Exploring the Most Effective Modality to Present Online Material to Language Students

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Abstract: This study seeks to identify the most effective way to present online content to language learners with the aim of maximising learning benefits and engagement. As teachers are the gatekeepers of content, we believe it is fundamental to understand how they, as well as learners, perceive the different modalities in which it is presented. This paper will present the preliminary results from a pilot study with learners of Spanish as a Foreign Language (FL) in Hong Kong and trainee teachers in Spain. The project has developed a FL online course to test different ways of presenting information to learners using a combination of modalities. The focus of the course is the marker "se", a specific linguistic unit that is seldom taught explicitly in the classroom but that occurs frequently in both the written and spoken language, and is critical to the production and comprehension of nuanced Spanish. Our preliminary results suggest that trainee teachers prefer the video modality but consider the audio modality a novel way of presenting content. The textual modality, however, is considered as the most traditional and "boring" to learners. This is confirmed by the results from the Hong Kong learners who indicate that the audio modality was more rewarding and appealing than the textual one (the results from the video had not been received at the time of writing). These results are encouraging as they suggest an alignment of trainee teachers' perceptions and actual learner engagement despite the cultural differences between the two groups.

Keywords: online content, teaching modality, teacher perception, learner engagement, input modalities, Foreign Language teaching

1. Introduction

Cultural diversity and technological breakthroughs in the past few decades have changed our communication and, consequently, foreign language learning/teaching (Tzirides 2020). What used to be considered an effective setting for teaching is now being questioned, as "learners nowadays live in fast paced, constantly changing times and they have developed different needs comparing to the past." (Tzirides 2020, p. 141). Even before the COVID-19 global pandemic, the advances in technology have been offering many opportunities to be used in the communicative classroom. What COVID-19 did was accelerate the need to adapt teaching, as formal foreign language teaching in educational institutions has been particularly hit by the situation. More and more of our teaching is transferred online, and it is essential that we understand how our audience prefers to learn. Some individuals prefer texts, others audio and yet others choose images or videos.

Despite having a body of research that shows no significant relation between learning styles and student performance (Coffiel, Moseley, Hall and Ecclestone 2004; Price 2004 cited in Hassan et al. 2019), learner engagement and performance do seem to be correlated (Askari, Makvandi and Neisi 2020; Ladd and Dinella 2009), explaining why pedagogues do take them into account when developing teaching materials. Learning preferences by modality, and by extension teaching preferences, seem to be strongly linked to the style of teaching experienced in earlier years. However, the discussion so far has mostly centred on these as individual learners' learning styles rather than situational cultural or educational preferences moulded by previous experiences (Lopez-Ozieblo 2018). Considering that many FL teachers might not share a cultural affiliation with their learners, in the vein of teacher cognition studies (Borg 2003), it is valuable to investigate teachers' beliefs and preferences in terms of the various modalities content can be presented in and how this matches learners' levels of engagement.

Learning requires engagement with the content being learnt. In this pilot study we sought to investigate the level of learner engagement achieved by each of the three modalities used to present content to learners, and also trainee teachers' expectations of those levels of engagement.

2. Background

Existing studies based on virtual learning do not provide conclusive results as to the most beneficial modality in which to present content (Macedonia and Klimesch 2014). These studies highlight the cognitive load imposed on learners, which varies with the content presented but also with how that content is presented. So far, existing studies have led to contradictory conclusions. Schnotz, Boeckheler and Grzondziel (1999) report learners experience cognitive overload when presented with certain types of animated input while Mayer and Moreno (2003) report an easing of cognitive load with narrated animation. Further research on cognitive load has been called for by a number of researchers (Brüncken, Plass and Leutner 2003; Paas, Tuovinen, Tabbers and Van Gerven 2003). Mayer and Moreno (2003) noted that it is difficult to evaluate the levels of cognitive load imposed by the various instructional materials available to learners, partly because this might depend on individual experiences (Lopez-Ozieblo 2018).

Those learner differences affect learners' levels of engagement. Schaufeli and colleagues define engagement as: "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (Schaufeli, Salanova, González-Romá and Bakker 2002, p. 74). Engagement is linked to academic achievement (Askari, Makvandi and Neisi 2020; Park 2003) and thought to be the integration of behavioural, cognitive, emotional and agentic components (Christenson, Reschly and Wylie 2011; Fredericks, Blumenfeld and Paris 2004; Reeve and Tseng 2011; Schaufeli et al. 2002). Behavioural engagement refers to personality traits such as effort, vigour and persistence. Cognitive engagement is related to the management and use of learning strategies. Emotional engagement refers to the emotional reactions to the learning process, such as enthusiasm, boredom, pride and challenge. Agentic engagement, a newer component proposed by Reeve and Tseng (2011), refers to learner's motivation both intrinsic and extrinsic.

A number of studies have linked levels of engagement to modality-based learning preferences (Halif et al. 2020; Hashim, Aris and Chan 2019; Stan and Plăiaşu 2018), suggesting that how content is presented affects engagement levels. However, the pedagogic recommendations are usually to present materials in a variety of modalities (Ko and Rossen 2010). Preparing online audio-visual materials is very time consuming and worth exploring their benefits versus less elaborate materials. With this study, we sought to explore the levels of learner engagement with three different input modalities as well as the expectations of future teachers about those levels to inform a subsequent study that will correlate levels of engagement with learning benefits.

2.2 Measuring engagement

O'Brien, Cairns and Hall (2018) indicate that the level of engagement of online course users depends on a number of factors including the level of challenge to learners, the aesthetic and sensory appeal of the content, feedback, interactivity and perceived level of control, among others. In order to calculate users' level of engagement, O'Brien and her colleagues developed a self-reporting tool, the *User Engagement Scale* (UES), which has subsequently been adopted in over 40 studies (O'Brien et al. 2018). The UES asks the user some simple questions about their difficulties in completing the activity, as well as questions on their interest in and perception of the experience, to evaluate their level of engagement. The UES was adapted for the purposes of this study (see Appendices).

3. Objectives

This pilot project had two objectives: (1) to identify what type of modality Spanish trainee teachers believe will engage language learners when learning content online; (2) to identify what type of modality engages HK Spanish FL learners when learning content online.

4. Methodology

The project has developed a series of online units, focusing on three different modalities: text, audio, and video+audio to present different functions of the marker "se". One of these functions (the middle voice "se" to indicate personal care of one's body) was presented to trainee teachers in the three modalities for analysis. Each trainee teacher, working individually, analysed one modality, using an adapted version of the UES to indicate their perceived level of engagement for learners with that unit/modality. Trainee teachers had to indicate their full or partial agreement or disagreement with a series of statements on a 1 to 4 Likert-type scale (1 = I completely disagree; 2 = I mostly disagree; 3 = I mostly agree; 4 = I completely agree). The statements included: The unit captures the students' attention; it can be confusing for students; it can be tiring for students; it has an attractive format; it can be engaging; it can be gratifying; it can be interesting; it is well sequenced. Later, in groups of 4 to 6, trainee teachers compared the three modalities together and provided their answers in a report.

For the Hong Kong learners of Spanish as a foreign language, three different functions of "se" were presented in three separate units, each following one modality. After completing each unit, participants also completed a version of the UES. Learners had to indicate their full or partial agreement or disagreement with a series of statements on a 1 to 5 Likert-type scale (1 = I completely disagree; 2 = I mostly disagree; 3 = I am not sure; 4 = I mostly agree; 5 = I completely agree). We added the neutral option 3 in order not to force learners to agree or disagree with the statements. The statements included: I was completely engaged by this module; the time I spent doing this module just slipped away; I felt frustrated while doing this module; I found this module confusing; doing this module was taxing; the format of this module is attractive; this module appealed to my senses; this experience was rewarding; I felt interested in this experience; I found the "SE" explanation easy to understand; I found the story easy to understand; I liked the last activity. The responses to the UESs and the trainee teachers' reports were analysed and the findings are presented below.

The content and its sequence were the same in the three modalities. The textual unit did not contain any illustrations to facilitate comprehension. The audio-visual unit minimized the use of text by omitting subtitles, although the instructions in the exercises were given textually. The audio modality contained no related illustrations and also minimized its use of text. For this last modality, instructions were given as text and audio.

4.1 Participants

The participants were 66 trainee teachers in their first year of an undergraduate course on Spanish language and its didactics studying at the University of Alcala, Spain. Their participation was a requirement of the subject and their reports were evaluated. In addition, eight learners of Spanish as a foreign language volunteered to participate (over 20 learners were asked but only 8 had completed at least two units at the time of writing). The proficiency of the learners varied between low to medium A2 (according to the Common European Framework of Reference for Languages). They were all learners of the same higher education institution in Hong Kong.

4.2 Procedure

The units were designed using the software *iSpring* and presented online, each following the same structure: (1) brief administrative introduction, (2) a story (presented as a text, audio or video), (3) questions related to the comprehension of the content of the story, (4) a grammar explanation of the specific function of "se" (presented as a text, audio or video), (5) questions on the function of "se", (6) additional and very brief, grammar explanation on the "se", (7) more exercises on the "se", (8) a final free production exercise (write a text, record an audio or a video) and finally the UES. Written text was included in all modalities as learners at the A2 level are at a low intermediate stage and are still very dependent on written text. The units developed for the trainee teachers can be accessed at: http://www.hispanicstudies.net/hispanicstudies/SEintro.html.

Before starting the units, learners completed a test to evaluate their knowledge of the various functions of the grammatical particle "se" to be covered by the project. After completing all the units, learners will be asked to retake the test and the learnings correlated with their evaluation of the various modalities. In addition, participants were asked to fill in a personal adaptation of the *Learning Style Survey: Assessing Your Own Learning*

Styles developed by Cohen, Oxford and Chi (2002), based on Oxford's categorization of learning styles. The results from these two tasks are not covered in this paper.

4.3 Analysis

The trainee teachers were divided into 13 groups of 4 to 6, preassigned by the teacher. A total of 53 valid UES answers and thirteen reports were received. Data from the trainee teachers was analysed using a mixed methods approach. Twenty-two trainee teachers analysed the textual modality, 17 the video and 14 the audio. Not all of the responses had been received from the Hong Kong-based leaners by the time of writing. Thus, we can only report on the preliminary results for the text and audio modalities. Mean values were calculated for each of the statements and compared by modality using a series of ANOVAs. Learner's data was manipulated to eliminate option 3 = I am not sure.

5. Results and Discussion

Overall, the results indicate that all trainee teachers agreed fully or partially that the three modalities could be interesting, engaging, attractive in format and content and gratifying to complete. All units were considered to be adequately sequenced. The differences in how the modalities are perceived are generally very small. Figure 1 presents the mean evaluations given by the trainee teachers.

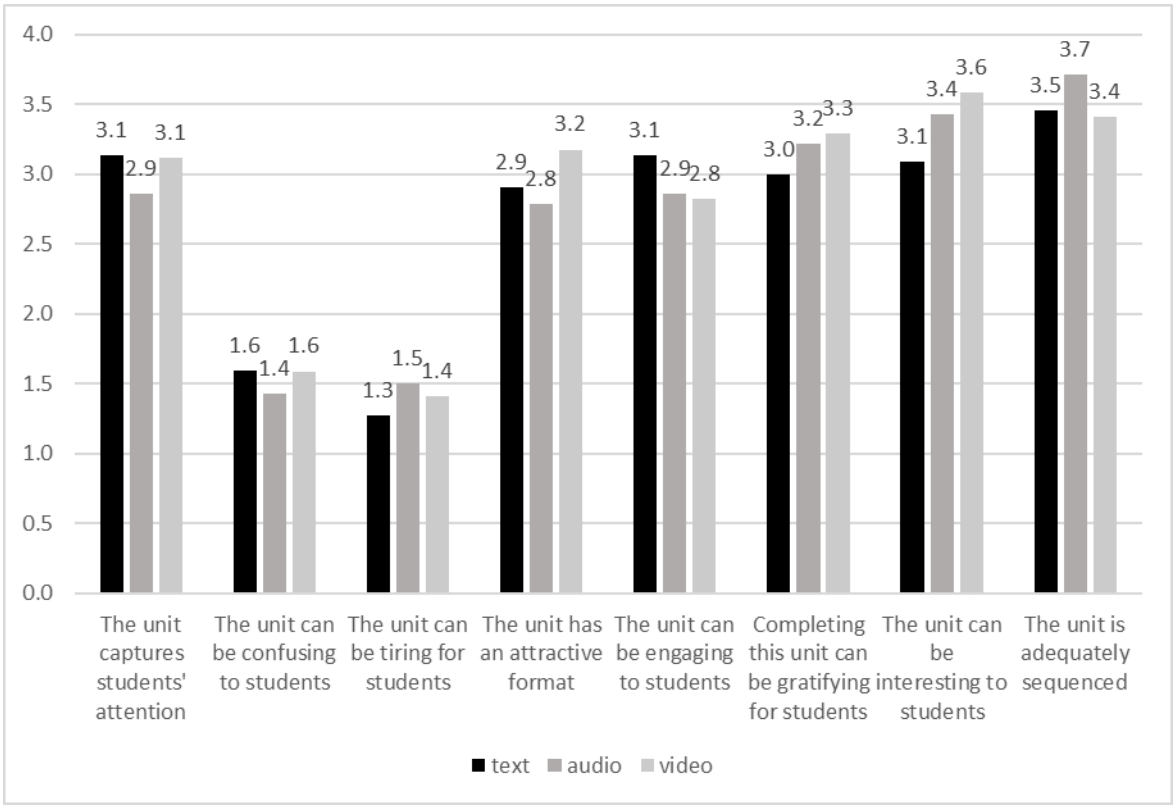

Figure 1: Means of trainee teachers' answers to the UES.

The ANOVAs do not indicate any significant differences in the overall perceptions of the three modalities. However, trainee teachers considered the video modality as the most interesting and gratifying one to learners and its format the most engaging. The text was considered the least gratifying and interesting modality but the most engaging and just as likely as the video to capture learners' attention.

The qualitative analysis explained some of the quantitative results, but there were some discrepancies. Despite the data suggesting that the text was likely to be the most engaging modality, it was reported as the least

preferred option. Trainee teachers commented on this being the traditional modality to present content to learners in the classroom and that it would lead to low engagement levels. They thought learners might be bored by it, needing to concentrate more than with audio or video modalities. It was considered to be cognitively more challenging and more tiring than the other modalities. Learners with reading difficulties were noted to be disadvantaged by a text-only modality. However, it was also recognized that, aside from the content of the story, it would be easier for learners to note the linguistic elements.

All trainee teachers unanimously agreed on the video modality as the preferred one, as it was felt that it matched how children and youth today interact with the world (mostly through digital audio-visual media). It was believed that this modality facilitates information retention and is engaging. Moreover, it was suggested that subtitles ought to be added to the videos, thus providing the content in three modalities at the same time.

Interestingly, the audio unit was considered a novel task and, for this very reason, it was evaluated as attractive and engaging. It was believed to be more suitable to autonomous learners, although the learning was thought to be more abstract than through the video modality. However, it was not considered suitable at all for deaf learners or those with hearing difficulties. In general, the participants felt that the audio would be easier than the text to follow as it contained prosody, which makes it easier to understand. Nonetheless, and even though the audio could be replayed as often as necessary, it was noted that without a transcript learners might lose the thread of the narration and not be able to get back to it.

The preliminary results of the learners' perceptions (Learners' UES) indicate that there is no significant difference in the evaluation of the two modalities tested so far, text and audio (although the sample is too small to be statistically valid). The main point to note is that learners seemed to find the content easier to understand when presented textually (this will be confirmed once the results of the exercises within each unit have been analysed). Figure 2 presents the summary of the means for the statements evaluated by the learners.

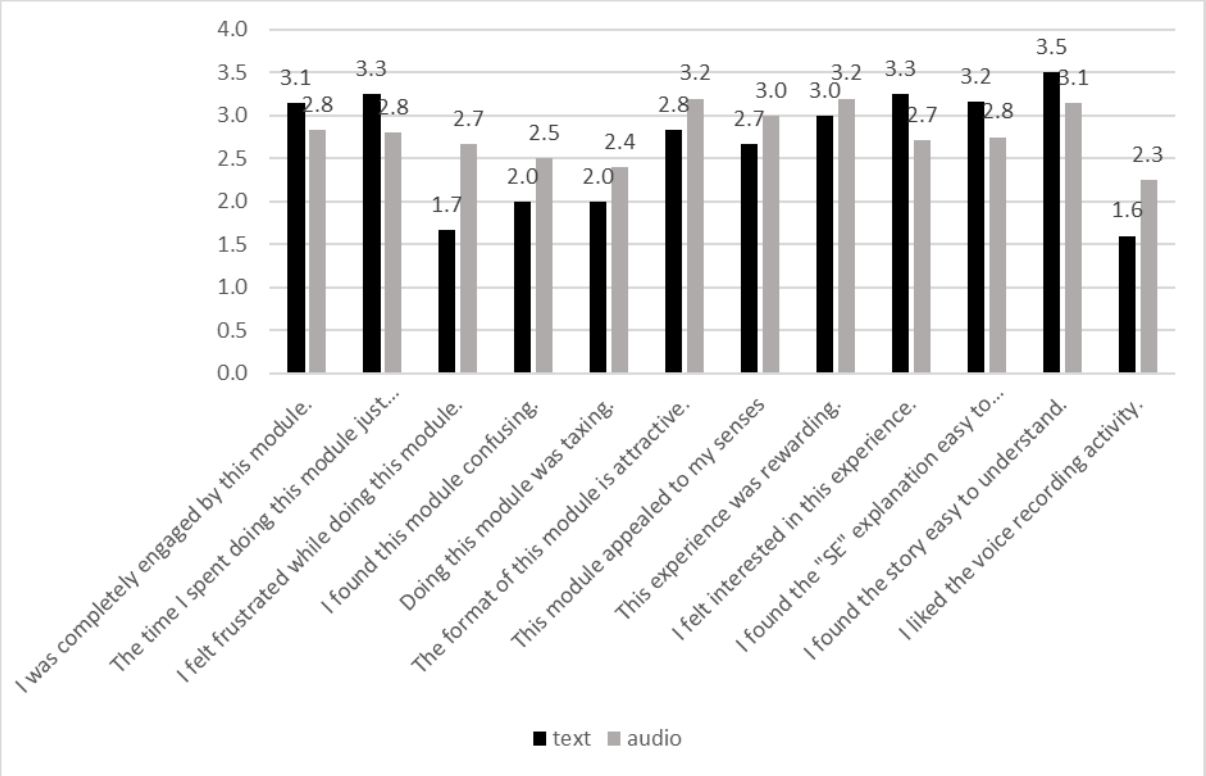

Figure 2: Means of learners' answers to the UES

6. Preliminary conclusions and next steps

When comparing the statements for the two modalities, learners seemed to have experienced more frustration and confusion with the audio modality which they also found more taxing. Interestingly, learners also perceived the audio modality as being more rewarding, more appealing to the senses and more compelling than the textual one. Thus, corroborating some of the observations made by the trainee teachers who felt that the audio modality might be attractive and engaging due to its novelty. An ANOVA test comparing the means of the statements relating to attention, engagement, attractiveness, reward, interest, confusion and tiredness indicated no significant differences between the answers given by trainee teachers and those given by students. Teaching/learning preferences in terms of how content is presented seem to be similar between Spanish trainee teachers and Hong Kong learners of Spanish.

Overall, the suggestion from trainee teachers was to integrate the three modalities within the same unit or to present content in alternating modalities. For learning to take place, content needs to grab learners' attention, this attention needs to be sustained long enough for the content to be processed and integrated with existing knowledge. The modality used to present the content is key to capture learners' attention in the first instance, but an overload of information via too many sensory-motor processing systems might cause a cognitive overload leading to frustration and confusion. Therefore, mixing too many modalities might not facilitate learning. As Miller (2001) notes, learning styles are not a limitation for processing content from various modalities. Individuals process information in their preferred learning style by transferring that information from the original modality into their preferred one.

These preliminary results indicate that both trainee teachers and learners believe that all modalities are equally engaging. The audio modality, not always used to its full potential in the foreign language classroom, should be integrated as much as possible as it engages other senses, rather than just the visual one. This is a positive outcome in which, despite cultural differences, trainee teachers' perceptions correspond to learner's evaluations. In the Hong Kong context, this is specifically relevant as all Spanish teachers in higher education institutions are Spanish native speakers and 90% are Spanish.

Based on these results, this study is being expanded to add more learners of Spanish, in Hong Kong and Spain, who will be completing three content units of the marker "se" each in a different modality. Three groups of learners will be randomly allocated three different sequences of units. Learners' answers to the various exercises will be correlated to their reported levels of engagement and to their learning of the various functions based on the differences between the answers to the "se" pre-test and post-test. Our final results seek to correlate learning benefits to each modality.

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