

Introduction

With a drastic change in today's educational environment, the importance of self-directed learning (SDL) has been seen as a potentially more effective way of education when compared with conventional learning (Benson, 2001; Gan, 2004; Gibbons, 2002; Oladoke, 2006; Takeda, 2002). Gibbons (2002) defined SDL as "any increase in knowledge, skill, accomplishment, or personal development that an individual selects and brings about by his or her own efforts using any method in any circumstances at any time" (p. 2). Possibly because SDL can be practiced anytime and anywhere, it has been widely applied by many teachers to foster independent learning skills in diverse educational settings.

Because of the educational benefits brought by SDL, more and more universities and educational institutes in Taiwan started to emphasize the importance of autonomous learning, especially in the field of second language learning. In recent years, to experiment with the idea of autonomous learning, a good number of self-access resource centers have been set up by local universities. More often than not, such centers provide learners with rich second language learning materials as well as abundant opportunities to try out self-directed learning as suggested by researchers and experts (Benson, 2001; Castellano, Mynard, & Rubesch, 2011; Cheng, 2006; Gardner & Miller, 1999; Victori, 2007). Nevertheless, an increasing number of researchers found that the effectiveness of such resource-based approach to SDL does not directly result in learners' ability to take control over their own learning. In other words, although self-access centers do offer plenty of opportunities to foster learners' SDL capacity, the evidence shows that they do not lead to greater autonomy on language learning (Sheerin, 1997; Sturtridge, 1997).

As self-access resource centers have been the major focus on the experimentation of autonomous learning in Taiwan, we are not surprised to discover that the research is rather limited on the incorporation of SDL in the classroom setting. A preliminary review of previous studies showed that the independent learning process or SDL had a positive influence on learners in the classroom (Gan, 2004; Littlejohn, 1983; Oladoke, 2006; Takeda, 2002; Williams, 2004). Moreover, classroom-based approaches, in Benson's (2001) view, attempt "to foster autonomy by involving learners in decision-making process concerned with the day-to-day management of their learning" (p. 161). He further pointed out the implementation of SDL into a curriculum is seen as a better approach than self-access language center when it comes to the effectiveness of developing learner's autonomy on learning. The current study, therefore, is designed to explore if such classroom-based approaches could help students develop their ability to direct their own learning in foreign language class. Specifically, we would like to find out college students' perceptions of the effectiveness of a classroom-based SDL approach in an advanced conversation class. Second, the

study attempts to determine if learners possess adequate skills for conducting online research required by the SDL program. The following section will briefly introduce the research context of the present study.

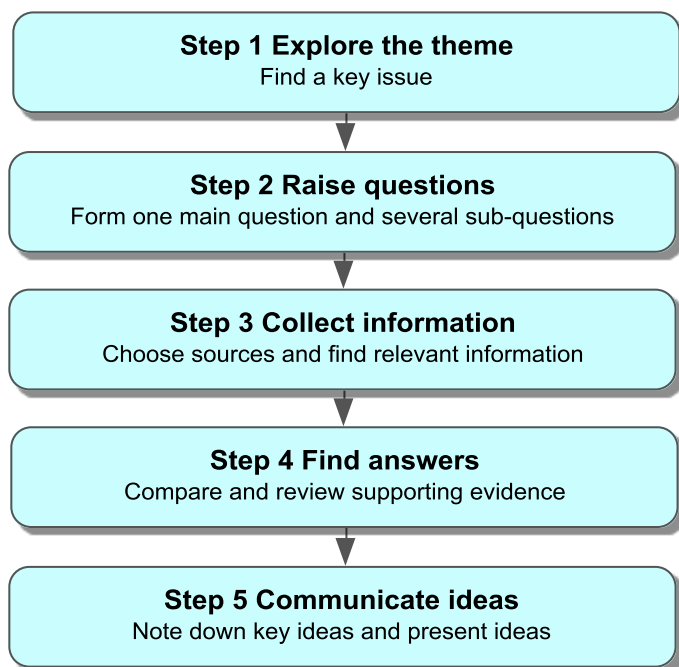
Research Context

In order to explore college students' attitudes toward a classroom-based SDL approach in the context of foreign language learning, the researchers co-designed an advanced English conversation class with a weekly SDL session to train students' ability to take charge of their own learning. This particular course was officially offered by the department of English at National Kaohsiung First University of Science and Technology (NKFUST). Enrolled students in 2 classes took the course which meets 3 hours a week for a total of 2 semesters in the fall of 2010 and in the spring of 2011. Apart from the 2-hour English conversation class held in the classroom, all the students were required to conduct self-directed learning 1 hour per week in a computer laboratory.

The purpose of embedding self-directing learning into the conversation class is to provide opportunities for students to explore conversational topics via online research, and most importantly to prepare ideas, concepts and questions for in-depth discussions when they meet in the classroom setting. To help students direct their study step by step and develop independent learning skills, the researchers modified a 5-step process template recommended by Gibbons (2002), including 5 major components: 1) explore the theme; 2) raise questions; 3) collect information; 4) find answers; and 5) communicate ideas as shown in Figure 1.

The 5-step learning scheme is intended to create independent learning experiences for students who take the advanced conversation class and to develop students' abilities to understand topics and issues via the process of self-directed learning. Therefore, having the conversation class set up the way it is designed for, the researchers are able to observe and explore if students benefit from the idea of embedding SDL into an advanced English conversation class from multiple perspectives. Moreover, we would like to probe if students have sufficient online research skills to perform the learning tasks required in the SDL course. It is evident that learners nowadays highly depend on the Internet for research and study; however, the competence of their online research skills has yet to be researched on. Through this study, the researcher would like to find out whether English-majored students have sufficient online research skills for self-directed learning or not. If not, what online research skills need to be taught or coached when conducting self-study?

Figure 1 The Five-step Learning Scheme Designed for the SDL Course



The present study, therefore, is designed to investigate the following two major questions.

(1) What are students' perceptions of the effectiveness of SDL for learning advanced conversational topics?

(2) What are students' perceptions of their online research skills required by SDL in an advanced conversation class?

Literature Review

Over the past decade, self-directed learning (SDL) has been seen as an effective approach to language learning. Gibbons (2002) defined SDL as “any increase in knowledge, skill, accomplishment, or personal development that an individual selects and brings about by his or her own efforts using any method in any circumstances at any time” (p. 2). Possibly because SDL can be practiced anytime and anywhere, it has been widely applied by many teachers to foster independent learning skills in diverse educational settings. Previous studies indicated that a wide array of variables would influence the success of SDL programs implemented in academic contexts, such as learner attitude, strategy use, and problem-solving skills (Gan, 2004; Oladoke, 2006; Takeda, 2002; Williams, 2004).

Self-directed Learning

Takeda (2002) carried out a study to find out how the experience of SDL influenced the L2 learning attitude in an intermediate Japanese class. Six enrolled students from the University of Alaska Anchorage (UAA) voluntarily participated in the study because of their interest in learning Japanese. During the course, students were allowed to choose learning topics and take charge their own learning by themselves. After the course ended, the students' interviews revealed interesting results. The findings suggested that the total time spent by the participants on studying Japanese greatly increased during the SDL process. Moreover, the students could identify their needs by analyzing the weaker areas of their language skills. Because of the increased awareness of their own learning needs, the participating students not only enhanced their learning autonomy but also developed greater ability to manage learning.

It is worth noting that in the literature the majority of experiments and studies in SDL have mostly been conducted in Western countries. Little is known about the educational benefits of SDL on Asian learners. To investigate Chinese learners' attitude toward SDL, Gan (2004) conducted a study to investigate if the attitude of Chinese EFL students toward SDL would affect their language achievements. Three hundred and fifty seven undergraduate students at 2 mid-eastern universities in China participated in a survey study. The analysis of the questionnaires revealed that Chinese EFL students in this study had a positive attitude toward self-directed learning. Besides, the correlation analysis indicated that the positive attitudes students had about the teacher's role could possibly facilitate their initiative and persistence in language learning. Therefore, when designing a well-organized and effective SDL course, the teacher's guidance role and functions should be taken into consideration.

Online Research Skills

The Internet has dramatically changed the way modern learners conduct their learning (Ford, Miller, & Moss, 2001; Van Deursen & Van Dijk, 2009; Walraven, Brand-Gruwel, & Boshuizen, 2009). There is no doubt that the World Wide Web (WWW) has become the best accessible sources of information for learners to achieve academic goals in educational settings. Recent research, however, has repeatedly shown that learners encounter various difficulties and problems when searching for information on the Internet (Ford, Miller, & Moss, 2001; Monereo, Fuentes, & Sánchez, 2000; Monoi, O'Hanlon, & Diza, 2005; Tu, Shih, & Tsai, 2008; Van Deursen & Van Dijk, 2009; Walraven, Brand-Gruwel, & Boshuizen, 2009; Willoughby, Anderson, Wood, Mueller, & Ross, 2009).

In order to identify the problems web-users are most likely to encounter when using the Internet, Van Deursen & Van Dijk (2009) carried out a study to have a better understanding of the skill-related problems when using the Internet. In this

study, the researchers recruited 109 subjects nearby the University of Twente. During the study, the subjects were asked to complete a set of assignments; most of them directed subjects to a specific website to obtain the straightforward answer. After the searching procedure was done, the data were collected by a questionnaire and screen recordings analysis. The results of the study revealed that users' online searching problems may result from the lack of knowledge about employing Booleans. Boolean searches can largely increase the accuracy of the search results because they specify relationships between keywords or phrases by using terms such as AND, OR, and NOT. Since the use of Booleans is not normally taught in schools, it is often ignored by learners when doing the search work on the Internet. Moreover, the findings indicated that the first-page results shown on the searching engines were given greatest attention. On the other hand, searching results on the second page was only opened occasionally. What's more, almost none of these users in the study attempted to evaluate the information found on the Internet and they seldom desired to compare or verify the outcomes. Van Deursen & Van Dijk (2009) suggested that in order to attain satisfactory searching goals, it is of great importance for educators and learners to pay attention to the online searching abilities not adequately taught in schools.

Another study conducted by Tu, Shih, & Tsai (2008) aimed to investigate eighth graders' web searching strategies and outcomes. A total of 81 students from a public junior high school in the middle part of Taiwan joined this study. They were asked to fill out a questionnaire and finished 3 searching tasks related to nuclear energy in their computer course at school. Their searching process was recorded by screen capture software, and 5 quantitative indicators were used to assess students' searching strategies: number of keywords, visited pages, maximum depth of exploration, refinement of keyword, and number of words used in the first keywords. The results showed that "refinement of keyword" and "number of words used in first keywords" were the only 2 searching strategy indicators that showed significant correlations with students searching outcomes. The keyword refinement is one of the most influential factors among the searching strategies. In other words, the students with better capability of keyword formulation could reach the successful searching outcomes than others. Tu, Shih, & Tsai (2008), therefore, argued that the mission for educators today is to help students enhance their metacognitive abilities of keywords refinement when searching for information on the Internet.

Data Collection

The present study adopts multiple methods to collect the data, including a two-part questionnaire survey and follow-up oral interviews. As Seliger & Shohamy (1989) stated, the use of questionnaire can easily attain participants' attitudes, motivations, and self-concepts in the second language learning research.

Moreover, the oral interview can help collect in-depth opinions and views from the students to supplement the quantitative data. Other instruments include a consent form to be signed and a personal data form to obtain demographic information of the participants. Finally, to enhance the quality of the official study, a small-scale pilot study of the questionnaire survey and interview was conducted 2 weeks before the official study. The official questionnaire survey was conducted in the spring of 2011 in the Department of English at NKFUST.

Participants

The participants were 2 intact classes of junior students from the Department of English at NKFUST. In total, 35 students, 5 males and 30 females, were officially recruited for the study and all of them were enrolled in the advanced English conversation and listening classes in the fall of 2010. Moreover, none of them had the experience of conducting SDL in previous conversation classes. It is worth mentioning that immediately after the participating students completed the survey, 7 randomly picked students were asked to join the follow-up oral interview.

The Design of the Questionnaire

The questionnaire is sectioned into 2 parts and a total of 22 questions are designed by the researchers in English with clear instructions for the participating students to answer the questionnaire. Besides, two experts were consulted to ensure the validity of all the questions asked in the survey. The first part of the questionnaire includes 12 questions. From Item 1 to Item 12, a five-point Likert scale is used to measure the effectiveness of incorporating SDL into an advanced conversation class from the perspective of English-majored students. The scale ranges from “Strongly Agree” to “Strongly Disagree.”

The first 5 questions ask whether it is a good idea to incorporate SDL into the conversation class (Item 1); if students have a better understanding of the content knowledge covered in the conversation class after conducting SDL (Item 2); whether the themes and topics selected for the conversation class appear to be interesting to students (Item 3); if SDL is an excellent way to acquire new knowledge in diverse content areas (Item 4); if they feel motivated to expand their knowledge in selected topics during self-study (Item 5). To acquire more viewpoints toward conducting SDL in the laboratory, the other 7 questions ask if students think conducting SDL in a laboratory setting is a meaningful experience (Item 6); if the 5-step process template is a good method to guide their self-study in the laboratory (Item 7); if they have increased problem solving abilities by taking charge of their own learning in the laboratory (Item 8); whether they have plenty of opportunities to do online research in the laboratory during self-study (Item 9); whether conducting SDL one hour per week in the laboratory is adequate for self-study (Item 10); if they are in good control of their learning and research

during self-study (Item 11); and if they will continue to conduct SDL after finishing this conversation class (Item 12) as summarized in Table 1.

Table 1
Questions for Self-directed Learning

Item	Statement
1	It is a good idea to incorporate SDL into the conversation class.
2	After conducting SDL, I now have a better understanding of the content knowledge covered in the conversation class
3	The themes and topics selected for the conversation class appear to be interesting to me.
4	SDL is an excellent way to acquire new knowledge in diverse content areas.
5	I feel motivated to expand my knowledge in selected topics during self-study.
6	Conducting SDL in a laboratory setting is a meaningful experience for me.
7	The 5-step process template is a good way to guide my self-study in the laboratory.
8	I have increased problem solving abilities by taking charge of my own learning in the laboratory.
9	During the self-study, I have plenty of opportunities to do online research in the laboratory.
10	Conducting SDL 1 hour per week in the laboratory is adequate for my study.
11	I am in good control of my learning and research during self-study.
12	I will still conduct SDL after finishing this conversation class.

In the second part of the questionnaire, a list of 10 online research skills is used to evaluate if participating students possess adequate skills for the Internet search. The participants were asked to evaluate their competence in each skill area on a 3-point scale (low, medium, and high). The first 4 items are the most fundamental online searching skills discussed by the literature. There are “using different search engines” (Item 1); “scanning web pages to explore the themes” (Item 2); “using keywords to find information” (Item 3); “finding relevant web sites” (Item 4). The other 6 items involves online research skills required by the 5-step process template adopted to structure students’ self-learning experiences in this study, including “deciding a key issue” (Item 5: the ability to choose one main topic for the group report); “forming the main question” (Item 6: the ability to create a main question for self-study); “creating the subordinate questions” (Item 7: the ability to make several sub-questions based on the main questions); “comparing and analyzing information” (Item 8: the ability to organize answers to the questions); “evaluating search results” (Item 9: the ability to assess the information gathered from the Internet); and “writing up the report” (Item 10: the ability to

write the group project in a required format) as summarized in Table 2.

Table 2
10 Essential Online Research Skills

Item	Online Research Skill
1	Using different search engines
2	Scanning web pages to explore the theme
3	Using keywords to find information
4	Finding relevant web sites
5	Deciding a key issue
6	Forming the main question
7	Creating the subordinate questions
8	Comparing and analyzing information
9	Evaluating search result
10	Writing up the report

The Design of the Interview questions

The interview questions are also designed by the researchers to further probe the role of SDL in the advanced conversation class and the adequacy of learners' online searching skills. The interview aims to compensate for the information that might be missed from the survey questions. Based on the research questions, a total of four interview questions are raised to gain a deeper understanding of students' views toward the SDL process. Besides, an indefinite number of follow-up questions are asked spontaneously during the interview to keep the flow going and see if students could come up with any additional comments or examples with regard to their opinions. The major interview questions include: 1) Do you think it is a good idea to integrate SDL into an advanced conversation class? 2) Do you think SDL is an excellent way to acquire new knowledge in diverse content areas? Can you give me some examples? 3) Do you think your online research skills are good enough to conduct SDL in the lab? Do you have any problem in online research when doing SDL? 4) Is it a good approach to use the 5-step process template during self-study? Why?

Results and Discussions

The Statistical Package for Social Science (SPSS) was used to analyze the data collected from the questionnaire. All the percentages of the analyzed items were rounded up to the first place after the decimal point. In addition to the questionnaire data, the recorded responses from the interviewees were transcribed for further analysis. Especially, the recurring comments, thoughtful ideas, and insightful examples that emerged from the data were selected to illuminate how the participating students evaluated the effectiveness of SDL from their perspectives. However, due to the scope of this paper, only the most relevant interview excerpts will be reported in detail.

Question 1: What are students' perceptions of the effectiveness of SDL for learning advanced conversational topics?

The data analysis of the first part of the questionnaire revealed that the majority of participants held a positive attitude toward incorporating SDL into the conversation class. Based on the statistical results, 82.8% of the participants were in favor of the statement "it is a good idea to incorporate SDL into the conversation class" (Item 1). After conducting SDL, 74.3 % of them felt they now had a better understanding of the content knowledge covered in the conversation class (Item 2). Additionally, 80% of them, about four-fifths of the participating students, stated that the theme and topics selected for the conversation class appeared to be interesting to them (Item 3). In regard to knowledge acquisition, as many as 88.6% of them reported SDL was an excellent way to gain new knowledge in diverse content areas (Item 4). During self-study 74.3% of them reported that they felt motivated to expand knowledge in selected topics (Item 5). Concerning the laboratory setting, nearly 71.5% of the participants declared that conducting SDL in the laboratory was a meaningful experience (Item 6), and 71.4% reported that the 5-step process template played an important role in guiding their self-study in the laboratory (Item 7). Encouragingly, as high as 97.1% of the students agreed with the statement "I have plenty of opportunities to do online research in the laboratory" (Item 9).

While the participating students generally considered SDL as an effective method that could be nicely integrated into an advanced conversation class, the same group of students only expressed a moderate attitude toward issues such as the continued practice of SDL, the increase of problem-solving abilities, and the adequacy of self-study time. The analysis revealed that when asked whether they would still conduct SDL after finishing the conversation class (Item 12), 62.9% of them showed their willingness to keep on the habit of SDL.

Table 3
The Investigation on English Majors' Perception of Self-directed Learning and its Effectiveness in an Advanced Conversation Class

Item	AGREE		*U	DISAGREE	
	*SA	*A		*D	*SD
1. It is a good idea to incorporate SDL into the conversation class.	82.8%		8.6%	8.6%	
	17.1%	65.7%		8.6%	0%
2. After conducting SDL, I now have a better understanding of the content knowledge covered in the conversation class.	74.3%		20%	5.8%	
	11.4%	62.9%		2.9%	2.9%
3. The themes and topics selected for the conversation class appear to be interesting to me.	80%		14.3%	5.8%	
	25.7%	54.3%		2.9%	2.9%
4. SDL is an excellent way to acquire new knowledge in diverse content areas.	88.6%		8.6%	2.9%	
	34.3%	54.3%		2.9%	0%
5. I feel motivated to expand my knowledge in selected topics during self-study.	74.3%		22.9%	2.9%	
	22.9%	51.4%		2.9%	0%
6. Conducting SDL in a laboratory setting is a meaningful experience for me.	71.5%		22.9%	5.7%	
	22.9%	48.6%		5.7%	0%
7. The 5-step process template is a good way to guide my self-study in the laboratory.	71.4%		22.9%	5.7%	
	14.3%	57.1%		5.7%	0%
8. I have increased problem solving abilities by taking charge of my own learning in the laboratory.	60%		25.7%	14.3%	
	8.6%	51.4%		14.3%	0%
9. During the self-study, I have plenty of opportunities to do online research in the laboratory.	97.1%		0%	2.9%	
	45.7%	51.4%		0%	2.9%
10. Conducting SDL 1 hour per week in the laboratory is adequate for my study.	54.3%		17.1%	28.5%	
	11.4%	42.9%		17.1%	11.4%
11. I am in good control of my learning and research during self-study.	37.2%		40%	22.9%	
	8.6%	28.6%		22.9%	0%
12. I will still conduct SDL after finishing this conversation class.	62.9%		28.6%	8.6%	
	20%	42.9%		8.6%	0%

* SA = Strongly Agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree

* Number of Respondents: 35 Students

Concerning problem-solving skills, 60% of the participants thought they had increased problem-solving abilities by taking charge of their own learning in the laboratory (Item 8). In regard to 1 hour per week of SDL in the laboratory, nearly half of them, 54.3% of the students, believed it was adequate for their study (Item 10). Besides the favorable results reported above, our study revealed possible weakness of Taiwanese college students when they were required to take charge of their own learning in a course. For example, only 37.2% of the participants,

slightly more than one-thirds, agreed with the statement "I am in good control of my learning and research during self-study" (Item 11). Table 3 summarized the results from Item 1 to Item 12 in the first part of the questionnaire.

Discussion of Question 1

The results of the current study indicated that the majority of the participants were satisfied with the incorporation of SDL into the advanced conversation class. A good number of participating students reported that they felt motivated to expand their knowledge in selected topics during self-study and the themes selected in the class were quite interesting. In addition to the strong motivation to expand knowledge, most students believed that SDL was an excellent way to acquire new knowledge in diverse content areas. They also considered the 5-step template was a good way to organize their inquiry during self-study. Furthermore, almost all the participants claimed that they had plenty of opportunities to conduct online research and prepare for the conversation class.

It is not difficult to see these participants apparently gained new content knowledge during self-study, especially with the help of the process template and through abundant research opportunities provided in an online context. Evidently, the experience of SDL coupled with the online environment exerted positive influence on students' learning success in the content-based conversation class. The following excerpt from Participant A described the advantages of using SDL to increase content knowledge required by the conversation class.

In my opinion, I think SDL is an excellent way to acquire new knowledge in diverse topics. For example, last semester we decided to do the research on plastic surgery as one of our topics. During the process of collecting information online, I found lots of information about plastic surgery, such as its medical after-effects. To find more details about this topic, I browsed many web pages to find the useful resources; I think this helped me to open my eyes to this area. Thus, I gained better understanding on this topic after I read many kinds of articles selected online.

The results of questionnaire also revealed some warnings that teachers should be aware of when implementing SDL in a laboratory setting. For example, when asked whether they were in good control of their learning and researching during self-study, only 37.2% of participants agreed they could control their learning pace effectively. To our surprise, 22.9% of them opposed the idea and 40% of them said they were unclear whether they had good control over their learning. The results indicated SDL may not benefit all types of students, especially those who

highly rely on the teacher for information and are not used to making decisions for their own learning. Some of them mentioned while they preferred the way to direct their own learning, they suggested that it would be more effective if the teacher could give more instruction on the selected themes during self-study. Thus, to enhance the effectiveness of SDL in the classroom setting, the teacher should explicitly explain some of the content and give more lectures to improve students' understanding on various topics as recommended by Participants B.

I like the way we learned about conversational topics this semester. In SDL, we could decide our own topics based on the general theme. However, I think teachers are more professional and believable than the fellow students when it comes to giving feedback to our research. We will learn more if teachers could provide relevant information through lectures. Therefore, I think both SDL and lectures are important to our learning.

Question 2: What are students' perceptions of their online research skills required by SDL in an advanced conversation class?

In the second part of the questionnaire, to evaluate students' online research skills required in the conversation class, the researchers asked the participants to rate their searching abilities on a 3-point scale of low, medium, and high. The data gathered from the questionnaire were then calculated and converted into percentages. In general, the participating students reported an average to above-average ability to conduct SDL with the 10 essential online research skills as shown in Table 4.

Among the 10 research skills, the first four skills (Item 1 to Item 4) involved students' ability to perform the basic search task. The statistical analyses showed that 48.6% of the students rated their ability to use different search engines as high and 45.7% rated it as medium (Item 1). As for the ability to scan web pages to explore the themes (Item 2), 57.1% of the students rated it as high and 37.1% rated it as medium. Concerning the ability of using keywords to find information (Item 3), as many as 85.7% of the students rated this skill as high, while only 2.9% of them rated it as low. In addition, over half of these students (54.3%) rated their ability to find relevant web sites as high and 40% of them rated it as medium (item 4).

Table 4
The Survey of Students' Online Research Skills in the SDL Program

Item	Low	Medium	High
1. Using different search engines	5.7%	45.7%	48.6%
2. Scanning web pages to explore the themes	5.7%	37.1%	57.1%
3. Using keywords to find information	2.9%	11.4%	85.7%
4. Finding relevant web sites	5.7%	40%	54.3%
5. Deciding a key issue	8.6%	42.9%	48.6%
6. Forming the main question	2.9%	54.3%	42.9%
7. Creating the subordinate questions	17.1%	62.9%	20%
8. Comparing and analyzing information	5.7%	48.6%	45.7%
9. Evaluating search results	2.9%	68.6%	28.6%
10. Writing up the report	2.9%	71.4%	25.7%

* Number of Respondents: 35 Students

Apart from the above four basic online research skills, the same group of students mostly indicated an average to high ability to perform online research required by the 5-step process template. In regard to the ability of deciding a key issue (Item 5), 48.6% of the students rated it as high, 42.9% medium and 8.6% low. About the ability of forming the main question (Item 6), 42.9% of these students rated this skill as high, 54.3% medium and 2.9% low.

Additionally, when asked about the ability of comparing and analyzing information (Item 8), 45.7% of the students rated this skill as high, 48.6% medium and 5.7% low. The results analyzed so far seemed to indicate the students in the current study had fairly good online research skills; nevertheless, they appeared to show less confidence on 3 skill areas in particular. To illustrate, concerning the skill of creating the subordinate questions (Item 7), only 20% of the students rated it as high, which was relatively low in percentage when compared to those for the other 7 skills. The same tendency was also found in Item 9 and Item 10. In Item 9, as few as 28.6% of students rated their ability to evaluate search results as high; in Item 10, only 25.7 % of students, less than one third, rated their ability to write up the report as high. Apparently, the above 3 skills – creating subordinate questions, evaluating search results, and writing up reports – presented more challenges and difficulties in online research for the participating students than the other skills that probably required less critical thinking.

Discussion of Question 2

In modern education, learners' online research abilities are closely linked with the success of any self-directed learning programs. As indicated, our findings revealed the majority of students had a medium to high level of competence on using the 10 online research skills required in the SDL course. In particular, the participating students claimed that they were proficient in using the basic online research skills to locate the information they need for their inquiry, including using different search engines, scanning web pages to explore the themes, using keywords to find information, and finding relevant web sites. It is worth noting that as many as 85.7% of the students rated their ability to use keywords to find information as high on the 3-point scale, which indicated they could pick the right keywords for their search or even refine the keywords to have more exact results during self-study. As discussed earlier, the study of Tu, Shih, & Tsai (2008) pointed out that "the refinement of keyword" and "number of words used in first keywords" are the two key factors contributing to successful searching results.

Besides the 4 fundamental online research skills, the other 6 online research skills were required by the 5-step process template and the majority of participants reported medium to high competence in these skill areas according to their experience of performing online searching in the laboratory. Among the 6 skills, three of them - deciding a key issue, forming the main question, and comparing and analyzing information - were rated as either medium or high by the participants and the percentages of high competence and medium competence were similar to each other. This particular finding indicated that the participating students were capable of following the 5-step process template by using proper online searching skills to direct their study. Moreover, the use of the 5-step process template not only promoted these students' SDL learning experience but also assisted them to get tasks done in a step-by-step manner. It is worth mentioning that out of 7 interviewees in the study, six of them viewed the use of the 5-step process template as an effective tool when conducting self-study. Participant A commented the advantages of the 5-step process template in the interview.

I am the one who is not very good at organizing the information. However, I could finish the report with the help of the process template. In other words, I felt more structured and focused on my study by following the 5-step process template.

As discussed above, while most of the interviewees recognized the advantages of the 5-step process template in organizing their self-directed learning experience, the statistical results revealed that some research skills presented more challenges and difficulties than other skills for the participating students when using the

process template. For example, the abilities to create the subordinate questions (20% high), to evaluate search results (28.6% high), and to write up the report (25.7% high) were rated as high by relatively lower percentages of students when compared with other skills in the HIGH category. That is to say, the participants in general showed less confidence in the above 3 skills that required more critical thinking and intellectual effort. The interview excerpt from Participant F discussed about the ability of evaluating search results. He reported that he often encountered difficulties in assessing the collected information on the Internet as follows.

When evaluating the searching results on the Internet, I sometimes found myself distracted by irrelevant information. For example, I would focus on something which was interesting but not really important to the questions asked by our group. What frustrated me was that even though the information was unrelated, I couldn't help but look for more information about it.

The researchers attributed the above result to learners' lack of ability to evaluate and assess the information obtained from the Internet. Van Deursen & Van Dijk (2009) found the same phenomenon in their research project and reported that the younger subjects seemed not to pay much attention to the source of the information found on the Internet. They discovered, surprisingly, "the older the subjects are, the less likely they select irrelevant search results" (p. 398). In other words, young students tend to believe what they see at the first sight without any further evaluating the reliability of the information. Probably we can attribute this phenomenon to the lack of research experience and training. Thus, to achieve academic success in an online environment, learners must master their evaluation skills through systematic learning and training.

Conclusion

The current study has added more empirical evidence to the body of knowledge with regard to the effectiveness of implementing SDL in the classroom setting. Our findings suggested that as many as 82.8% of the participants reported that it was a good idea to incorporate SDL into the conversation class and 74.3 % of them felt they now had a better understanding of the content knowledge covered in the conversation class. Moreover, because of the freedom they had to decide the topics, they felt motivated to improve their learning. However, over half of the participants had trouble controlling their learning pace during self-study primarily because of the lack of direct and explicit instruction from the teacher. Therefore, language teachers, who intend to integrate self-learning into their class,

should be aware of such conditions and strive to make SDL a more rewarding experience for all types of students in Taiwan's education system.

In addition, the statistical evidence clearly showed that the participants had medium to high competence in using the 10 online research skills for self-study in the laboratory. As a result, the researchers could conclude with confidence that the majority of students possessed adequate skills to direct their own study and research in an advanced conversation class. With good ability to use these searching skills, most students could easily follow the 5-step process template and finish the required research tasks in a systematic way. Other than the favorable results, the current analysis indicated that the participants seemed to show less confidence in their ability to evaluate if the search results were relevant or reliable. This particular finding appeared to be commensurate with those of other studies conducted in other countries (Van Deursen & Van Dijk, 2009). The lack of research experience and training was the main cause of this problem. As Van Deursen & Van Dijk (2009) suggested, student's ability of evaluating searching results requires educational intervention and systematic training. As a result, to achieve academic success, SDL teachers should be aware of the difficulties facing their students and place the ability to evaluate online sources as a priority. It is also important for teachers to help students develop better strategies to compare and judge the information collected from the Internet so that students can get the most out of their self-directed learning experience.

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