Pedagogical frameworks and action research in open and distance learning

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Abstract

A sizable proportion of the innovative work carried out in educational technology falls under the umbrella of large funded programmes. This paper arises from one such programme - the European Union's Socrates Open and Distance Learning (ODL) programme. The programme consists of dozens of semi-independent projects, and it can be argued that, whatever the individual achievements of these projects, their collective contribution to progress in the field is hampered by lack of common theoretical frameworks. For instance, few project co-ordinators have a well-articulated idea of what a 'pedagogical framework' might be, or what role it might play in analysing their contribution to the field. This is despite the fact that the term features prominently in the aims of the ODL programme. This paper attempts to meet the need for a workable version of the idea of a 'pedagogical framework'. It does so by sketching the anatomy of a pedagogical framework suitable for ODL action research projects and by relating the idea of a pedagogical framework to concrete instances of educational innovation and organisational context. The goal is not so much to erect an ideal pedagogical framework. Rather, the point is to suggest the kind of architecture that such conceptual entities ought to have. This architecture has to reflect a balance between the needs of innovative practitioners and the complexities of the field within which we work. It has to speak to practice, but not trivialise what it represents.

Keywords
Pedagogical frameworks; open and distance learning; learning environments; research and development methodology

Introduction

This paper has evolved as a contribution to a highly distributed programme of research and development in open and distance learning (ODL) sponsored by the European Union's Socrates programme. Within the Socrates programme, 'ODL' is used to mean:
'the introduction of new models of "open" learning through all available delivery mechanisms, notably multimedia products and services, in all places where some form of education may occur; and the provision of "distance" learning services.' (Socrates, 1998)

There are four key objectives:

1. developing pedagogical frameworks appropriate to the environment in which learning is taking place;
2. improving the quality of the organisational environment in which these modes of education take place, and in particular the quality and user-friendliness of pedagogical materials and on-line services;
3. enhancing the skills of teachers, trainers and managers in the use of innovative methods and techniques;
4. encouraging the recognition of qualifications obtained through ODL.

The work is carried out, at any one time, by between 40 and 70 project teams, each involving personnel from three to a dozen or more organisations in different European countries.

The emphasis in the projects is on educational innovation, solution of real problems and dissemination of lessons learned. While there are many impressive individual achievements among the projects, the extent

of collective learning is limited by the lack of common theoretical frameworks within which the projects can locate their goals, methods and achievements. This paper describes a candidate framework that has emerged from discussions in the Socrates ODL project co-ordinators meetings.

Action research

The methods used by the ODL projects are quite varied. Some are primarily concerned with the collaborative offering of novel courses using innovative techniques, such as computer conferencing. Others conduct careful experimentation or evaluative user trials. But none of the projects is *purely* concerned with either research or development. Almost all of them can be characterised as engaging in some kind of action research, involving the pragmatic solution of real problems, but also reflection, self-evaluation, evidence gathering, and the dissemination of experience. The framework proposed here is believed to be particularly appropriate for such action research projects.

Why do we need a pedagogical framework?

Roughly speaking, there are two ways that ODL project teams can learn from each other. Project can learn directly from project. This can be done by examining the concrete objectives, actions and outcomes of another project and mapping them onto the objectives, intended actions and desired outcomes of one's own project. It is easier to do this if the mapping is close: for example, if the subject area, or educational methods, or learner profile is similar. The specific lessons learned by a project can speak directly to our experience as practitioners and innovators. There is little need for the sophistications of theory or abstract concepts, it seems. There has been a great deal of good, innovative work within the Socrates ODL programme that has operated at this level - lessons learned and expressed in the clear language of everyday educational practice. But there are limits to what we can collectively achieve through such forms of enquiry. At some point we need also to make space for a more principled approach - for example, an approach which uses theoretical constructs as a framework for understanding educational action. When we can see an apparently unique form of educational intervention as an instance of some broader, well-defined category, then it becomes possible for us to engage in more powerful and robust reasoning about what we are doing and what we have achieved. All educational interventions can be seen as unique - but they can also be seen as variations on common themes. What we lose in de-emphasizing some of the uniqueness in a project, is compensated by what we can gain through the power of reasoning about patterns, similarities and principles. Educational research should not try to mimic the methods of the physical sciences, but neither can we progress as an innovating community without some high-level frameworks within which to organize our ideas and our achievements.

The kind of pedagogical framework outlined in this paper can play a useful role in helping us understand what each project is trying to do, what it achieves and what the rest of us can learn from it.

What is a pedagogical framework?

Figure 1 is an attempt to capture a version of what might be meant by this term. The point is not to construct one ideal pedagogical framework; but neither are all possible frameworks equally satisfactory. We offer Figure 1, and the following account, as a starting point for a discussion about how we might make good use of this abstract concept in our work in the ODL programme.
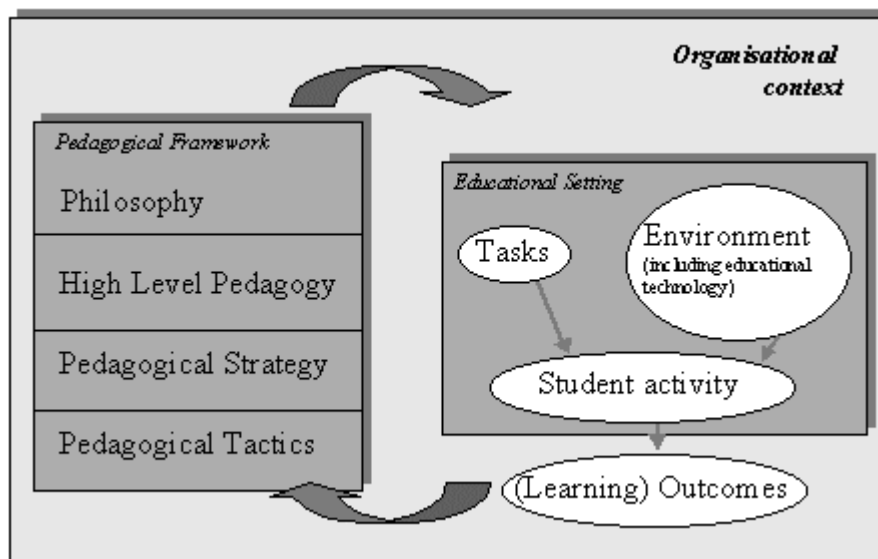

Figure 1: Pedagogical framework, educational setting, organisational context

A danger and a strength of representations like Figure 1 is that they simplify complex processes and relationships. We recommend that, in reading what follows, you also carry out the mental exercise of relating aspects of your own project to the framework. Let us know where it works and where it fails!

Finally, do not become distracted by the labels we have used. They may carry unintended meanings and will not work smoothly across the many varied learning situations to be found in ODL projects across Europe. It is the underlying idea, rather than the label, which is important.

Figure 1 falls into three main parts. The *pedagogical framework* itself is on the left hand side. It needs to be understood in relation to concrete educational activity in a real world setting. On the right hand side of the figure is what we have called the *educational setting*. This is a way of describing the real-world, concrete activities, processes, people and artefacts involved in a learning activity. Both the pedagogical framework and the educational setting exist within an *organizational context*, such as within a university, a corporation or a virtual learning institute. I shall say more about organizational context towards the end of this paper. For now, it is useful to point out that organizational context exerts its influence mainly by conditioning (a) the design and management of the educational setting and (b) the processes through which a pedagogical framework feeds into the design and management of an educational setting.

The educational setting

I see no reason impose limits on the *scale* of the learning activity or educational setting as a conceptual entity. For some projects, the educational setting may involve (say) 10 learners, a single task, and an hour of learning activity. For others, educational settings might more typically involve hundreds of learners working on multiple tasks over several months. A key feature of an educational setting is that it is of an appropriate scale to design and manage. Indeed, it exists primarily as an artefact or system to be designed and managed. It is artificial and constructed, not a set of naturally occurring phenomena whose properties, relationships and boundaries have to be discovered.

The educational setting is a way of representing the coming together of tasks, activities and environment. The distinction between tasks and activities is necessitated by two factors: the strengthening influence of so-called constructivist approaches to learning (e.g. Wilson, 1996; Bostock, 1998) and the high value placed on learner-managed learning in ODL. The flavour of the constructivist shift can be found in Figure 2.
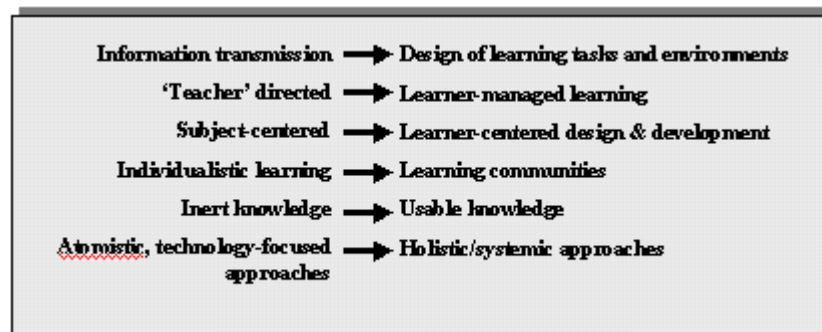

Figure 2: Transitions associated with the growth of constructivist, learner-centered approaches to education

Learning tasks

Those with professional responsibility for helping other people to learn (let's call them 'educators' for short) can meet these responsibilities by carrying out two kinds of work. The first is concerned with the design of good learning tasks. A learning task is a specification for learner activity. Its design draws on the best of what we know about how people learn, on a deep knowledge of academic subject matter and/or vocational competences, and on knowledge of the learners. Essays, laboratory exercises, a structured discussion session or debate, a diagnostic exercise, a topic to research, an artefact to build, a program to write - all these are examples of kinds of learning task. A task needs to be sufficiently well-specified that the chances of a learner engaging in unproductive activity are kept within tolerable limits. Its specification may also need a degree of openness in order to meet variable learner needs and initiate a creative response.

Learning environment

The second kind of work required of educators is the design and management of the learning environment. This term is very heavily used in the Anglophone educational literature. (Searching with the term 'learning environment' on the ERIC database produces over 18,600 hits). There are surprisingly few clear definitions of the term and there are several quite different common usages (see Goodyear, 1997 for a discussion). In this paper, we use the term to mean the physical environment - the physical setting - within which learners work. It includes everything from paper and pen to textbooks, computers, the Internet and all its on-line information resources. The important point here is that learning is severely constrained by the learning environment. Part of the point of ODL is to ensure that more flexible access to learning opportunities is accompanied by appropriate redesign of the learning environment.

Learning activity

The French ergonomist Alain Wisner makes the important distinction between 'task' and 'activity' (Wisner, 1995). Tasks are what managers set - they are the prescribed work. Activity is what people actually do. Educators set tasks. Learners interpret the specifications of the task. Their subsequent activity is a more or less rational response to the task, shaped and constrained by all the other tasks they have to face, all the other calls on their time, and their experiential knowledge of what their educators actually value. It is perfectly legitimate for activity to be different from the task which initiated it. If we want learners to take more responsibility for their own learning, we have to rely on them to make their own interpretations of learning tasks. We also have to recognise that learners are busy people and learning is only one of the things they have to fit into the day. Like all busy people, successful learners know how to cut corners - how to *satisfice* a learning task (Simon, 1969).

Task, activity, environment

A consequence of accepting the legitimate distinction between task and activity is that we should design the learning environment so that it is compatible with activity rather than task. This claim is crucial to user-centered educational technology. In the world outside education, good software systems are built around a proper understanding of how people actually do their work - rather than on the basis of a manager's view of how the work should be done. If it is possible to construct the environment so that it encourages real world activity which is close to the task as set, so much the better. But technology which enforces an unacceptably restricted interpretation of the task will be rejected by its intended users. Understanding what learners actually do is a cornerstone of good design when it comes to learning environments for ODL. That is why we need an ergonomics of learning environments - an applied science of the relations between workers/learners and their environment.

Learning outcomes

The consequence of learning activity is a set of learning outcomes. Outcomes achieve a special significance in ODL action research projects because they are taken as an index of the success of the project, or at least of some of its innovative elements. Using outcome measures as an index of success is fraught with difficulties. That doesn't mean we can ignore outcome measures. Sometimes they give a very clear indication of failure, and we can all learn a lot from failures. But when they seem to indicate success, we usually find it very difficult to make a confident attribution of credit. The learners' scores on tests may have improved significantly: but why? Was it the type of computer we used, or the particular multimedia resources that ran on it? Was it the pedagogical approach we used? Was it the enthusiasm of the teachers? Was it novelty? Was it an interaction between some or all of these factors? There has been an extended debate within educational technology about the difficulties of assigning credit (see e.g. Clark, 1994; Kozma, 1994). Part of the complexity of the problem may stem from assuming an identity between task and activity. Partly it may stem from having too global a view of an innovative educational intervention, failing to distinguish the contribution of its component parts or failing to use an appropriately wide range of outcome measures. Part of the value of having a pedagogical framework such as the one sketched here is to help with analyzing an educational intervention into component parts - to help with the assignment of credit. A consequence is that we need a representative set of outcome measures. This does not mean just a good broad set of measures of learning outcomes (including long-term recall, transfer, tests of implicit knowledge, learner satisfaction measures, etc.). It also means having good ways of capturing the outcomes of work in our projects on the several components of the framework. These may not be the learning outcomes for the learner, but they are among the learning outcomes for the project.

Relationships within the Educational Setting

There is a temporal logic to some of the relationships within the Educational Setting. Learning outcomes come last (though we may also be interested in interim outcomes). In general, learning outcomes are the result of learner activity (though the learner's knowledge of interim outcomes may influence their subsequent activity: feedback is important).

Learner activity flows from learning tasks, though not unproblematically. But in general, an educator sets a learning task, the learners interpret its requirements and do the best they can in the circumstances. An educator's approach to task design may evolve, as they get more experience of how learners' activity is shaped by tasks. But this kind of feedback is not generally a major feature of the model sketched in Figure 1, for we are concerned with a single Educational Setting. A new course, a new group of students, a new set of tasks - that is a new Educational Setting.

Activity and tasks have a dialectical relationship with the learning environment. An environment *should* be designed to support the learners' activity. But it is common for the environment to be inherited - in large part - from earlier Educational Settings. We cannot replace all our computer equipment or all the textbooks every time we run a new course. In ODL, we sometimes have more freedom to reconfigure the learning environment than we do when working in more traditional ways - where the 'legacy environment' is shared with, and controlled by, many others. The amortization of the costs of the learning environment may also mean that we are stuck with it for a number of years. For these reasons, environment can constrain both activity and task. What learners do will be influenced by the tools and resources to hand. What educators can reasonably ask them to do will be constrained by a knowledge of the limitations of what the learning

environment can afford. Simply put, if the *European Journal of Speculative Ergonomics* is not in the University library, don't set a task which requires access to it. If your target learners have 14000 baud modems, don't task them to use multimedia conferencing.

The left hand part of Figure 1 is the pedagogical framework itself. Its four elements are ordered and loosely coupled. This internal structure can be described in a number of ways - to which I shall return after describing the individual elements.

Philosophy

The 'top' element is composed of a number of sets of beliefs: about the nature of knowledge and competence, about how learning occurs, about how people should and should not be treated, etc. The flavour of this element is best shared through giving some examples. For instance, we might distinguish between instructivism and constructivism as approaches to the design of educational interventions. Or we might distinguish between positivism, phenomenology and realism as epistemological positions. For some educators, a relativist or phenomenological epistemology necessarily implies a constructivist approach to education (Cunningham, 1992). For others, constructivism can sit comfortably with a realist epistemology (e.g. Stone & Goodyear, 1995). In many ODL projects, I suspect philosophy is left implicit or is only rarely discussed, or is held to be too remote from the hard day-to-day problems of making an educational innovation work to justify spending time on it. There can also be a sense that a project starts with concrete ideas and commitments, and that unraveling their philosophical assumptions will move the project backwards. Such beliefs are the product of hard experience and so should not be dismissed lightly. But I would claim that *some* attention to the enacted philosophy of the project is required, at least in the project's self-evaluation activities. It is hard to create a shareable account of a project's achievements without saying something about the beliefs of its team. Also, deep and unexplored philosophical differences within a team can lead to fatal divergence in the day-to-day operational work. It is not uncommon to find some members of a team believing that learners are poor at organizing themselves and learn best by being fed information in small amounts, while other members of the team want to promote active, student-managed learning. The sooner such discrepancies are found, discussed and reconciled, the less likely is catastrophic failure.

High level pedagogy

This element is concerned with the concrete instantiation of philosophical positions in the context of creating a new Educational Setting. At a philosophical level, someone might say 'I see great advantages in using a Cognitive Apprenticeship approach'. When one makes a commitment to using a Cognitive Apprenticeship approach in a specific Educational Setting, then one is in the realm of high level pedagogy. There are many candidate forms of high level pedagogy and not all would have the same scale, scope, complexity or coherence. Claims might be made for such things as 'guided discovery learning', 'problem-based learning', 'programmed learning', or 'computer-supported collaborative learning'. From the point of view of their place in the framework, the important thing is that they are at a level of abstraction which is intermediate between philosophy and action. They are a way of turning a philosophical position into a space of commitments and possibilities. A high level pedagogy does not contain direct prescriptions for action, but it puts some forms of possible action into the foreground and others into the background.

Strategy

Strategy *is* directly concerned with action. A strategy is a broad-brush depiction of plans - of what should be done to achieve certain objectives. Strategy needs to account for uncertainties; a good strategy will plan for alternative ways of reaching the objectives. In English, the word 'strategy' has lost some of its military origins, such that it is commonly used in business or the management of universities. It still carries implications of outsmarting the opposition, or, in the case of pedagogical strategy, of outwitting the learner. It implies that the educator will stay at least a couple of mental steps ahead of the learner and will not be too surprised by what the learner actually does. These resonances are unfortunate. In the ODL context at least, we rarely subscribe to philosophies which make the learner a pawn in our chess game. So what we mean by strategy is actually something more open, cooperative and egalitarian. Its main purpose is communicative - it supports a description of actions and intentions at a level which hides confusing details. This description of actions and intentions may be constructed for the benefit of members of a project team or a team of educators. It may also be constructed for the mutual benefit of learners and their teachers. In both cases, the point is to promote a shared understanding of intentions and permit coordinated action.

Tactics

The only difference between pedagogical strategy and pedagogical tactics is one of grain size. Tactics are the detailed moves through which strategy is effected. Take an example from work on the use of text-based computer conferencing in ODL. A team of tutors, acting as conference moderators, might agree to adopt a strategy which is intended to encourage all the learners to participate in a conference. This strategy might involve a number of tactics - including writing an encouraging, positive response whenever a learner makes

a contribution to the conference; providing examples of valued kinds of contribution; posing stimulating and non-threatening questions to the group; writing private emails to 'lurkers' to encourage them to participate; rewarding contributions to the conference through the assessment system, etc. In contrast, a team of tutors might decide that it is more important to promote an online debate of high academic quality than to ensure that all the learners participate. Many of the tactics they use would be different: writing critical responses that challenge sloppy thinking or unsupported claims in a learner's contribution; exemplifying fine academic writing and argumentation; rewarding academic content rather than social contribution through the assessment system, etc.

Does strategy determine tactics? Not always. A rational planning model would encourage us to derive high level pedagogy from philosophy, strategy from high level pedagogy, and tactics from strategy, through some process of top-down inference. Life is rarely so simple. Indeed it is not uncommon to find strategy which is really *emerging* from tactics - thus strategy becomes a way of describing the common threads woven by intuitive tactical activity. Emergent strategy is still useful. Its articulation can serve the coordination and communication functions outlined above and help turn intuitive action into something more reflective, self-aware and discussible.

The internal structure of the pedagogical framework

Figure 1 partitions the pedagogical framework in two different ways.

First, the 'philosophical cap' is separated from the other three elements. This division is referred to in the description of High Level Pedagogy (above). It is a division between (a) a set of general philosophical positions which are independent of any one instance of a real world educational setting and (b) a set of commitments (high level pedagogy, strategy and tactics) specific to one instance of a real world educational setting.

Second, the two upper elements are described as 'declarative' or 'conceptual' while the two lower elements are described as 'procedural' or 'operational'. This distinction touches on both the form in which real world descriptions of the elements are given and the nature of the activity which surrounds those descriptions. Philosophical positions and high level pedagogy can be described in ways which are not prescriptive of action. The descriptions contain statements of fact or belief - they may sketch the nature of a problem and outline the resources available for its solution. But they will not specify exactly what should be done. Such prescriptions for action are to be found in descriptions of strategy and tactics. These *do* need to contain well-formed specifications of the action that should be taken to achieve certain objectives given certain conditions - specifications that cognitive scientists like Johnson-Laird refer to as 'effective procedures' (Johnson-Laird, 1983, 6).

A final point to be made about the internal structure of the pedagogical framework is that the four elements need not be tightly coupled. Indeed the real world practices of educational innovators are sufficiently undisciplined that we should say the elements are 'loosely coupled' (at best). Loose coupling is both real and advantageous. It reflects the need to work with underspecified conceptual entities, particularly in the early stages of a project. One can become clearer about the nature of what one is trying to do once one has made commitments in doing it. Thus, it is hard to make a case that the consequences of choices in one element or 'layer' of the pedagogical framework have clear, precise implications for activity in another layer. It is not a deductive process or one that we can see ways of automating. But neither are the elements/layers free floating. External forces cause us to account for our activity and intuitions in rational terms: high value is placed on coherence. Cooperation within a project team, and between learners and teachers, depends on mutual intelligibility - our intentions and actions have to be sufficiently coherent to be understood. The loose coupling of elements gives space within which we can be both disciplined and creative, listen to our instincts and make them accountable to others.

Organizational context

The third part of Figure 1 is the least visible. This mimics its status in the real world. It is the organizational context within which the pedagogical framework and educational settings are created and develop. The organizational context is particularly important when support for learning is being provided in large and complex institutions such as universities or corporations. If we do not give due recognition to the organizational context, then there is a danger of *idealizing* the processes through which pedagogical frameworks, educational settings, tasks, learning environments etc. are created and develop. Organizational context brings a number of important constraints to such processes: such as logistical and financial constraints and constraints set by staff motivation. ODL projects often have to create a protected niche for themselves, within the organizational context, so that some of these organizational constraints can be temporarily relaxed. They may, for example, use special forms of capital investment to create an enhanced infrastructure for experimental purposes: making available to their learners a learning environment which is richer than the one available to 'normal' learners in the organization.

Depicting the pedagogical framework and educational setting within their organizational context can also help us locate key interactions between the context and innovative activity. Features of the organizational context may have a particularly strong influence at certain key points - for example, where a new educational setting is being created according to the ideas sketched in a pedagogical framework (the top arrow in Figure 1). It is important for ODL projects to be able to identify the nature of such influences as clearly as possible. They can be as crucial to the long term success or failure of an innovation as the

pedagogical strategy or the learning environment.

Formalizing the framework

There may be more than one way of using a pedagogical framework of this kind. The possibility we had in mind in discussions within our working group was that members of a project team would use the framework (or an adapted version of it) as a way of anchoring their preliminary discussions about the make up of their own project. It would be a prompt for discussion, and certainly not a bureaucratic straitjacket. But a second possibility would be to use a framework of this kind for organizing information about ODL projects - for example, in a database of Socrates ODL projects. This would push the framework towards a greater degree of formalisation than it might actually be able to support (which is often the case with theoretical constructs in education). For example, it might be useful to enumerate possible values for each of the elements in the pedagogical framework, so that one could be confident of providing appropriate descriptors for a project in terms of its component parts. Such rough and ready treatment could produce a usable database for finding similar projects, or synthesizing results, but it would be at the expense of subtlety and adaptability in the framework itself. In the end, it must be up to the ODL community to decide whether and how productive use can be made of such conceptual tools.

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