Development of Learning Object from IP-Based Television Programme

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Abstract— **The TAMALLE+[1, 2] is a prototype system that supports learners in their television viewing, enhancing informal language learning via interactive television and mobile phones. In this paper we describe a learner-centred study designed to elicit criteria for selection of those language learning object whose annotation or explanation through TAMALLE+ system could best enhance the advanced learner's understanding of popular broadcast television programmes in English. We identified two main areas for further research: customisations and adaptation of TAMALLE+ interface, and automatic generation of learning object**

Keywords—Learning Objects, Digital Television, IPTV, Informal Learning, Mobile Application. TAMALE+ System.

I. INTRODUCTION

The TAMALLE+ is a prototype system that supports learners in their television viewing, as just one element in their language learning activities [1, 2]. As the focus of the learners will be on media consumption rather than on conscious language learning, this support is designed to be as discreet and non-intrusive as possible. The system provides support, in the form of captions and other onscreen displays, for comprehension of specific linguistic and cultural items for viewers as they watch television programmes. These items and their annotations, together forming Language Learning Objects (LLOs), may be saved by learners in their personal 'learning sphere', a private data storage area accessible both via the TV and mobile phone. These LLOs can be accessed prior to, during and after the show. Learners are also able to add, find, and remove LLOs from their personal spheres.

In this chapter we describe a learner-centred study designed to elicit criteria for selection of those LLOs whose annotation or explanation could best enhance the advanced learner's understanding of popular broadcast television programmes in English. Three different TV genres (UK soap opera - EastEnders, news broadcast and lifestyle programme - Relocation, Relocation, Relocation) were shown to advanced EFL learners, who were asked to annotate a transcript of the programmes to indicate items they found difficult or would have liked to pursue. The results suggest a number of categories of broadcast language that may need support via annotation and explanation. It might be expected that such selection criteria would already exist in the language pedagogy literature, but this is pedagogic knowledge that does not seem to have been formalised. Deciding which elements of a specific TV programme to highlight in a formal and/or face-to-face teaching context will be heavily dependent on the teacher's knowledge of the learners' competence and/or the learning outcomes of a particular stage. The context for which we are designing is informal or even incidental language acquisition by adult learners, where neither competence nor learning outcomes can be specified, and here a generalisable approach is needed.

II. METHOD

Three groups, each of 4-6 advanced EFL learners, took part in the study. Each session took about one hour. After a screening questionnaire (age, nationality, gender and language qualifications), they were asked to watch ten minute clips of programmes from three different genres:

- UK soap opera - EastEnders
- News broadcast
- Lifestyle programme - Relocation, Relocation, Relocation

Although more genres could have been selected, the above are considered to be distinct enough to highlight different aspects of broadcast television. After each clip, participants were given a transcript of what they had just watched and were asked to use two differently coloured highlighters to mark a) parts of the sound track whose meaning was not clear when they viewed the programme, i.e. those sections that they just didn't 'get' because they were indistinct, unknown, obscure and so on, and b) items that they would have liked to have more information about, i.e. unfamiliar or intriguing vocabulary, phrases, expressions. Each group was shown the clips in the same order, on the assumption that their understanding of what we saw as the most difficult clip, the soap opera, would be enhanced by 'warming up' on the rather formulaic lifestyle programme and the very familiar news format.

Once they had seen all three programmes and highlighted the transcripts, participants were asked a number of questions about the clips, which they were asked to rank in terms of ease of comprehension. They were also given a list of categories of language item and asked to rank them to indicate a) those they would most like to see annotated on-screen as the programme ran and b) those they would have liked to be able to refer to before or after the programme. The categories we used were:

- Place names, e.g. Westward Ho!
- Language referring specifically to UK culture, e.g. GP or General Practitioner for family doctor
- References to Western culture, e.g. David and Goliath from the Bible, "the stuff dreams are made of" based on Shakespeare's The Tempest
- Figurative expressions, e.g. get your skates on, up sticks
- Slang, e.g. stuff Swindon, crash pad
- Regional accents, e.g. East London, Northern Irish
- Numbers
- Homophones (different words that sound the same), e.g. rains, reigns, reins
- Words that mean different things in different contexts, e.g. pad, provisional
- Phrasal verbs, e.g. pile in, pile up, pile on.

The categories were developed on an informal basis drawing on our personal experience and also suggestions from language teachers, which resulted in numbers and phrasal verbs being included. Participants could also recommend categories that did not figure on the list, although none did so.

III. PARTICIPANTS

Participants were recruited on the basis that they had to be advanced English foreign language learners. Fourteen people in total from twelve different nationalities participated in the three sessions. There were eleven females and three males. Seven were between 20 and 29 years old, five were between 30 and 39, and two were 40 to 49. The nationalities were: Iranian [1], Turkish [1], Malaysian [1], Kuwait [1], Chinese [2], Romanian [1], Sri Lankan [1], Brazilian [2], Spanish [1], Mexican [1], French [1], and Dutch [1]. They were volunteers from the staff and students of Brighton University, mainly research staff and PhD students in a wide range of disciplines. They were all advanced EFL learners with qualifications equivalent to IELTS 7 or TOFEL 725 and several had acquired undergraduate or postgraduate degrees in the UK. None of the participants had seen these particular episodes before, although they were familiar with the various formats.

IV. DATA ANALYSIS

The raw data was analysed first by aggregating the words and sentences highlighted in each paragraph of the transcript. This

was necessary when it became clear that participants had not distinguished between the 'during' and the 'before/after' conditions. We then identified those language items that were selected most often by our participants. A shortlist was made for each clip, eliminating items chosen by only one participant. These were used in conjunction with the results from the questions to form the rationale for selecting language items for annotation (see below).

(We also analysed the items on the shortlist in terms of the theme to which they related. Eight different subject themes emerged from the content: literature, sport, family affairs, immigration, geography, politics, health and religion. These were not used in the rationale but we expect them to be of use in the information architecture of any further vocabularies at a later stage).

V. RESULT

Most of the participants indicated that television had had a positive impact on their language learning experience in the past. Only one participant mentioned that he had never used any television programme for language learning. Television was recognised as a useful medium for learning about foreign culture as well as language. It also provides an opportunity to hear different accents, dialects and pronunciations, which helps towards acquiring better listening skills. A full account of our results is given within the following two sections: comprehensibility of TV genres and categories of language learning objects.

A. Comprehensibility of TV genres

We asked our participants to indicate which programme they found easiest to understand. As Figure 1 shows, the news was rated most comprehensible, followed by the lifestyle programme, with the episode of the soap opera rated most difficult to understand. Only one person thought the soap opera was the easiest to understand.
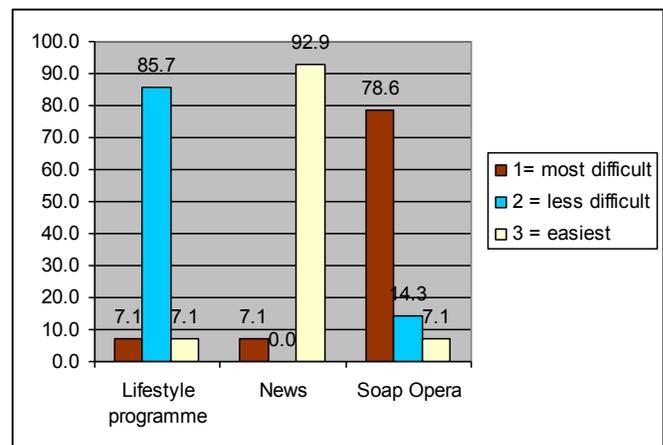

Fig. 1. Comparing TV generas for comprehensibility

The three genres compared here are also different in terms of their general characteristics and the way they are structured. This might be the reason that our participants indicated the results above. For example, the news has a rigid structure, starting with the main headlines, which are followed by more information. It is also sign-posted with other on-screen materials and explanations like figures, numbers and images, which make it easier to follow the spoken language. On the other hand, soap opera and lifestyle programmes usually contain lots of regional, colloquial and figurative language that makes them more difficult for language learners to understand.

B. Categories of language learning objects

Participants noted items from a number of different categories which they thought could be usefully either displayed or explained on-screen during the programme. Figure 2 indicates all ten categories suggested and the participants' ratings of the potential usefulness of each category. The five most wanted categories were:

- Word referring to UK culture (85.7%),
- Figurative expressions (71.4%)
- Names of unknown places (64.2%)
- Slang (64.2%)
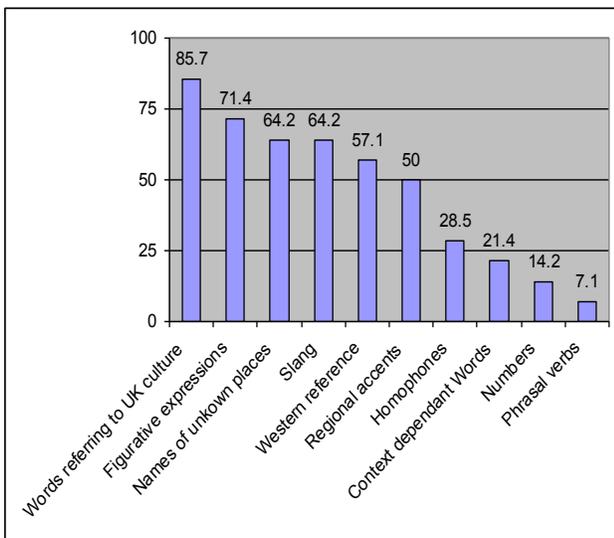- Western references (57.1)

Fig. 2.   Categories of items selected for annotation

Participants also rated the desirability of being able to access information about the same categories of language item categories before or after the programme show time. Figure 3 indicates all ten categories suggested and the participants'

judgements on the usefulness of each category. The five most wanted categories were:

- Word referring to UK culture (92%),
- Figurative expressions (71.4%)
- Slang (64.2%)
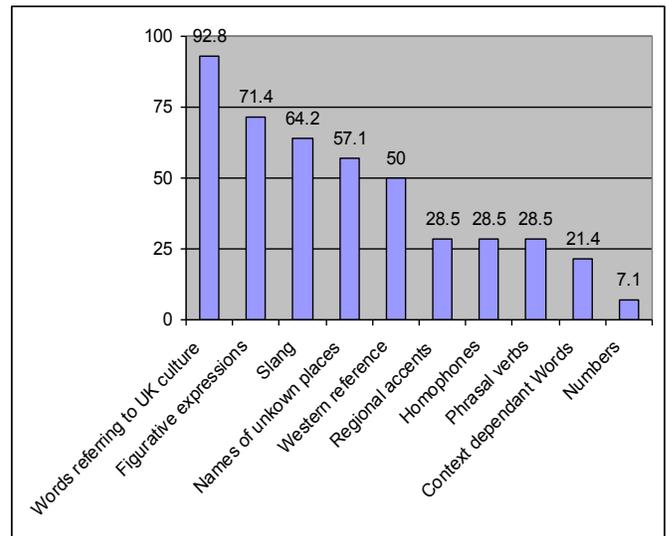- Name of unknown places (57.1%)
- Western references (50%)

Fig. 3.   Categories selected for before/after retrieval

Although we expected participants to request different services during and outside the programme transmission time, the above results indicate that this is not the case. The five most wanted categories selected by more than half of our participants in the above questions were the same, with only a slight change in order.

These results, indicating the most wanted categories of language item, were combined with the results of the participants' selection of raw language items from the programme transcripts to form the basis of a rationale for selecting language items for display and/or explanation. It was also important to bear in mind that any explanations had to be brief, suited to the learners' assumed level of competence and sensitive to context. Between 35 and 50 items were extracted for each clip and short explanations were provided for each. Table 1 shows some examples of the simple learning objects that were developed for news, lifestyle programmes and soap operas.

TV Genre	Language item	On-screen	Further Explanation
News			
	Stop the drain on NHS	Stop waste of NHS funds	NHS = National Health Service
	GP	Family doctor	GP = General Practitioner
	Bradford	industrial city in Yorkshire	
	David against Goliath	Struggle of weak against strong	Struggle of weak against strong. Biblical – from story of giant Goliath against boy David
Lifestyle - Relocation, Relocation, Relocation			
	It's the stuff dreams are made of	An ideal	Poetic – Shakespeare, The Tempest
	High and dry	Left stranded	Dead metaphor. Strand = beach
	Westward Ho!	Seaside village in Devon,	Devon – rural county in SW UK
	We put in the blood, sweat and toil	We worked very hard	Echo of speech by Winston Churchill
	Get our skates on	Hurry	Ice skates or roller skates
Soap opera - EastEnders			
	The novelty wears off	It becomes normal and less interesting	
	Stop fighting the inevitable	Accept what has to happen	
	Spiteful	Nasty, hateful	
	Provisional	Temporary (driving licence)	Practical information on driving licences
	Once the cat is out of the bag	Once a secret is in the open	

Table 1. Examples of simple LLOs developed for news, lifestyle and soap opera programmes

As can be seen from Table 1, explanations provided could be extended to include more information and explanations. This would be especially useful for those learners who seek to gather more information about a particular aspect of the LLOs. For example, in the case of 'David and Helen against Goliath', more information, possibly in the form of a hyperlink, could be provided to explain the source of this expression (i.e. the Bible), and an example of its usage in different situations could be given. Also, a more general definition could be provided for specific geographical locations like 'Bradford'. However, the affordances of media in use, in our case iTV and mobile, do not allow for the provision of long textual information and explanations and therefore they were not developed within the TAMALLE system.

VI. DISCUSSION AND IMPLECATION

The study described here was designed to begin the process of developing guidelines for selecting language items from authentic TV programmes for annotation to support the comprehension of adult advanced EFL learners. By eliciting learners' perceptions of the language of three genres, we found that annotation of a number of categories of language item - place names, figurative language, culturally specific vocabulary and so on - was perceived as being potentially useful to learners.

This exploratory study raises a number of questions. At the level of methodology, it is clear that this study is limited by a) the small number of genres tested and b) the number and range of learners. It could be that non-academic or younger/older participants would have found other language items to be of interest, or that they would have responded differently to our categorisation, which could be criticised for being too formal. It is not clear, for instance, whether figurative language or phrasal verbs are labels comprehensible by all learners. A subsequent study might also need to take into account the length of time each user had spent in the target language country and also their levels of TV consumption. A further development would be to elicit similar data from language teachers, to see if their perceptions match those of independent adult learners.

Several aspects of the annotations lend themselves to adaptation and personalisation. As discussed earlier, between 35 and 50 annotations were developed for each 10 minutes of audio-visual content. This means that an average maximum on-screen display time of between 12 to 17 seconds. This time frame seems to be more than enough for reading a brief line of text on-screen, (although it assumes no gaps between displays, which is arguable) [3]. However, as most research in this area has been directed at full subtitles for deaf people, we know little about its applicability for language learners. More directed research would be required to investigate the suitability of speeds for annotated words for language learners. Speed and rate of display are areas where learners would likely benefit from adaptation and customization. A full system would provide features to allow learners to select the number of words for attention, e.g. in accordance with their own pace or cognitive loads. Details of screen display, such as font size, might also be adaptable.

A different aspect of adaptation might also be developed to allow a system to display annotations not simply according to the category based criteria described here, but also with regard to themes of interest to the user - historical, social

geographical - and/or in accordance with different individual differences, e.g. age, attitude, motivations, cognitive ability, etc. This might also change the nature of the annotation. For instance, a viewer with little time might choose to see only minimal, semantic annotations, to enable basic comprehension, whereas someone with more time or different interests might prefer to find out about register, style, history, source and other aspects of language items.

Another issue important for further development is the possibility of *automatic* selection of items for annotations and the annotations themselves. Currently, there are a number of methods developed for indexing video content, using speech recognition and closed captions. These methods originally aimed to provide assistance in developing metadata from videos that could be employed by applications for search and segmentation [4]. Natural Language Processing (NLP) techniques also help in retrieving text in accordance with different rules and in real-time systems [5]. Using similar techniques, algorithms could be developed to select and segment the part of the text that utilizes the result of our experiment, for example to segment slang, cultural knowledge, name of places etc., from programme transcriptions or closed captions.

VII. CONCLUSION

We have described a small scale exploratory study that develops a methodology for eliciting user centred requirements for a language learning facility for iTV and suggests a ranking of categories of types of language item that might usefully be annotated for learners. The most frequently chosen categories were names of unknown places, references to UK culture, references to western culture in general, figurative expressions and slang. We suggest that further studies exploring in more depth, using different genres and learner types, may eventually lead to the possibility of automated and personalised generation of language-oriented learning objects from audio-visual material.

The results discussed here have been integrated into the TAMALLE+ prototype [6, 7], the evaluation of which is discussed in [2, 1]. However, we believe that others could

also benefits from these results, when developed with more rigour. For example, language teachers who incorporate authentic TV programmes into their lessons, could use them as heuristics for directing students' attention during comprehension exercises, and/or self-directed learners might like to develop the strategies to better understand target language programmes and learn more from their television viewing. We identified two main areas for further research: customisations and adaptation of TAMALLE interface, and automatic generation of learning object

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