

Serving up server side programming

Trevor Nesbit

Richard Raizis

Christchurch Polytechnic
Institute of Technology
Christchurch, NZ
nesbitt@cpit.ac.nz

This paper explores what content should be focussed on in the teaching of a level 7 server side programming course (covering PHP) that is part of the Bachelor of Information and Communication Technologies (BICT) and the Graduate Diploma in eCommerce (Grad Dip eCommerce) at Christchurch Polytechnic Institute of Technology (CPIT).

Opinions were sought from members of a variety of PHP user groups about the importance of various topics that could be included in such a course. The project reports of students from both BICT and Grad Dip eCommerce who had completed their major projects using PHP were analysed, to determine which content in the course was the most useful for their projects.

The outcome of the research includes some recommendations for increased coverage of some topics in the course under review, and the possibility of changing one of the other courses in the Grad Dip eCommerce from being strongly recommended to being compulsory.

The findings of this research will be of use to CPIT and other institutions that are already teaching or are contemplating teaching web-programming courses using PHP at this level.

1. INTRODUCTION

In 2001 CPIT began offering a Grad Dip eCommerce as described in Nesbit (2003a), with one of the more important courses in its Web Programming Specialisation being BCPR342 (Server Side Programming). The main focus of this course is on development using PHP. In 2002 this course became part of the new eCommerce specialisation in the restructured BICT degree.

Nesbit (2003b) explored the relative importance and difficulty of skills needed to complete a major assignment in BCPR342. This paper explores how relevant the content of the course is for industry practitioners, with a view to identifying new content that could or should be included in the course.

The data sources for this paper include:

- A survey of members of a variety of PHP users groups

- Examining the analysis of content of BCPR342 that has been completed by students in the Grad Dip eCommerce and BICT who completed their major projects using PHP

2. METHODOLOGY

A questionnaire to be distributed to members of PHP user groups was constructed, and was made up of two main parts. In the first part the respondents were asked to rate the relative importance of a number of possible topics for the course on a Likert scale from “1” to “5”, with “1” being “Very Important” and “5” being “Not Important At All”. The topics that the respondents were asked to rate are shown in Table 1.

Table 1 – Topics To Rate The Importance Of For Including In The Course

Regular Expressions
Unit Testing
SQL
Database Design
Usability Testing
Object Oriented PHP
Session Variables
Cookies
Associative Arrays
Separating HTML and PHP
ODBC Connectivity

The current content of the course was also analysed as it relates to the topics shown in Table 1. The statements were grouped, based on a set of criteria that was developed. The set of criteria is shown in Table 2.

Table 2 - Criteria Used To Group Statements

Group	Criteria
Very High Importance	At least 90% 1&2 and At least 50% 1
High Importance	At least 75% 1&2 and
Moderate Importance	At least 50% 1&2
Low Importance	Less than 50% 1&2 and At least 50% 1,2 & 3
Very Low Importance	At least 60% 4&5

Table 4 – Current Coverage of Each Topic in BCPR342

Topic	Current Coverage
Regular Expressions	No coverage
Unit Testing	Some coverage
SQL	An essential prerequisite
Database Design	An essential prerequisite
Usability Testing	Covered in other courses
Object Oriented PHP	Some coverage
Session Variables	Good coverage
Cookies	Little coverage
Associative Arrays	Good coverage
Separating HTML and PHP	Little coverage
ODBC Connectivity	Little coverage

Table 3 – Frequency of Responses Rating Relative Importance of Topics

Topic	1	2	3	4	5	Total
Regular Expressions	1	7	4	1	1	14
Unit Testing	4	4	3	3	0	14
SQL	11	3	1	0	0	15
Database Design	9	6	0	0	0	15
Usability Testing	8	6	1	0	0	15
Object Oriented PHP	4	8	3	0	0	15
Session Variables	4	6	3	1	1	15
Cookies	2	4	6	2	1	15
Associative Arrays	4	5	6	0	0	15
Separating HTML and PHP	7	6	1	0	1	15
ODBC Connectivity	0	1	3	4	5	13

In the second part of the questionnaire the respondents were asked to comment on which of the following would be the best 20% special topic for the course:

- Developing and calling web services, for example XMLRPC web services
- Learning an alternative server side scripting language, for example ASP, Cold Fusion etc

3. RESULTS

A summary of responses rating the relative importance of topics is shown in Table 3 (with “1” being “Very Important” and “5” being “Not Important At All”).

Table 4 shows the current coverage of each topic in BCPR342.

The responses to the questions about the content of the special topic in the course are shown in Table 5.

4. ANALYSIS AND DISCUSSION

The statements were classified based on the set of criteria that was developed, with the groupings being shown in Table 6, along with the current level coverage that was shown in Table 4

There are three topics whose classification is “Very High Importance” with these being SQL,

Table 6 – Classification of Topic and Level of Current Coverage

Topic	Classification	Current Coverage
Regular Expressions	Moderate Importance	No coverage
Unit Testing	Moderate Importance	Some coverage
SQL	Very High Importance	An essential prerequisite
Database Design	Very High Importance	An essential prerequisite
Usability Testing	Very High Importance	Covered in other courses
Object Oriented PHP	High Importance	Some coverage
Session Variables	Moderate Importance	Good coverage
Cookies	Low Importance	Little coverage
Associative Arrays	Moderate Importance	Good coverage
Separating HTML and PHP	High Importance	Little coverage
ODBC Connectivity	Very Low Importance	Little coverage

Table 5 – Frequency of Responses Regarding Special Topic

Topic	Frequency
Web Services including xmlrpc	8
An alternative server side language	4
XML and XLST	1
Client side programming with Javascript	1
ASP is Evil!	1

Database Design and Usability Testing. Of these, SQL and Database Design are both covered in courses that are essential prerequisites of BCPR342. Usability Testing is covered in a compulsory BICT course (BCIS202 – Systems Implementation), with most Grad Dip eCommerce students doing a combined Project Management and Usability Course (BCEB301). The level of important attached to Usability Testing by the respondents suggests that consideration should be given to making BCEB301 a compulsory course for the Grad Dip eCommerce as opposed to it being highly recommended.

It is worth noting that the work of Nesbit (2003b) suggested that the most important skills for a group of students completing a PHP assignment were skills that were needed earlier in the development life cycle. Database Design is the topic that belongs earliest in the development life cycle of the topics being looked at, and with it being classified as of “Very High Importance”, which is what Nesbit (2003b) suggested.

There are two topics whose classification is “High Importance”: Object Oriented PHP and Separating HTML and PHP. Object Oriented PHP is seen as having some coverage, and Separating HTML and PHP is seen as having little coverage in BCPR342. The level of importance attached to both of these topics suggests the level of coverage of both of them should be increased.

There are four topics whose classification is “Moderate Importance”: Regular Expressions, Unit Testing, Session Variables and Associative Arrays. Of these Session Variables and Associative Arrays are seen as having good coverage, Unit Testing is seen as having some coverage and Regular Expressions having no coverage. This suggests that Regular Expressions should be introduced to the course, and that some consideration should be given to increasing the coverage of Unit Testing.

The topic of Cookies has a classification of “Low Importance”. This topic is seen as having little coverage in the course, which on the basis of these responses would appear to be appropriate.

ODBC Connectivity has a classification of. This topic is seen as having little coverage in the course, which on the basis of these responses would also appear to be appropriate.

Based on this analysis of the responses, the topics that could be covered in more depth are:

- Object Oriented PHP
- Separating HTML and PHP
- Regular Expressions

- Unit Testing

It is interesting to note that in semester one of 2004 more emphasis had already been placed on Object Oriented PHP and Unit Testing than in previous semesters.

The project reports of 10 BICT and Grad Dip eCommerce students who had completed their major projects in PHP were selected, and their evaluation of how BCPR342 had helped their project was analysed. The majority of students commented how BCPR342 had prepared them well for their projects, however a number made comments about topics that could included in the course in more detail than they were, with these topics being:

- Object Oriented PHP
- Regular Expressions
- Unit Testing

With these three topics being amongst the four that were identified as topics that could be covered more, it would appear that the experiences of these students are consistent with the responses to the questionnaire.

The responses to the question regarding the special topic showed 8 respondents indicating that xmlrpc web services would be the better option, with 4 respondents indicating that an alternative server side scripting language would be the better option. Interestingly, two other options identified (XML & XLST and server side programming in JavaScript) are both covered in another course (BCPR341 – Client Side Programming). This suggests that the current practice of covering xmlrpc web services as the special topic is possibly the best option., however the sample size if not large enough to make statistically sound generalisations about the entire population of PHP developers.

5.CONCLUSIONS

Through the analysis of the responses to the questionnaire and comparing this with aspects of PHP that the students felt would have enhanced their projects if they had been covered in BCPR342, it is recommended that the following topics be covered in more depth than they were up until the end of 2003:

- Object Oriented PHP
- Separating HTML and PHP

- Regular Expressions

- Unit Testing

To address the very high level of importance that is attached to Usability Testing it is recommended that BCEB301 (covering both Usability Testing and Project Management) be made compulsory for students studying the Grad Dip eCommerce (noting that Usability Testing is covered in BCIS202, which is compulsory for BICT).

Given that the other topics of very high importance or high importance are either covered in essential prerequisites for BCPR342 or are well covered in BCPR342, the changes that have started to be made, and that are recommended in this paper should enable BCPR342 to meet the needs of students as they venture into industry.

REFERENCES

- Nesbit, T.R. (2003a) The Development of a Graduate Diploma in eCommerce @ CPIT. Proceeding of the Sixteenth Annual Conference of the National Advisory Committee on Computing Qualifications, Palmerston North, July 2003.
- Nesbit, T.R. (2003b) 2 Classes, 2 Methodologies, 2 Languages and 1 Assignment. Proceeding of the Sixteenth Annual Conference of the National Advisory Committee on Computing Qualifications, Palmerston North, July 2003.