materials and other elements in the classroom ecology.

Building on the wealth of research on materials development and the small but growing body of research on language classroom materials use, the members of MUSE International are engaged in

inquiry in diverse language teaching contexts. In the next section, four members of MUSE share brief vignettes from their research and teaching contexts that highlight the important synergy between processes of materials development and materials use.

MUSE International Vignettes

In this section, we draw on the experiences of some of our MUSE International group members. Marcus Grandon, Siwon Lee, Corinne Mathieu, and Anne Marie Guerrettaz present four brief vignettes from their experiences in English as a foreign language (EFL), Korean heritage language education, one-way Spanish immersion, and French as a foreign language education, respectively. The first vignette is drawn from Marcus's experiences of teaching English in Japan, and the latter three emerged from Siwon's, Corinne's, and Anne Marie's research sites across the United States. Salient themes related to materials development and use that arise within and across these scenarios will be explored in the analysis section.

Marcus: Montage Videos into the Classroom

I (Marcus) became interested in the use of materials for practical reasons. As an EFL teacher in Japanese higher education, the majority of the courses that I teach focus on oral communication skills. Typically, these are compulsory courses with upwards of 30 learners, and I am always looking for ways to maximize student-talking time. As a videographer, I like to shoot videos of my travels, and make short montage videos accompanied by instrumental music. These have been well-received by friends and media professionals. What I really like about the videos is that people from multiple countries can watch them together because no language is used. However, I never considered them to be language teaching materials.

Then, one day in the final lesson of a semester, I shared one of these videos with my students, which they seemed to enjoy. Two years after showing that video, I happened to meet one of those students while out shopping. With enthusiasm, she then made several comments about how the video had been a positive and memorable part of her classroom experience. That chance meeting got me thinking about how I could design lessons around these videos to nurture constructive pair-work experiences. So, I created and pilot-tested lessons built around these videos. Although different from traditional instructional methods in Japan, I firmly believe that pair work has benefits for language learners. In addition to a lively classroom atmosphere, many pair-work activities offer practical language use. Several colleagues became interested in my video materials and before I knew it, I had produced two local textbooks (Grandon, 2005, 2008) that were being used at seven universities.

I really wanted to better understand how my video-based materials functioned in class. Furthermore, I wanted to learn how other types of videos were used. As a result, I started to investigate how different kinds of videos are used in classrooms. Imagine my surprise when I discovered a lack of published research on the actual use of materials. As a language teacher, I just assumed that use of materials in classrooms had been well-researched. How else could effective materials be created if we did not know how they are used? I started to look for others who are interested in researching the use of materials. I continue to ask questions about video-based lessons: How do learners use video materials? How do teachers use videos? How do different genres of video function in classrooms?

Siwon: Teacher and Student Interpretation of Materials

My (Siwon's) research context is a community-based Korean heritage language (HL) school in the United States, which is the focal site of my dissertation research. The semester I began fieldwork, the school decided to adopt secondary school Korean language arts textbooks from South Korea, as it received regular support from the Korean government. This is not a unique case in that many community-based HL programs are reported to suffer from a lack of materials, and a prevailing practice has been to adopt foreign language textbooks or language arts textbooks from the home countries (Kagan & Dillon, 2008; Lee, 2002; Sohn, 1995). However, there is still little empirical research on how these textbooks are used in HL classrooms, which in turn should inform the development of materials for HL learners. This was the reason why I became interested in exploring how teachers and students in the school interpreted and utilized the Korean language arts textbooks that suddenly became available to them with the support from South Korea.

As I observed classroom interactions, I found that the new textbooks engendered various interpretations and responses from teachers and students in the classroom, which led to interesting discussions and learning opportunities. The teachers and students were clearly aware of the fact that the textbook was written in the South Korean context, and this awareness often led to the discussion of 'we' and 'they'—that is, intercultural differences between Korea and the United States and between Korean Americans and Koreans. At the same time, they empathized with the stories and characters in the textbook drawing on their common identities as 'Koreans,' 'students,' 'friends,' 'daughters' and 'sons'. Also, although the textbook was written in Korean, the students and teachers often discussed the textbook contents and vocabulary through translanguaging practices and dramatizations, drawing on their own communicative repertoires, which also led to further language learning opportunities.

These findings reveal the complex classroom ecology (van Lier, 2004), where the textbook, students, and teachers interact with one another and engender new learning opportunities by presenting certain cultural perspectives, identity positionings, and communicative repertoires, in ways that would never have been intended by the textbook authors or (in this case) the South Korean government. In my dissertation, one of my goals is to provide practical suggestions for developing materials suited for the needs of HL learners by closely analyzing how these interactions happen in the classroom ecology.

Corinne: Materials Use in Secondary Spanish Dual Language and Immersion Classrooms

Dual language and immersion (DLI) programs in the United States are a form of content-based instruction in which the target language is the vehicle through which the subject matter (e.g., math, science, history) is learned, rather than a separate focus of study. In the European context, the term content-and-language integrated learning (CLIL) is used for content-based language programs, and the CLIL approach has many similarities to DLI (Cenoz, Genesee & Gorter, 2014). In both contexts, curricular materials used in the classroom are designed to support content teaching and function differently than those used in traditional EFL or World Language classrooms. I (Corinne) am interested in materials use research in the DLI context because DLI educators consistently cite a lack of appropriate materials as a challenge to integrating content and language effectively (e.g., Cammarata & Tedick, 2012; Walker & Tedick, 2000).

To explore the roles of materials in a DLI classroom ecology, I observed and collected data over the course of one unit in a seventh-grade Spanish immersion social studies class. I found that because the materials were very much social studies materials that happened to be translated into Spanish, their designs did not engender opportunities for language instruction or content and language integration. For example, the textbook was text-heavy and fact-based, with only limited pictures and bolded key vocabulary words providing linguistic scaffolds. Moreover, the teacher mobilized the materials in ways that not only privileged content but also privileged a one-correct-answer paradigm (Tanner, Olin-Scheller & Tengberg, 2017; Zwiers, O'Hara & Pritchard, 2014), which further limited the type and amount of discourse that students produced. When looking for correct answers in the textbook, students nearly exclusively produced short utterances and communicative rather than academic language functions. Because they produced very little academic discourse when engaging with the materials, students rarely participated in language-related episodes, possibly constraining opportunities for language development (Swain & Lapkin, 1998). The teacher's mobilization of the materials was influenced

by two compounding factors: the teacher's main objective that students be prepared for the fact-based unit exam, and the design of the materials, which mainly represented display comprehension questions or cued cloze activities to support learning.

While the findings that materials' designs can engender certain discourse or instructional processes is not new (see, for example, Guerrettaz & Johnston, 2013), I was intrigued by the complexity of the DLI space where, given their centrality, materials really must support both subject matter learning and second language development (see Morton, 2013 for a similar discussion of CLIL materials). This study has led me to further hypothesize that in content-based instructional contexts in which teacher identities and practices are often strongly oriented toward subject matter (Fortune, Tedick, & Walker, 2008), the design of materials might serve an integral role in shifting attention back towards language. This exploratory materials use study, therefore, will inform my future research on materials development and design. I intend to continue with this research agenda by incorporating language-focused design elements into DLI materials with the hopes of supporting DLI teachers' efforts in integrating content and language in their classrooms.

Anne Marie: French Professor as Materials Creator and Classroom Orchestrator

In 2015, I (Anne Marie) conducted a semester long case study of a French as a foreign language class in a large public university in the United States. In this beginning level language course, the French instructor, Sophie (a pseudonym), developed almost all of her materials herself. While many teachers develop some or many of their materials, it was striking to see an instructor completely set aside the prescribed textbook and create such an overwhelming portion of the course materials. The department required the class to purchase the book, which Sophie rarely used and students came to view as a reference text.

The teacher had made her own materials because she believed the activities and tasks in the commercially produced textbook to be inadequate and monotonous. While the teacher-created materials were innovative in many respects, my research quickly revealed that in reality they followed patterns of grammar-translation language pedagogy embedded in the pages of the textbook by, for example, focusing heavily on written activities such as fill-in-the-blank and matching tasks concerned with grammar and vocabulary.

Interestingly, Sophie reported that as a scholar of French literature, she had limited training in second language pedagogy and had not anticipated teaching rudimentary French language classes in the United States. She had several years of language teaching experience and her expertise in language pedagogy

came predominantly from her on-the-job learning. She reported that the commercial textbook prescribed for this beginning French class was similar to other grammar-translation focused texts she had used in the past. Sophie's materials development patterns and professional history suggest that her knowledge of language teaching was largely derived from her experience with grammar-translation oriented textbooks. This was a strong reminder of how central language teacher expertise is to the synergy between processes of materials use and materials development (see also Tsui, 2003).

This dedicated teacher believed that her created materials departed significantly from the pedagogy embedded in the textbook, yet my observational data painted a different picture. This dissonance between her beliefs and my observations about her materials highlights the importance of longitudinal classroom-based research on materials use. This mismatch between her and my perspectives also pushed me to dig deeper in order to better understand her pedagogy. I initially saw only the 'grammar-translation' orientation of Sophie's materials. Yet I eventually came to understand this teacher, the students, the materials, the students' tools (e.g., reference texts, notebooks), the classroom environment (e.g., physical space, chalkboard), and classroom language as a highly complex multimodal system (see Canagarajah, 2018), and Sophie as its head engineer. She was constantly orchestrating meaning-making within and across the material objects (e.g., the board, notebooks, pedagogical materials) and people of the classroom. I gained a deep appreciation for the expertise that this requires and wondered what more Sophie and other foreign language teachers, myself included, could learn about language teaching by studying materials in classroom interaction.

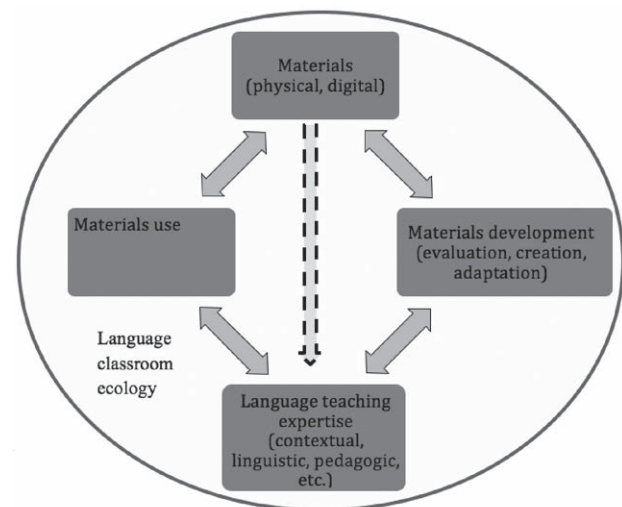
Reflections on Vignettes and Future Research

These four vignettes from Marcus's teaching context and Siwon's, Corinne's, and Anne Marie's research contexts provided brief glimpses into ways that materials development and materials use intersect, in both teaching practice and classroom-based research. They demonstrate the potential and need for investigation of how materials provide or inhibit language learning opportunities, how actors in the classroom utilize such resources, and how materials affect various elements of the classroom ecology.

As illustrated in the vignettes, one frequent consideration in our research on language classroom materials use is the critical role of the teacher in mediating the impacts of materials on the classroom (for example, on student learning and classroom discourse). Marcus's vignette demonstrates how a teacher can leverage newly-developed materials—personal videos—to support his

pedagogical beliefs about language learning, such as the benefits of pair work. In contrast, Anne Marie's and Corinne's vignettes illustrate some obstacles vis-à-vis the creation of effective language learning materials, including widespread contextual difficulties in the case of scarce DLI materials and individual challenges as they relate to pedagogical training and teacher beliefs. These complex interrelationships between materials use, materials development, and teacher expertise are illustrated in Figure 1. This conceptualization shows a reciprocal relationship between materials use and materials development that is mediated by language teacher expertise. The actual processes of developing and using materials in the classroom also affect language teacher knowledge.

In thinking about the relationship between materials use and teacher expertise, it is also important to consider how processes of materials development affect teacher knowledge, materials use, and the classroom more broadly. Investigating materials use is a key way for teachers to participate in the research process. Teachers and classroom-based researchers are best positioned to conduct such studies and enable voices from classrooms to inform theory.



In addition to the role of teacher expertise, student agency and experience is another factor that needs to be considered in research on materials use and development. Siwon's research in Korean heritage language education in the United States shows how bilingual immigrant youth perform their own identities and communicative repertoires in response to the monolingual textbook imposed as a top-down language policy. This is one of several examples of how materials and how they are used might interact with student identity in the language classroom (see also Canagarajah, 1993; Chun, 2016; Helmer, 2014; Yakhontova, 2001).

Future research on language teaching materials use must raise a range of research questions by placing students at the center. For example, what is the relationship between language classroom materials use and questions of identity as they relate to language learners? Moreover, how do particular types of materials and teachers' deployment of classroom artifacts (i.e., materials) optimize student agency? Another critical question that must take into account students' experiences is the interrelationship between materials use and classroom interaction and discourse.

These vignettes also illustrate the importance of contextual considerations in researching materials use since context critically shapes language classrooms. The ways that materials are used are also informed by forces seemingly external to the classroom such as language policy and politics, as illustrated in Siwon's and Corinne's vignettes. For example, Corinne's research in Spanish immersion education in the United States highlights the problem of the lack of adequate materials for DLI classrooms and shows the need for the development of context-appropriate materials that then foster effective materials use. While there is globally an abundance of English language teaching/learning materials, Marcus's vignette regarding his montage videos clearly shows that even in the teaching of dominant international languages, teacher innovation is an invaluable resource that powerfully affects student experiences.

Conclusion

It would not be an overstatement to again emphasize that materials are key actors in language classrooms and essential elements in language teaching and learning processes. Our four vignettes across diverse learning and research contexts illustrate how language teaching materials interact with various other actors, such as teachers and students, which in turn can lead to the adaptation and development of future materials. The vignettes also demonstrate the range of disciplinary approaches from which materials use research can draw, such as language teacher education and expertise, second language learning, multimodality studies, and analysis of classroom interaction, to name but a few. In this way, classroom-based materials use research is innovative and contributes important understanding to the symbiotic and iterative relationship between materials development and materials use in language instruction. This paper serves as an introduction to the synergy between materials development and materials use research, and we hope that it will foster future dialogue as the two branches of language education support and engage with one another.

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Keywords organization of educational process, synergetic approach, higher education, education manager. RESUMEN - an increase in the requirements for students' research and social work; - the development of academic mobility programs for future teachers. The need to use the synergetic approach in the organization of the learning process is predetermined by the fact that the subject-based professional training system developed in higher education is oriented towards independent, severely restricted academic subjects, which leads to deterring the process of formation and development of interdisciplinary links that are the most important imperative (factor) for training a modern specialist. The conducted research was aimed to analyze the application prospects of synergetic theory for the project management in the base of system synergetic knowledge. Mechanisms of nonlinear developments in view of the general theory of self-organizing systems are examined. The application possibilities of the general synergetic knowledge principles are examined as integrative disciplines for project management methodology. Comparative analysis of traditional and synergetic approaches to the organization development project management is presented. The discussion of project structure, project phase Materials Development and Research - Making the Connection. Jack C. Richards. Paper presented at a colloquium on research and materials development, at the TESOL Convention, San Antonio, March 2005. Within applied linguistics the activities of those involved in developing instructional materials and those working in second language learning research and the more theoretical areas of applied linguistics are often seen to have little connection. 6. Language learning is a gradual process that involves creative use of language and trial and error. Although errors are a normal product of learning the ultimate goal of learning is to be able to use the new language both accurately and fluently. This process is used in all research and evaluation projects, regardless of the research method (scientific method of inquiry, evaluation research, or action research). The process focuses on testing hunches or ideas in a park and recreation setting through a systematic process. Research projects can focus on a specific group of people, facilities, park development, employee evaluations, programs, financial status, marketing efforts, or the integration of technology into the operations. For example, if a researcher wants to examine a specific group of people in the community, the study could examine a specific age group, males or females, people living in a specific geographic area, or a specific ethnic group. Innovative methods of processing and analysis of metal-containing raw materials based on adsorption phenomenon I.V. Pleskunov, A.G. Syrkov, L.A. Yachmenova & A.S. Mustafaev. The patterns of bitumen distribution onto surfaces of different mineral materials V.V. Vasil'ev, A.S. Ivkin, E.V. Salamatova, N.K. Kondrasheva & G.S. Givirovskiy. Effective use of raw materials as a common goal for Germany and Russia. Development algorithms for raw materials markets. Research-experimental and design work, aimed at development of technology and equipment for drilling in ice commenced in 1967 in Leningrad Mining Institute by the order of the Arctic and Antarctic Research Institute. By that time a number of countries achieved much progress in this field.