Studying the Learning Practice:
Implications for the Design of a Lifelong Learning Support System

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Abstract

A phenomenological study of personal experiential learning was conducted. This informed a descriptive Framework of Lifelong Learning (FoLL) which describes four facets of lifelong learning: the learner, the organisation of learning, the process for carrying out learning projects, and the breakdowns that occur during, or because of, learning.

The FoLL was then used to derive a set of general requirements for a lifelong learning support system. System design has commenced based on these requirements. The paper discusses the FoLL and presents the system's general requirements.

1. Introduction

We report on an investigation aimed at the design of personal technologies to support adult learning over long periods of time. Sharples [1] proposed general requirements for this type of system based on a study of theories of personal and lifelong learning. In this study we take a different approach: we are seeking to ground the requirements for a system that supports the user in their everyday learning over a lifetime on a model of lifelong learning which originates in a theory-informed phenomenological study of learning.

Section 2 describes the methods used for the study. The result of the study, a descriptive Framework of Lifelong Learning (FoLL), is presented in section 3. Section 4 outlines the general requirements for a (lifelong) learning support system, which were derived from the FoLL.

2. Study methodology

The study employed the "diary: diary-interview" method [2] for data collection. Twelve diaries were distributed to adults whose occupations were learning intensive (e.g. postgraduate students), or who were involved in continuing education programmes. The participants kept the diaries for 4 days. A total of 118 learning experience descriptions were collected. This amount of data was enough to allow us to identify what a learning experience is in practical terms and what different forms it might take. Categorisation of these forms provides a means to conjecture possible configurations of lifelong learning.

In-depth interviews, focusing on the diary entries, were carried out shortly after the diary period. The data obtained with this method were then subjected to analysis using Grounded Theory (GT) techniques [3]. These techniques have been used before in the study of specific learning situations (e.g. novice mathematician's encounters with mathematical abstraction during tutorial study [4]) and as part of knowledge elicitation in knowledge-based systems design [5].

Theories of learning informed the analysis in two stages: at the beginning where a set of categories arising from the theories was superimposed on the data and at the end, during the definition and discussion of the emergent categories.

3. FoLL

The learner. At the core of the learning practice, and therefore of FoLL, is the learner: a person with certain physical characteristics, who assumes a number of social roles, and who has a number of characteristics that relate to how (s)he practices learning. All these characteristics change in time as the learner develops and changes, or as the learning topic/project changes.

Organisation of learning. Learning is organised in three operational levels. At the lowest level, the learner performs learning activities such as reading, discussing, observing, and taking notes. These activities are then grouped at the middle level into distinct learning experiences based on (learner's) criteria such as the topic of learning, the time, and the context in which the activities are performed.

At the top level, the learner organises learning experiences into learning projects based largely on purposes and outcomes: experiences which add to the achievement of a certain aim are likely to be grouped under a single project. A number of learning projects may be pursued during the

same period of time.

The physical, social and organisational environment, the time, the topic, the objects used, the relevant information presented to the learner, his/her objectives, and the tree(s) in this hierarchical organisation where the specific learning episode lies, further specify the learning context.

Learning projects. As regards the procedure for carrying out learning projects, a cyclic pattern was inferred. Learning needs or opportunities are translated into objectives, which are translated into plans. Plans prepare the learner for learning action [6]. Action results in learning outcomes, which are used in other (non) learning situations, which give rise to further needs or opportunities for new projects, and so forth. Oscillations between the different phases are possible. Through the study we could see that all the phases in this cycle could be initiated either by the learner or by someone else and that some cycles may start with a phase other than the first one described above. Based on which is the starting phase for a learning project and who initiates it, we could arrive at a useful typology of learning projects (table 1).

Table 1: Typology of learning projects

Phase	*Initiated by learner*	*Initiated by others*
Identify needs	Intrinsic necessity learning	Extrinsic necessity learning
Identify opportunities	Intrinsic opportunistic learning	Extrinsic opportunistic learning
Formulate objectives and plot plans	Self-managed goal-driven learning	Institution-managed goal-driven learning
Learning action	Self-initiated experiential learning	Externally-initiated experiential learning
Evaluation of, and reflection on experience	Self-managed reflection	Externally-managed reflection

The process of learning was first described as a cyclic one by Kolb [7], with the well-known experiential learning cycle. What we present here, however, is different in that it describes the life cycle of learning projects, highlighting the way learning is intertwined with everyday life.

Breakdowns. Breakdowns may occur in all phases and levels of the learning practice. A learner may fail to formulate an objective/identify a need; plan how to satisfy it; carry out a learning activity both practically and conceptually; apply his/her existing knowledge; organise his/her learning activities into experiences and projects; and develop new abilities in order to respond to physical, social, and situational changes. Breakdowns, however, may also occur not during but because of the learning experience: some new piece of knowledge may require further

exploration; or some background knowledge might be missing which does not allow learning to continue. Breakdowns form possible starting points for new, intervening learning experiences/projects, carried out as problem-solving exercises.

4. Requirements

Based on FoLL as we described it above, a set of general requirements for a lifelong learning support system was devised. Such a system should be able to:
1. Follow the user's development in life and aid them to consider new responsibilities they have undertaken, new abilities they have developed, and new learning habits and tactics they've adapted.
2. Aid the user in synthesising serendipitous learning, planning deliberate learning, and managing semi-structured learning
   2.1 Aid the organisation of learning activities into experiences or the planning of activities for an experience.
   2.2 Aid the association of experiences with learning projects or the planning of experiences to complete projects.
3. Support the user in carrying out learning projects, in:
   3.1 identifying and articulating learning needs
   3.2 creating/ grasping learning opportunities
   3.3 planning and assessing learning
   3.4 performing learning activities
   3.5 identifying and linking learning outcomes
   3.6 using outcomes in future tasks
4. Support the user in recovering from breakdowns

5. References

[1] M. Sharples, "The Design of Personal Mobile Technologies for Lifelong Learning", *Computers and Education*, 34, 2000, pp. 177-193.

[2] D.H. Zimmerman, and D. L. Wieder, "The Diary: Diary-Interview Method", *Urban Life*, **5**(4), 1977, pp. 479-498.

[3] B.G. Glaser, and A.L. Strauss, *The Discovery of Grounded Theory,* Aldine, Chicago, 1967.

[4] E. Nardi, *The Novice Mathematician's Encounter With Mathematical Abstraction: Tensions in Concept-Image Construction and Formalisation,* Doctoral Thesis, Linacre College – Oxford University, 1996.

[5] N.F. Pidgeon, B.A. Turner and D.I. Blockley, "The use of Grounded Theory for conceptual analysis in knowledge elicitation", Int.J.Man-Machine Studies, 35, 1991, pp. 151-173.

[6] L.A. Suchman, *Plans and Situated Actions: the problem of human machine communication,* Cambridge University Press, UK, 1987.

[7] D. Kolb and R. Fry, "Toward an applied theory of experiential learning", in C.L. Cooper (ed), *Theories of Group Processes*, John Wiley and Sons, UK, 1975.