Developing multimodal communicative competence: Insights from "semantic gravity" and the Knowledge Process framework

Abstract: This article explores how EFL students' multimodal communicative competence can benefit from a pedagogical design, informed by "semantic gravity" (i.e. the extent to which meaning is dependent on a context) and the Knowledge Process framework (i.e. epistemic moves of *experiencing*, *conceptualizing*, *analyzing*, and *applying*). 68 Chinese EFL students were enrolled in a workshop-style course on becoming effective communicators. The study focused on a thematic unit about multimodal communication, which included two 90-minute lessons and a take-home assignment (i.e. an essay on four subtitled versions of a nursery rhyme). The students were engaged in semantic waves between concrete multimodal products/practices and a multimodal metalanguage and pedagogical weaving between *experiencing*, *conceptualizing*, *analyzing*, and *applying*. Thematic analysis of the students' essays showed that the students were able to (a) analyze the metafunctions in the four subtitled videos; (b) analyze modal contribution and intersemiotic complementarity; (c) evaluate the subtitles from a semiotic perspective; (d) offer ideas to recreate the subtitled nursery rhyme as a multimodal ensemble; and (e) recognize the multimodal nature of communication. Implications are drawn for EFL teachers to use "semantic gravity" and the Knowledge Process framework to move pedagogies in the direction of multimodality.

Keywords: multimodal communicative competence; semantic gravity; Knowledge Process framework; EFL

1. Introduction

In the 21st century, EFL teachers have been increasingly called upon to better prepare students for the multimodal nature of communication occasioned by new technologies and media (Early et al., 2015). As such, pedagogical space should be created in EFL classrooms to develop students' multimodal communicative competence (MCC), defined as "the ability to understand the combined potential of various modes for making meaning" (Royce, 2002, p. 192). In response to the call for multimodal pedagogies, EFL researchers/teachers

have designed various multimodal projects, such as PowerPoint presentations (Hung et al., 2013), digital storytelling (Nishioka, 2016), and video making (Jiang & Luk, 2016). While these projects drive students' motivation and facilitate expression of authorial voices (Li, 2020; Shin et al., 2020), they are readily available in students' lifeworld. This possibly prompted van Leeuwen (2015) to ask "What multimodal skills that are of value to students can schools (and universities) provide that students do not already have access to?" (p. 588). Thus far, multimodal projects have tended to focus on *production*, with relatively little regard to the *reception/interpretation* of multimodal texts (but see Coccetta, 2018 for an exception). Students' MCC should include the abilities "to communicate effectively through multimodal representations" *and* "to view multimodal texts critically" (Lim & Tan, 2018, p. 291). In fact, the abilities to analyze, interpret, and evaluate multimodal texts are included in the national curriculum in Australia (Callow, 2020) and Singapore (Lim & Tan, 2018). A growing body of studies from these countries have shown that when a metalanguage is explicitly taught, students develop critical awareness and a deeper understanding of the forms, functions, and patterns of multimodal texts (Lim & Tan, 2018; Macken-Horarik, 2016; Unsworth, 2006; Unsworth & Mills, 2020). However, such a critical/interpretive element (i.e. metalanguage) has been under-represented in EFL multimodal pedagogies. Therefore, one major objective of this study is to explore how a pedagogical design featuring both multimodal products/practices and a multimodal metalanguage can benefit EFL students' MCC. The pedagogical design is guided by "semantic gravity" (Maton, 2013, 2016) and the Knowledge Process framework (Cope & Kalantzis, 2015; Kalantzis & Cope, 2012), both of which are explained in the following sections.

2. Multimodal communicative competence and semantic gravity

Two decades ago, Royce (2002) argued that EFL teachers should develop students' multimodal communicative competence (MCC), which entails the abilities to understand and construct texts that draw on multiple modes (e.g. linguistic, visual, and gestural). Since then, efforts have been made to move EFL pedagogies in the direction of multimodality. A recent example includes Yeh's (2018) study, which asked students to make videos to showcase their local culture. The students reported that they were aware of the possibilities

of using pictures, sound, and shooting angles to encode meanings. Similarly, in Jiang et al.'s (forthcoming) study, the video-making project afforded rich opportunities for the focal ethnic minority student to draw on multilingual/multimodal resources and sustain her investment in English learning.

While these studies provide valuable insight into the (perceived or observed) benefits of multimodal projects, a metalanguage appeared to be absent from the pedagogical design that could otherwise promote students' deeper conception of and reflection on semiotic resources. For instance, in Yeh's (2018) study, the students' reflections on the multimodal skills were mainly expressed in everyday language. Maton (2013) points out that these concretized expressions are characteristic of high semantic gravity. "Semantic gravity refers to the degree to which meaning relates to its context" (Maton, 2016, p. 15). Higher semantic gravity (SG+) means that more contextualized, concrete, and non-technical concepts are deployed, as opposed to more abstract and generalized concepts in lower semantic gravity (SG-). The students in Yeh's (2018) study and similar others focused on multimodal practices of high semantic gravity (i.e. specific to their local contexts), as represented by the blue line in Figure 1 (following Maton's [2016] convention of mapping the sematic gravity scale). However, based on Maton's (2013) theorization of "sematic waves" (i.e. varying levels of context-dependency and abstraction), EFL classrooms can move up the semantic scale through the overt instruction of a multimodal metalanguage, such as "intersemiotic complementarity" (i.e. how modes operate in concert to make meanings; Royce, 2002) and "multimodal ensembles" (i.e. products of "selecting/assembling/designing" multiple modes to "meet the rhetor's interests"; Kress, 2010, p. 162). These abstract and generalized concepts will become thinking tools to guide students' subsequent multimodal practices, as represented by the red line in Figure 1. The semantic waves between concrete particularities (SG+) and abstract conceptualizations (SG-) can bring practice and theory into dialogue (Maton, 2016), thus enabling students to become skillful and reflective multimodal communicators.

[Insert Figure 1 here]

3

In the literature, the three metafunctions grounded in the systemic functional linguistics have been widely used as a useful set of metalanguage to understand communication across languages and modes (Unsworth, 2006). For instance, in Macken-Horarik's (2016) study, students were introduced to the concepts of ideational metafunction (i.e. the representation of experiences, people, and objects), interpersonal metafunction (i.e. the construction of social relations) and textual metafunction (i.e. the organization of the message) (Halliday & Matthiessen, 2004). Analysis of students' written responses to picture books showed that the metalanguage enabled them to identify modes, analyze functions, and interpret semiotic significance. This study and similar others (e.g. Pantaleo, 2016, 2017; Ravelli, 2019; Unsworth & Mills, 2020) demonstrate the benefits of equipping students with a metalanguage to make implicit semiotic choices/meanings explicit so that they can evaluate the "modal division of labor" (Kress, 2010, p. 11) and interpret how multiple modes work together to "meet the rhetor's interests" (Kress, 2010, p. 162). In sum, Maton's (2013) notion of "semantic gravity" and existing studies from English-speaking countries provide theoretical and empirical support to the overt instruction of technical vocabularies. However, explicitly teaching students a metalanguage is still not popular in EFL multimodal classrooms. While Coccetta (2018), as a valuable exception, elucidated how a metalanguage could aid EFL students' multimodal text analysis, more information is needed to plan and sequence activities in multimodal pedagogies that develop students' abilities to interpret and produce multimodal texts. As such, our study seeks to demonstrate how multimodal practices (SG+) and multimodal concepts (SG-) can be systematically integrated into EFL pedagogies, informed by the Knowledge Process framework.

3. Knowledge Process framework

In the original manifesto of the pedagogy of multiliteracies (New London Group, 1996), four elements were proposed to guide curriculum development and lesson planning: *situated practice*, *overt instruction*, *critical framing*, and *transformed practice*. Subsequently, these elements have been reconceptualized as four Knowledge Processes to facilitate "epistemic moves, or things students can do to know": *experiencing, conceptualizing, analyzing,* and *applying* (Kalantzis & Cope, 2012, p. 359). Each Knowledge Process can be divided into two sub-processes, the details of which are

provided below.

Experiencing refers to drawing on students' prior and/or new experience in the learning process. In *experiencing the known*, students' personal interests, prior knowledge, and lifeworld experience are tapped. Examples in a multimodal classroom include students discussing their selfies and how they use emoticons in text messaging. When *experiencing the new*, students are exposed to unfamiliar experience, "situations, and texts" (Mills, 2015, p. 174). Engaging students in a new genre (e.g. watching a parody video) and new audience (e.g. making videos for intercultural peers) are examples of *experiencing the new*. Here, "new" is relative to students' perception. The "new" is experientially unfamiliar to students but at the same time familiar enough to "make intuitive overall sense" so that scaffolded learning can happen (Cope & Kalantzis, 2015, p. 19).

Conceptualizing is a Knowledge Process in which students develop abstract concepts, a metalanguage or interpretive system to identify, synthesize, and organize experiences, texts, and meaning-making resources. *Conceptualizing by naming* requires students to use abstract concepts to identify and categorize particularities, while *conceptualizing with theory* focuses on using a systematic, explicit conceptual framework to "[uncover] implicit or underlying realities" (Cope & Kalantzis, 2015, p. 20). For example, asking students to identify semiotic modes in a parody video targets the sub-process of *conceptualizing by naming*, while generalizing obligatory and optional genre moves after watching parody videos is an instance of *conceptualizing with theory*.

Analyzing refers to examining the function and "inter-relation of the constituent elements" of texts, and "the underlying rationale for a particular piece of knowledge, action, object or represented meaning" (Cope & Kalantzis, 2015, p. 20). *Analyzing functionally* requires students to examine the structure, function, and relation of constituent elements in a communication act. This includes, for example, analyzing the modal relations in a video and drawing conclusions about whether these modes work with or against each other. *Analyzing critically* asks students to examine the interests, motives, and intentions embedded in a text. One example is discussing why the color "red" is more often used in Chinese advertisements of wedding gifts vis-à-vis their American counterparts.

Applying is a Knowledge Process in which students act upon their experiential, conceptual, and analytical knowledge (Cope & Kalantzis, 2015). *Applying appropriately*

involves students acting upon knowledge in line with conventions and norms, while *applying creatively* entails using knowledge in unpredictable, unconventional and innovative ways. Making a parody video following typical genre moves is an instance of *applying appropriately*. Examples of *applying creatively* include transforming a narrative story into a rap, and designing an animated wedding invitation for a Chinese groom and his American wife (which hybridizes Chinese and American wedding invitation genres).

The Knowledge Process framework provides a useful set of heuristics to design activities that systematically engage students in *experiencing*, *conceptualizing*, *analyzing*, and *applying* multimodal knowledge, thereby moving EFL pedagogies in the direction of multimodality. Although the framework has been adopted in various sociocultural contexts (e.g. Australia and South Africa) and subject domains (e.g. audiology and advertisement) (Cope & Kalantzis, 2015), its application in EFL classrooms has been limited to learning material analysis (Rowland et al., 2014) and reading practices (Bhooth et al., 2015). As such, this article seeks to address the following research question: to what extent did a pedagogical design informed by "semantic gravity" and the Knowledge Process framework develop EFL students' MCC?

3. The study

3.1 Context and participants

This study involved 68 Chinese EFL students at a first-tier university in China. They were enrolled in a workshop-style course to train them to become effective communicators. One unit of the course focused on multimodality. The design of this thematic unit was guided by the notion of "semantic gravity" (Maton, 2013, 2016) and the Knowledge Process framework (Kalantzis & Cope, 2015). To elevate students' everyday understanding about multimodal communication, a metalanguage (see Appendix A) was introduced to the students. Figure 2 summarizes the pedagogical procedures in relation to semantic gravity, knowledge (sub)processes, and MCC concepts/skills. The following subsections describe the pedagogical design in details.

[Insert Figure 2 here]

6

3.2 Upward semantic shifts: Experiencing & Conceptualizing

In Lesson 1, as an activity with high semantic gravity (SG+), the students watched video excerpts from an intra-lingual Chinese-subtitled film, *Qi Men Dun Jia* (Yuen, 2017). This fantasy-wuxia film follows members of a clan in their quest to fight against outer space creatures. As the students were familiar with the movie, the viewing activity was regarded as an instance of *experiencing the known.* One pedagogically relevant point is that the clan members use sign language as a secret code for communication. All sign-language scenes come with Chinese subtitles, explaining to viewers what the members are "talking" about. These subtitles are part of the closed captions of the film, contributing to the running flow of the intra-lingual subtitles. However, in one particular scene, the flow is interrupted: when a member signs to her clan "brother," no (explanation) subtitles are provided. The semiotic meaning is revealed later: the "brother" is an imposter ignorant of the sign/clan language. After watching these video excerpts, the students were exposed to an upward semantic shift from concrete audiovisual instances with high semantic gravity (SG+) to abstract multimodal concepts with low semantic gravity (SG-). Specifically, through *conceptualizing by naming*, they identified modes in the video excerpts. Then, they were guided to discuss how modes worked in concert to fulfil metafunctions: (1) the linguistic mode (explanatory subtitles) constructed meanings for viewers (ideational metafunction); (2) the gestural mode (sign language) with the abrupt absence of the explanatory subtitles (textual metafunction) implicated the imposter identity (interpersonal metafunction). After this discussion activity targeting *conceptualization with theory*, the students were guided to summarize how semiotic modes work complementarily to form a multimodal ensemble.

Lesson 2 also started with an activity with high semantic gravity: the students watched video excerpts from a Cantonese-dubbed version and an American-transadapted version of the Japanese anime *Doraemon*. Based on the students' (un)familiarity with the two versions, the Cantonese version was used for *experiencing the known* and the American one for *experiencing the new.* In the Cantonese version, the visuals remained largely unchanged but the auditory mode was altered from Japanese to Cantonese. In the American version, the auditory mode was changed (from Japanese to English) and Japanese visuals were also altered. For instance, the Japanese postal sign (〒) was replaced by an envelope symbol (✉)

in the American version. After watching the video excerpts, the students were engaged in an upward semantic shift from concrete audiovisual instances (SG+) to a multimodal metalanguage (SG-). Through *conceptualizing by naming,* the students identified the semiotic modes in the excerpt videos. Then, they were guided to discuss how elements were changed within the same mode as instances of modal transformation (Kress, 2010). Next, they discussed how these versions were positioned in a continuum with two ends: "translation" (primarily focusing on linguistic transfer) and "transadaptation" (more credence given to non-linguistic modes). These discussion activities targeted the Knowledge Sub-process of *conceptualizing with theory* and enabled the students to understand how semiotic modes can be transformed to accommodate audience in a different milieu.

3.3 Semantic waves: Analyzing & Applying

For a take-home assignment, the students were asked to analyze the subtitles of a nursery rhyme in an action drama film (Hung, 2016), as an in-depth engagement with "semantic waves" (more on this below). The film features a retired Central Security Bureau agent, Mr. Ding, in a small town in northeast China. Years ago, he lost his granddaughter in a trip and was disavowed by his daughter, but now he develops friendship with a local girl, Chunhua. About five minutes into the film, a nursery rhyme and an animated cartoon are presented. Interestingly, the film was released in two parallel language versions (Mandarin and Cantonese), with two corresponding sets of English subtitles. The nursery rhyme is chosen as an analytical case for two reasons. First, the Mandarin lyrics and the animated cartoon are highly complementary (Royce, 2007). As shown in Figure 3, the cartoon (an old man) is made up of (a) Chinese characters (丁 as the nose, 三 as the forehead wrinkles, 四 as the mouth); (b) numbers (3 as ears, 6 as hands, and 7 as legs); and (c) iconic objects (eggs as the eyes and the round face, leeks as the hairs, bean curd as the body, and candied haws as the buttons). The nursery rhyme arranges these pieces in such an elaborate way that the rhyme is practically a mnemonic step-by-step guide for drawing the old man. Reciprocally, the cartoon provides an underlying logic for juxtaposing seemingly random Chinese characters, numbers, and objects in the lyrics.

The second reason for choosing this rhyme is that although the music and the cartoon

8

are the same across the four versions, the lyrics and subtitles are markedly different. As shown in Figure 4, the Cantonese rhyme has fewer lines and draws on even fewer multimodal resources. As such, the drawing and the Cantonese rhyme are largely independent from each other. To complicate the case, the English subtitles are also different. The Mandarin-based English subtitles are much more faithful to the Mandarin subtitles, while the Cantonese-based English subtitles seem to aim for discoursal equivalence (music genre) and thus much looser in terms of semantic equivalence (Cook, 2010). Relatedly, the Mandarin, Cantonese, and Cantonese-based English-subtitled versions are readily recognizable nursery rhymes, while the Mandarin-based English-subtitled version is opaque in terms of the music genre.

[Insert Figure 3 here]

[Insert Figure 4 here]

The students were asked to write an analytical essay on the four subtitled videos, using the multimodal metalanguage discussed in the two lessons. The essay was structured in three parts to guide the students in navigating shifts of semantic gravity between multimodal particulars in the subtitled videos (SG+) and the multimodal metalanguage (SG-). Specifically, the first part (*what*) targeted the Knowledge Sub-process of *analyzing functionally* and asked the students to analyze metafunctions and modal interplay in the four subtitled videos. The second part (*so what*) asked the students to *analyze critically* by evaluating the communicative effects and whether the four subtitled versions function as multimodal ensembles. The third part (*now what*) prompted the students to *apply appropriately and creatively* and offer ideas to translate/transadapt the nursey rhyme for English-speaking audience who might be unfamiliar with the Chinese language and culture. In Maton's (2013) terms, the design of the essay exposed the students to "semantic waves" between higher and lower semantic gravity, because throughout the analysis they needed to constantly move between specific audiovisual instances and abstract multimodal concepts. Such semantic waves could contribute to students' sophisticated, critical understandings about multimodality in practice and theory. Additionally, the design echoed

the notion of "pedagogical weaving"—"bring[ing] learners back to the world of experience, but a world into which they [can transfer multimodal] understandings developed" in the classroom (Cope & Kalantzis, 2015, p. 22).

There was no length requirement for the essay but the students needed to adequately address the three parts. They wrote primarily in Chinese, with mixture of English. The extracts cited in this paper were translated by the authors.

3.4 Data collection and analysis

This study followed the line of research (e.g. Pantaleo, 2016, 2017; Ravelli, 2019) that analyzed students' written responses in order to gauge the effectiveness of multimodal pedagogies. Thus, the data source included 68 students' essays, totaling 81,000 words. Following Pantaleo (2016, 2017), we conducted thematic analysis to examine the extent to which MCC was demonstrated in the students' essays. To ensure the validity of data analysis, Miles, Huberman and Saldaña's (2014) two-cycle coding procedure was adopted.

In the first coding cycle, we independently marked up all technical vocabularies (e.g. *interpersonal*, *transformation*, and *multimodal ensembles*) in the students' essays and used them as *in vivo* codes (i.e. using students' own languages as codes). We also marked up the segments containing words that signaled epistemic observations (e.g. *think*, *suggest* and *represent*) and evaluative judgments (e.g. *confusing*, *important* and *necessary*) (Macken-Horarik, 2016; Pantaleo, 2018). Then, we assigned process codes (i.e. gerunds to label conceptual actions) to these segments. For instance, "I think this modal transformation is necessary" was coded as "evaluating the transformation strategy."

In the second coding cycle, we independently generated thematic categories based on recursive reading of the coded segments in the previous cycle (Miles et al., 2014). We met and compared our (sub)categories, which were refined by moving back and forth between our codes and the essay data. For instance, during deliberation, we found that the students almost always evaluated whether the modal transformation strategy reproduced the image-subtitle synergy. Hence, the initial codes of "evaluating the transformation strategy" and "evaluating the effect of reproducing the image-subtitle synergy" were combined as one subtheme: "evaluating the strategy of modal transformation to reproduce the image-subtitle synergy." In this way, consensus on each (sub)theme was achieved "through collaborative

discussion rather than independent corroboration" (Smagorinsky, 2008, p. 401). Finally, we decided on five themes and ten subthemes (see Table 1) that indexed the students' MCC.

4. Results

Table 1 summarizes the aspects of MCC demonstrated in the students' essays and the frequencies of (sub)themes. As can be seen, the majority of the students used the multimodal metalanguage to analyze the videos. For instance, all 68 students identified semiotic modes in the videos; 65 students based their evaluation of the subtitles on the metafunctions; and 58 evaluated the intersemiotic complementarity in the videos. Additionally, to improve the image-subtitle coherence, they offered three types of solutions (i.e. transadapting the linguistic mode, the visual mode, and both) with similar frequencies. This indicated that the students did not privilege one mode over another. Rather, they recognized and mobilized available modal resources when attempting to recreate multimodal ensembles. To corroborate this, 60 students reported that they were keenly aware of the multimodal nature of communication after the lessons and the take-home assignment. In the following subsections, extracts of students' essays will be cited to exemplify their MCC in details.

[Insert Table 1 here]

4.1 Analyzing metafunctions

The first theme emerging from the students' essays was their ability to analyze the metafunctions in the four subtitled videos. 60 students pointed out that the four versions differed in the ideational metafunction because they provided different information about the protagonist, Mr. Ding. For instance, Kwan (all pseudonyms) observed that:

> the Mandarin version and its corresponding English version do not foreshadow the status of Mr. Ding as a retired Central Security Bureau agent. However, in the Cantonese version, the word "cop" hints at Mr. Ding's previous job…these versions differ in ideational meanings.

45 students commented on the interpersonal metafunction of the nursery rhyme and the animated cartoon. They discussed how the music genre and the cartoon were co-deployed to enact the relationship between Chunhua and Mr. Ding:

> The music genre (nursery rhyme) and the drawing genre (cartoon) are usually associated with children. So these generic choices contribute to interpersonal meanings: we, viewers, are invited into a girl's story-world about her and her beloved Mr. Ding. (Yi)

36 students made an apt observation of how versions of film titles and the nursery rhymes fulfilled both interpersonal and textual metafunctions:

> The Mandarin title of the film is *My Special Agent Grandpa* and the Cantonese title is *Special Agent Grandpa*. Both suggest that the narrative is told from a girl's perspective. As such, a nursery rhyme is deployed at the beginning of the film to encourage viewers to empathize with the girl. (Chen)

> The girl's perspective is not obvious in the English title *The Bodyguard*, which is less interpersonal. The nursery rhyme as a genre is perhaps confusing in the English version…the textual organization of the film title and the nursery rhyme is not coherent. (Wong)

There extracts show that the students were able to analyze the metafunctions of the subtitled nursery rhymes. Ideationally, the lyrics/subtitles encoded different amount of information about the protagonist. Interpersonally, the rhymes evoked childhood memory and invited viewers to approach the film from a little girl's perspective. The students also analyzed the interpersonal and textual metafunctions of the Mandarin and the Cantonese film titles, which suggested a grandfather-granddaughter-like relationship between the protagonists and thus motivated the deployment of the nursery rhyme. By contrast, the English film title was less interpersonally committed and thus rendered the nursery rhyme as a confusing choice for textual coherence.

4.2 Analyzing modal contribution and intersemiotic complementarity

All the students were able to articulate what modes were used in the four audiovisual texts. For instance, Liu wrote that "in the videos, there are non-linguistic modes, such as images and background music, and linguistic modes (lyrics and subtitles)." After naming the semiotic resources, 58 students commented on how these modes worked complementarily or not:

> In the Mandarin version, the cartoon and the rhyme co-contextualize each other. The rhyme helps me remember the steps of drawing the cartoon, while the constituent parts of the cartoon remind me of what comes next in the lyrics. (Kwan)

> In the Cantonese and the Cantonese-based English versions, the image and the lyrics are like two parallel lines, which run simultaneously and do not intersect. The visual-linguistic or image-subtitle relationship is independent. (Qing)

Clearly, the students were cognizant of the "modal division of labor" (Kress, 2010, p. 11) in the four audiovisual texts, and were able to judge the levels of intersemiotic complementarity across the four subtitled videos. The analysis reported in this and the previous subsection paved the way for the students to critically evaluate the subtitles.

4.3 Evaluating the subtitles from a semiotic perspective

The take-home assignment created a problem space for the students to evaluate subtitles not merely from a linguistic perspective but from a semiotic perspective. As it turned out, 65 students commented on the semiotic efficacy of the subtitles with reference to the metafunctions:

> If we preserve the nursery rhyme genre, the interpersonal meanings will be kept, but the "Eeny, meeny, miny, moe" subtitles would hurt the textual meanings because they are largely incoherent with the cartoon. (Lee)

The adapted English rhyme suggests that something is being counted in the visual frame. But there is only one man. In this sense, the English rhyme misleads viewers about what they are watching and what they expect…The textual incoherence distracts viewers' attention from the interpersonal relations implicated by the rhyme. (Chang)

That was why the students argued that preserving the intersemiotic complementarity was more important than preserving the music genre:

Between the two English versions, I prefer the Mandarin-based one. Although it isn't a nursery rhyme, it tries to reproduce the semiotic interaction…it's more important to maintain the textual coherence—with subtitles and images complementing each other—than to keep the nursery rhyme genre. (Chiu)

Additionally, more than half of the students made keen observations about the modal transformation (Kress, 2010) as a deliberate strategy to reproduce the image-subtitle synergy in the Mandarin-based English version. They also argued that the strategy was sometimes successful but sometimes not:

In the Mandarin subtitles, all the numbers are written as Chinese characters, but in the Mandarin-based English subtitles, the numbers are transformed into numerals. I think this modal transformation is necessary to enable non-Chinese viewers to make the connection between the numbers and the cartoon, such as 33 as ears and 66 as hands. (Lam)

Unfortunately, the numerals are not a perfect solution, because in the cartoon the wrinkles and the mouth are represented by the Chinese characters 三 [three] and 四 [four]. Even though they are transformed into 3 and 4 in the English version, non-Chinese viewers might not associate them with the wrinkles and the mouth. (Niu)

These extracts demonstrate that the students were able to judge whether the translated

subtitles functioned as part of a multimodal ensemble (Kress, 2010). As argued by the students, although the Cantonese-based English subtitles achieved genre equivalence (Cook, 2010), the English counting rhyme suggested that something was being counted in the visual frames, which would leave non-Chinese viewers confused about the cartoon. Additionally, they appreciated the attempts to reproduce the semiotic interaction through modal transformation (presenting numbers as Chinese characters vs. presenting numbers as numerals). They also pointed out that some attempts were not successful because the Chinese characters were the constituent parts of the cartoon and thus not immediately recognizable to non-Chinese viewers.

4.4 Recreating multimodal ensembles

The take-home assignment also created a problem space for the students to *apply appropriately* and *creatively*. They were asked to provide solutions to semiotic issues that arose from subtitling the nursery rhyme for English-speaking viewers. The solutions they provided could be grouped into three types: transadapting the linguistic mode, the visual mode and both.

Specifically, 33 students proposed to modify the subtitles to make them more aligned with the visuals. For instance, Tseng suggested to replace Chinese characters with English words to highlight the topographical resemblance in the cartoon:

> In both English versions, the protagonist's name is rendered as "Ding." For those who do not understand Chinese, it is difficult to make the connection between the name "Ding" and the nose 丁 in the cartoon. One solution is to change the name to Ting, with T resembling the nose. Or better still, use Mr. T or even Grandpa T in the lyrics.

Along the same line, suggestions were made to change the culture-specific references in the subtitles to enable English-speaking viewers to appreciate the image-subtitle interplay. As modes are culturally shaped meaning-making resources (Kress, 2010), "images are far from universal" and "all cultures have different visual as well as oral and linguistic traditions" (Díaz Cintas & Remael, 2007, p. 46). Therefore, the students proposed

to use alternative culture-specific references that were more familiar to English-speaking viewers so that they could better understand the visual representations of the iconic objects:

> "Bean curd" (representing the body of the old man) and "candied haws" (representing the buttons on the man's shirt) might be unfamiliar to audience outside China. Therefore, if "bean curd" is replaced by "a piece of cake," and "candied haws" is replaced by "marshmallow," the English subtitles might be more straightforward. (Yuen)

As a second type of solutions to improving intersemiotic complementarity, 35 students proposed to alter the visual mode to cohere with the semiotic meanings implied by the English nursery rhyme:

> If the English counting rhyme is used, I think we can create a new cartoon, having four cops popping up to correspond with the lyrics "Eeny, meeny, miny, moe" and "Cop A, B, C, D." Mr. Ding can be the fifth figure in the cartoon to go with the lyrics "Old Ding is not at all that old." (Sun)

As a third type of solutions, 36 students discussed the idea of transadapting both the linguistic and the visual modes to maximize intersemiotic complementarity:

> If the Mandarin-based English subtitles are used, we need to change how the wrinkles and the mouth are represented. The lyrics…can be slightly changed to "I said return them in 3 days. But he said 'No Way!'" Accordingly, in the cartoon, the wrinkles are represented by an elongated and flattened "3" and the mouth is made up of the letters N and O…As such, the visual and the linguistic modes are both transadapted to recreate a multimodal ensemble. (Peng)

Figure 5 reproduces Peng's suggestion to transform Chinese characters into a numeral and two English letters so that the altered visuals and the modified subtitles could complement each other.

16

[Insert Figure 5 here]

In another example, Tsui suggested to recreate the visuals and the lyrics to achieve intersemiotic complementarity and fulfill the interpersonal and textual metafunctions:

> I rewrite the lyrics in a catchy style…and transadapt some elements to ensure that the subtitles and the visuals are complementary to each other. For example, I replace "eggs" with "peas" and accordingly replace the "circle eyes" with "dot eyes" in the cartoon … [more examples reproduced in Figure 5]. In this way, the catchy rhyme and the funny cartoon could textually cohere with each other and implicate the granddaughter-granddad-like relation.

Although the students differed in the number and the type of modes they chose to transadapt/transform, their solutions shared the same goal of reproducing/recreating multimodal ensembles. They did not rely on the Mandarin/Cantonese subtitles as the sole source of meanings, but rather focused on the semiotic meanings emergent from the visual-linguistic interplay. They proposed (creative) ideas to help non-Chinese viewers better understand and appreciate the image-subtitle synergy in the recreated multimodal ensembles.

4.5 Recognizing the multimodal nature of communication

At the end of the essays, 60 students reported that they developed a deeper understanding about the multiplicity of semiotic resources and that the linguistic mode should cohere with non-linguistic modes in communication:

> I used to think that images cannot be edited in the subtitling process. Now, I think if we keep the images unedited and leave the incongruence with the translated subtitles unchecked, we are actually pushing a square peg through a round hole. We need to change the shape(s) of the peg and/or the hole to find a semiotic match. (Lee)

17

Before the workshop, I thought that language proficiency was the primary factor to translate films for international audience. Now, I come to understand that audiovisual texts and meanings are always multimodal. (Kang)

This thematic unit has enabled me to appreciate the importance of arranging multiple modes in a coherent way. We cannot treat the linguistic mode as the one and only resource in our communication. Modes function as multimodal ensembles. (Cheung)

These extracts, especially Lee's apt analogy about "pushing a square peg through a round hole," demonstrate that the students developed a critical awareness of the multimodal nature of communication. They did not privilege the linguistic mode over other modes, but rather strive for intersemiotic complementarity in multimodal communication.

5. Discussion

The thematic analysis of the students' essays showed that the two lessons and the take-home assignment contributed to their MCC. They were able to use a multimodal metalanguage (e.g. "modes," "metafunctions," and "multimodal ensembles") to tease out and discuss the inadequacies in the subtitled videos. The students contended that if the linguistic mode was treated as a separate, autonomous code, even though the translation preserved the music genre, it would fail to evoke the desired semiotic effect. Therefore, as they argued, it was a better strategy to preserve the semiotic interaction between the cartoon and the subtitles. The attention and importance attached to intersemiotic complementarity led them to offer multiple translation/transadaptation solutions that were culturally more aligned with English-speaking viewers. They developed the awareness that images were not universally understood (Díaz Cintas & Remael, 2007). Thus, they proposed to adapt some culture-specific references to facilitate viewers' understanding of the visuals, such as changing "candied haws" to "marshmallow." They also transcended the traditional belief that images were "untouchable" in subtitled videos (Zabalbeascoa, 2008, p. 18) and thus adopted a more holistic, semiotic view of the audiovisual texts. This was evidenced by their

suggestions to create new visuals to go with the rhyme. Some students went further to transadapt both the cartoon and the subtitles to maximize the image-subtitle coherence. As illustrated in Peng's and Tsui's recreated multimodal ensembles, the students attended to not only the visual mode but also the interplay between semiotic resources (Bonsignori, 2018; Morell, 2018).

Previous studies on the effectiveness of a multimodal language were primarily conducted in English-speaking countries (e.g. Macken-Horarik, 2016; Pantaleo, 2017; Unsworth, 2006; Unsworth & Mills, 2020). Our study extends this line of research by showing that EFL students can also benefit from the overt instruction of a metalanguage that enhances their abilities to systematically analyze, critically evaluate, and creatively improve multimodal texts. These critical, reflective elements have been under-represented in EFL classrooms, where students are engaged in multimodal productions not very different from those in their lifeworld. That was possibly why van Leeuwen (2015) urged EFL classrooms to offer students "something that is not readily available elsewhere" (p. 584). Based on our findings, one possible "something" is a multimodal metalanguage to reflect and work on intersemiotic complementarity. Although EFL students are exposed to and involved in abundant multimodal practices in their everyday life, they might be "mired in minute particulars" (Maton, 2016, p. 1). They need to step back to think deeply about "the 'aptness' of the means for representation" (Kress, 2010, p. 28). To this end, teachers can equip EFL students with a principled way to interpret and interrogate multimodal texts. In our case, the metalanguage was structured around the forms (e.g. *modes*), functions (e.g. *metafunctions*), and patterns (e.g. *intersemiotic complementarity*) of semiotic resources. As shown in the students' essays, these concepts facilitated their multimodal text analysis (Coccetta, 2018; Pantaleo, 2016, 2017) and heuristically guided them to identify modes, analyze modal interplay, and critique semiotic choices.

Our study also makes contribution by demonstrating how a multimodal metalanguage can be integrated into EFL pedagogical designs, informed by the notion of "sematic gravity" and the Knowledge Process framework. The combined insights of these two enabled us to orchestrate the ups and downs of semantic waves (i.e. between contextualized practices and abstract conceptualizations). As illustrated in Figure 7, the two lessons and the take-home assignment were carefully sequenced so that the students were engaged in a

theoretically grounded process of coming-to-know. In Lesson 1 and Lesson 2, students' real-world experience was drawn upon (SG+) and then abstract concepts (i.e. the multimodal metalanguage) were explained (SG-) and used to conceptualize the audiovisual texts as multimodal ensembles. The upward and downward shifts of semantic gravity were embedded in the Knowledge Processes of *experiencing* and *conceptualizing* (see Figure 7). In this way, "weaving between the experiential and the conceptual" (Cope & Kalantzis, 2009, p. 185) engaged students in a developmental process, whereby segmented, episodic meanings were (re-)organized and developed into generalized knowledge (Maton, 2016). Building on the two lessons, the take-home assignment created a problem space for the students to use the metalanguage to *analyze* a new case and *apply* their knowledge about multimodality. This required the students to use concepts as thinking tools to systematically examine and solve issues that arose in real-world multimodal communication. As demonstrated in the students' essays, the weaving of multimodal concepts and practices was characterized by the constant upward and downward shifts of semantic gravity (as represented by the bobbing in Figure 6), which contributed to the development of students' multimodal communicative competence.

[Insert Figure 6 here]

6. Implications and conclusion

As language teachers are increasingly called upon to address the multimodal nature of communication (Early et al., 2015), our study makes contribution by examining the extent to which a pedagogical design informed by "semantic gravity" (Maton, 2013, 2016) and the Knowledge Process framework (Kalantzis & Cope, 2012; Cope & Kalantzis, 2015) can develop EFL students' multimodal communicative competence (Royce, 2002). One implication of our study is that it is not enough to expose students to mere experiences of multimodal practices to the exclusion of developing a metalanguage. Tacit *experiencing* activities are typically context-bound and they alone cannot promote the level of analytical and problem-solving skills necessary to cope with a wide range of multimodal communication exigence. In this regard, "semantic gravity" and the Knowledge Process framework can theoretically and heuristically guide teachers to design learning activities

in three aspects: selection, sequence, and substantiation, corresponding to the *what*, *how* and *why* of multimodal pedagogies. First, the idea of "semantic gravity" enables language teachers to select multimodal texts and concepts. Placing these selected texts and concepts along the semantic gravity scale can visualize the ascent/descent of semantic waves and better connect concrete examples with abstract concepts (Maton, 2013; 2016). Second, the Knowledge Process framework further offers a principled way to sequence pedagogical activities and systematically engage students with epistemic moves in the process of coming-to-know (Cope & Kalantzis, 2015; Kalantzis & Cope, 2012). The pedagogical weaving between *experiencing*, *conceptualizing*, *analyzing*, and *applying* can expose students to the downward and upward shifts of semantic gravity (i.e. between local particulars in multimodal texts and abstract multimodal concepts). As such, students can have deeper and more critical engagement with multimodal meaning-making, rather than tacit or commonsense understandings of multimodal communication (van Leeuwen, 2015). Third, as demonstrated in this study, both "semantic gravity" and the Knowledge Process framework substantiate the necessity and feasibility of integrating multimodality into EFL classrooms. Multimodality shall not remain "on the margins" in EFL teaching (Early et al., 2015, p. 450) or simply something interesting to do as peripheral add-ons to language-dominant curricular. We should and can treat multimodality more seriously and systematically (Royce, 2002, 2007; van Leeuwen, 2015). To this end, "sematic gravity" and the Knowledge Process framework can guide and justify our decisions when designing learning activities to enhance EFL students' MCC.

One limitation of our study is that it did not follow up on the students who seemed to develop their MCC to a lesser extent. It is necessary to examine the potential factors that constrained their development. As this study primarily focused on the (meta)cognitive aspect, future studies can explore how affective factors and other individual differences figure in EFL students' development of MCC. Given its exploratory nature, this study is also limited by its modest scope, i.e., one thematic unit about multimodal communication. More thematic units with extended instructional scaffolding are certainly needed to develop students' MCC to the fullest possible extent. Notwithstanding this limitation, this study has potential wider application for language teachers. As argued by Maton (2013), semantic waves can move "from micro through meso to macro levels" (p. 17). Similarly, the

Knowledge Process framework can guide both micro and macro educational decisions (Cope & Kalantzis, 2015). As such, future studies can examine the extent to which these conceptual tools inform course and/or curriculum design for developing EFL students' MCC. In this regard, the present study represents one attempt in the EFL community to move multimodality "out from the margins" (Early et al., 2015, p. 447).

References

Bhooth, A. M., Azman, H., & Ismail, K. (2015). Investigating the reading practices of EFL Yemeni students using the learning by design framework. *TESOL Journal*, *6*(3), 418–446.

Bonsignori, V. (2018). Using films and TV series for ESP teaching: A multimodal perspective. *System*, *77*, 58–69.

Callow, J. (2020). Visual and verbal intersections in picture books–multimodal assessment for middle years students. *Language and Education*, *34*(2), 115–134.

Coccetta, F. (2018). Developing university students' multimodal communicative competence: Field research into multimodal text studies in English. *System*, *77*, 19–27.

Cook, G. (2010). *Translation in language teaching: An argument for reassessment*. Oxford University Press.

Cope, B., & Kalantzis, M. (2009). "Multiliteracies": New literacies, new learning. *Pedagogies: An International Journal*, *4*(3), 164–195.

Cope, B., & Kalantzis, M. (2015). The things you do to know: An introduction to the pedagogy of multiliteracies. In Cope, B., & Kalantzis, M. (Eds.). *A pedagogy of multiliteracies: Learning by design* (pp. 1–36). Palgrave Macmillan.

Díaz Cintas, J. & Remael, A. (2007). *Audiovisual Translation: Subtitling*. St Jerome.

Early, M., Kendrick, M., & Potts, D. (2015). Multimodality: Out from the margins of English language teaching. *TESOL Quarterly*, *49*(3), 447–460.

Halliday, M. A. K. & Matthiessen, C. (2004). *An introduction to functional grammar (3rd ed.)*. Arnold.

Hung, S. (Director). (2016). (*Wo De*) *Te Gong Ye Ye* [The Bodyguard] [Film]. Irresistible

Alpha Ltd.; Edko Films Ltd.; Focus Films Ltd.; Good Friends Entertainment Sdn Bhd; Edko (Beijing) Films Ltd.; Tencent Penguin Pictures (Shanghai) Co. Ltd.; BDI Films Inc.

Hung, H. T., Chiu, Y. C. J., & Yeh, H. C. (2013). Multimodal assessment of and for learning: A theory-driven design rubric. *British Journal of Educational Technology*, *44*(3), 400–409.

Jiang, L., & Luk, J. (2016). Multimodal composing as a learning activity in English classrooms: Inquiring into the sources of its motivational capacity. *System*, *59*, 1–11.

Jiang, L., Yang, M., & Yu, S. (Forthcoming). Chinese ethnic minority students' investment in English learning empowered by digital multimodal composing. *TESOL Quarterly*. https://doi.org/10.1002/tesq.566

Kalantzis, M. & Cope, B. (2012). *Literacies*. Cambridge University Press.

Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. Routledge.

Li, M. (2020). Multimodal pedagogy in TESOL teacher education: Students' perspectives. *System*, *94*, 102337.

Lim, V. F., & Tan, S. K. Y. (2018). Developing multimodal literacy through teaching the critical viewing of films in Singapore. *Journal of Adolescent & Adult Literacy*, *62*(3), 291–300.

Macken-Horarik, M. (2016). Building a metalanguage for interpreting multimodal literature: Insights from systemic functional semiotics in two case study classrooms. *English in Australia*, *51*(2), 85–99.

Maton, K. (2013). Making semantic waves: A key to cumulative knowledge-building. *Linguistics and Education*, *24*(1), 8–22.

Maton, K. (2016). Legitimation code theory: Building knowledge about knowledge-building. In K. Maton, S. Hood & S. Shay (Eds.), *Knowledge-building: Educational studies in legitimation code theory* (pp. 1–24). Routledge.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook (3rd ed.)*. Sage.

Mills, K. A. (2015). Doing digital composition on the social web: Knowledge processes in literacy learning. In Cope, B., & Kalantzis, M. (Eds*.). A pedagogy of multiliteracies:*

Learning by design (pp. 172–185). Palgrave Macmillan.

Morell, T. (2018). Multimodal competence and effective interactive lecturing. *System*, *77*, 70–79.

New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, *66*(1), 60–93.

Nishioka, H. (2016). Analysing language development in a collaborative digital storytelling project: Sociocultural perspectives. *System*, *62*, 39–52.

Pantaleo, S. (2016). Primary students' understanding and appreciation of the artwork in picturebooks. *Journal of Early Childhood Literacy*, *16*(2), 228–255.

Pantaleo, S. (2017). Critical thinking and young children's exploration of picturebook artwork. *Language and Education*, *31*(2), 152–168.

Pantaleo, S. (2018). Elementary students' analytical responses about David Wiesner's The Three Pigs. *New Review of Children's Literature and Librarianship*, *24*(2), 167–188.

Ravelli, L. (2019). Pedagogical strategies for developing interpretive language about images. *English Teaching: Practice & Critique*, *18*(1), 100–118.

Rowland, L., Canning, N., Faulhaber, D., Lingle, W., & Redgrave, A. (2014). A multiliteracies approach to materials analysis. *Language, Culture and Curriculum*, *27*(2), 136–150.

Royce, T. (2002). Multimodality in the TESOL classroom: Exploring visual-verbal synergy. *TESOL Quarterly*, *36*(2), 191–205.

Royce, T. (2007). Intersemiotic complementarity: a framework for multimodal. In Royce, T. D., & Bowcher, W. (Eds), *New directions in the analysis of multimodal discourse*, (pp. 63–109). Lawrence Erlbaum.

Shin, D., Cimasko, T., & Yi, Y. (2020). Development of metalanguage for multimodal composing: A case study of an L2 writer's design of multimedia texts. *Journal of Second Language Writing*, *47*, 100714.

Smagorinsky, P. (2008). The method section as conceptual epicenter in constructing social science research reports. *Written Communication*, *25*(3), 389–411.

Unsworth, L. (2006). Towards a metalanguage for multiliteracies education: Describing the meaning-making resources of language-image interaction. *English teaching: Practice and critique*, *5*(1), 55-76.

Unsworth, L., & Mills, K. A. (2020). English language teaching of attitude and emotion in digital multimodal composition. *Journal of Second Language Writing*, *47*, 100712.

Van Leeuwen, T. (2015). Multimodality in education: Some directions and some questions. *TESOL Quarterly*, *49*(3), 582–589.

Yeh, H. C. (2018). Exploring the perceived benefits of the process of multimodal video making in developing multiliteracies. *Language Learning & Technology*, *22*(2), 28–37.

Yuen, W. P (Director). (2017). *Qi Men Dun Jia* [*The Thousand Faces of Dunjia*] [Film]. Le Vision Pictures; Acme Image; Film Can Production Ltd.

Zabalbeascoa, P. (2008). The nature of the audiovisual text and its parameters. The didactics of audiovisual translation. In J. Díaz Cintas (Ed.). *The didactics of audiovisual translation* (pp. 21–37). John Benjamins.

Appendix A

A multimodal metalanguage featured in the two lessons

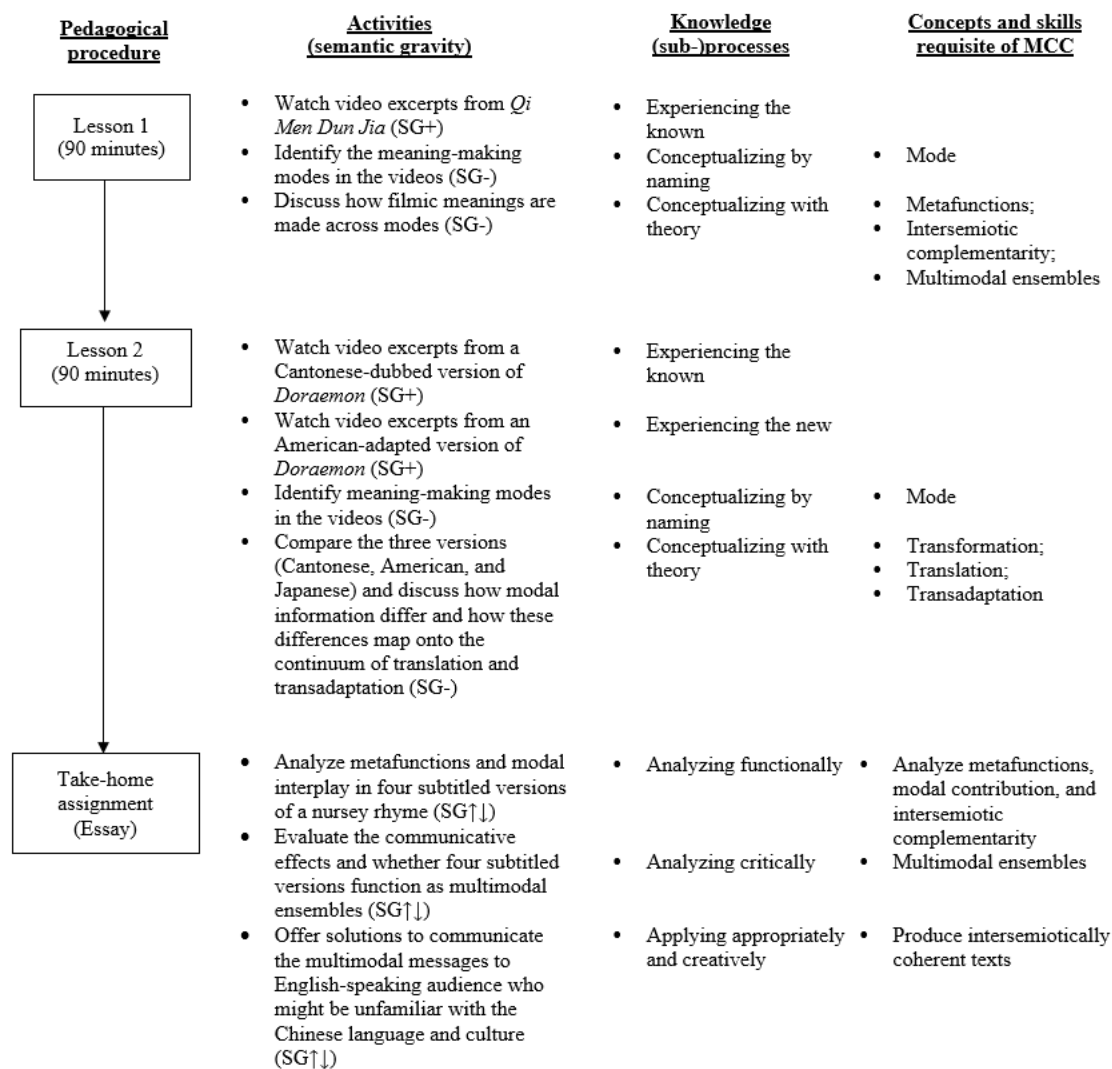| Concepts	Definitions presented to the students in class
Mode	"Mode is a socially shaped and culturally given semiotic resource for making meaning" (Kress, 2010, p. 79).
Metafunctions	Ideational metafunction: representing world experiences, events, people, objects and their logical connections. Interpersonal metafunction: enacting social relations. Textual metafunction: organizing meanings in a coherent way.
Intersemiotic complementarity	Modes "complement each other to realize an intersemiotically coherent multimodal text" (Royce, 2002, p. 192)
Multimodal ensembles	Multimodal ensembles are products of "selecting/assembling/designing" multiple modes to "meet the rhetor's interests" (Kress, 2010, p. 162).
Transformation	Transformation refers to "changes in ordering and configurations of elements within one mode" (Kress, 2010, p. 43).
Translation	Conventionally, translation refers to transfer from one language code to another. Translation is one type of transformation (because the language mode remains unchanged, but the linguistic elements are altered).
Transadaptation	Unlike translation, transadaptation gives more credence to non-linguistic modes and adapts visual and verbal elements in the translated text to accommodate audience from a different linguistic/cultural context.

Table 1. MCC demonstrated in students' essays

Themes related to MCC	Sub-themes related to MCC	Frequency
A. Analyzing metafunctions	a) Comparing the ideational metafunction across the subtitled videos	60
	b) Analyzing the interpersonal metafunction of the nursery rhyme and the cartoon	45
	c) Comparing the interpersonal and textual metafunctions of the film titles and nursery rhymes across the videos	36
B. Analyzing modal contribution and intersemiotic complementarity	a) Identifying semiotic modes in the videos	68
	b) Evaluating intersemiotic complementarity across the videos	58
C. Evaluating the subtitles from a semiotic perspective	a) Evaluating the semiotic efficacy of the subtitles based on the metafunctions	65
	b) Evaluating the strategy of modal transformation to reproduce the image-subtitle synergy	38
D. Recreating multimodal ensembles	a) Transadapting the linguistic mode	33
	b) Transadapting the visual mode	35
	c) Transadapting both the linguistic and visual modes	36
E. Recognizing the multimodal nature of communication		60
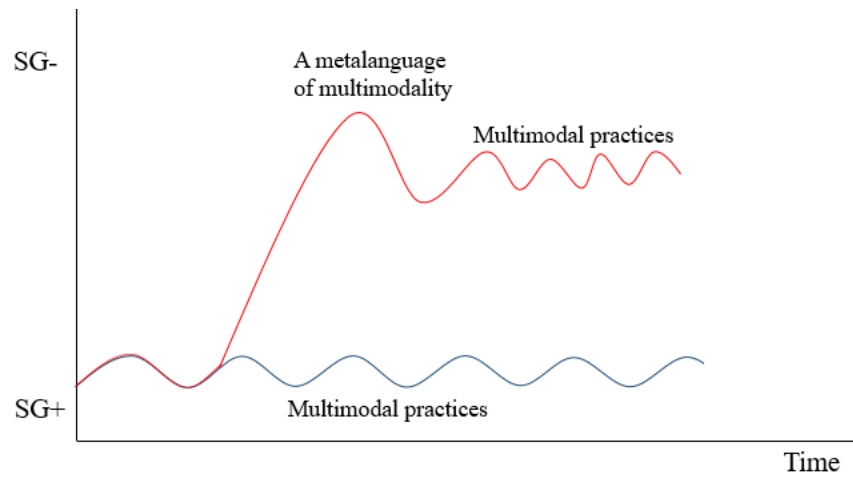
SG+: higher semantic gravity (more context-dependent);

SG-: lower semantic gravity (less context-dependent)

Figure 1. Semantic gravity profile of two classroom scenarios

Pedagogical procedure	Activities (semantic gravity)	Knowledge (sub-)processes	Concepts and skills requisite of MCC
Lesson 1 (90 minutes)	• Watch video excerpts from *Qi Men Dun Jia* (SG+) • Identify the meaning-making modes in the videos (SG-) • Discuss how filmic meanings are made across modes (SG-)	• Experiencing the known • Conceptualizing by naming • Conceptualizing with theory	• Mode • Metafunctions; • Intersemiotic complementarity; • Multimodal ensembles
Lesson 2 (90 minutes)	• Watch video excerpts from a Cantonese-dubbed version of *Doraemon* (SG+) • Watch video excerpts from an American-adapted version of *Doraemon* (SG+) • Identify meaning-making modes in the videos (SG-) • Compare the three versions (Cantonese, American, and Japanese) and discuss how modal information differ and how these differences map onto the continuum of translation and transadaptation (SG-)	• Experiencing the known • Experiencing the new • Conceptualizing by naming • Conceptualizing with theory	• Mode • Transformation; • Translation; • Transadaptation
Take-home assignment (Essay)	• Analyze metafunctions and modal interplay in four subtitled versions of a nursey rhyme (SG↑↓) • Evaluate the communicative effects and whether four subtitled versions function as multimodal ensembles (SG↑↓) • Offer solutions to communicate the multimodal messages to English-speaking audience who might be unfamiliar with the Chinese language and culture (SG↑↓)	• Analyzing functionally • Analyzing critically • Applying appropriately and creatively	• Analyze metafunctions, modal contribution, and intersemiotic complementarity • Multimodal ensembles • Produce intersemiotically coherent texts

Notes. SG+: higher semantic gravity; SG-: lower semantic gravity;

SG↑↓: upward and downward shifts of semantic gravity

Figure 2. Pedagogical design

Animated cartoon	Mandarin subtitles (Word-for-word English glosses)	Mandarin-based English subtitles
	一个 丁 老头， (One Ding old-head)	Old Ding owed me 2 eggs.
	欠 我 两 鸡蛋 (owe me two eggs)	
	我说 三 天 还， (I say three day return)	I said "Return them in 3 days." But he said 4
	他说 四 天 还 (he says four day return)	
	不 还 去你 个 大 鸭 蛋 (No return go you piece big goose egg)	Otherwise I'd pay you
	三 根 韭菜 (Three pieces leeks)	33 cents for leeks
	三毛三 (thirty-three cents)	
	一 块 豆腐 (One piece bean curd)	66 cents for bean curd
	六毛六 (sixty-six cents)	
	冰糖 葫芦 (candied haws)	77 cents for candied haws.
	七毛七 (seventy-seven cents)	
	老子 就是 丁 老头 (I am Ding old-head)	Old Ding is good for his word!

Note. The line drawings in this article are reproduced by the authors.

Figure 3. Animated cartoon with Mandarin and Mandarin-based English subtitles

Animated cartoon	Cantonese subtitles (Word-for-word English glosses)	Cantonese-based English subtitles
	點 指 兵兵 (Point finger solider-solider)	Eeny, meeny, miny, moe.
	點 著 誰 人 做 肥 丁 (Point to who man becomes fat Ding)	Old Ding is not at all that old
	點 指 賊賊 (Point finger thieve-thieve)	If he hollers, let him go.
	點 著 誰 人 做 大 賊 (Point to who man becomes big thieve)	Eeny, meeny, miny, moe.
	ABCD, (ABCD)	Cop A, B, C, D
	大 頭 綠 衣 (big head green coat)	can't catch a thief.
	捉 不到 賊, (Catch no thieves)	When that happens,
	肥 丁 吹 哨子 (fat Ding blows whistle)	Old Ding brings relief.

**Figure 4**. Animated cartoon with Cantonese and Cantonese-based English subtitles

Original cartoon	Mandarin-based English subtitles	Visual-linguistic interplay
	I said "return them in 3 days". But he said "4".	Chinese character 三 [three] as wrinkles Chinese character 四 [four] as the mouth
Peng's suggested cartoon	Peng's suggested subtitles	Visual-linguistic interplay
	I said "return them in 3 days." But he said "No Way!"	Numeral 3 as wrinkles Letters N and O as the mouth
Tsui's suggested cartoon	Tsui's suggested subtitles	Visual-linguistic interplay
	Long ago, there was an old Mr. T. He owed me two peas. I asked him to return them in 3 days. But he said, why?	Letter T as the nose Iconic "peas" as the eyes Numeral 3 as the wrinkles Letter W as the mouth or beard

Figure 5. Illustration of the transadapted visual and linguistic modes
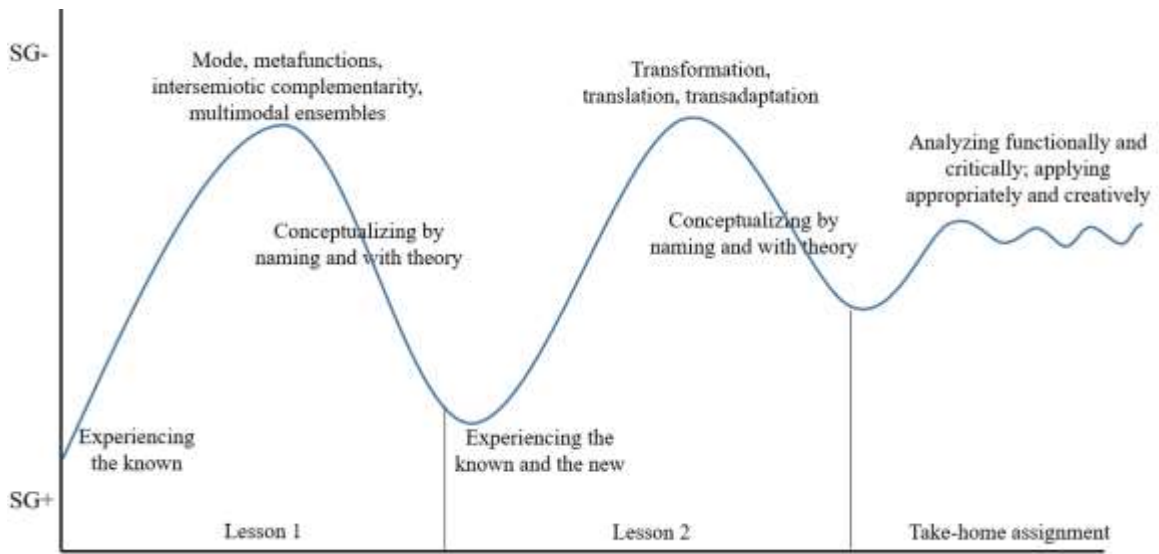
Notes. SG+ = higher semantic gravity; SG- = lower semantic gravity

Figure 6. Pedagogical design informed by the notion of "semantic gravity" and the Knowledge Process framework