

Interaction Preferences and Learning in an Inspectable Learner Model for Language

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Abstract. We present an inspectable learner model to prompt noticing in language learning, considering interaction preferences. Four patterns of model inspection were seen, but most students viewed the same information. Most improved their knowledge during a session, retaining knowledge in a one week delayed post-test.

Keywords. inspectable learner model; language learning; noticing; preferences

Introduction

Traditionally the learner model (LM) has not been accessible to the learner. However, benefits of opening the LM to users to encourage reflection, have been argued [1], [2], [3]; and offering a choice of how to view the LM may help to accommodate individual preferences [4]. Using *Notice* [5], we consider how language learners interact with an inspectable LM (for irregular plural nouns/irregular past verbs in English); and whether such interactions may facilitate learning. *Notice* is an 'independent inspectable LM' [6] (the main teaching materials are not part of the system; the aim is to help learners identify their needs by accessing their learner model, to plan their independent study).

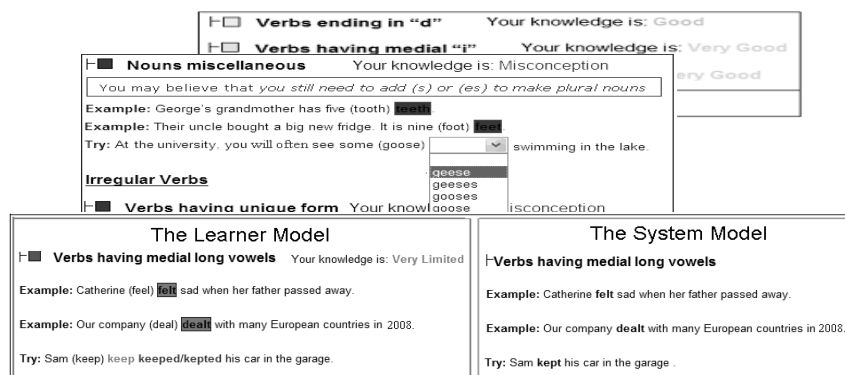


Figure 1. Upper - LM(Basic); middle - LM(CR Sentences); lower - LM(Comparison)

Cloze (fill-the-gap) and multiple choice questions are used to build the LM. Users can inspect the LM at any point during exercises, as in Figure 1. There are 3 LM views:

- LM(Basic): knowledge level shown by the colour of nodes and text (e.g. 'good');

- LM(CR Sentences): node colour; examples from the learner's own language rules with highlighted words indicating skill level (as an approach to Consciousness-Raising [7], to facilitate 'noticing' of language features [8]); option to try out alternatives with immediate feedback in the LM;
- LM(Comparison): LM and expert knowledge side by side (to prompt 'noticing the gap' between one's own rules and the target [9]); highlighted words; node colour.

Use of "Notice"

Participants were 30 multilingual volunteers at a UK College of Further and Higher Education, working towards an advanced level in English. In two 1-hour sessions, users (i) interacted with *Notice* answering questions followed by unconstrained use (inspecting LM and returning to questions); (ii) 24 took a delayed post-test 1 week later.

The logs show 4 interaction patterns (Figure 2). All patterns begin with LM(Basic), the starting point of LM inspections (154 viewings). Sub-pattern A comprises LM(CR Sentences) → questions; Bi, LM(Comparison) → questions; Bii, LM (Comparison). Pattern 1 combines sub-patterns A/Bi; pattern 3, A/Bi/Bii; pattern 2 is Bi only; pattern 4, A only. Thus patterns 1 and 3 are similar but in a different sequence; 2 and 4 each comprise one sub-pattern. There were 98 occurrences of pattern 1 (by 28 of the 30 users); a further 44 of pattern 2 (18 users). Pattern 3 was infrequent (8 cases; 6 users), but patterns 1 and 3 are similar in content. Pattern 4 was rare (4 viewings; 2 users). While many used pattern 2 in addition to pattern 1, only two used *only* pattern 2, i.e. without LM(CR Sentences). In total there were 110 inspections of LM(CR Sentences); 158 of LM(Comparison). In all but 8 inspections, users returned to answering questions after viewing the LM. Figure 3 shows the knowledge of the 24 users who took the post-test. All made significant improvements in the final LM over initial LM, i.e. starting knowledge ($t=3.945$, $p<0.0001$); and post-test over initial LM ($t=3.784$, $p<0.0001$).

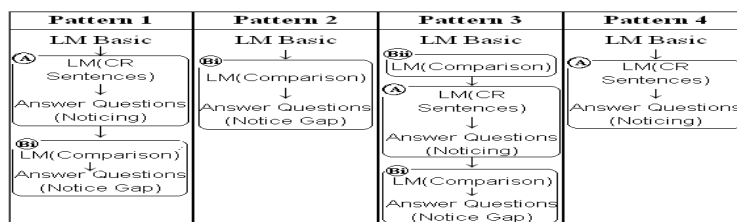


Figure 2. Patterns of LM inspections

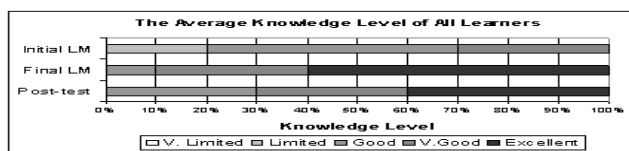


Figure 3. Learner knowledge levels

The college lecturers did not teach the target forms between the interaction and delayed post-test, suggesting that inspecting the LM may have helped learners. This

may have been because of understanding retained after using *Notice*, or knowledge obtained from further individual study, based on students recognising areas that were problematic for them in their LM. Either way, this seems to demonstrate that students such as these can use an inspectable learner model to raise their awareness of their knowledge and facilitate noticing.

While 2 users did not use the first pattern of inspection (view LM with consciousness-raising sentences, attempt questions, compare knowledge against expert, attempt questions), most used this pattern as a learning approach. Learners may inspect LM(CR Sentences) to practise the target forms, to view their misconception descriptions, or both, as these two features are not available in LM(Comparison) and LM(Basic). High use of LM(Comparison), with nearly all inspection sequences including it, suggests that users also found it helpful to compare their knowledge to the target. Most used both sets of information - LM(CR Sentences) and LM (Comparison) - and seemed able to use these in sequences they wished.

Increasing saliency of words can raise learner awareness of correct forms [10], [11] to facilitate noticing [8] and noticing the gap between their production and that of an expert [9]. Highlighting target words may not only draw attention to correct forms, but also help learners work out a correct rule themselves. Use of salience in *Notice* does appear able to facilitate noticing, and noticing the gap, for these students. Further study could investigate: whether one of the views contributes more to the noticing process; the effects of use of an inspectable LM for language over time; and use of an open LM in other areas (e.g. building on work on speech technologies in language learning (see [12]), such as audio access to the LM for noticing pronunciation; or visualising speech patterns in inspectable LMs for teachers, or teachers and students to explore together).

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