

**Paper Presentation at the
AARE 2001 International Education Research Conference
Crossing Borders: New Frontiers for Educational Research**

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Learning Plans for Student Scaffolding [CHN01046]

We all know that lesson plans are introduced to initial teachers as an initial management tool for scaffolding organizational learning, but little work has been done to connect the ideal scaffolds for individualized student learning. Our research project has investigated and developed the practical classroom implementation of Learning Plans as a personal task-management scaffold for student learning. The teacher's role in enabling self-organized learning for large groups of students can be achieved through the deployment of Learning Plans, which converts teacher-centered curriculum management into student-centered learning tasks. This paper briefly considers the pedagogical practice behind this innovative curriculum reform initiative in the context of a recently completed research project in Singapore.

Introduction

The onset of the information age brought about by the rapid development of technology has resulted in the exponential growth and easy availability of a massive amount of information. Coupled by the call of education ministries to reform curriculum to promote more open-ended problem solving to teach critical thinking and information management, as practitioners, we should also re-look at the way teaching is conducted. As students grapple with managing projects, struggling to make sense of the large chunks of information, they should be equipped with the skills to make sense of the information, whilst managing their own learning. This paper proposes that such an agenda for teaching and learning would result in a re-emergence of the relevance of the psychosocial constructivist theory of scaffolding. Through a brief review of Vygotsky's notion of the Zone of Proximal Development, followed by a discussion of what scaffolding entails, this paper then considers the practical application of Self-Organized Learning (S-o-L) in the form of the critical thinking scaffold, a Learning Plan (LP), for project management in an economics course at a local polytechnic. By pointing to the critical elements in authoring a Learning Plan, the pedagogical value of scaffolding is highlighted. Finally, it proposes how LPs can be further developed to give adult learners greater ownership of learning.

Zone of Proximal Development and Scaffolding Re-visited

Vygotsky believed that social interaction plays a role in the development of cognition, that is, learning could occur through experiencing social contact. By introducing the idea of the Zone of Proximal Development (ZPD), he explained that there exists a difference between the learner's observed ability and the same learner's potential abilities. It is hence argued that it is necessary to test the learner in a dynamic environment with either the teacher, or possibly even peers, who could give hints to the learner in trying to determine what are the learner's latent abilities. As such, the distance between the actual developmental level that is reflected and the level that is accomplished is closed through interaction between able and less able learners. This assistance provided by the more able learner introduces the notion of "scaffolding", which is described as "the tutorial process where an adult or "expert" helps somebody who is less adult or less expert" Bliss and Askew (1996). The basic premise of scaffolding is that the adult provides the support and scaffolding for the individual, until *she* assimilates the knowledge into their own cognitive structure, i.e. the new knowledge becomes part of their normal repertoire of thinking skills. The scaffolding support system is then gradually taken away, as the learner begins to take over and understand the required thinking process.

Self-Organized Learning for Scaffolding

As a theory and a practical approach, Self-Organised Learning (S-o-L), also has its roots in psychosocial constructivist theory. According to Harri-Augstein and Thomas (1991), human learning within the S-o-L conversational paradigm is defined as the "conversational construction, reconstruction and exchange of personally significant, relevant and viable meanings with awareness and controlled purposiveness" (p.23). As such, self-organized learners have a purpose in mind and being consciously aware of their thoughts, feelings and actions, they are actively defining and re-defining their purpose for learning such that it remains alive and relevant. This is achievable, as S-o-L is rooted in the group learning theory of social constructivism that enables systematic reflection on one's experience in a social

setting to construe personal learning¹. In addition, S-o-L is also based on instructional design axioms that provide a practical set of thinking tools to facilitate reflective conversational learning.

In S-o-L, the “conversational individual”, or C-indi, carries out a Learning Conversation of a dual nature. Two conversations exist; one internally, from within our self, to our self, and another externally, with others (Thomas and Harri-Augstein, 1985). This is much akin to Vygotsky’s (1978) idea which states that “every function in the child’s cultural development appears twice: first, on the social level, and then, later, on the individual level; first, between people, then inside the child”. He further believed that all higher-order functions begin as actual relations between individuals. Thomas’ and Harri-Augstein’s notion of the conversational individual assumes “human beings as meaning, construing, negotiating and attributing organisms. Being engaged in a constant flux of mental activity, humans are building upon past knowledge to create new knowledge, which explains personal learning as a form of conversational knowledge construction” (p.20). In keeping with the imagery of scaffolding as step-wise progressions, Harri-Augstein and Thomas (1991) offer a three-step criterion for evaluating reflective learning. Reflective critical thinking should be based on the *general structures of meaning* heuristic comprising of (i) elicitation of items of meaning, (ii) the sorting of relationships and (iii) the display of final patterns (p.271). As a systems thinking model, it is crucial in that it provides the basis for the construction of a pedagogical system for reflective project management. Based on these principles, S-o-L links reflective and critical thinking with authentic problem solving learning situations and this is explored in the next section.

The Learning Plan (LP) as a Critical Thinking Scaffold

In the form of practical conversational thinking tools, a critical thinking scaffold for project management can be presented in the form of Learning Plans (LP) (see Appendix 1). A LP is a flexible, 'content-free' conversational tool that allows students to both scaffold and manage their own learning as the skills of critical thinking can be modelled through practical activities to result in discovery learning². The learning tasks making up the LP are designed as real-world simulations that play an important social function of helping the learner to personally identify with the abstract concepts and to model personal knowledge from the experiential event (See Table 1). Functioning as a Knowledge Elicitation System (KES), Coombs (1995) explains that such a controlled reflective process gives personal voice to prior knowledge, designing experiential linkages between past and present learning, thus increasing meaning making to a greater depth of personal relevance.

¹ S-o-L has its roots in George Kelly’s (1955) Personal Construct Theory (PCT). From a psychological perspective of systems-based thinking, it states that individuals self-manage their inner reflective process, constructing knowledge and modelling concepts of the world experienced through a complex process of personal “hypothesis testing” between past and present experiences. In constructing personal constructs, the “personal scientist” adopts a holistic world-view, linking one’s personal experience with societal influences and behaviours.

² *Content-free* in the sense that the individual can put their own ideas and experiences into the critical thinking template, i.e. the template operates as a critical thinking scaffold by focusing and shaping the ways in which the learner thinks about ideas and issues.

Table 1: The Design Stages of Authoring a Learning Plan

Comments	Teacher's Action	Resources Produced
How will they be achieved? Student-centred projects?	Identify the curriculum learning objectives to be achieved.	List Objectives within the Learning Plan project management brief.
What are the prior learning requirements and assumptions made before students progress with the project work tasks?	Identify the prior learning requirements.	Revision activities as separate units of work to be completed either before or in conjunction with the project work.
Real-life metaphors need to be matched to the project tasks. An activities task-based assignment of the project works needs to be drawn up. Consider action steps in terms of any reflective learning heuristic.	Identify the key project work themes as authentic learning tasks to achieve the original learning objectives, i.e. the main project work Purposes. Design the project work tasks that defines the goals to be achieved as project work Outcomes and the Reviewing system to be used.	A project management brief needs to be produced with logically assigned tasks as a series of action steps defining the project Purpose, Strategy, Outcome and Reviewing procedures to be adopted.
Assessment and examination tasks need to be part of the main project work brief; i.e. built into the Learning Plan.	Identify any formal assessment tasks that require being built into the overall project work brief. What evidences are required – log of activities, group presentation, reports?	These coursework assignment tasks are integrated into the main work brief above.

Source: Coombs (2001, in press).

Student-centred scaffolding is workable as the LP defines discrete learning pathways that represent a pedagogical process that gives access to curriculum content that can be located at Learning Nodes. (Coombs, 2001, *in press*). In practical terms, these points of learning are part of a logical thought process as outlined in Figure 1. A LP comprises of four essential components: (i) the list of the learning objectives, (ii) activities to review prior learning, (iii) task-based activities to achieve the new learning goals and (iv) a description of the desired learning outcomes or assessment method. It is an operationalized expression of the problem-solving heuristic in the form of a Purpose-Strategy-Outcome-Review (PSOR) cycle.

Teachers can guide the scaffolding process by negotiating the LP(s) with students to arrive at customised solutions that define the scope and nature of the self-directed learning activity (Coombs & Smith, 1998). Alternatively, with adult learners, students may author their own LPs in response to a problem-based project. To support such student-centred learning and enable empowerment of the learning process, the teacher facilitates as "Learning Coach" to guide and support the learner (Coombs, 1995). They help students come to an awareness of

the problem solving skills necessary for independent learning and inculcate a positive attitude towards critical thinking through empowering student control of the curriculum tasks to be achieved. LPs are thus flexible project management critical thinking tools with built-in curriculum and assessment goals that remain relevant to the learning objective as identified during the PSOR reflection stage.

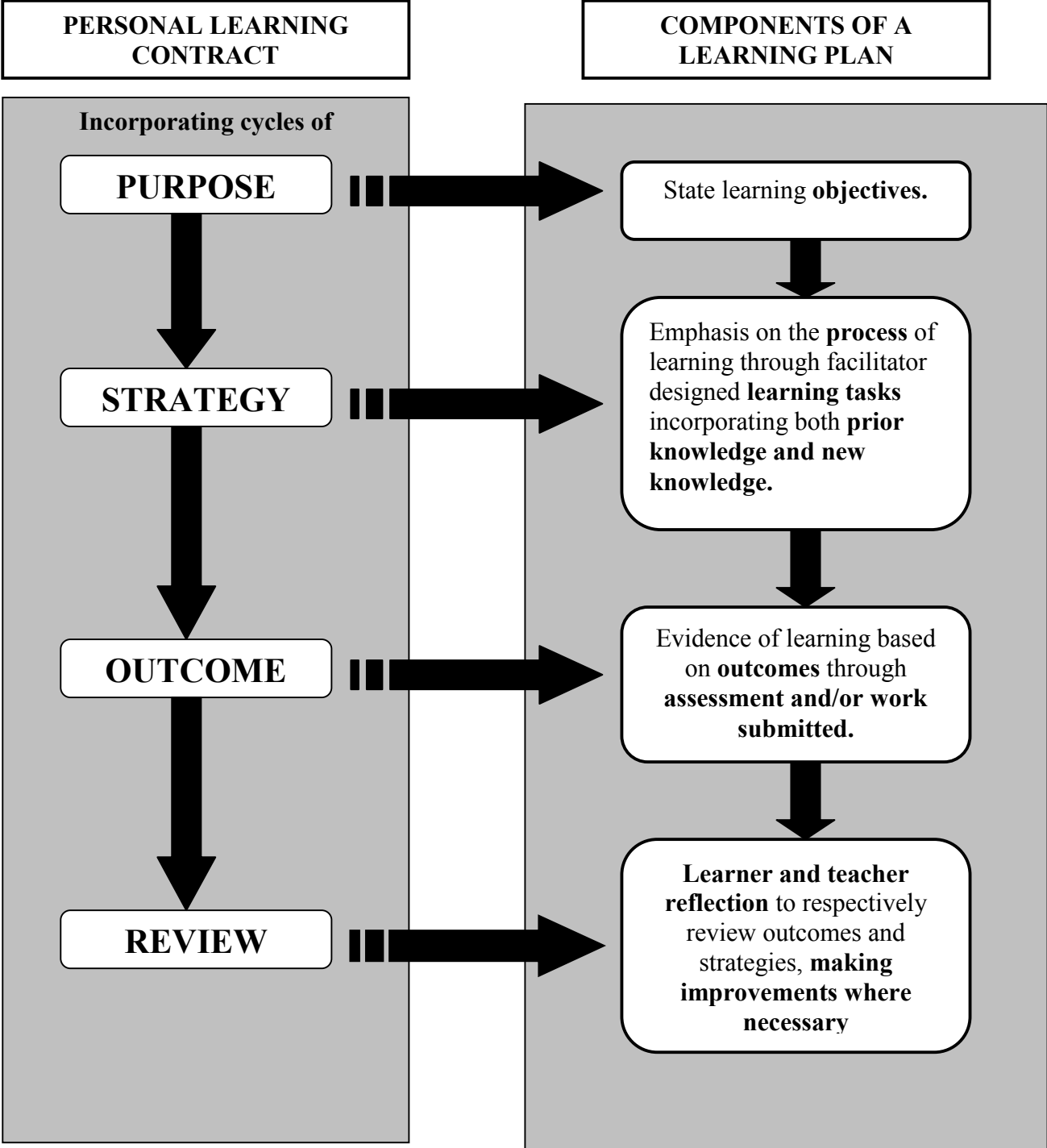


Figure 1: A schematic relational representation of the problem-solving Purpose-Strategy-Outcome-Review cycle operationalized as a Learning Plan (Lee, 2001b)

Current Practice and Need for Action

First year business students at Temasek Polytechnic take two courses in economics; Microeconomics in semester 1 and Macroeconomics in semester 2. The purpose of the Macroeconomics course is to introduce the students to the fundamental economic objectives of any government, and the tools and policies used to achieve these aims.

As part of course fulfilment, students are required to compile an economics portfolio that constitutes 15 percent of their final grade for the subject. The portfolio assignment requires students to analyse eight newspaper articles over a period of 12 weeks. Students are free to select articles of interest in relation to any of the topics taught over the 12 weeks. As a general guide, students are told to write analyses that include a brief summary followed by an explanation and application of the relevant economic concepts and principles. Students are also encouraged to critique the writer's use of economics and to include their own comments, opinions and even making economically sound counter proposals. There is a period for interim submission during Week 8, during which students are encouraged to submit three drafts to the tutor for feedback. This process of submitting a draft provides students with an opportunity to clarify their thinking. This mode of assessment through using the portfolio to assess for understanding of economics has been in place for several years.

Clearly, the purpose of introducing portfolio writing is to encourage independent learning by having students apply the macroeconomics concepts discussed in the classroom to a range of real world situations and specifically how real world economists and policy makers use macroeconomics. The writing of each news analysis is challenging in that it requires students to demonstrate understanding of basic definitions of concepts and principles, the use of diagrams as an economic tool for analysis, application of the theories to changes evident in the dynamic external environment whilst appreciating the fact that many factors and events influence economic decisions.

Following the experience of Semester 1 2000/01, where students were given free rein over the organisation of their Microeconomics portfolios, it was found that it was not uncommon in this Internet age that news clippings were obtained from online sources. With the massive availability of news article available on the Internet, it is not surprising that students who are overwhelmed are not discerning when selecting news articles. Starting with badly chosen articles that provide more of a socio-political commentary rather than economic perspectives, it is found that students simply re-produced the article by writing long summaries with little attempt to engage in economic analysis. Students appeared unable to identify the relevant economic concepts and principles to use or either applied the concepts wrongly. It further illuminated students' economic illiteracy when they were unable to interpret any data provided. As such an action research study seeking to improve this classroom practice made sense (Lee and Coombs, 2001).

Introduction of the Learning Plan

Motivated by the need to enhance students' dispositions to think more critically, an action research project was conducted in Semester 2, between the periods of January to April 2001 to look into how students' ability to write critically could be improved.

Given my intensive experience through the use of S-O-L and its conversational thinking tools over a two-year period, I was convinced about the value of S-O-L and its tools

as a content free technology that could be easily introduced and integrated across all levels and learning cultures (see Lee, 2001a). As such, a LP was designed and introduced to two classes following the submission of the students' first drafts in Week 8 (see Appendix 1)³. The LP was designed to aid the process of reading, summarising and finally analysing the article, that is, proceeding from lower order to higher order task-based thinking activities. Table 2 summarises how each component of the LP mirrors and operationalizes the PSOR cycle.

Table 2: Learning Plan Activities Mirroring the Purpose-Strategy Outcome Review Cycle

Purpose	To summarise and analyse a news article using economic concepts and principles.
Strategy	To identify prior knowledge (economic concepts and principles previously taught) when surveying the article (Task 1). To summarise the article (Task 2). To analyse the key issue in the article using the relevant economic concepts and principles (Task 3).
Outcome	A write up of 200-300 words.
Review⁴	Assessment breakdown distributed at start of semester.

Source: (Lee, 2001b)

Such a systems thinking protocol in designing successful writing assignments has also been supported by Davidson and Gumnior (1993) who point out the importance of sequencing the writing assignment to function as a logical, progressive critical thinking rubric. Likewise, Cohen and Spencer (1993) emphasise the need to focus on the “writing processes, the strategies and procedures followed in the act of writing” (p.219), rather than simply the finished product. The direct involvement of students in a hands-on learning environment is fundamental in providing opportunities for internalisation.

Opportunities for Integrating Learning Plans

Being a content-free technology, LPs can easily be authored to be integrated across all cultures and levels of learning. For example, LPs have also been used with primary school children for mathematics and science in Singapore (Lee, 2001) and adult learners in a flexible information technology unit in the United Kingdom (Coombs, 1995). But stemming from this project, one implication for learning in higher education and adult learners can be drawn. On reflection, I felt that one can move away from teacher-designed LPs towards student-authored LPs. Table 3 illustrates and proposes how students can be personally engaged in authoring their own LPs. Such an authoring plan can be distributed to students to assist them in managing their own learning. More importantly, the *reflective conversational* scaffolds in column 3 are designed to model one's naturalistic conversational structures and are intended

³ A preliminary LP was introduced to two tutorial groups in Weeks 5 and 6. These students were provided with a news article to actually spend time in class completing one written analysis. The written work was collected so that I could review whether the instructions were clear and to identify areas needing further improvement. Following the period of interim portfolio submission in Week 8, the new improved LP was distributed to the same two classes for use.

to help the learner tie in the *life conversation* with the *tutorial conversation*. This makes perfect sense, as there is no one better than the students themselves to understand the social context in which they operate, seeing the economic concepts and principles at work in their lives as consumers. By giving students ownership of the learning process, the student's mental links between expected learning outcomes and reality becomes instantaneously personally relevant and the Learning Conversation comes to life.

Table 3: Steps in Authoring a Learning Plan for a Student

	Action	Reflective Conversational Scaffolds	Resources Produced within LP Project Management Brief
PURPOSE	Identify the curriculum learning objectives to be achieved.	What's the purpose of the project? What am I expected to learn? Are the learning objectives I identified clear and achievable?	List of objectives
STRATEGY	Identify the prior learning requirements.	What have I previously learnt about this topic that will help me complete the project? What information do I already have about the problem?	Brief of previous knowledge related to task at hand. List of resources required for review of prior learning.
	Design the project work activities.	What real-life metaphors are there that I can identify the problem with? What steps do I need to take to solve the problem? What additional information do I need? How can this information be obtained?	A description of logically assigned tasks as a series of action steps to be taken in solving the problem. Consider action steps in terms any reflective learning heuristic, for example, PSOR.
OUTCOME	Identify any formal assessment and examination tasks.	What outcomes are expected from my learning? What evidences will show learning on my part?	The coursework assessment tasks, maybe student defined or teacher assigned.

REVIEW	<p>Identify the assessment criteria.</p> <p>Evaluate learning against the assessment criteria</p>	<p>How will my learning be assessed?</p> <p>Do my learning outcomes meet some minimum standards of quality?</p> <p>Do the objectives and learning tasks identified above fulfil the assessment criteria?</p>	<p>A description of the assessment structure/grading criteria, similarly maybe student defined or teacher assigned.</p>
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Source: Lee (2001b).

How then does one evaluate the effectiveness of LPs as a critical thinking scaffold? McKenzie (1999) offers a checklist of the essential characteristics of educational scaffolding. The guiding principles that could be kept in view are that scaffolding results in (i) clear directions, (ii) clarifies purpose, (iii) keeps students on task, (iv) offers assessment to clarify expectations, (v) points students to worthy sources, (vi) reduces uncertainty, surprise and disappointment, (vii) delivers efficiency and (viii) creates momentum.

Conclusion

Through an action research project conducted at a local polytechnic, Learning Plans have been introduced to students as a personal task-management scaffold for enhanced learning. In a discussion, explored elsewhere (see Lee and Coombs, 2001), the use of LPs as a systematic progression of thought, has been indeed able to enhance the critical thinking abilities of students. In further developing LPs as a scaffold, the paper further proposes how these LPs can bring about learning that increases learning independence by giving students greater ownership of the process through reflective conversational scaffolds.

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Appendix 1

LEARNING PLAN FOR ECONOMIC ANALYSIS OF A NEWS ARTICLES

Instructions

Select an appropriate news article on a topic of your choice and complete an analysis of it using the steps laid out below. Each step can be viewed as components of a checklist.

Learning Objectives

By the end of this project, you should be able to:

1. Summarise a news article
2. Analyse the news article from an economic perspective
3. Identify appropriate economic concepts to apply in the economic analysis of the news article.

Task 1 Reading the News Article

1.1 Survey the article

- Read the heading and sub-headings
- Read the introductory and concluding paragraphs
- Review any pictures/graphics, noting the captions

1.2 Question

- Turn the heading/sub-headings into questions.
- Ask: What did the lecturer say about this topic when it was assigned?
- Ask: What do I already know about this topic?

1.3 Read

- Read each paragraph one at a time with your questions in mind.
- Look for answers, making up new questions when necessary.
- Make a list of the important points; underlining or highlighting them.

Task 2 Summarising the News Article

- Using the main points identified in Task 1, write a one-sentence thesis statement that sums up the article.
- Condense the article into a one-paragraph summary by including the major points.
- Do include one or more of the author's examples and/or evidences.

Task 3 Writing the News Analysis

- Identify all the economic concepts and principles used in the article by highlighting them.
- Categorise the concepts and principles highlighted above according to chapters and sub-chapters.
- Identify the chapter and sub-chapter you would like to do further analysis on.
- Explain the relevant concepts briefly.
- Use diagrams to illustrate the main points where necessary.
- Ask: Are there any hidden assumptions in the article?
- Ask: Are there any weak arguments in the article?
- Ask: Are there other points of views that can be considered?