Workplace Assessment -
Balancing the Needs of Student and Organisation

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ABSTRACT

This paper compares the needs of the student and employer as they undertook a cooperative education project, completed during the last six months of a full-time, three-year degree in business computing. Some apparent conflicts of interest were examined and ways to resolve these conflicts were explored using Alexander's patterns framework.

The study derives from experiences with the first two cohorts of the Bachelor of Business Computing (BBComp) at Christchurch Polytechnic, where students apply the knowledge and skills gained on the course to real challenges and opportunities presented to them by companies in a business computing environment. The respective outcomes are negotiated between student and employer before the project begins. The student must in addition meet the academic requirements of the Polytechnic; they submit a number of assessments both during and after the project's completion.

The employer's focus is on producing a commercial product subject to typical constraints such as budget, quality and time. Conflict may arise when - despite the agreed outcomes - the exigencies of the commercial environment force changes upon the student, deflecting them from their original intent.

The author has responsibility for the coordination of the student project and acts as arbiter for both parties.

1. INTRODUCTION

The Bachelor of Business Computing (BBComp) comprises three years of full-time study; its purpose is to prepare students for a career in the computing industry. The course options allow students a number of elective permutations. Students are required to demonstrate the assimilation of core skills and knowledge, through the acquisition of a number of compulsory modules. The electives chosen define a theme such as programming or computer systems; students choose either a project that reflects this theme or one that contrasts with it because they seek to diversify. This paper will examine issues surrounding the assessment of the course and suggest a way to aid its management through the use of Alexandrian Patterns, for some years now the source of much activity in the field of code re-usability. The paper offers five proto-patterns (patterns found to work for the author but without having had the benefit of extensive field testing) to start with. It is planned to generate many more and so develop a cooperative education assessment pattern language (which, to generate a meaningful acronym, should probably be re-arranged to read: Pattern Language for the Assessment of Cooperative Education (PLACE).

2. THE COOPERATIVE EDUCATION COURSE (CE 301)

CE 301 has a foot in both camps; while it is compulsory, due to the wide range of acceptable projects, it allows for considerable choice of specialisation when students are deciding what to do. An industry supervisor is assigned to monitor progress in the workplace and, ultimately verify the student's performance both during and at the end of the project. As Jessup states, (Jessup, 1991, p52) the key person in this "...is the assessor who must normally be in day-to-day contact with the trainee..." A member of staff, connected with the BBComp, is allocated to act as the student's academic supervisor. Their role is to stimulate thought and guide the student when necessary, prompting, for example with an alternative course of action when a student bogged down with project details, is unable to see the wood for the trees.

A number of criteria must be met before a cooperative education project can proceed. The project should be within the realm of business computing, under the supervision of an experienced computing industry professional and represent about 350-400 hours work. The project outcomes are negotiated at the start of the project but up to half way can change to meet revised organisational needs — accepted in this dynamic industry — and they provide a means of measuring the its success. The industry supervisor's assessment is given prominence; if the student can satisfy organisational needs, they can score highly on this part of the assessment.

In addition to satisfying industry, students must demonstrate a clear grasp of quality control and risk management, they may produce thin, inconclusive evidence or show only a superficial understanding of the need to document and communicate their progress. Experience has shown that, despite careful briefing sessions and written instructions, this information may be received only intermittently. Students should aim for a balance between a high level of application and commitment to the project, and an equivalent responsibility to fulfilling other course requirements. The better students initiate communication rather than waiting to be nudged and exercise control over the project's development rather than responding to events.

Students are also asked to locate their findings in a broader context, demonstrating that they have learned to see the limitations of their achievements as well as the magnitude of their successes. In order to be able to do this they present evidence of relevant research in their project area; students are required write an essay that explores the many methodological variants that can be found in the computing industry. They must read widely, drawing comparisons and perhaps inspiration from a range of sources create a backdrop for their organisation's methodology, if indeed one is used there.

The best students become truly self-directed with regard to their learning; conscious of their strengths and weaknesses, they address them with minimal staff input. Having discovered how they learn best, they develop tactics to get quick, effective answers to their questions. These students don't know all the answers — they even understand that that isn't the most important thing — but they learn how and where to quickly find what they need. It was heartening to discover that, having developed their own student network, they sometimes found what they wanted from each other.

Many students are entering a novel environment, so a period of adjustment to new locations, faces and work practices is usually required. Routines such as getting to work on time, appropriately dressed and in a collaborative frame of mind are tackled. Several students have reported the "culture shock" of having to find and iron shirts without slogans or references to alternative lifestyles. They often find themselves put into highly "visible" positions or are placed in teams with diverse personalities that serve to stretch their social skills.

3. EDUCATIONAL AIMS OF THE COURSE

There is a learning contract established that sets out what will be achieved and how that achievement will be measured. According to David Nicholls (1993, p89), cooperative education not only allows the application of skills already learned but provides for the extension of those skills while at work: new skills being developed to cope with the new circumstances in which students find themselves. Knowledge and skills acquired or developed in the workplace include:

Self organisation	Creativity
Meeting deadlines	Goal setting
Problem solving	Presentational and communication skills
Teamwork	A better understanding of the workplace

The learning contract effectively draws boundaries around the project so that all parties have an agreed record of what is part of the project and hence assessable, and what lies outside and will not be formally assessed.

4. NEEDS OF THE STUDENT

Many of the students interviewed so far say that initially they just want to succeed in the course so they can graduate. Along the way, those happy with their placement hope they will either be offered employment directly, or else receive a good reference for their CV, by impressing their host organisation. Some start by assuming they will get a project in the field of their choice or perhaps in the subject area in which they are most proficient. This is often impossible to achieve and may be undesirable in any case; several post-course discussions have revealed that the initial shock felt by "programmers" doing a networking-oriented project, for example, gave way to a realisation that they were only increasing their employability by enlarging their skill-set. Most found that the experience anyway was "not as bad as they had imagined." A number expressed the desire to learn from an experienced practitioner in the belief that this would prepare them for the workplace - their mentor's work practices hopefully "rubbing off" on them. Their hopes are well founded: as Hill reports (1990, p.139) "Many of the stimuli that influence our behaviour are those from other people, and one way we can respond to these stimuli is to model our behaviour after someone else's."

5. NEEDS OF THE ORGANISATION

The organisations used so far often need a short-term project completed and lack the expertise or staff to complete it. Alternatively, they may add a student to a larger project team. Two extreme types of organisations illustrate the range of corporate attitudes observed to date. One might use the student as a human resource in entirely the same way as any other employee, here the student slips almost unnoticed into the team and receives little if any special treatment. At the other extreme the organisation takes steps to protect them from the very forces that shape the computer industry; they receive special treatment, are not assimilated into the workforce and are sheltered from the real challenges that confront the workforce on a daily basis. Why should this be so? The way the student is treated might be due to the organisation's adoption of either a short or a long-term view. Those with short-term views invest sufficient to just satisfy the requirements of the learning contract while maximising student output, getting their deadlines

met and customers satisfied. Commercial pressures may explain this approach.

At the other extreme, a company taking a long-term view of the student is primarily concerned with the student's professional development, perhaps at the expense of the project. Thus they might be shielded them from the real-world problems of aggressive clients, exceptional workloads and unreasonable time constraints that they miss the point of commercial exposure altogether. Both ends of this spectrum represent a possible conflict of interest.

6. THE CHALLENGE

In some ways the experiences of managing different students in different workplaces will always be unique. No magic set of formulae is envisaged to solve all problems at a stroke. However, there are a number of recurring problems that are encountered when managing students' work placements. Assessing students fairly and appropriately is one of the challenges faced by staff — there are a number of others. Since the number of student placements is due to increase with successive cohorts and staffing is short, a way of codifying the knowledge and wisdom gained so far is needed. The wisdom of many individuals (staff and students) and many different circumstances must not be lost or diluted; rather it should be distilled and made available to as many as possible.

7. THE SOLUTION

Thankfully, many of the problems encountered are not new, so a solution might be tried if it has enjoyed prior success. But what if the context is completely different? What if the problem is not quite the same? If proven solutions to known, recurring problems can be recorded in such a way that when faced with a new problem, a tailor-made solution can be quickly identified and implemented, time and effort can be saved. A concise way of doing this is to use a new but growing approach familiar to some architects and software authors, due to Christopher Alexander — a Patterns framework.

Five patterns that offer possible solutions to these recurring problems are shown below. The format chosen is based on that in Meszaros and Noble, 1998. The slightly oddball names are intended to encapsulate the problem and make it easy to remember - they may evolve given sufficient feedback.

8. PATTERN 1 - POUND OF FLESH

Problem

Cooperative education students might work for a company whose overriding concern is the solution to a substantial, pressing problem. They are exploiting the student and will not fulfil their obligations to the course.

Context

It should be established that the student is not a willing participant in this scenario and they are not merely trying to excuse poor performance. Interviews, formal or informal might be needed to give substance to such claims. Firms are subject to competitive pressures and don't need deadweight. A boss in industry who may not be the industry supervisor.

Forces

Needs of the hosting organisation are to be met (in learning contract)

♦ Needs of course are also to be met (requirement to report, document the project)

♦ Pleasing the boss is viewed as important for student to get a job or good reference.

♦ Organisation taking a short term view due to exceptional commercial pressures.

Solution

Ensure the organisation appreciates the aims of the course as a whole - that the course is more than just the project and the learning outcomes provided for are worth preserving.

Formalise and enforce the requirements to communicate on a regular basis. Evidence should be sought to confirm any impression made, ideally perhaps by personal observation in the workplace.

Examples

Four students have all had to cope with being re-directed to other urgent problems arising at work. All of these problems were due to exceptional demands placed on the company by clients of the organisation. They often required geographical re-location as well as a shifting focus from the student's original line of study and thinking.

At the other extreme, we see organisations who see this as an opportunity to "give something back to the community." They adopt a long term view, perhaps they have more slack in the system (though they might never admit it) and realise that a fresh graduate, even with a qualification currently much in demand, faces a "catch 22" situation of not being able to get a job due to the lack of practical experience and yet unable to acquire the experience by remaining without a job. There are a number of other motivations why they are perhaps a little less demanding in terms of tangible results, these include:

"You can't expect much - they're only a student after all"

"This way we get a good look at how a student performs when given a real job to do"

"If we recruit in the conventional way we might spend a lot of money on advertising and still not be happy with someone, once they have to adjust to our way of working"

9. PATTERN 2 - NURSING

Problem

A number of students were not mentally stretched in the ways they had anticipated or hoped for. Companies were reluctant to allow students to get involved with "real work."

Context

Careful monitoring of the initial project phase and the approval process every proposal undergoes prior to acceptance is designed to prevent companies merely taking advantage of cheap labour. Student working on a mission-critical Industrial supervisor is reluctant to accept the student as a capable, if new, member of the team.

Forces

♦ Students are well capable of real work

♦ Overly protracted or particularly difficult projects are filtered out, so that students don't become frustrated by slow or no progress.

♦ Needs of the hosting organisation are to be met (in learning contract)

♦ Needs of course are also to be met (requirement to complete a "proper" project, as defined in the learning contract)

♦ Students are usually reluctant to challenge the boss's work allocation

♦ Organisations are overly protective of their own resources.

Solution

Brief the Industrial Supervisor on the capabilities of the student(s), appraise them of the students' past successes. Inform the organisation of the support mechanisms available at the Polytechnic; the students are almost graduates and are willing and motivated to perform a professional job.

10.   PATTERN 3 - CARRIED AWAY

Problem

Student gets carried away with the project, (the fun stuff), and doesn't pay attention to the all-important administration (the chores).

Context

It is interesting, absorbing project. Some students are ill-disciplined. Busy, pre-occupied or inadequately trained or inexperienced supervisors are offering low levels of supervision.

Forces

♦ Some projects are time consuming, totally absorbing and inherently interesting.

♦ Project payoff (e.g., working programs) is immediate.

♦ Some of the course management tasks have no immediate payoff to the student

♦ Students don't immediately see the point in course management tasks, so they leave them until the end, where they may not get done.

Solution

Emphasise the full contents of the marking scheme and that the final grading will suffer by this approach. Incorporate significant assessment tools that focus on course management.

11.   PATTERN 4 - FAIR ASSESSMENT

Problem

How do we assess projects that are quite different in nature yet generate a grade of equal course currency.

Context

Grading dissimilar projects in a fair and consistent way is a recurring thorn in the assessors' side. It occupies a good deal of the concern of students who perceive they are in competition with other course members. Students hear of significant apparent differences in expected output between projects. They tend to accept this as unavoidable but expect that their effort is somehow reflected in their grade. There is a requirement to compare projects of widely different nature - for example between a programming and a helpdesk-oriented project.

Forces

♦ Some projects are relatively easy to scope and furnish with easily measured outcomes while others have relatively fuzzy outcomes that are not easily measured and are difficult to scope.

♦ Projects are assessed, in part, on the completion of outcomes. Different projects frequently have unique outcomes. (Projects include programming, network analysis, technical writing, helpdesk all exhibiting a wide variety of challenges, skills required, outcomes.)

♦ Even when these difficulties are resolved, the projects can take a significant change of direction midway through. (See moving goalposts pattern)

♦ You want to assign a grade that fairly reflects the effort and achievement invested in the project.

Solution

Include a flexible weighting scheme to enable students to compose a weighting profile to suit their project. Employ criterion-referenced assessment that will allow all students to obtain the highest grade. The assessing should be shared by several people who contribute to the marking. Some assessors should be present for a large number of assessment to provide continuity.

12.   PATTERN 5 - MOVING GOALPOSTS

Problem

The project fundamentally changes direction or the objectives are replaced with new ones or are added to, at least once. The student has focussed their attention on achieving one objective but has to change their approach and having time constraints, becomes stressed.

Context

A student is overawed or desperate to please their boss The industrial supervisor must make changes due to market forces outside their control. Academic supervisor

maintaining only tenuous links with their industrial counterpart. Generally, no extra work is required, just different work.

Forces

♦ Dynamic nature of the computing industry implies changes will be unavoidable from time-to-time.

♦ Industry payoff for a rapid change (e.g., working programs) is immediate - hence tempting to industry.

♦ Pleasing the boss is viewed as important for student to get a job or good reference.

♦ Student unable to enforce the contract signed off at the start of the project.

Solution

Install course correction mechanisms that can re-scope the project to suit the new outcomes. Turn the enforced change to the student's advantage by offering the opportunity to tackle a new problem and demonstrate their ability in this new way. Use a marking scheme that rewards this kind of initiative. Reassure student that changes in project direction will not adversely affect their final grade.

13. SUMMARY

The patterns identified above show promise in terms of their ability to deliver ready-made solutions to commonly occurring problems. It is planned to write more and so develop a cooperative education language of patterns that will address a wide, if not altogether exhaustive range of problems associated with cooperative education.

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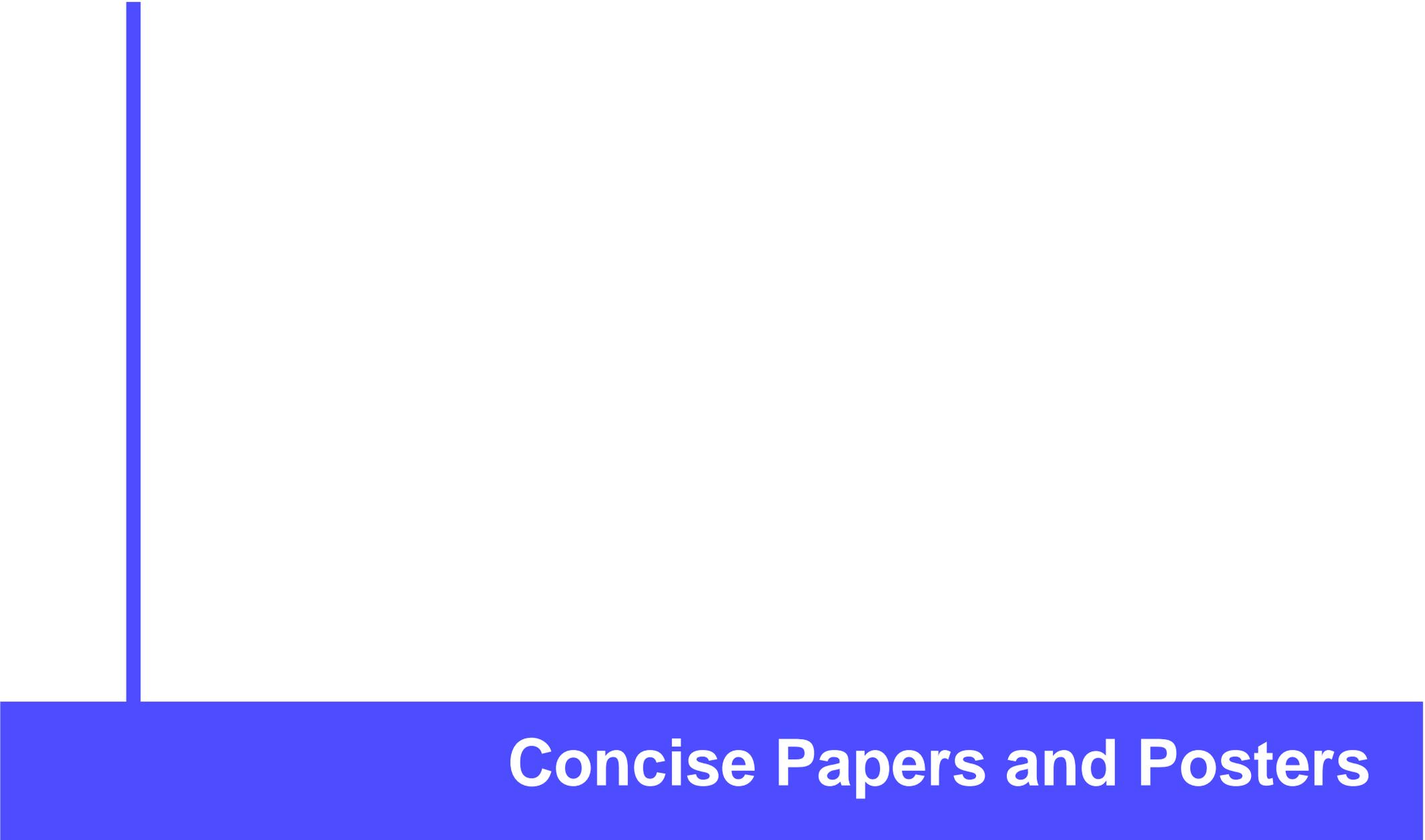
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