Interactive software to accompany *Yookoso*: Has it all been worthwhile?

BARBARA BOURKE & MAYUMI PARRY
Queensland University of Technology

In this paper, we describe the development of interactive software to accompany Yookoso *(Tohsaku 1999), the textbook in use in the first two years of the Japanese language course at Queensland University of Technology. We begin with a discussion of what is meant by interactivity; we then examine the advantages of using the software in association with the textbook package, as opposed to using the textbook package alone. We also discuss the importance of integrating multimedia materials into the curriculum and the role of the teacher in this model of 'blended learning'. It is hoped the paper will prove useful to those who are considering implementing or have already implemented a CALL component in their Japanese language program.*

The rapid evolution in computer technology in recent years has resulted in more computer-assisted language learning (CALL) systems being implemented (Yang & Akahori 1999, p. 59). However, given the time and resources needed to develop multimedia applications, we may well ask whether the investment is justified. Does CALL have advantages over other forms of instruction? Once developed, what is the most effective method of implementation to maximise the benefits? And what is the role of the teacher in this new paradigm? In this paper, we describe the software we developed and examine the advantages of using the software as part of the curriculum as opposed to using the textbook package alone. Through reference to the literature, our own observations and results of a student evaluation, we endeavour to provide answers to the above questions in an effort to determine some of the implications of using multimedia resources in Japanese language programs.

Towards a definition of 'interactive'

What exactly is meant by 'interactive'? Since educational applications are often referred to as 'interactive multimedia', we begin by defining both of these terms. 'Multimedia' means the presentation of various forms of media such as text, graphics, animation, sound, and video via computer. Multimedia is therefore not inherently interactive (Sims 1997, p. 157). It is what developers do with the multimedia that determines the level of interactivity. The literal meaning of 'interactive' is 'between' from 'inter' and 'do' from 'act', implying that some action occurs between two (or more) entities. Chapelle (1997, p. 22) makes a useful distinction between two types of interactivity in CALL, depending on who the participants are. In the first type, learner–learner interaction, the participants are learners communicating with each other using spoken or written language transmitted via computer. In the second type, learner–computer interaction, one of the participants is the student (or several students) and the other is the computer. The user interacts with the computer through typed input, voice input, mouse clicks or touch screen. The computer responds to the user's input with some form of visual or audio output, moving through the program in the sequence that

the user chooses, giving positive and negative feedback, providing scaffolding, etc. The interactivity in the *Yookoso* software is the second type, learner–computer interaction.

Holmes (1999) adds an extra dimension to the interactivity discussion by explaining that just because a program is interactive doesn't mean it is good. 'Bad' interactivity occurs when the user is frustrated by too much information and poor instructions. She claims that, 'Well conceived interactivity knows its audience, understands their knowledge base, and uses the terms and phrases that are commonly understood by the audience' (par. 6). The advantage of teachers designing and authoring their own content is that they are the ones who best know the specific needs and situations of their learners.

Sims (1997) suggests that educational products require more complex forms of interactivity in order to facilitate the acquisition of knowledge or development of new skills and understanding. He found extensive evidence that learner involvement through interaction maximises the achievement of learning outcomes and argues that the higher the level of interactivity, the more effective the instruction is. Sims (1994) proposed seven levels of interactivity, which are summarised in Table 1.

Table 1: A summary of Sims' seven levels of interactivity

	Title	Description
Level 1	Passive interactivity	Learner can move through a predetermined, linear sequence of material
Level 2	Hierarchical interactivity	Learner can select path through predefined set of options
Level 3	Update interactivity	Computer provides update or feedback on learner's response
Level 4	Construct interactivity	Learner manipulates component objects to indicate their response
Level 5	Simulation interactivity	Learner controls individual selections that determine the presentation sequence and subsequent response-specific updates
Level 6	Free interactivity	The program contains numerous hyperlinks through which the learner can 'travel' at will to solve given problems
Level 7	Situate interactivity	Complete virtual training environment in which the learner is able to work in a meaningful, job-related context.

The activities in the *Yookoso* software fit into Levels 1–4. The types of interactivity described in Levels 5–7 require more sophisticated programming and are maybe more suitable for more advanced learners. Stepp-Greany (2002, p.174) found in her study with beginner students in a Spanish language class that they preferred the computer-assisted activities with many internal supports, resources and 'traditional building block reinforcement activities' to the internet activities which were much more 'holistic and authentic'. Conrad (1999) also found that first semester students in regular foreign language classes favoured repetition and structured activities over more creative linguistic activities. Since the *Yookoso* software has been developed for students in the first two years of the QUT program, the structured activities with

internal support seem appropriate. The types of activity available in the software are described in more detail later in this paper.

Background to the project

At QUT, we have been using multimedia applications in our Japanese language program since 1992. These have included off-the-shelf applications such as 'Power Japanese', commercial templates such as '*Kanji* Guess', and a laserdisc-based application developed at QUT called 'Language Master'. The latter was based on the video series, *Yan and the Japanese People* (kindly made available on laserdisc by the Japan Foundation), as that was the most comprehensive sequence of videos available at the time. Exercise types included true and false questions, multiple-choice questions, scrambled sentences and scrambled dialogues. Even though the cultural and linguistic content of the Yan series was aligned as closely as possible to the textbook in use in class, students still considered the laserdisc program to be an 'add-on' which was fun but not really essential to their 'main' learning. They found the textbook content quite difficult and the pace of the course quite fast and so many expressed a preference to base their study solely on the textbook in order to master it adequately. Probably an important influential factor in this attitude was that exams focused mainly on the content of the textbook. This experience was also reported by Nowaczyk (1998) who found that students appeared to value multimedia components that related to exams and Stepp-Greany (2002, p. 175) who concluded that 'measures must be implemented that link TELL[1] activities to regular assessments, so that students attribute relevancy and educational benefits to technology-enhanced instruction'.

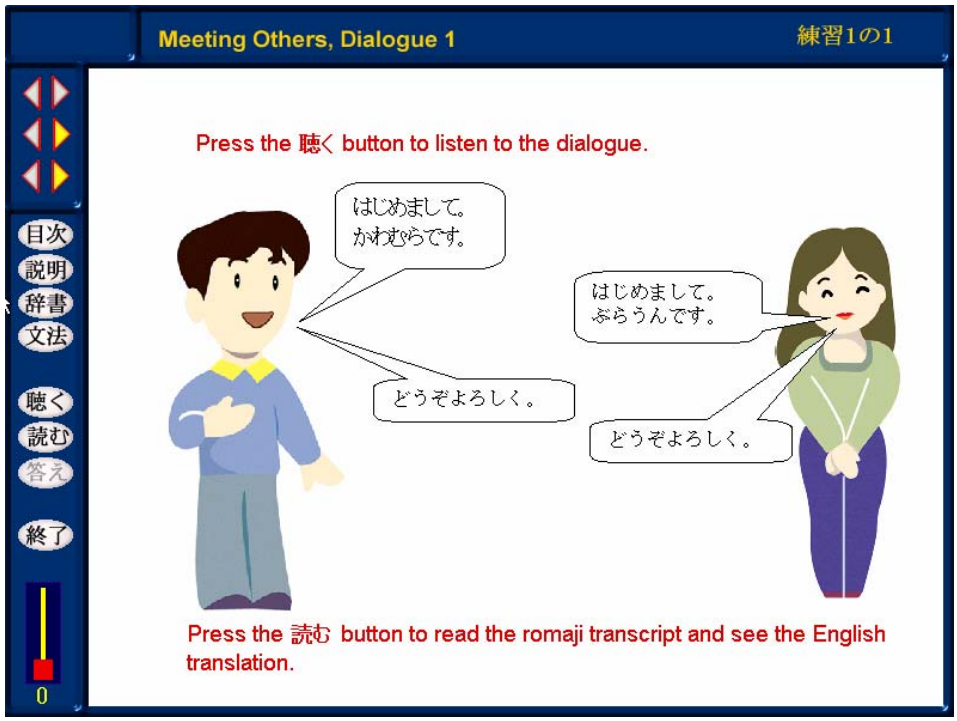
Technical difficulties with the aging laserdisc technology at QUT meant that computing staff decided to cease supporting it from the beginning of 2000. This necessitated an urgent search for its replacement. When one of the authors of this paper was teaching at Miyagi Gakuin Women's University (MGU) in 1998–1999, she recognised the potential of the template they were using for teaching English there for the Japanese program at QUT. The template, which had been developed using Authorware, included text, audio, video, graphics and animations, and allowed students to input their answers and receive immediate feedback. In cooperation with the lecturer who developed the software, the template was modified for use in Japanese language classes at QUT, an undertaking that was supported by two grants from the Queensland Program for Japanese Language Education.

Description of the Japanese template

Firstly, the delivery interface was modified from the English version in use at MGU to one that had a distinctly Japanese 'flavour'. It includes *noren* and *maneki neko* on the entry screens and *daruma* and *hagoita* on the help screens. All button labels were translated into Japanese and some extra buttons were created (see Figure 1).

[1] Technology-enhanced instruction (equivalent to CALL).

Figure 1: The *Yookoso*-user interface showing the range of buttons available. [3]



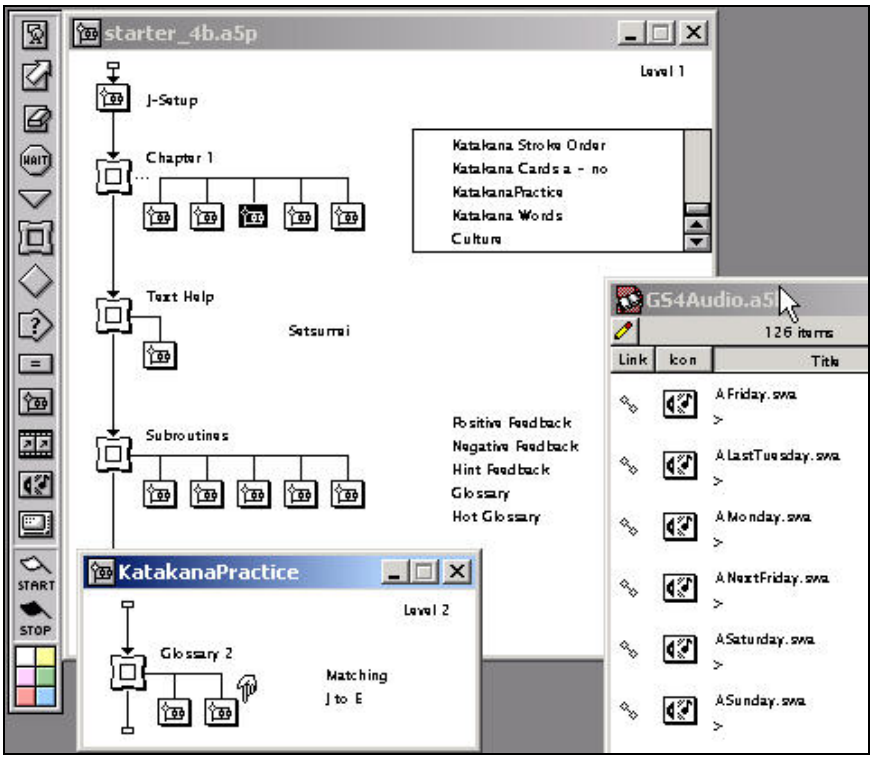
Navigation is via the sets of triangular arrows visible at the top left of Figure 1 (previous/next question, previous/next section, previous/next topic) or through the Contents screen, which is available in the top oval-shaped button (目次 *mokuji*).

While it is not the aim of this paper to give a lesson in Authorware development, basically, the authoring template is arranged as a flowline onto which the developer places the elements needed to create a 'movie'. This could include ready-made knowledge objects (activity types) that come with Authorware or objects written by a programmer with knowledge of the Authorware language. Figure 2 shows the Authorware flowline for one chapter. The box in the right-hand bottom corner is the audio library where all the sound files are stored. The sound icons can simply be pulled onto the flowline when needed.

Many of the knowledge objects that had been developed for the English template at MGU were readily transferable to the Japanese version — for example, short answer, cloze exercises, vocabulary matching, true and false, multiple choice, and so on. This was a great benefit to QUT as we were not obliged to start from scratch. As Adamson (1998, p. 220) proposed, 'If developers made their programs as groups of independent components that could be reused by others, progress would be much faster and cheaper'. Some additional knowledge objects were developed to cater for the special needs of the Japanese program at QUT — for example, the *Kanji* Animator.

[3] The clipart on this screen is from the *GuMantan* series. It can be used in software development that is not for commercial use.

Figure 2: The authoring template showing the flowline and the audio library



With written permission from McGraw-Hill, the program contents are based closely on the *Yookoso* textbook package using dialogues and vocabulary lists from the textbook, audio tracks from the CDs, and a selection of exercises from the workbook. Many of the dialogues and exercises have been 'illustrated' using clip art available from Japan or personal photos and videos. Table 2 lists the exercise types that are available in the *Yookoso* software.

Table 2: List of activities available in the *Yookoso* software

Exercise types	Description of activity
Vocabulary introduction	Point and click, hear pronunciation of new words, sometimes in tables, sometimes with graphic or photo
Dialogues	Listen to dialogues — view graphics for clues to meaning; read transcript if necessary
Matching	Matching English to *kanji* or *hiragana* to *kanji* to form paired lists
True/False	Write in T or F to answer questions about script
Multiple choice	Check one or more boxes to answer questions about script
Cloze	Write in the missing words
Concentration	Click two cards in a row to find the match of *kanji*/English or *kanji*/*hiragana*, then the two cards disappear
Kanji animations	Click on the button to see the stroke order of *kanji*, *hiragana* or *katakana* (in the case of *hiragana* and *katakana*, hear the sound)

Exercise types	Description of activity *(continued)*
Short Q & A	Input answers in English or Japanese. If incorrect, hints are provided to indicate where the mistake is
Click & drag	Select appropriate objects and drag into place, e.g. location of shops in a town
Short sentences	Write sentences to practise a grammatical point, e.g. past tense of adjectives
Glossary	Click to hear pronunciation of every word in the chapter. *Hiragana* and *romaji* readings are also provided
Culture	View or read about cultural items related to the content of the chapter (photos, videos, text, etc.)

Advantages of the software

While we do not recommend using the software alone without buying the textbook package, the advantages for students of using the software for practice over using just the textbook and audio CDs alone are numerous. In this section, we highlight the following three aspects: ease of navigation; multiple scaffolding features including the hint function; and the use of animation for the presentation of *hiragana, katakana* and *kanji*. First and foremost, navigation around the template via the available buttons and screens is quicker and easier than the paper version where there is a separate textbook, workbook and seven different audio CDs. For example, from the Contents screen, users can jump immediately into any exercise, dialogue or activity and the correct sound file will be instantly available with the click of a button. Finding the same soundtrack on the CD could take some time.

Secondly, the software contains various forms of scaffolding to help students when they get stuck. For example, transcripts are available for all listening exercises by clicking on the 読む (*yomu*; Read) button. Students can follow the written words as they listen to the sound recording or open the transcript screen just to check an unknown word. The listening tracks even for the beginners' level are at normal speed and students can find them quite difficult to understand at first. The transcripts of listening comprehension exercises are not available in the students' textbooks. Audioscripts are provided in a separate booklet generally only available to the teacher.

Another form of scaffolding is found in the hint function. In exercises requiring the input of a word or sentence, the parts which are wrong are shown as hash signs and omissions are shown by question marks. Students can see where they went wrong and have another try. On the third incorrect attempt, the 答え(*kotae*; Answer) button becomes active and they can check what the correct answer should have been, thereby avoiding excessive frustration. Click and drag exercises let students know immediately whether they've made the right choice as a correct selection will stick and an incorrect one will float back to its origin.

The *kanji* animations are a very definite advantage of the software. Stroke order is indicated in the workbook through numbers, but in a *kanji* which has many strokes, it is sometimes difficult to determine which stroke comes before which. The *kanji* in the software have been animated using Flash and appear in a large frame

allowing characters to be viewed in detail. The animation can be replayed as often as desired by clicking a button.

Because the software contains a lot of colour, it is more visually appealing than the textbook, which is in black and white. Students have commented that the vocabulary presentation screens with photos or graphics help them to remember words more easily and graphics give clues to the gist of dialogues. Teaching staff have informally received feedback from students about the software since its introduction. In order to gain a better understanding of how the software was perceived, we conducted a survey at the end of first semester in 2003. The results are attached as an Appendix.

All in all, the interactive nature of the software forces the students to be more active learners which, according to Sims, maximises the achievement of learning outcomes. A comment made by a student in the evaluation survey sums up the advantages of the software over the textbook in the following way: 'The software helps me learn, it forces me to think and lets me know when I make a mistake' and another, when asked what it would be like to use just the textbook and CDs and no software, answered: 'We wouldn't have that type of interaction that we get with the software; it makes us use our knowledge in actual situations.' Other comments can be viewed in the Appendix.

Integration into the curriculum

Authors such as Martin (1985), Garton (1986) and Levy (1991) all emphasise the importance of integrating CALL into the curriculum. As has been described above, the content of the *Yookoso* software is directly related to the main textbook. As such, it is perceived by students as not only an essential part of their learning, but as a valuable tool to help them practise what they are learning in the classroom. Out of four face-to-face hours per week of Japanese language classes, one hour is spent in the language computer room. Students are also encouraged to use the room in self-access mode outside class time. The rationale behind using the computer room in class time is that if students encounter technical difficulties or specific problems with the software, the teacher is there to help them. If their experience in the computer room is positive, they are more likely to use it in their own time. Over 73% of students in Stepp-Greany's study of student perceptions of learning in a technological environment reported that they liked having a regularly scheduled lab class where they learned with the teacher present (2002, p. 170).

At QUT, we use the computer lab session as an extension of the classroom lesson, and activities which might have once been done in the classroom, stopping and starting one CD player in front of the whole group of students, can now be done by students at their own pace concentrating on the parts they choose. However, we give guidance as to which activities they should be completing in each session which provides them with a focus and tends to prevent them from racing through the chapter pointing, clicking and doing only the 'fun' parts. The teacher is on hand to help with technical or linguistic difficulties and to 'provide a scaffold for … students' learning with their own knowledge and experience' (Kern 1996, p.108). In Stepp-Greany's study (2002), over 85% of students agreed that having an instructor present during the lab session increased the potential to learn in class.

The role of the teacher in the technological environment

The roles for teachers and learners in this technological environment and the patterns of interaction between them are changing (Kern 1996). Schofield (1995) compared the social structure of a classroom and of a computer lab, and observed a shift both in teacher–student and in student–student interactions. He argued that the use of technology in educational contexts transforms the social aspects of the classroom. The fact that students are occupied one-by-one at their own computer means that the teacher is free to move around the room and give individual attention to students, which is often not possible in the regular classroom. Students in the lab will often ask the teacher privately for an explanation or clarification which they may not do in the whole-class situation. Nevertheless, Stepp-Greany (2002, p. 174), in spite of reporting high levels of teacher facilitation in the computer lab, agreed with Schofield that 'the computer lab was primarily an independent learning environment. Videotaped observations demonstrated that there was generally less student-to-student interaction, and less teacher-to-student interaction in the lab than in the regular classroom.'

Many researchers agree that the teacher's role is significant in technology-mediated situations (Becker 1994; Glisan et al. 1998; Kern 1996; McGrath 1998). McGrath (1998) concludes that:

> Introducing technology resources alone into students' learning experience does not automatically result in improvement. Both the preparation and the knowledge of teachers about technology, as well as how to integrate and refine the lesson with technology, are the key to whether it is effective or not (cited in Stepp-Greany 2002, p. 170).

Given the importance of the teacher's role in the computer-mediated learning environment, Stepp-Greany believes teachers need support and preparation to adapt to their new role. 'Professional development must include those skills necessary for the instructor to function appropriately as a facilitator and a co-learner, rather than as an information purveyor' (2002, p. 175). In addition to new pedagogical skills, Stepp-Greany believes they need to develop technical and routine management skills and to learn to create opportunities for increased person-to-person interaction while keeping students task-focused. At QUT, most of the teachers who take lab classes have been using the software since 2000, but any new staff who join the team are given guidance as to how to use the lab, what the various features of the software are and how to incorporate the software into their lessons. As discussed previously, the coordinator of the respective units indicates which parts of the software should be focused on in a given week, and this is usually introduced to students on the big screen with a data projector before they start to work through it on their own machines. This serves as an introduction to the session and provides an advance organiser to orientate students to the focus of the lesson. After that, the teacher usually circulates among students as they work, observing where they are at and helping them with difficulties. Kern (1996, p.118) states that 'the degree to which computer-mediated communication promotes language and content learning, cultural awareness, and critical reflection depends fundamentally on the teachers who coordinate its use.'

Conclusion

Many advantages of computer-assisted language learning have been discussed in this paper, making a fairly convincing argument that the investment in the development of CALL resources is justified. The multimedia capabilities of computers mean that text, graphics, audio, animation and video can be presented to learners in a seamless sequence making learning more engaging and enjoyable. Students can choose their own path through the available exercises and work at their own pace. Depending on the level of interactivity, they can be forced to think and communicate with the computer, receiving immediate feedback on their responses. All of this gives them more control over their learning and promotes the development of more active, autonomous learners.

However, CALL is only going to be effective if appropriate methods of implementation are used. The model we have adopted at QUT is to totally integrate it into the curriculum and to have a compulsory class in the lab each week. It is important to work on students' attitudes that the lab session is not an optional extra but an essential part of the weekly schedule and students are aware that we record attendance for lab sessions. It is our experience, however, that if CALL materials are related to the 'main' coursework and examinable content, students value the opportunity to use the software as an aid in their learning. Warschauer (1996) also found that the degree to which computer-based projects were integrated into general course goals and structure correlated to differences in student motivation. This does not necessarily mean that assessment has to be carried out using computers, but that the content of the material being studied or the skills being developed during CALL sessions should be an important part of examinable content. The model we have described in this paper represents an example of 'blended learning' (Smith 2001), which takes advantage of the power of technology to provide learning opportunities, but as one part, albeit a key part, of a comprehensive program — an adjunct to the overall learning process.

As many researchers have argued, the role of the teacher in the technological environment is crucial to the successful implementation of CALL programs. Teachers need to be prepared to adapt to their new role in the computer lab as coordinator, facilitator and support person rather than the often teacher-centred role that they undertake in the classroom. Teachers may need some extra support in undertaking this new role, not only in the technical aspects of the workings of the computer lab, but also in the best way to integrate and refine the lesson with technology.

While the initial development of CALL materials takes time (the *Yookoso* software took approximately two years to develop and another year to modify and refine), the materials are then available for use over a number of years by hundreds of students. They can be modified along the way, and teachers don't need to photocopy each time they wish to reuse them. We believe that this paper has presented evidence that the multimedia software has many advantages over use of the textbook package alone, although we emphasise that the textbook is still necessary for its detailed grammatical explanations and for use in class for valuable conversation practice in pairs and groups.

Plans for the future include updating the software to improve some of the features students have found problematic (see Appendix). This may be done by updating to the latest version of Authorware or transporting the software to another platform such as Flash or Director, which would have better capabilities for internet delivery, animation and so on. At present, the resource is only available via the LAN

(local area network) and accessible from the quite heavily booked language computer lab. If we can make it available via the internet and/or on CD, all students will have access to it via their home computers or other university computer labs, which would mean they could use it more often in their own time.

In this paper, we have described the way we are using technology in the first two years of our Japanese language program, which combines traditional face-to-face teaching with in-house developed CALL resources. We have proposed some answers to the questions raised in the introduction regarding the rationale for developing multimedia resources and the recommended methods of implementation into the curriculum. Our experience has shown that, given the benefits of a more enjoyable, engaging and flexible learning environment which promotes more active, more autonomous and more effective learners, it has all been worthwhile!

Appendix: Student Evaluation Summary (Semester 1, 2003)

Student profile (Sex)

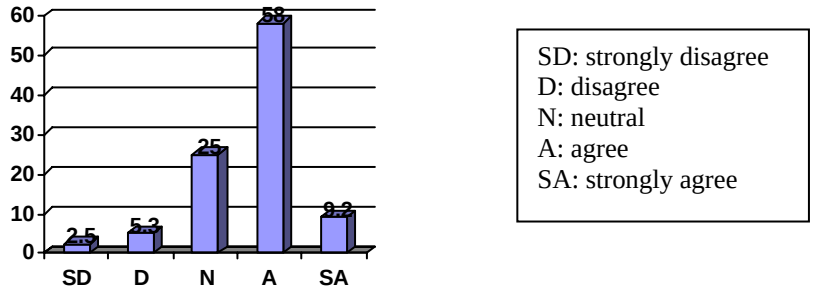
	Male	**Female**	**All**
Japanese 1	32	41	73
Japanese 3	18	61	79
Total	**50 (33 %)**	**102 (67 %)**	**152 (100%)**

Student profile (Background)

	Australian	**Asian**	**Other**	**All**
Japanese 1	20	46	7	73
Japanese 3	39	39	1	79
Total	**59 (39 %)**	**85 (56 %)**	**8 (5 %)**	**152 (100%)**

Note: 'Asian' includes Chinese, Taiwanese, Mongolians, Indonesians, Malaysians and Koreans. 'Other' includes Swedish and Danish.

Response to the statement:
'I enjoy using the *Yookoso* software to practise Japanese.'



Note: The figures indicate percentages.

A sample range of answers to open-ended questions

Q 1: What do you like about the software?
1. Original, creative and different.
2. It is at times a creative way to learn.
3. Easier and fun way to do workbook questions.
4. It is an escape from normal styles of learning and makes class more interesting.
5. It makes a nice change from being in the classroom.
6. Let's me know when I make mistakes.
7. Immediate feedback.
8. It's interactive.
9. Individual practice of what you need, whenever you like.
10. Step by step guide — work at own pace.
11. Can see how native speakers talk.
12. It is easy to navigate.
13. How it tests you is good — makes you think.
14. The pictures help us to understand.
15. Introduction to Japanese culture at the end of every chapter.
16. I like the dictionary section that helps me to remember.

Q 2: Do you have any suggestions for improvements?
1. Cannot use at home.
2. Input method sometimes tricky.
3. Some bugs in the program.
4. When you write, there's always some small details that make you confused.
5. To fill in spaces with correct answers is tricky sometimes (i.e. need full-stop).
6. Often get it wrong when it is right.
7. Have to compete with other languages to use lab.
8. The computer is sometimes slow.

Q 3: If there were no software, just the textbook and CDs, how would it be?
1. The text and CD just build on the basics, while the software enables the student to practise newly acquired skills.
2. The software helps me learn, it forces me to think and lets me know when I make a mistake.
3. Wouldn't have that type of interaction that we get with the software — makes us use our knowledge in actual situations.
4. If we just study from textbooks and CDs, it's very boring.
5. I found it helpful; especially it was a good study help before the exams.
6. Although there would be more time for pure learning, there would be less variety and no multimedia/interactive component.

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