



A Multimodal Framework for Teaching and Learning: Case Study of a Japanese University Context

Jeffrey Mok

National University of Singapore (Singapore)

elcmchj@nus.edu.sg

Abstract

In this information and consumer age, social and business exchanges have become visibly multimodal. Socially, we not only communicate using multiple platforms but we co-participate. Businesses engage customers multi-modally in order to cater and customise products and services to meet individual preferences. Faced with this multimodality in everyday life, how do our classrooms compare when attending to our students living in the age of consumerism? How do teachers respond and facilitate learning to meet the demands of today's digital age? This paper presents a multimodal teaching and learning framework for the classroom. Taking the cue from multi-modality in communication, this paper extends the notion of multimodal learning beyond multimodal text and expands the notions of multi-literacy into a pedagogical approach. The paper contends that unless our classroom teaching embraces an overtly multimodal learning approach, we risk disconnecting with and disadvantaging our students.

The main research question is: how do teachers and students engage the various modes and mediums to share and make meaning in the classroom. Using an ethnographic study of 24 cases of classroom sessions in a Japanese university, this paper will demonstrate, from the findings, a typology of informational representations for a framework of multimodal teaching and learning. Specific examples on what and how both teachers and students use to communicate and make meaning will be presented. The research methods include observations, repeated video viewing, audio recordings, interviews and examinations of artefacts. Analysis of data was done using grounded theory methods for observation, video and interview data and conversational analysis for classroom audio data.

This study will reveal that there are major categories for the image, text, and audio mediums with further three to five sub-groups. The paper will also show that there is a variety of verbal and nonverbal modes with a clear pattern of primary and subordinating modal relationships. The findings also include the range of social-cultural artefacts and technological platforms that the old and new media affords. It will also illustrate how the variety of modes that make meaning and the range of artefacts that represent information function in both space and time continuums. The paper concludes with suggestions on future directions to facilitate learning in this information and consumer age.

1. Introduction

The digital age has ushered in new media affording multimodality in communication that has profound impact to businesses, social and professional practices. Businesses engage customers multi-modally in order to cater and customise products and services to meet individual preferences. Social and professional practices communicate using multiple platforms to increase higher levels of engagement and messaging [1]. Classrooms are trying to respond to this multimodality [2] [3]. As Roswell [4] rightly pointed out the complicated nature of translating the digital multi-literacies of today's students into today's classrooms, there is a clarion call for new pedagogical frameworks to guide teaching and learning in the face of multimodality. This paper seeks to add to the number of studies studying multimodality in a classroom context.

Multimodality is seen as an innovative approach to investigate the multitude of ways we communicate [5]. Multimodality analysis involves the study into modes, semiotic resources, affordances, interaction, discourse, and media of distribution. In seeking to address the research question, *how do teachers and students engage the various modes and mediums to share and make meaning in the classroom*, this paper examined the various semiotic resources and media of distribution of these semiotic resources. This paper sees mode as a naturally occurring means, "a socially shaped and culturally given semiotic resource" [6], for learners to engage in making meaning in the classroom. Because modes are culturally and socially dependent on the learners, it is of interest to this study to identify these semiotic resources they meaningfully engage in. Because semiotic resources require media to distribute information this study also investigated these media and their quality.



A total of 24 cases were ethnographically studied. They were videoed and were repeatedly observed. These cases were purposively sampled, selecting three teachers that had excellent student feedback and used technology in their classrooms. Two of the three teachers and all the students were Japanese. These three teachers' classes were observed over a semester of twelve weeks. The students and teachers were also interviewed and their artefacts used in the classroom were examined. Grounded theory methods [7] were used to analyse data derived from observations, participants' interviews and documents analysis. The data was coded using open and axial methods. The interviews and examination of artefacts were used to confirm the themes and findings that emerged from the data analysis.

2. Findings and Discussion

2.1 Core and subordinating modalities

Teaching and learning are set in contexts and there are several contextual modes that students learn in this study. The observations revealed four levels of interactional modes that the students learn meaningfully in: class, group, sub-group, and individual (Figure 1). These levels were seen to emerge and sustained for periods of time during the phases (P1-P7) of the class. These phases were observed to be common in all the 24 case studies which involved the teacher teaching and students working on a task. Each block within the phase shows the sustained amount of time where one level was dominating as the core with other levels as subordinates.

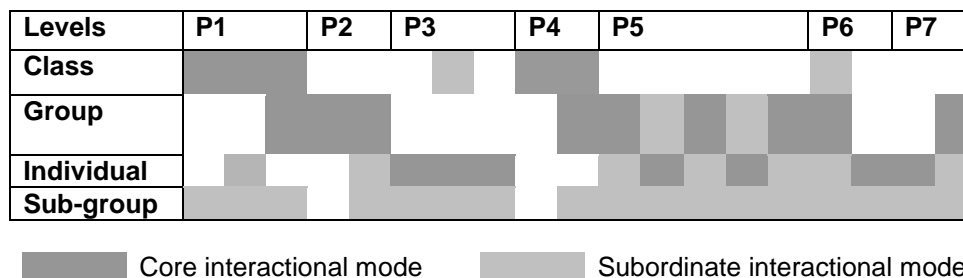


Figure 1. Levels of interaction over phases

Class level interaction was observed in P1: the teacher talked to the students collectively as a class. Group level interaction was observed between members in groups ranging from pairs, triads to groups (P2 and P5). Individual level interaction was observed where the student was doing individual activity (P3 and P6) such as consulting dictionaries, notes and hand-outs. Sub-group level interaction was observed where a student engaged in an activity (e.g. discussion) with another student(s) or teacher *while* the core process was going on. The interviews revealed that students found these levels facilitated the learning of the subject matter: teacher's teaching at the class level, clarification at the sub-group level, and elaboration at the group level. Artefact examination revealed individual levels of accessing information (websites, notes, etc.) and clarification of words (dictionaries) for further understanding.

What is clear is that there is a core level that dominates as the context of interaction between the teacher and students in the exchange and sharing of information with subordinating modes which are meaningful. The different contexts of interaction (levels) afforded different modes of meaning making for the students to construct their understanding. Contexts are intertwined with learning where meaning making is a product of the context within which meaning occurs [8]. These interactional contexts *become* the semiotic resources where learners can engage in to learn what the teacher has intended. Some students require group or sub-group levels, while others need individual actions to get a grasp of what needs to be learnt. These interactions are also studied as multimodal interaction where learners learn from the interaction [8]. By affording these different levels in the classroom, we are affording a multimodal context of interaction for students make meaning.



2.2 Medium of modality

There were two main media used in communicating and meaning making: audio and visual medium. These two main media can be further seen as seven different categories ranging from digital to human images and (Table 1).

Table 1. Media, Representations and Modes

	#	Medium	Representations	Modes
Audio	1	Audio digital text	Computer audio words	Information/ Resource voice
			Electronic dictionary audio words	Information/ Resource voice
			Computer screen video	
	2	Audio human text	Human speech – verbal words	Peer voice
Human speech – visual words			Teacher voice	
Visual	3	Visual digital image	Computer display on projector screen	Illustrative and Information/ Resource image
			Computer screen video	
			Computer screen dictionary website	
			Electronic dictionary display screen	
	4	Visual digital text	Computer display on projector screen	Illustrative and Information/ Resource words
			Computer screen video	
			Mobile phone/ iPad display	
			Electronic dictionary display screen	
	5	Visual human text	Written notes	Illustrative and Information/ Resource words
			Words on whiteboard	
			File (previous written notes)	
	6	Visual human image	Facial expressions	Illustrative image (emphasis, etc.), Attention feeling
			Gestures	
Body language			Attention feeling	
Gaze				
Proximity movement				
Hovering movement	Monitoring feeling			
7	Visual human print text	Hand-outs	Information/ Resource words	
		File (previous Hand-outs, clippings)		
		Book (text book, dictionary, etc.)		
8	Physical touch	Pat on the back	Attention feeling	

Digital representations involved electronic artefacts (#1, #3 and #4) while human representations were the traditional pen, paper, and human voice (#2, #5, #6 and #7). Some representations had a combination of media such as “computer screen video” (audio digital and visual digital text and image) and “human speech” (human verbal words and visual human text).

The main medium of modality is human speech (audio human text): the co-deployment of verbal and visual words. This co-deployment was further supported by visual human text, image and print text. The co-deployment of verbal and visual words were critical to students meaning making as the visual words clarified the more abstract verbal words. This co-deployment of semiotic resources, seen as visuospatial modality (gesture, gaze, and body postures), accompanies the vocal modality in interaction [8]. The further support by the human text, image and print text had various effect on the students. Some felt that the human image of gestures, gaze and body language were essential in engendering the importance of the lesson points expressed via human speech and the sense of personal attention given to the student, resulting in a higher sense of meaningfulness. The human visual text (on the whiteboard) afforded an association of authority and expertise that accompanied the human speech of the teacher. The human print text provided an association with a sense of completeness and also authority of the lesson points taught.



2.3 Stability of modalities

The nature of the medium has implications to the stability of the representation and therefore duration of accessibility to students for meaning making. The duration was observed to be determined by the qualities of permanence and frequency of the representation. Representations were observed to have either temporary or permanent properties. Representations such as hand-outs, computer displays and notes were observed to be highly permanent as they remained and persisted in the classroom for long periods of time (50-100%). Others such as speech, gestures and physical touch were temporary (<1%). They disappeared after listening, viewing and were irretrievable. Highly permanent representations could be stored and be frequently retrieved at will by the students. Examples were the notes made by the students. Semi-permanent representations persisted for a certain amount of time but disappeared over time and space. Examples were the writings on the whiteboard or computer display on the projector screen. Semi-permanent representations can become permanent when stored.

Representations were also observed to either occur frequently or less frequently. A highly frequent representation was one that was repeatedly distributed. Examples were repeated instructions or reminders. The teachers, in seeking to be clear and effective in their distribution, engaged in higher frequency of distribution. Highly frequent representations have the effect of importance and urgency to the students. Different types of media clearly showed higher or lower permanence and frequency (Table 2).

Table 2. Stability of Media: permanence and frequency

Medium	Permanence	Frequency
Audio digital text	High	High
Audio human text	Low	Low
Physical presence		
Physical touch	Semi	High
Visual digital image		
Visual digital text	High	Semi
Visual human text	Semi	
Visual human image	Low	Low
Visual human print text	High	High

In a classroom of multiple modalities, the stability of the modes determine the duration and affordances of the meaning making opportunities. The availability of the semiotic resources and therefore the modes must be carefully designed to engender a multimodal environment for teaching and learning.

3. Conclusion and implications

In seeking to address the research question, *how do teachers and students engage the various modes and mediums to share and make meaning in the classroom*, this brief paper has examined the various semiotic resources and media of distribution of these semiotic resources. While there are many semiotic resources that students and teachers found meaningful (Table 1), the chief mode of audio human text was paired or supported by other semiotic resources. The audio element of the human text is multimodal: with various visual human text, image and print text. In fact, within the audio human text, it is multimodal in of itself – a co-deployment of verbal and visual words (combination of concrete words, analogies, metaphors, etc.). The other important finding was the chief mode of interactional context where students learn meaningfully was the class level of interaction supported by three other levels, group, sub-group, and individual levels. These multimodal levels of interaction afforded a more complete and satisfying learning experience for the students and teaching experience for the teacher. The third important finding was the stability of these modes in the classroom that affords the durability of the meaningful experiences. The more stable the modes were, the higher the durability of meaning making for the students. A careful consideration of the permanence and frequency of each of these modes in a teaching and learning environment will provide for a better environment for learning.

Multiple modalities are clearly at work together in interaction not just in this study but in other studies [8]. Co-deployment and support of several semiotic resources are common in multimodal sense making [5] [6]. In designing for effective teaching in a class in keeping with the digital age, attention must be paid to the affordances of these multiple modalities that students require for their meaning making. In approaching a multimodal framework for teaching and learning in the classroom, these considerations of modes, representations, media, stability and interaction should be carefully designed and provided for.

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