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# Enhancing metacognitive knowledge: Structure, affordances and self

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## Abstract

Metacognitive knowledge – what students know about themselves, the tasks they complete and their learning strategies – is essential for successful self-directed learning. It follows that those who work in self-directed learning settings need to stimulate their students' metacognitive development. Previous research in metacognition has defined its characteristics and contribution to language learning, but little has been written about how it develops or can be promoted. This paper seeks to fill that gap by reporting on a three-year study involving more than 400 Japanese students of English which investigated the development of their metacognitive knowledge.

The paper will first discuss research in metacognitive knowledge as it relates to language learning. Then, it will describe the aims and nature of the learning opportunities provided in the study before describing the research methodology. Thirdly, the results of analysing quantitative and qualitative data gathered will be presented and discussed. The data provide evidence of change in the students' beliefs about assuming control of their learning, and reflect increases in their ability to plan, monitor and evaluate their learning. It is argued that distinctive elements in the learning structure contributed to the growth of students' metacognitive knowledge.

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## 1. Introduction

Metacognitive knowledge is essential for self-directed learning because it represents the knowledge base that students draw on as they make decisions about their learning. Therefore in the self-directed language learning course reported on here, we incorporated opportunities for the students' metacognitive knowledge to develop, and cues to prompt its growth. During the study we investigated the way in which the metacognitive knowledge of three successive cohorts of students developed over a 15-week period. We did this by

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asking them to document their reflections on the experience of designing their personal language learning programmes, and to articulate their evolving understanding of what is involved in learning a language.

First the paper will discuss research in metacognitive knowledge as it relates to language learning. Then it will describe the aims and nature of the learning opportunities provided in the context investigated in the study. Following a description of the research methodology and instruments, quantitative and qualitative data from the most recent administration of the course will be presented and discussed. The paper concludes by identifying features in the learning environment which were instrumental in fostering the growth of students' metacognitive knowledge.

## 2. Literature review

Recent research on self-directed or independent language learning has focused on the kind of support provided, as the titles of two recent publications suggest (Lamb and Reinders, 2006; Gardner, 2007). Support can be provided in the form of materials, tasks, interaction, strategies, technology or language advising (see e.g. Rubin (2007)). However, regardless of the nature and quantity of support provided, one of the key findings of recent studies is that students are often “lacking in the metacognitive skills needed in order for the independent learning . . . to be carried out successfully.” (Fisher et al., 2007, p. 47).

What then does the metacognitive knowledge required for successful independent language learning consist of? According to Flavell (1976, p. 232) metacognitive knowledge is “knowledge concerning one's own cognitive processes and products or anything related to them”. Flavell (1979, p. 907) identifies three different types of metacognitive knowledge: *person knowledge* (the knowledge a person has about him or herself and others as cognitive processors); *task knowledge* (the knowledge a person has about the information and resources they need to undertake a task); *strategy knowledge* (knowledge regarding the strategies which are likely to be effective in achieving goals and undertaking tasks).

Wenden (1986) was one of the first researchers to apply Flavell's taxonomy to language learning. She claims (2001) that metacognitive knowledge is essential for successful learning because students' understanding of themselves, the tasks they engage in and the strategies available to them directly impact on all their decisions about learning. Wenden (1986) argues that metacognition consists of a knowledge element and a strategic element. She defines the strategic component of metacognition as “general skills through which learners manage, direct, regulate, guide their learning, i.e., planning, monitoring, and evaluation” (Wenden, 1998, p. 519). She goes on to say that “the deployment of these three strategies in learning is referred to as self-regulation in cognitive psychology” (Wenden, 1998, p. 519). Working in the field of educational psychology, Zimmerman notes that as metacognitively active participants in their own learning “self-regulated learners are persons who plan, organize, self-instruct, self-monitor, and self-evaluate at various stages of the learning process” (Zimmerman, 1986, p. 308). In the last few years self-regulation has begun to receive a lot of attention (for example, Pintrich, 2004; Zimmerman, 2000, 2008) and is appearing with increasing frequency in the literature on language learning. For instance, Tseng et al. (2006) proposed a reconceptualisation of learning strategy research which would focus less on the outcomes of strategic behaviour and more on “the learners' innate self-regulatory capacity that fuels their efforts to search for and then apply personalised strategic learning mechanisms” (Tseng et al., 2006, p. 79). As Gao (2007) notes in his critique of their paper, the term ‘self-regulatory capacity’ appears to be closely related to Wenden's use of the term ‘metacognition’.

Studies of metacognitive knowledge in language learning can be divided into three categories. Papers in the first category explore its nature and role, and highlight its importance in effective language learning in a range of settings (Victori and Lockhart, 1995; Wenden, 1987, 1998, 2001, 2002), including that of distance language learning where it has received a significant amount of attention (Hurd, 2000, 2006; Murphy, 2007; White, 1999). Studies in the second category report examples of students' metacognitive knowledge (Cotterall, 1999, 2009; Rivers, 2001; Wenden, 1986; Zhang, 2001; Zhang and Goh, 2006), including a group of studies focused specifically on beliefs about language learning (Horwitz, 1987; Kalaja and Barcelos, 2003; Usuki, 2003; Victori, 1999). Research reports in the third category examine the relationship between metacognitive knowledge and other variables in language learning such as students' disposition towards autonomy (Cotterall, 1995), motivation (Vandergrift, 2005) and the use of learning strategies (Yang, 1999; Zhang, 2008). Zhang

(2008), for example, reports on a study that demonstrates how a carefully designed programme of reading strategy instruction resulted in increased metacognitive awareness and improved comprehension on the part of his Chinese learners.

A common theme in these studies is the importance of metacognitive knowledge in language learning. [Chamot and O'Malley \(1994, p. 372\)](#) suggest:

metacognition . . . may be the major factor in determining the effectiveness of individuals' attempts to learn another language and . . . explicit metacognitive knowledge about task characteristics and appropriate strategies for task solution is a major determiner of language learning effectiveness.

In light of the central role attributed to metacognitive knowledge, the dearth of studies on how to encourage its development comes as something of a surprise. While, admittedly, the literature on learner strategies includes some reports of increments in metacognitive knowledge, the interventions on which these are based are usually short-term and conducted in experimental settings. Furthermore, interest in the acquisition of metacognitive knowledge is usually limited to the strategy targeted in the intervention. Clearly, much could be learned from a study aimed explicitly at enhancing students' metacognitive knowledge about language learning. This article seeks to address this need by reporting on a study which aimed to enhance, investigate and document students' acquisition of metacognitive knowledge about language learning.

### 3. Background to research project

#### 3.1. Context and course

Akita International University (AIU) is a small, recently founded (2004) university in northern Japan which offers a liberal arts curriculum with two majors – Global Business and Global Studies. The courses in these programmes are delivered in English. As a part of their degree requirements, students must spend a year abroad studying at one of the university's partner institutions. Before they can start taking courses toward their degree, all students entering the university have to first successfully complete an English for Academic Purposes (EAP) programme.

During their first semester in the EAP programme, students are required to take a course called self-directed language learning – the course which is the focus of the study described in this paper. The two principal objectives of the course are to provide students with opportunities to develop aspects of their language proficiency which they feel they need to improve, and to develop their metacognitive knowledge and skills. In order to meet these objectives, the students design and carry out their own learning plans. Based on [Holec's model of learner autonomy \(1981\)](#), the course enables students to determine their own goals, choose appropriate materials, decide how they are going to use these materials, monitor their progress, and assess their learning. [Holec \(1981, 1987\)](#) suggests that in order for learners to successfully assume these responsibilities, a learning structure which supports them as they take charge of their learning is essential.

While [Holec's model](#) outlines the basic pedagogical principles and concepts which guided the development of our self-directed learning course, the learning structure developed for the course boasts several other noteworthy features (for details see [Murray \(in press\)](#)). First, students improve their language skills by working directly with language materials; there are no language lessons. Secondly, instruction in learning strategies is provided in mini-lessons at the beginning of each session in an attempt to ensure that the students have the necessary knowledge and skills to use the materials effectively and efficiently. Thirdly, portfolios play a key role in the management, monitoring, and assessment of learning. In their portfolios students keep evidence of learning, including their Personal Learning Plans (PLPs), Daily Learning Logs (DLLs) and other evidence resulting from their efforts to design and implement self-assessment strategies (for more information see [Cotterall, 2008](#)) Fourthly, self-assessment is continuously encouraged, with final grades determined through a process of collaborative evaluation ([Dickinson, 1987](#)) in accordance with a rubric of performance criteria. Finally, rather than take on the role of “teacher,” instructors for the course become facilitators of learning and language advisors.

### 3.2. The study

#### 3.2.1. Aim of the study

Over a three-year period we investigated the experiences of the students learning English in the self-directed language learning course. The principal aim of the study was to explore the progress students made in achieving the course's two objectives: the development of their language proficiency and their metacognitive knowledge and skills. From the outset we recognized the impossibility of attributing gains in language proficiency solely to the course. For this reason, rather than attempt to conduct a formal assessment of proficiency gains, we chose instead to elicit students' perceptions of aspects of proficiency they felt they had improved through their work on the course. This information also provided evidence of the extent to which students were meeting the second objective of the course, the development of metacognitive knowledge and skills.

#### 3.2.2. Participants

The study participants were 400 students enrolled in the self-directed language learning course at AIU. The majority of these had a TOEFL score within the 400–500 range at the time of entering AIU. While all 400 students participated in all data collection activities (apart from the interviews and focus group discussions) since these were an integral part of the course, a subset of 269 students agreed to participate in the research project, giving us permission to use their materials for data analysis and to report on their experiences.

#### 3.2.3. Methods and procedures

In seeking to document the learners' linguistic and metacognitive development, we chose to adopt a research methodology which incorporated survey research methods in an emergent ethnographic design. Data was collected from six different sources: a language beliefs questionnaire, language learning histories, learner portfolios, a course evaluation, interviews and focus group discussions. At the beginning and end of the 15-week semester, the students were asked to complete the same language beliefs questionnaire. During the second week of the course, the students wrote language learning histories, and at the end of the semester they reviewed their histories in terms of their experiences on the course and wrote their reflections. The students also completed a course evaluation questionnaire consisting of 20 Likert scale items and six open-ended questions. In addition, 25 individual interviews and two focus group discussions were recorded and transcribed. Interview schedules, the questionnaires and the DLL template were modified each year based on analysis of the previous year's data.

## 4. Data analysis

Data gathered during the study yielded evidence of positive movement in students' beliefs about self-directed learning as well as numerous instances of students' enhanced ability to plan, monitor and evaluate their learning. Due to limitations of space, we have chosen to restrict our discussion to data gathered during the most recent administration of the course (2007).

### 4.1. Beliefs questionnaire

Exactly 100 participants completed the Beliefs questionnaire in both April and July 2007. They were required to respond to the 10 Likert scale items in the questionnaire using a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Responses to each of the questionnaire items were analysed using a paired sample *t*-test. Table 1 shows the mean differences between pre-course and post-course students' beliefs. As can be seen from the table, students' responses demonstrated an increase in means for eight of the 10 items. Items 3, 4, 9 and 10 – relating to monitoring, evaluating and planning learning – are the items most centrally concerned with metacognitive knowledge. Of these, Items 9 and 3 reflect the largest increases in mean. In addition, the overall means increased, reflecting more positive beliefs about self-directed learning in July than in April.

Table 1

Pre- and post-course beliefs questionnaire responses (including only those who completed both questionnaires).

		Mean	SD	Mean difference	<i>t</i> values	
1. I will be able to communicate effectively in English one day	Post (July)	4.58	0.70			
	Pre (April)	4.29	0.71	0.29	4.46	***
2. My ability to speak English is an important part of who I am	Post (July)	4.55	0.75			
	Pre (April)	4.49	0.77	0.06	0.84	n.s
3. I have my own ways of measuring how much I have learned	Post (July)	3.65	0.76			
	Pre (April)	2.78	0.89	0.87	8.49	***
4. I usually know when I am making progress	Post (July)	3.78	0.83			
	Pre (April)	3.30	0.96	0.48	5.34	***
5. I am better than average at language learning	Post (July)	2.83	0.92			
	Pre (April)	2.29	0.94	0.54	5.20	***
6. To learn English, I need a teacher	Post (July)	2.96	1.10			
	Pre (April)	3.11	1.11	-0.15	-1.10	n.s
7. I know what I need to do to learn English	Post (July)	3.80	0.63			
	Pre (April)	3.27	0.88	0.53	6.19	***
8. I can identify my strengths and weaknesses as a language student	Post (July)	3.98	0.74			
	Pre (April)	3.52	0.96	0.46	4.87	***
9. I know how to plan my English language learning	Post (July)	3.56	0.81			
	Pre (April)	2.48	0.86	1.08	11.22	***
10. I know which aspects of my English I want to improve	Post (July)	4.47	0.67			
	Pre (April)	3.93	0.83	0.54	6.93	***
Mean	Post (July)	3.82	0.45			
	Pre (April)	3.35	0.51	0.47	10.97	***

Notes:  $N = 100$ . \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

Subsequently we carried out a factor analysis using principal component analysis with Promax rotation. As a result, two factors with eigenvalues of 1 were extracted to explain approximately 50% of the total variance (see Table 2). We labelled these two factors *identity* and *metacognition*.

## Factor 1: identity

1. I will be able to communicate effectively in English one day
2. My ability to speak English is an important part of who I am
7. I know what I need to do to learn English
8. I can identify my strengths and weaknesses as a student
10. I know which aspects of my English I want to improve

Table 2

Total variance explained.

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings <sup>a</sup>
	Total	% of Variance	Cumulative (%)	Total	% of Variance	Cumulative (%)	Total
1	3.650	36.505	36.505	3.650	36.505	36.505	3.089
2	1.249	12.491	48.996	1.249	12.491	48.996	2.971
3	1.003	10.034	59.029				
4	.919	9.191	68.221				
5	.714	7.143	75.364				
6	.687	6.873	82.236				
7	.560	5.596	87.832				
8	.493	4.934	92.766				
9	.373	3.731	96.497				
10	.350	3.503	100.000				

Extraction method: principal component analysis.

<sup>a</sup> When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Factor 1 consists of items which reflect students' understanding of themselves as learners, and inevitably, as people, corresponding to Flavell's notion of "person knowledge". Items 1 and 2 were originally included in the questionnaire in order to determine the extent to which competence in English formed a part of the student's imagined "future self" (see, for example, Markus and Nurius (1986), Norman and Aron (2003)). Given the type of students AIU attracts, it was considered likely that English would play a significant role in participants' future aspirations. This factor therefore pertains to the student's vision of a possible future self, incorporating the belief that s/he will one day communicate effectively in English.

#### Factor 2: metacognition

3. I have my own ways of measuring how much I have learned
4. I usually know when I am making progress
5. I am better than average at language learning
6. To learn English, I need a teacher
9. I know how to plan my English language learning

The items which form the second factor focus on planning, monitoring and evaluating learning. In Flavell's (1979) taxonomy of metacognitive knowledge, these elements are referred to as "strategic knowledge". Item 5, which reflects the student's confidence in her/his language learning ability, also clusters with the metacognition-focused items. This suggests that a relationship may exist between perceived linguistic competence and metacognitive development. Item 6 is negatively related to Factor 2. Students who agreed with Items 3, 4, 5 and 9 are confident about their metacognitive knowledge, so are less likely to feel they need a teacher in order to learn English.

A paired sample *t*-test was subsequently carried out on the result of the factor analysis using factor scores to examine whether there was any differential effect on the two factors extracted. The result of this analysis is presented in Table 3. The results show that there was a statistically significant increase in both factors (Factor 1,  $t = 7.982$ ,  $p < .001$ ; Factor 2,  $t = 11.073$ ,  $p < .001$ ). Table 3 also provides the Cronbach Alpha internal consistency reliability coefficients of the factors. The reliability for Factor 1 was sufficiently high ( $\alpha = .742$ ), while the reliability for Factor 2 was relatively low ( $\alpha = .493$ ), suggesting the need for caution in interpreting the results for Factor 2. Nonetheless, when the *t*-test results are considered along with the tendencies in changes in individual questionnaire items (see Table 1) and the qualitative data, we can conclude that overall changes in students' beliefs were significant, indicating that the course was effective in enhancing students' metacognitive knowledge about language learning.

#### 4.2. Language learning histories and portfolio comments

Portfolios, which included the students' learning plans, daily learning logs, language learning histories, reflections on their language learning histories, artifacts resulting from their efforts to assess their learning, and their final evaluation reports, generated a large amount of data. This data documented students' reactions over time to various aspects of the course. While some comments were inevitably idiosyncratic, a trend towards enhanced metacognitive awareness and control of the learning process was observed. For example,

Table 3

Mean differences in factors between pre- and post-course beliefs questionnaire responses (including only those who completed both questionnaires).

		Pre-course (April)	Post-course (July)	Mean difference	<i>t</i> values	$\alpha$
Factor 1. (Identity)	Mean	-.382	.373	.750	7.982***	.742
	SD	1.033	0.811			
Factor 2. (Metacognition)	Mean	-.541	.531	1.072	11.073***	.493
	SD	.938	.742			

Notes: Factor scores were used to produce the results in this table.  $N = 100$ . \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ . In 'mean difference,' increase in the rate from April to July.

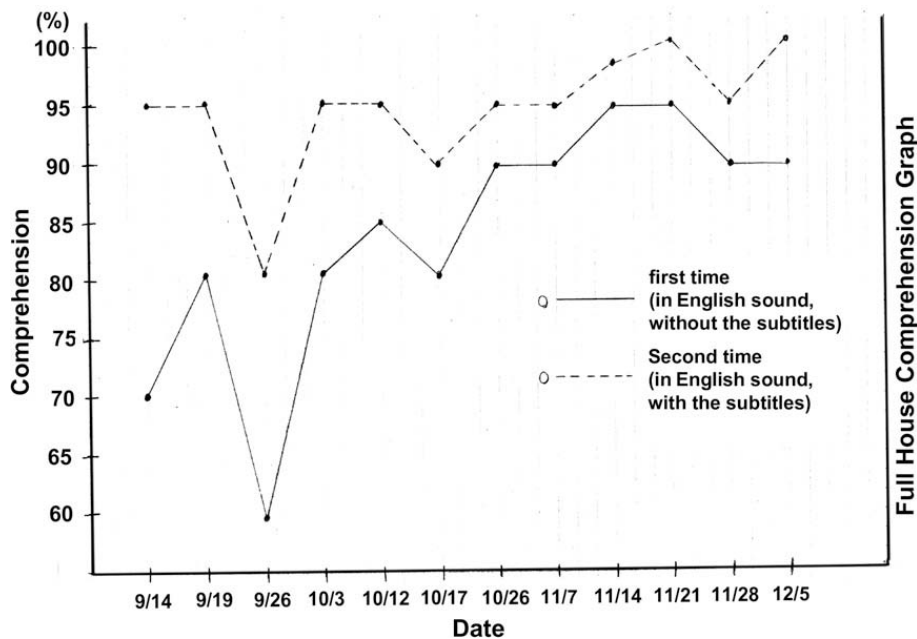


Fig. 1. Measuring listening progress.

a number of students developed their own measures of learning, such as the listening comprehension graph shown in Fig. 1. The learner used this graph to subjectively assess her understanding of the DVD extracts she watched each session. As the graph indicates, she watched each extract twice – firstly without subtitles, and then with subtitles – and estimated what percentage of the story she had understood each time.

Another student, Narumi (not her real name), wrote of the differences between studying English at high school and learning English on the self-directed learning course:

... last year, although I had a clear motivation and aim at studying English, I didn't make firm plans, and didn't use strategies. I just studied as hard as possible in an inefficient way. In addition, I thought that it was very important that how long I studied. In other words, I evaluated my efforts by the time which I took to study. The way in which I studied then was not effective at all ...

This course taught me the importance of making a clear plan, and showed me many useful strategies for learning languages. When I worked with my first Personal Learning Plan (PLP) with the material I had chosen by myself, I noticed what I was doing would not work on what I wanted to study. Then, I looked my first PLP over again, and I changed my plan. Though it was my PLP that was problem, it was also my PLP that made me think more deeply about my learning way ... If I had started with the material without writing any plan, I would have continued working on it, nevertheless it would not have led me my goal. I realized the importance and usefulness of having a clear plan and considering whether it is really effective for me or not again and again.

Narumi's account of the role planning and reflection played in her learning bears eloquent witness to the quality of her metacognitive activity.

#### 4.3. Course evaluation

Responses from the course evaluation questionnaire administered at the end of the semester not only support the claim that the course was effective in enhancing students' metacognitive knowledge, but also suggest which aspects of the learning structure played a role in its development. Table 4 presents responses to the items that focused on metacognition. Approximately 80% of the participants reported increased person knowledge in relation to language learning (Item 1). They also demonstrated confidence in their capacity to plan their learning (Items 2, 10). Furthermore, their responses suggest that assessing their learning outcomes and reflecting on their learning (Items 4, 9, 13) helped them better understand the language learning process.



Table 4  
Self-directed learning course evaluation results (expressed as percentages).

Item	Strongly disagree (%)	Disagree (%)	Don't know (%)	Agree (%)	Strongly agree (%)
1. In this course I learned about myself as a language learner	1	4	17	59	19
2. I set meaningful and realistic goals for myself	0	4	12	55	29
4. Having to assess my portfolio and give myself a grade at the end of the term helped me learn about myself as a language learner	1	11	21	50	18
9. In this course I made progress toward achieving the goals I set for myself	0	1	17	65	17
10. The materials and strategies I chose helped me meet the goals I set	0	2	15	63	20
13. Having to reflect on my learning each day (in order to complete the learning log) has helped me to understand better how I learn a language	3	13	23	47	14

These conclusions are supported by responses to the open-ended questions. When students were asked what they liked about the course, many responses focused on their being able to take responsibility, set goals, increase their metacognitive knowledge, and seek help when they needed to. For example, one student wrote:

What I like about this course is we can decide our goals and what to do for it on own and get teacher's useful advice only when we need it. It made me learn the important things about self language learning.

Another student wrote:

I think the very significant of this course is to 'learn how-to-learn' ... I also liked that whole responsibility is on me. It makes me become more thoughtful and serious.

The importance of being able to personalise learning was another common theme in the questionnaire responses. One student wrote:

The best way [to learn is] to choose whatever you are interested in as your textbook.

Taken together, the Likert scale and open-ended responses suggest that aspects of the learning structure which supported the learners' metacognitive development included the opportunity to set and pursue their own goals, to assess their learning outcomes, to reflect on the process and to seek advice from the instructor when necessary.

#### 4.4. Interview and focus group discussion data

Much of the interview and focus group discussion data gathered during the study also provided evidence of students' enhanced understanding of ways in which resources could be used to further language learning. For example, Akiko said during an interview:

Before the course, I thought to watch DVDs, or listen to interviews that I like, doesn't mean I am learning English, but during this course I learnt that if there is a secure strategy or effective reflection on that, that's very helpful to learn English.

In addition, Narumi commented specifically on the way she used the Personal Learning Plan:

Even if I didn't have sheet, maybe I would make a plan, but maybe that plan was vague ... But ... if I write down on paper I can watch again and again. ... So the paper was useful I think.

Narumi's comments suggest the "sheet" or Personal Learning Plan template served as scaffolding for both her planning and monitoring processes. The template encouraged her to produce a concrete and precise learning plan, in which she noted her goals, materials and activities. Furthermore, making the plan tangible enabled her to refer to it repeatedly and use it as an object for reflection on her learning.

## 5. Discussion

The primary aim of this study was to explore the experiences of students enrolled in a self-directed learning course which focused on the development of linguistic and metacognitive knowledge and skills. As the data analysis demonstrates, the students' experience was characterized by a metacognitive awakening involving both knowledge and skill. We argue that the learning structure created a pedagogical environment conducive to metacognitive growth. In this section of the paper we examine the features of the learning structure which the data suggest were instrumental in fostering this development.

### 5.1. Affordances

Inspired by Singleton and Aronin's (2007) application of Gibson's (1979) theory of affordances to multiple language learning, we decided to explore the notion of affordances in relation to our study of self-directed language learning. Affordances are possibilities for action within an environment as perceived by the observer (Gibson, 1979). A crucial feature of this definition is the link it makes to identity. An individual's propensity to perceive affordances in any given environment is dependent upon his or her identity. Different people will see different opportunities for action or view them in different ways. In our self-directed learning course, affordances are opportunities for learning which the students perceive within the learning structure. Analysis of the data resulted in our identifying five affordances which appear to have contributed to the students' metacognitive development: personalisation, engagement, reflection, experimentation, and support.

#### 5.1.1. Personalisation

We use the term Personalisation to refer to elements within the learning structure which enabled the students to explore their identities as learners and to adapt their learning to suit their identities. Several aspects of the learning structure made this possible. First and foremost, through the goal setting process students could decide what they wanted to learn. Secondly, they could choose materials which interested them and, thirdly, use them in ways that accommodated their learning styles. One student wrote - "I could choose materials and how to learn English. This allowed me to know which the best way for me to learn English is." By investing aspects of themselves in their learning – personal needs, goals and learning style – the quality of students' learning was enhanced. Comments on the course evaluation questionnaire such as the following support this conclusion: "This course helped me know my weak point and a good materials. This course also helped me know myself."

In addition to enabling the students to explore their identities, the learning structure also provided affordances for realizing their future identities, or *possible selves* as English language users. Markus and Nurius (1986, p. 954) have defined a possible self as "the individual's ideas of what they might become, what they would like to become, and what they are afraid of becoming". They note that possible selves can be seen as a "cognitive manifestation" of an individual's goals and aspirations. We maintain that two affordances within the learning structure contributed to the realization of students' possible selves as users of English: the opportunity to set goals and to assess progress in achieving those goals. A vision of a possible self is likely to play an important role in both goal setting and self-assessment. For example, students' imagined interactions with people from the host country suggest a number of immediate language learning goals. Likewise, an individual's future vision of her/himself as an English speaker can provide a benchmark against which to measure current language proficiency and progress. According to Markus and Nurius (1986, p. 956) future selves "furnish criteria against which outcomes are evaluated". By serving as "cognitive bridges between the present and the future, specifying how individuals may change from how they are now to what they will become" (Markus and Nurius, 1986, p. 961), possible selves can play an important role in language learners' linguistic and metacognitive development.

#### 5.1.2. Engagement

Wenger (1998) has proposed that a key source of identity formation is engagement in practice. The self-directed learning course afforded the students opportunities for direct engagement in the practice of learning. Rather than passively consuming teacher-delivered lessons, they were engaged in designing their own learning

experiences. This opportunity to engage in directing their learning also enhanced the students' awareness of factors (person, task and strategic) that impact on the learning process and their identity as language learners.

### 5.1.3. Reflection

But engagement without reflection is unlikely to lead to learning. A third crucial affordance provided by the learning structure was the opportunity to reflect on the learning process. As one student wrote, "It is necessary to critically observe what are the points I should focus on in this course. This course encouraged me to think my English learning seriously." Reflection was fostered through verbal prompts to monitor and assess learning and by a collection of course documents aimed at scaffolding student learning. Narumi's commentary (see Section 4.2) on the importance of planning is an excellent example of both the process and outcome of the opportunity for reflection.

### 5.1.4. Experimentation

Another affordance in the learning structure was the opportunity for experimentation with goals, materials and strategies. One student wrote, "Although I'm not sure what is the best way [to learn], I learned that to seek it gives me great improvement." Many of the students commented on the freedom of choice the course afforded them and its benefits. For example, "I liked to decide my way of learning English by myself. Thanks to this system, I found my weakness and strength". By experimenting with elements of the learning process, students were able to enhance their understanding of themselves, the tasks they were engaged in and the strategies available to them.

### 5.1.5. Support

The final affordance in the learning structure which contributed to the students' metacognitive development was the support provided. This took the form of the DLL and PLP templates, the learning strategy guides, mini-lessons, peer interaction and the availability of the instructor. As Narumi's comment (reported in Section 4.4 above) indicates, completing a written learning plan facilitated reflection, enabling her to return to it and revise it at will. The instructors' availability and helpfulness was also commented on by numerous students in interviews and questionnaires. These data sources indicate that students also discussed their learning with their peers who offered information and support, highlighting the role interdependence (Kohonen, 1992; Little, 1996) played in their learning. As one student put it, "I could get advice on my strategy or materials from my teacher and classmates."

Yet, however helpful it may be to itemize these affordances, it is also essential to recognize their inter-relatedness. Each of the affordances offers students the possibility of personalising their learning, of making decisions in accordance with their identity. The freedom, or autonomy, to make decisions concerning their learning then is the defining characteristic of the learning structure, enabling students to engage in supported learning by experimenting with different goals, materials and strategies. As they experiment, they are encouraged to reflect on the outcome of their decisions, and to use those reflections to enhance their learning. We argue that this interplay of elements results in a synergy which contributes to students' metacognitive growth.

## 6. Conclusion

As we pointed out at the beginning of this paper, further research is required to explore how the development of metacognitive knowledge can be fostered in language learning. This study adds to our current knowledge by providing empirical evidence of one set of conditions under which metacognition can develop. At the same time our inquiry points to avenues for additional research. For example, a limitation of this study was its inability to explore the relationship between enhanced metacognitive knowledge and gains in language proficiency, due to intervening variables. Future research might not only investigate this relationship but also examine the possible influences of learning in self-directed environments on learning in other settings. For instance, were students able to transfer the metacognitive knowledge and skills they acquired in the self-directed learning course to their work in other courses in the EAP programme or to out-of-class language learning? Further research might also explore the link forged in this study between metacognitive development and the realization of learners' possible selves. As Markus and Nurius (1986, p. 955) note "development can be seen as

a process of acquiring and then achieving or resisting certain possible selves.” This study suggests that students’ language-related self-concept and metacognitive knowledge can be enhanced by exposure to a learning structure characterized by the affordances described here. Such a learning structure can, paradoxically, provide both freedom and support, enabling students to explore and expand their metacognitive knowledge by taking responsibility for all aspects of their learning.

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