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To cite this article: Fei Victor Lim, Weimin Toh & Matthew Ong (2024) Assessing multiliteracies: a systematic review and a perspective from Singapore, Asia Pacific Journal of Education, 44:3, 597-610, DOI: [10.1080/02188791.2024.2390658](https://doi.org/10.1080/02188791.2024.2390658)

To link to this article: <https://doi.org/10.1080/02188791.2024.2390658>



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Assessing multiliteracies: a systematic review and a perspective from Singapore

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ABSTRACT

The literacy demands on our students in the contemporary digital age goes beyond the reading of linguistic texts to include the viewing and representing with multimodal texts that make meanings across semiotic modes. Students need to possess multiliteracies to navigate the complex multimodal communication landscape and schools are responsible to both teach and assess multiliteracies. In this paper, we perform a systematic review of studies from 2013 to 2023 on multiliteracies and assessment in the English language classrooms and identified the themes of the importance of a metalanguage of multiliteracies for assessment, the productivity of multimodal analytical frameworks for assessment of students' artefacts, and the preoccupation with language and print literacies in multiliteracies assessment. We reflect on these themes in relation to our multiliteracies project in Singapore and discuss how we have engaged with the issues on multiliteracies and assessment. Our findings attest to the need for a commonly shared pedagogic metalanguage to assess students' learning of multiliteracies and the need to move beyond the focus on language and print literacy in assessment. Our paper contributes towards initiating a conversation on how multiliteracies can be equitably assessed in anticipation of the changes that must come in today's digital age.

ARTICLE HISTORY

Received 15 May 2023

Accepted 14 November 2023

KEYWORDS

Multiliteracies;
multimodality; assessment;
literacy; metalanguage

Introduction

Today's digital age has ushered in changes to the literacy demands on our students beyond the reading of linguistic texts to include the viewing and representing with multimodal texts that make meanings across semiotic modes such as language, images, animations, and music (Jewitt & Kress, 2003; New London Group, 1996). It is now widely acknowledged that students need to be equipped with multiliteracies to navigate the complex multimodal communication landscape as part of their preparation for the future (Cope & Kalantzis, 2015; F. V. Lim, 2021; F. V. Lim, Cope, et al., 2022; Weninger, 2019).

In Singapore, the English Language Syllabus 2020 has introduced multiliteracies as a pedagogical emphasis to reflect the expanded notion of literacy. Viewing and representing with multimodal texts have been introduced in the earlier syllabi to be integrated with listening, reading, speaking, and writing to include meaning-making across different semiotic modes in multimodal texts. Students are expected to analyse a variety of multimodal texts as critical viewers and to communicate with effective multimodal representations (Curriculum Planning and Development Division [CPDD], 2020). Even as the curriculum has signalled the

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 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/02188791.2024.2390658>

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importance of multiliteracies learning in the classroom, concerns over assessment continue to constrain the teachers' pedagogical practices and focus on multiliteracies learning (Kohnke et al., 2023; F. V. Lim, Chia, & Nguyen, 2022; F. V. Lim & Tan, 2021; F. V. Lim et al., 2021; Mizusawa, 2021). As such, there is a keen interest in understanding how multiliteracies can be assessed as a way of recognizing the different forms of students' learning (Adami et al., 2022; Kress & Selander, 2012).

Our paper follows from an earlier systematic review we conducted on studies related to multimodality in the English language classroom (F. V. Lim, Chia, & Nguyen, 2022) where we identified that concerns over the assessment of multiliteracies were one of the themes of interest reported in previous studies. As such, in this paper, we have focused on the theme of assessment and multiliteracies to develop a deeper understanding of the issues involved in assessing multiliteracies. We report the findings of a systematic review performed on studies related to the assessment of multiliteracies in the English language classrooms over the last decade from 2013 to 2023. The research question guiding our systematic review was: What are the approaches to the assessment of multiliteracies in international studies conducted in the English language classrooms from 2013 to 2023? We then introduce our research project on multiliteracies in Singapore led by the first author. The thematic findings from the systematic review are discussed in relation to the findings from the multiliteracies project we implemented. Our paper concludes with the argument that even as education systems incorporate multiliteracies into the literacy curriculum, the meaningful assessment of multiliteracies teaching and learning is now the next frontier of change.

Systematic review of studies

We perform a high-level review of the relevant information available in educational databases and academic search engines and extract specific information related to the assessment of multiliteracies in the English language classrooms to address the research question (Siddaway et al., 2019). Our review is guided by the stages of research synthesis (Cooper et al., 2019). We first formulate the research question and then we select the journals. Following that, we define the inclusion and exclusion criteria and specify the search terms. Thereafter, we extract, code, and synthesize the data into themes using thematic analysis. Finally, we report the results, discuss the findings, and provide a conclusion.

Selection of journals

We include reputable journals to extract information from papers that are relevant for our systematic review according to the research question. Relevant articles are included from Q1 journals such as *System*, *Journal of Second Language Writing*, and *Computers and Composition*, as well as relevant articles that include the discussion of approaches to the assessment of multiliteracies in the English language classroom from peer-reviewed journals such as *Journal of Applied Linguistics*, *International Journal of Educational Research Open*, and *English Teaching: Practice and Critique*.

Inclusion and exclusion criteria

The inclusion criteria that are used to select the articles are:

- Articles published between 2013 and 2023.
- Articles published in English language.
- Articles reporting empirical studies published in peer reviewed journals, book chapters, and grey literature such as dissertations.
- Articles focusing on the assessment of multiliteracies in the primary, secondary, and high school English language classrooms.

The exclusion criteria are:

- The reported studies must not be conducted in the students' homes.
- The reported studies must not be conducted in non-English language and literature classrooms.
- Non-English language articles are excluded.
- Studies that are conducted in preschools and universities are excluded.
- Conceptual articles are excluded.
- Articles not focusing on the assessment of multiliteracies in the English language classrooms are excluded.
- Review articles are excluded.

Search strategy and filtering process

During the search cycle, a comprehensive search was conducted using Google Scholar and six databases including ERIC, ProQuest, Web of Science, Academic Search Complete, Education Source, and ScienceDirect. Keyword search terms included “assess”, “English language”, “multiliteracies”, and “digital multimodal literacy”. The search terms were combined using Boolean operators such as “AND”, “OR”, and “NOT” or the minus sign operators (depending on the database) to form specific search strings for Google Scholar and each of the databases.

We conducted the search on Google Scholar using the incognito mode to maximize replicability of the search. The search string for Google Scholar was “(assess* OR evaluat* OR test*) AND ('multimodal composing' OR multiliteracies OR 'multimodal literacy' OR 'digital literacy') AND ('English language' OR ESL) -home -science -STEM -college -preschool”. The search string for ERIC, ProQuest, Web of Science, Academic Search Complete, and Education Source was “(assess* OR evaluat* OR test*) AND ('multimodal composing' OR multiliteracies OR 'multimodal literacy' OR 'digital literacy') AND ('English language' OR ESL)”. The search string for ScienceDirect was “(assessing OR testing OR evaluating) AND ('multimodal composing' OR multiliteracies OR 'multimodal literacy' OR 'digital literacy') AND ('English language' OR ESL)”. The last search was conducted on 12 February 2023. The search identified 1608 results from the search terms and designated time period.

The RIS files, a standardized tag format developed by Research Information Systems company to express bibliographic citation information, including the titles and abstracts of the 1608 results were downloaded from the databases and then imported into the online platform, Covidence, for titles and abstracts screening. Covidence detected 137 duplicates and deleted them, leaving us with 1471 records for titles and abstracts screening. We reviewed the titles and abstracts of the 1471 papers based on the inclusion and exclusion criteria to quickly filter and remove the irrelevant ones. Two researchers independently reviewed the 1471 papers on Covidence. Disagreements between the two coders were resolved through discussion and further review of the disputed studies. An example of a disagreement is that the two coders had involved whether to include articles that did not focus on the assessment of multiliteracies in their research questions. The two coders finally decided to include the articles (e.g., *Canady, 2017) as long as there were discussions of approaches to the assessment of multiliteracies in specific sections of the paper. 1434 irrelevant records were excluded during the titles and abstracts screening, leaving us with 37 papers for full-text screening.

During the full-text screening, all the articles were read in their entirety to verify that these articles met our inclusion criteria. The two researchers independently reviewed all the 37 papers and disagreements between the two coders were resolved through discussion and further review of the disputed studies. Twenty-two full-text articles were excluded, with reasons (see [Figure 1](#)). During the search cycle, 15 articles met the criteria for inclusion in the final review.

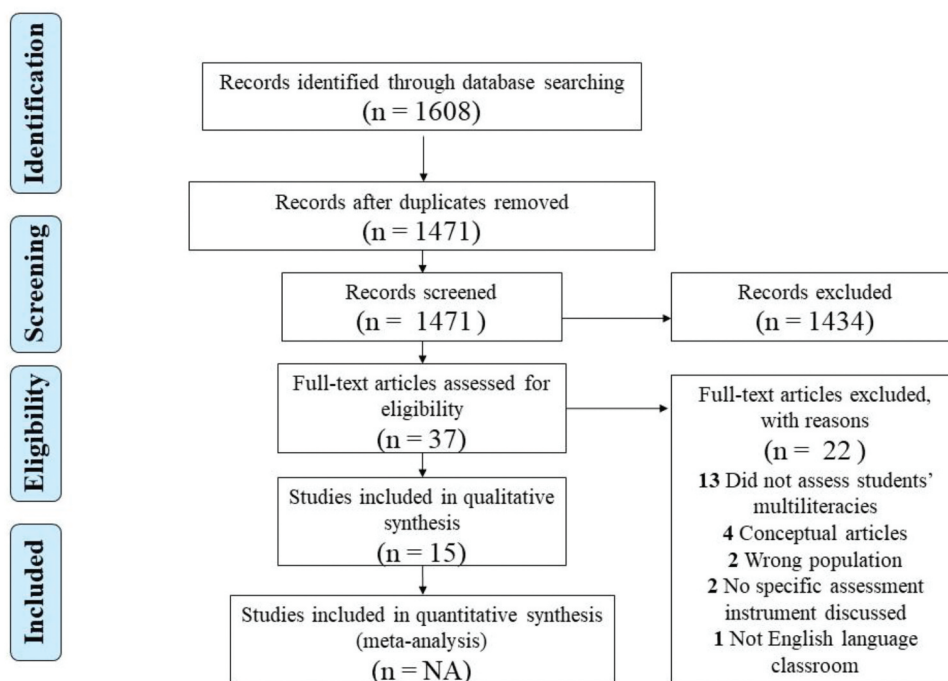


Figure 1. PRISMA flow diagram for the screening of papers.

Data extraction, coding, and thematic analysis

After an agreement between the two researchers on the data extraction form, the following data were extracted from the selected articles in the systematic review and were coded based on the following dimensions:

- (1) Author/year
- (2) Study design and type of methodology used (e.g., qualitative case study)
- (3) Country/region
- (4) Students' grade level/age
- (5) Types of assessment approach (e.g., assessment for/as/of learning)
- (6) Types of assessment (e.g., self/peer/teacher)
- (7) Modes in multimodal literacies assessed (e.g., linguistic, visual, etc.)
- (8) Factors hindering the assessment of multiliteracies
- (9) Factors facilitating the assessment of multiliteracies
- (10) Implementation results of the approaches of assessing multiliteracies

A second researcher checked the coding and a consensus was reached in relation to any disagreements in the coding of the studies analysed during the discussion. The qualitative coding process was conducted in the following steps. First, a preliminary coding scheme was generated using descriptive coding. Second, in focused coding, the data (list of studies) were analysed using the coding scheme, and the coding scheme was refined. Third, concepts were created from the codes, and relationships between the concepts defined using axial coding (Corbin & Strauss, 2008). Fourth, in process coding, codes that repeatedly appear in the data were searched, and they were combined to form topics in topic coding. Finally, themes were generated from the topics.

Synthesis of results

The heterogeneity of the included articles in the systematic review did not allow a standard quantitative synthesis (i.e., meta-analysis) to be done. Instead, we conducted a narrative synthesis and performed a thematic analysis (Facchin et al., 2021) to extract large-scale patterns from the analysis of the studies in the articles. The summary tables in Appendix 1 present the synthesis findings according to the categories we have described in the section on data extraction and coding. In the process of synthesizing the findings from the studies in the included articles, the two researchers critically discussed and aggregated the studies' results to identify descriptive categories (i.e., assessment approaches and types of assessment), to which the implementation results of the approaches of assessing multiliteracies could be assigned based on evident similarity. The researchers resolved all uncertainties by discussing together using a consensus-based approach.

Thematic findings from studies on assessment and multiliteracies

Theme 1 – metalanguage of multiliteracies for assessment

A common theme that we found across the studies is that researchers have implemented lessons based on the metalanguage for specific text types such as posters and comics to structure English language lessons in a systematic way to teach multiliteracies such as viewing and representing skills to students. J. C. Y. Lim and Hoong (2022) proposed an adapted model of the FAMILY framework or metalanguage (F. V. Lim & Tan, 2017) to guide and formatively assess students' multiliteracies of viewing and representing posters. The adapted FAMILY framework consists of the main categories of form, audience, and message. The category of form guides students to describe and interpret the visual and language semiotic resources in the poster. The audience category guides students to describe and interpret how the poster engages the viewer in terms of prominence and address. Finally, the message category guides students to describe and interpret the purpose of the poster such as whether it conveys an educational or entertainment message. The researchers implemented the lessons for the primary school students in Singapore using the FAMILY framework. Their analysis of the students' artefacts demonstrated students' learning whereby students displayed their understanding of the parts of a poster, the engagement strategies used and purpose of the poster, and this highlights the suitability of the adapted FAMILY framework for teaching and assessing students' multiliteracies in a primary school.

Unsworth and Mills (2020) developed and implemented a metalanguage for the explicit teaching and assessing of students' multiliteracies in composing digital comics using a digital multimodal authoring software. The metalanguage was adapted from Mills and Unsworth (2018) and Martin and White (2005) and consists of a linguistic framework for describing resources for expressing attitudinal meanings such as affect, judgement, and appreciation across multimodal modes in digital multimodal composition. The lessons were systematically designed and implemented based on the metalanguage. For instance, in the first lesson, the students were introduced to the language of positive and negative affect and in the second lesson, the language of judgement was introduced to the students by the media artist. In the third lesson, the language of appreciation was introduced to the students using photos to teach vocabulary about the expectation, worth, and value of nonhuman beings. Finally, lesson four taught students how to use the comic creator software *Comics Head* for iPad and lessons five and six allowed students to create and edit their digital comics with facilitator support. The analysis and formative assessment of students' artefacts showed that students developed productive repertoires for expressing affect, judgement, and appreciation through both language and image. Similarly, Zammit (2018) noted that when 8–9-year-old students were taught the relevant multimodal "grammars" to discuss multimodal compositions, they were able to critique their own and peers' multimodal mini-documentaries. The students negotiated the success criteria for assessing their own multimodal compositions and this also allowed them to assess their own work to edit and improve their work.

Theme 2 – multimodal analytical frameworks for assessment of students' artefacts

Another common theme that we found across the studies was that a range of multimodal analytical frameworks grounded on multimodality theories or multiliteracies theory were developed for the informal assessment of students' artefacts in the form of different text types such as videos and posters. Lee and Ho (2013) used multimodal discourse analysis to describe and analyse the multimodal meaning conveyed through the interplay of semiotic choices (O'Halloran, 2011) in the video artefacts composed by students in the two animation projects. They found that the students employed various multimodal resources at various points of the animation on their own or in combination with other semiotic modes to express different meanings at different timings of the animation. D. Kim et al. (2021) developed a multimodal analytical framework for analysing students' digital stories. This framework included representational, interpersonal, compositional, and socio-cultural dimensions. They derived this framework by combining Kress and van Leeuwen (1996), Unsworth (2001), and Serafini's (2015) approaches to multimodal analysis. They argue that students use multimodal semiotic resources such as images, video, audio, and text to express their thoughts and feelings and their systematic analytical framework enables for a nuanced analysis of each semiotic mode and reveals how students make meaning as an ensemble in their artefacts. They suggested that their framework could help teachers to obtain a deeper understanding of who students are, and teachers can also use the framework as a form of informal assessment of students' artefacts.

Avelar et al. (2017) developed a checklist systematizing the main characteristics of a textual genre such as a campaign to scaffold students' textual production. They used the checklist to assess students' final products from the perspective of the Pedagogy of Multiliteracies (New London Group, 1996). They found that students demonstrated multimodal literacy in their artefacts when they combined different semiotic resources such as the visuals, colour, light, and the linguistic modes to communicate the campaign's message to the viewers. They argue that assessing students' final product was made more meaningful and less subjective with the support of the checklist. In *Canady's (2017) study, the teacher developed a Digital Self Portrait for students to assess their own writing, creativity, effort, and presentation of the digital artefacts. The teacher co-constructed the broad criteria of the Digital Self Portrait contract, which was the primary assessment piece together with the students. The Digital Self Portrait contract was meant to allow students to assess for diverse modes that align with learning objectives. The implementation of the Digital Self Portrait contract for students' self-assessment of their digital artefacts contributed to their awareness of semiotic resources.

Likewise, Ørevik (2021) developed an assessment grid for assessing students' multimodal persuasive posters. Her assessment tool was restricted to the linguistic (writing) and visual modes and developed by drawing on elements from Kress and van Leeuwen's (2006) Grammar of Visual Design. She implemented the assessment tool in a Norwegian upper secondary school involving 15 students aged 16–17 years, one EAL teacher, and the researcher and revised it using the students' empirical data such as their artefacts. The revised assessment grid for multimodal persuasive poster assessed (1) the clarity of message, (2) relations between modes, and (3) originality and creativity of the poster. Clarity of message assesses whether the multimodal text conveys a focused message where arguments can be clearly perceived. Relations between modes assess whether students can compose a poster by combining modes to communicate a persuasive message to the viewers. Finally, originality and creativity assess whether students take an independent and inventive approach to text creation. The students' artefacts were graded minimum, middle, and high levels based on these three criteria. She argued that the revised assessment grid could be used to assess students' multimodal texts and inform further discussions of how semiotic resources can be deployed to create effects that align with the sign-maker's interests.

D. Kim et al. (2021) introduced a new multimodal framework for analysing students' digital storytelling. Building on earlier systemic functional linguistics frameworks (Kress & van Leeuwen,

1996; Serafini, 2015; Unsworth, 2001), this new framework described different representational, interpersonal, compositional, and sociocultural dimensions. By using this new multimodal framework, teachers could analyse students' digital stories in a more holistic way. This framework could also guide teachers in using digital stories as a pedagogical tool more effectively.

Larsen (2022) combined the multiliteracies framework of the New London Group (1996) and Cope and Kalantzis (2009) with embodied literacies (Leander & Boldt, 2013) to study how students made sense of their writing portfolios on their own and together with their peers. This hybrid approach could allow teacher researchers to investigate how material discursive entanglements can provide avenues for students to understand and apply their literacies. Y. Kim and Kang (2020) also proposed using a rubric to aid students in assessing collaborative multimodal compositions. This allowed students to peer-assess each other's work during the post-task phase.

Theme 3 – preoccupation with language and print literacy in multiliteracies assessment

One of the themes that we found in our studies is the preoccupation with language and print literacy as opposed to other modes such as visuals and sound, even in assessment on multiliteracies. For instance, the rubrics in Lee and Ho's (2013) study for assessing the students' animation project focus on assessing more language items such as grammar and punctuation, spelling, and vocabulary in group work as well as clarity, fluency, expression, prominence, pronunciation, and volume in students' oral presentations. In contrast, there were fewer assessment items for the other semiotic modes such as sound and images/graphics. For instance, sound was only assessed in terms of quality and appropriateness, and graphics was only assessed in terms of transition and appropriateness. Additionally, when assessing the other semiotic modes, the assessment rubrics are not specific in evaluating the relationship between the semiotic modes in students' artefacts such as the sound effects and graphics in the animations. When assessing the quality of the creation of animation in the overall product, the rubrics gave a broad assessment such as the "final product brings together various media elements to present a coherent and engaging story" (Lee & Ho, 2013, p. 114). Even though the multimodal analysis was conducted to assess the students' use of multiple semiotic modes in their animation projects, the visuals were perceived as a support to the language used in the animations and this was evident in the description in the multimodal analysis of how the images, as visual representations, elaborated the meanings expressed through the voice recordings by providing supporting details. Similarly, the checklist on the main characteristics of a typical campaign in Avelar et al. (2017) study focused on assessing more linguistic aspects in comparison to other semiotic modes such as images and colour. For instance, there were six items in the checklist for assessing the linguistic aspects, whereas there were only two items for images and 1 item for colour. There were also only two items assessing the relationships between the different semiotic resources such as the text and images.

The emphasis on assessing language is also seen in the Digital Self Portrait contract that was developed for students' self-assessment of their digital artefacts (Canady, 2017). For instance, the items for assessing writing are placed at the very front of the Digital Portrait Contract terms and the assessment of the other semiotic resources such as poise, voice, eye contact, and gestures are placed at the very end of the Digital Portrait Contract terms under presentation. The number of items used to assess writing in the Digital Portrait Contract terms is also more than the number of items used to assess the other semiotic resources. Ørevik (2021) also mentioned that in school examinations, written work is primarily being assessed over other modes such as the visuals. To overcome this lack of emphasis on the multimodal text and semiotic modes other than the linguistic mode in the English language classrooms, she developed an assessment tool to assess and promote students' multimodal genre awareness of a specific text type such as multimodal persuasive posters. However, the assessment tool was restricted to the linguistic and visual modes. Additionally, the assessment tool is still quite preliminary and can be further developed because at present, the different semiotic resources assessed by the assessment tools such as the visual, verbal, and linguistic (writing) modes

are quite broad. For instance, the visual mode can be further subdivided into more detailed and specific descriptors focusing on the assessment of camera angle, eye contact, proximity, and colour.

In a similar vein, Grandits (2019) argued that one of the barriers to implementing changes to the English language arts curriculum has been the Common Core learning standards and associated high stakes testing in the United States that did not include appropriate space for new literacy practices. Pedagogical practices in the classrooms were directly constrained by the high stake tests that typically assess a few standards and their respective skill sets. The narrow view of teaching, learning, and assessment in which print literacy remains dominant in what students are tested leads to little room for multimodal literacies in the English language classrooms. While implementing new literacies in the English language classroom, Grandits (2019) reflected that non-traditional and writing assignments must fit within the confines of the Common Core learning standards. She argues that one way to go about teaching and assessing multiliteracies in the English language classrooms is by giving students choice about which project to complete as part of an assessment and recognizing students' lived experiences to be valuable contributions to their learning.

The multiliteracies research project in Singapore

In Singapore, multiliteracies have been explicated as one of the three pedagogical emphasis alongside metacognition and inquiry through dialogue in the current English Language syllabus (Curriculum Planning and Development Division, 2018) for all public primary and secondary schools. ELS 2020 builds on the earlier English Language syllabus where the areas of language learning have been expanded beyond the focus on language-oriented skills of reading, writing, speaking, and listening to include the viewing and representing of multimodal texts. In the syllabus, multimodal texts can be derived from various sources including print, non-print, and digital networked sources (Curriculum Planning and Development Division [CPDD], 2018). As part of the learning outcomes in the curriculum, teachers guide students to understand how different semiotic modes contribute independently and are combined to convey the meanings in the text. Students also need to recognize the context, audience, purpose, and culture of the multimodal texts they view or represent.

Against the backdrop of multiliteracies now being a pedagogical emphasis in the curriculum, the research project on "Integrating Multiliteracies into the English Language Classroom: Developing an Instructional Approach to Teach Multimodal Literacy (Critical Viewing and Effective Representing of Multimodal Texts)" was funded by the Singapore Ministry of Education and was conducted from March 2019 to June 2023 (Lim, Chia, Weninger, et. al., 2022). It aimed to first understand how multiliteracies were taught in the English language subject classroom in Singapore schools and second to co-develop an instructional approach with exemplar lesson packages for the teaching of multiliteracies in lower secondary and upper primary students, ranging from 9 to 12 years old (F. V. Lim, 2021). The researchers worked with the teachers in the design-based research project to co-design the lesson packages with them. The lesson packages that were co-designed between the researchers and teachers focused on developing primary and secondary school students' ability to view and represent with multimodal texts as part of their learning of multiliteracies. The lesson packages were guided by an instructional approach (F. V. Lim & Tan-Chia, 2023) which outlined the four learning processes in multiliteracies – that of encountering, exploring, evaluating, and expressing which were adapted from the Learning by Design Framework (Cope & Kalantzis, 2015; New London Group, 1996).

The learning of viewing and representing with multimodal texts involved the introduction of a metalanguage (F. V. Lim, Cope, et al., 2022) to support teachers and students in thinking and talking about multimodal meanings. The instructional approach reflected contextually sensitive pedagogies such as having a "scaffolding-balance" (Smith et al., 2017, p. 19) between student choice and teacher guidance in digital multimodal composing (F. V. Lim & Nguyen, 2022). The lesson packages developed reflected the instructional approach and were offered as resources for both

teacher training as well as ready-to-go lesson packages for adoption and adaptation by teachers. The final report as well as the lesson packages are available to the public for reference and use (F. V. Lim, Chia, & Nguyen, 2022).

In this paper, we focus on the core issue of the assessment of multiliteracies. As part of the research project, F. V. Lim and Tan (2021) have analysed the assessment items in the visual text comprehension in Singapore's national examinations, the Graduate Certificate of Education Ordinary Level (GCE O' Level), and the Primary School Leaving Examination (PSLE), for the English language examination, as well as the literacy components of Programme for International Student Assessment (PISA) and Progress in International Reading Literacy Study (PIRLS) reading items. F. V. Lim and Tan (2021) found that the role of images as essential or supporting in answering the questions is few and limited. As such, multiliteracies in the form of assessing the students' understanding of images to express meanings are given low emphasis in the national examinations. In the next section, we discuss the possible reasons for this by reflecting on the findings from our research project in relation to the thematic findings of the systematic review.

Discussion on multiliteracies and assessment

The case for the teaching and learning of a metalanguage for multiliteracies has been well made by many researchers (Macken-Horarik et al., 2017; Serafini, 2015; New London Group, 1996; Unsworth, 2001). In particular, our review has shown how a metalanguage can be productive for the assessment of multiliteracies as it offers the resources to guide and formatively assess the students' viewing and representing with multimodal texts (J. C. Y. Lim & Hoong, 2022; Mills & Unsworth, 2018; Karatza, 2020). In the research project on multiliteracies in Singapore, we introduce a pedagogic metalanguage for multimodal literacy (F. V. Lim & Tan-Chia, 2023) through the lessons. The pedagogic metalanguage contains the key concepts and vocabulary for students to describe and discuss the meanings made in the multimodal texts. For example, it identifies the integral features of specific multimodal texts, the ways of interaction between the text and the viewer, the representations of ideas and the interplay of meanings across the modes. Figure 2 depicts an example of the pedagogic metalanguage for print advertisement.

The pedagogic metalanguage offers a basis for the assessment of multiliteracies as it introduces the concepts and terms in relation to a specific multimodal text type as well as a transpositional grammar for multimodality (F. V. Lim, Cope, et al., 2022). Teachers and students can then draw on this shared language in their thinking and talking about multimodal meanings as well as in the assessment of students' understanding. For example, in our research project, we developed pre- and post-tests to measure the learning gains from the students after the lessons. The pre- and post-tests were based on the concepts according to aspects such as the integral features, ways of interaction, representation of ideas and interplay of meanings in the pedagogic metalanguage. The students' performance in these tests offered a proxy indication of their learning. As such, the introduction of a pedagogic metalanguage in the learning of multiliteracies is an essential starting point towards the assessment of multiliteracies, particularly for the viewing of multimodal texts, given that it serves to define and explicate the knowledge involved in multimodal meaning-making.

In their study, Anderson and Kachorsky (2019) synthesize empirical literature related to practices and possibilities for assessing students' multimodal compositions. They include the discussions of studies that examine the use of various rubrics when assessing multimodal compositions. These include studies that focus on flexible and collectively generated descriptors for assessment and studies that use flexible rubrics or metalanguages as formative scaffolds for students' processes more than for summative assessment purposes. Our systematic review has also identified the use of multimodal analytical frameworks to assess the students' artefacts, created as part of their representing tasks (D. Kim et al., 2021; Larsen, 2022; Lee & Ho, 2013). This can involve the development of a checklist or a rubric (Avelar et al., 2017; Y. Kim & Kang, 2020; Ørevik, 2021) to assess specific components such as clarity, relations between modes as well as originality. Notwithstanding the ease

ASPECTS	FEATURES	SYSTEMS	CHOICES
INTEGRAL FEATURES	Organisation (Visual)	Image	Main Visual Display Focus of Attention Logo Graphic Text (font size and type)
	Organisation (Linguistic)	Written Text	Headline Brand Name Main Text Call to Action Slogan Product Name List Contact
WAYS OF INTERACTION	Prominence (Visual)	Size Sharpness Foreground Colour Contrast	Large, Medium, Small In Focus, Out of Focus Front, Back High, Low
	Address (Visual)	Gaze	Direct Gaze, Indirect Gaze, No Gaze
	Mood (Visual)	Colour Lighting	Primary, Secondary, Tertiary Bright, Dark, Natural
	Power (Visual)	Angle	High Angle, Low Angle, No Angle
	Distance (Visual)	Shot	Close Shot, Medium Shot, Long Shot
	Relation (Spatial)	Layout Placement	Order, Organic Positioning, Proximity
	Affect (Gestural)	Facial Expressions	Happy, Sad, etc.
	Attitude (Gestural)	Gestures	Positive, Neutral, Negative
REPRESENTATION OF IDEAS	Depiction – What	Message	Literal Meaning, Inferential Meaning
	Persuasion – How	Appeal	Authority, Reason, Emotion
	Purpose – Why	Intent	Economics, Education, Entertainment, etc.
	Interpretation – Who, When, Where	Context	Production, Reception
INTERPLAY OF MEANINGS	Reinforcement	Similar Meanings	Repetition, Elaboration, Extension
	Variation	Different Meanings	Play, Ambivalence, Breakdown

Figure 2. Pedagogic metalanguage for print advertisements (F. V. Lim & Tan-Chia, 2023).

and perceived fairness in the use of a standardized rubric for the assessment of multiliteracies, the use of rubrics has been the subject of critique. For example, Towndrow et al. (2013), p. 346, argued that it was difficult for students' multimodal meaning-design work to be "supported by and woven through the technical substrate of [an] assessment rubric". Instead, teachers needed to cultivate their own senses of semiotic awareness before meaningful assessment of students' artefacts can be performed. This is not to say that rubrics are not helpful, as Towndrow et al. (2013), p. 348, have pointed for the need in further work towards "devising and testing rubrics that describe types and levels of semiotic connection to facilitate more designful, but still efficient assessment of digital multimodal texts".

Our research project has responded to this call by drawing on multimodal analytical frameworks, such as visual grammar (Kress & van Leeuwen, 1996), social semiotics (Kress, 2010), and systemic functional multimodal discourse analysis (O'Halloran, 2007; O'Halloran & F. V. Lim, 2014), to inform the pedagogic metalanguage developed and nurture both the teachers' and students' semiotic awareness. In our research project, the lesson packages that were co-designed with the teacher-participants incorporated formative assessment of the students' creation of multimodal artefacts, to reinforce the integrated learning of viewing and representing skills in relation to other areas of language learning (F. V. Lim, Chia, & Nguyen, 2022). The multimodal analysis of the students' artefacts using the pedagogic metalanguage can be a form of formative assessment when a clear mapping between the concepts in the pedagogic metalanguage with the students' artefacts can be made in the students' multimodal composing (F. V. Lim & Unsworth, 2023). For instance, the assessment of one of the student's artefacts of the print advertisement highlighted signs of learning in the student when the print advertisement reflected the Integral Features from the pedagogic metalanguage introduced to the students such as the Product Name, Focus of Attention, and Logo

with fidelity. The assessment for learning is another approach that has been used to assess students' development of multiliteracies in the English language classroom. Assessment for learning involved students' sharing of their video artefacts with the class whereby they explained both the videos' message and their semiotic choices in the video, and this was followed by teachers' and peer feedback that encouraged the students to consider ways to improve their work (F. V. Lim & Nguyen, 2022). Additionally, the students were also asked to reflect and share their experience of composing their own digital multimodal texts in focus group discussions (F. V. Lim & Nguyen, 2022) to obtain feedback to improve their work.

A persistent challenge related to the assessment of multiliteracies relates to the findings from the systematic review that language and print literacy continues to be privileged in the English language classroom and remains the main focus in the examinations. This has resulted in assessment rubrics for multiliteracies to default towards a focus on language and print literacy (Avelar et al., 2017; Canady, 2017; Lee & Ho, 2013). Similarly, in our research project, when we examined the assessment items in the visual text comprehension in Singapore's national examinations, we found that what was examined was the understanding of language rather than meanings from the visuals. The disconnect between the curriculum outcomes and national assessment is not unique to Singapore and has also been observed in Australia, the UK, and the USA, as well as in international literacy tests. Unsworth et al. (2019), p. 128, describe this as an "educational chasm" where literacy assessment has largely neglected the need to assess students' multiliteracies.

It is well recognized that in contexts where the national examinations are high-stakes, such as in many East Asian societies, including Singapore, the coverage of the national assessment will narrow the curricular content to what is ultimately tested (Au, 2007; Klenowski, 2011). Reflecting on the perceptions of teachers and students as well as their pedagogical practices evident from our research project, teachers have raised concerns over the "constraining influence of assessment on multiliteracies learning" (F. V. Lim, Chia, & Nguyen, 2022, p. 388) and students have also revealed the "spectre of assessment" that haunts much of classroom practices (F. V. Lim et al., 2021, p. 107). As such, we argue that even as education systems incorporate multiliteracies into the literacy curriculum, the meaningful assessment of multiliteracies teaching and learning is now the next frontier of change.

Conclusion

The assessment of multiliteracies has been the focus of several studies in recent years given that multiliteracies are now represented in the literacy curriculum in many education systems around the world. Our systematic review of these studies has identified the themes of the importance of a metalanguage of multiliteracies for assessment, the productivity of multimodal analytical frameworks for assessment of students' artefacts, as well as the preoccupation with language and print literacies in multiliteracies assessment. We have reflected on these themes in relation to our multiliteracies research project in Singapore and discussed how we have engaged with the aforementioned issues. Our findings from the research project attest to the need for urgent action to both provide teachers and students a way to think and talk about multimodal meanings with a commonly shared pedagogic metalanguage, which can also be used as a basis for assessment of students' learning of multiliteracies. Such a pedagogic metalanguage needs to be both theoretically oriented and practically grounded. The pedagogic metalanguage must be informed by existing multimodal analytical frameworks that can support sophisticated and nuanced assessment of multimodal texts by students and the assessment of multimodal creations by teachers. The pedagogic metalanguage must be sensitive to the profile and needs of the teachers and students such that it is accessible and aligned to the metalanguage of language, that is already used in the English language classroom. The translational process from theory to practice as implemented in our design-based research project on multiliteracies in the Singapore charts a path towards developing such a contextually sensitive pedagogic metalanguage. Likewise, other education systems in Asia-Pacific and around the

world need to find their way forward in developing similar pedagogic metalanguages to support the assessment of multiliteracies in their unique literacy classroom contexts.

Our paper also advances the argument for the importance to move beyond the focus on language and print literacy in assessment. What is assessed is, ultimately, a signal of what is truly valued by the education system. In the contemporary digital age, where the literacy practices of our students are mediated by social media, digital games (F. V. Lim & Nguyen, 2022; Toh, 2018; Toh & Kirschner, 2020, 2023; Toh & Lim, 2021, 2022), as well as the emerging ubiquity of generative artificial intelligence tools, the sole privileging of language through the mode of writing in literacy assessment can no longer be tenable. Our paper hopes to contribute towards initiating a conversation on how multiliteracies can be equitably assessed in anticipation of the changes that must come as educators around the world attempt to answer the question of what it means to be literate today.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This study was funded by Singapore Ministry of Education (MOE) under the Education Research Funding Programme (DEV 01/18 VL) and administered by National Institute of Education (NIE), Nanyang Technological University, Singapore.

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