AN EXPLORATORY EXPERIMENT TO CREATE A NEW MASTERS PROGRAMME THROUGH THE ENGAGEMENT AND PARTICIPATION OF CURRENT PHD RESEARCH SCHOLARS

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ABSTRACT

This paper reports on a small experiment into the involvement of a group of PhD research students in the design of a Masters course in the field of ecological design. A total of 15 participants were involved in 2 groups. A small naive group (4/5) acted as a control and were compared with a larger group (10) of PhD researchers familiar with the field (ecological design) under consideration. The experimental process involved the selection of possible curricular topics from a large prescribed list (100) by the allocation of a limited (200) number of units of investment in blocks of 5, 10, or 20 units. The experimental protocol compared the participants selections as individuals (15), pairs (7) and groups (2) in 3 course designs, only one of which is represented here – MSc Natural Design. The paper presents data on the ranked selection by individuals, pairs and groups and compares rank orders. It highlights the top ranked topics, compares them and briefly discusses their application in a future standard modular course design entitled Natural Design. This is a work in progress.

Keywords: Experiment, masters programme, ecological design, PhD scholars, co-creation

1   INTRODUCTION

The Centre for the Study of Natural Design (CSND) was formed in 2002 by one of us (SB) and two postgraduate (PhD) students. At the moment, (Dec 2009) it has ten postgraduate students at various stages of study for PhDs. In addition, since 2002, six students have graduated with higher degrees – three PhD's and three MPhil's. All of these students, past and present, constitute the Natural Design Group (NDG). Natural Design is a continuously evolving movement [1]. The discipline has developed from the idea of Ecological Design as conceived by Baxter and associates at The Robert Gordon University (RGU) Aberdeen in 1993 (MSc Ecological Design) and is similar to that propounded by David Orr [2] and others in the USA. Its underlying philosophy is 'deep sustainability' [3]. Since 2002, the NDG has accrued a wealth of original research in this area (Natural Design) and this continues to evolve. We were particularly interested, in the light of an earlier speculative paper of ours [4] on the explicit or implicit recognition of material resource issues in engineering and product design that might emerge from the selection of topics. We believe that it is now time to embed this research in a new taught Masters degree. Furthermore, we have found that all research students at CSND have, to a greater or lesser extent, been involved in some common learning through readings and conversations. This common learning substrate, together with the participation of active research scholars, would form a unique convivium for this course. NDG has recently instigated several explorations into the development of such a Masters programme and this paper describes one such experiment.

2   METHOD

This small experiment was conducted in November 2009 during a research away-day at one of the centres operated by Scottish Outdoor Education Centres (SOEC), a research collaborator with CSND at The University of Dundee. The purpose of the experiment, to design an MSc course, was briefly explained to the participants. There were 15 participants although one left early in the experiment. The

participants were divided into two groups. A small group (4/5) of staff from SOEC acted as a naive control group. The experimental group consisted of 10 researchers from the NDG. In the experimental process, the participants selected a limited amount of topics from a prescribed list containing 100 words or expressions drawn from three clear sources [5] and suitably randomised into two columns of 50 terms. No attempt was made, in the selection of the original 100 expressions, to remove any possible overlap of an interpretation of their contents. Participants were free to make their own interpretations. The experiment was conducted in three rounds. The first round treated all participants as individuals (15). The second round consisted of seven self-selected pairs (7) from the original cohort of individuals and in the final round all participants were divided into two groups (2). In this way, the selection of terms progressed from the individual selection of topics to selections by agreement, - first in pairs then in groups. In each round, individuals, pairs or groups invested 200 units (UI's) in blocks of 5, 10 and 20 units in the selection of topics. They did so 3 times in 3 course designs, two of which were given titles i.e. MSc in Natural Design and MSc in Sustainable Futures. In the third case, they created their own titles to match their choice of topics. This paper, however, only deals with the first named course - Natural Design, the remaining data being dealt with in later papers. In addition to the list of preselected terms, and from the beginning of the experiment, participants were encouraged to add new terms/expressions to the original list. These terms and expressions were displayed publically on a flip chart for use by any participant in the selection process.

3 RESULTS

3.1 Natural Design – Individuals (15)

During this part of the experiment, 19 of the original 100 terms/expressions were not selected and 17 new expressions were added. When all 15 participants are included, 93 topics were selected. The SOEC group (5) on its own, selected 51 topics and the NDG (10) selected 84. In the SOEC group only 2 out of 5 participants selected the same topic and the total allocation of Units of Investment (UI's) in topics ranged from 40 to 5. The maximum available UI's for this group was 1000 (5 x 200) although not all were used. In the NDG only 5 out of 10 participants ever selected the same topic and the total allocation of UI's to topics ranged from 105 to 5. The maximum available UI's for this group was 2000 (10 x 200).

The decision to use an allocation of 200 UI's was based on its proximity to the standard of 180 credits for a Masters course at The University of Dundee without making it obvious to the participants. They were not informed of this until after the experiment. To convert UI's to credits for a whole course the multiplier is 0.9 (180 divided by 200) or, in our case, where the topics would be used to build 6 modules of 20 credits each (120 credits), forming the "taught" part of the course, the multiplier is 0.6 (120 divided by 200) i.e. 30 UI's = 18 credits. Due to the short nature of this paper the following histograms do not display the full range of topics selected. In long lists, we have drawn the lower limit at 30 UI's (approximately 20 credits = 1 module). In shorter lists, we have included all topics. In addition, because the final design of the MSc course would contain 6 modules, we have emphasised the first 6 choices in the descending rank order of selections.

All our data is displayed in descending rank order either as UI's, number of participants selecting a topic or average allocation of UI's (i.e. total UI's per topic divided by number of selectors). Generally, the rank order of the number of participants, or average UI's is similar to the rank order of total UI's. We have therefore concentrated on total UI's per topic in this discussion.

Figures 1, 2 and 3 display the histograms in UI's for the ranked selections made by individuals in total (15) and also by sub groups i.e. SOEC (5) and NDG (10). Regarding the top 6 ranked topics, two topics – Principles of Ecology and Sustainability/Resilience were both selected by SOEC and NDG groups. 5 of these topics selected by either SOEC or NDG also remained in the top 6 of the combined total (SOEC+NDG). Figure 4 compares the rank order of topics selected by the SOEC and NDG groups thereby avoiding the inevitable disparity between available UI's as a result of group size.
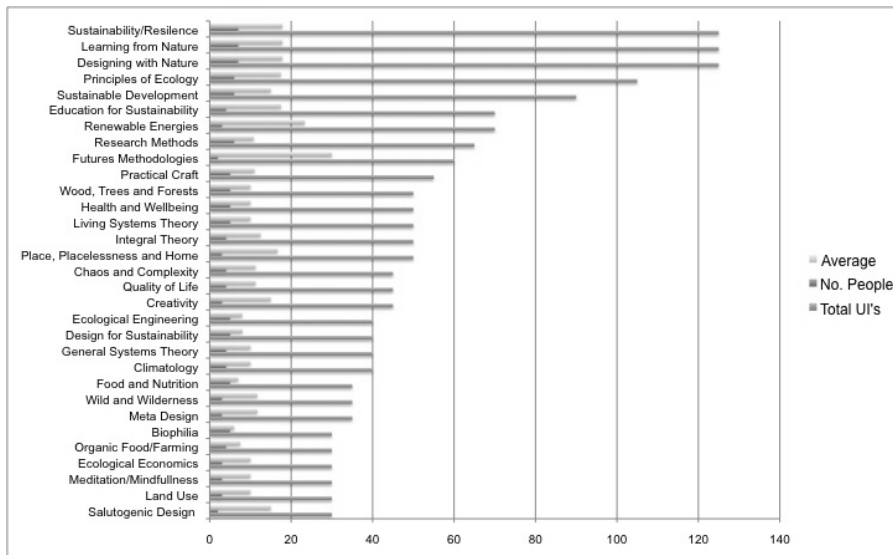
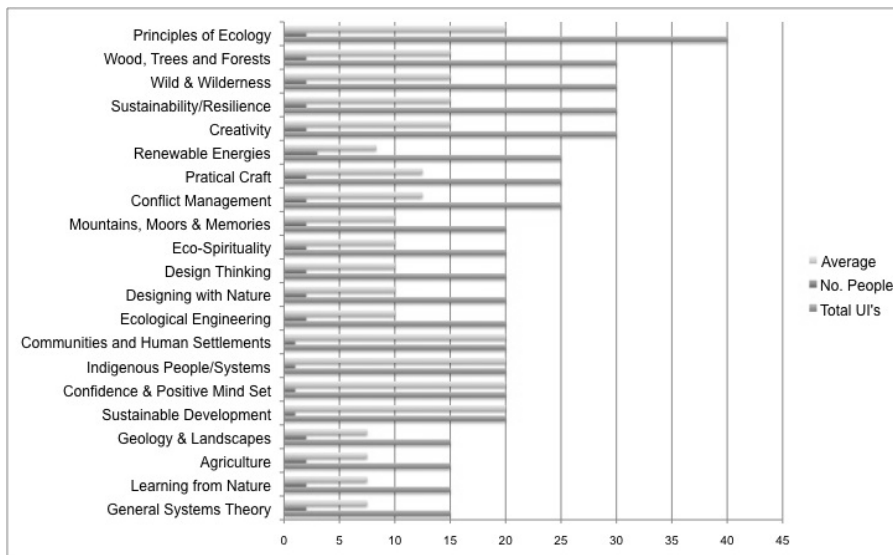*Figure 1. Rank order of selections for all participants (Individuals; SOEC+NDG - 15)*

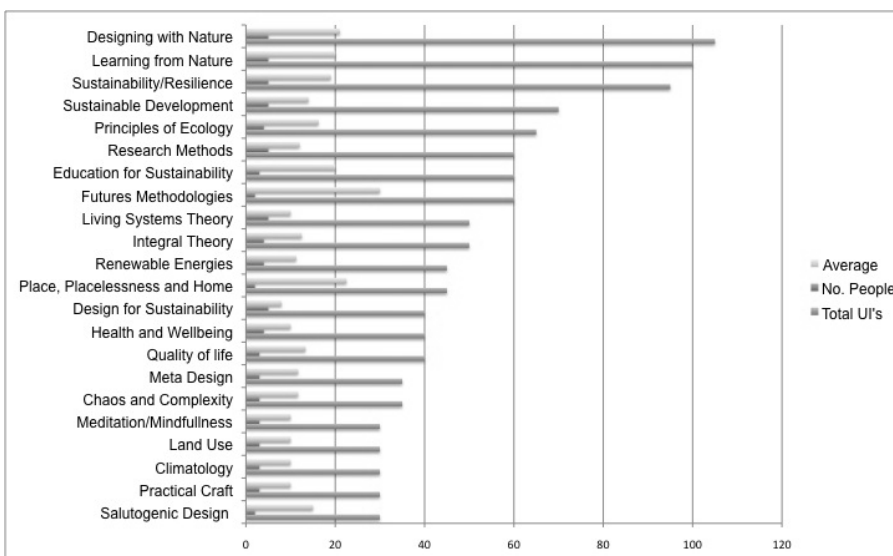*Figure 2. Rank order of selections for SOEC Group (Individuals - 5)*

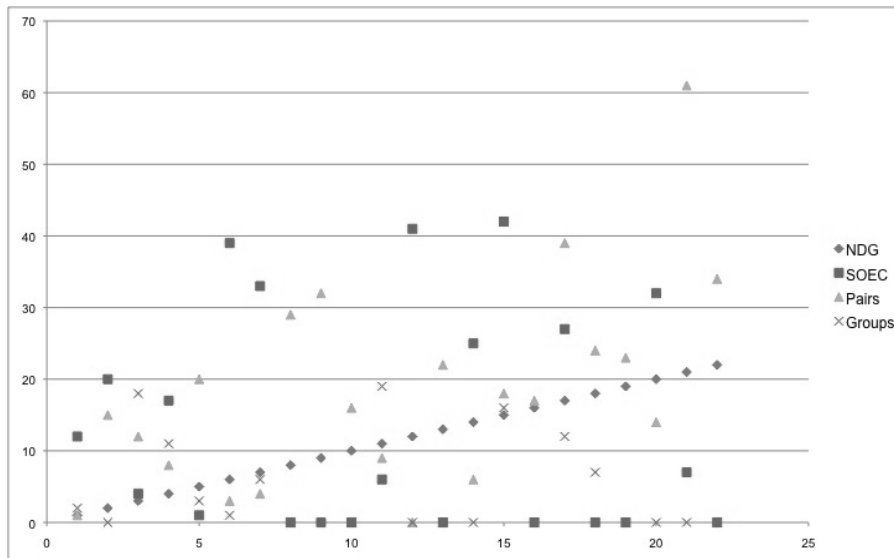*Figure 3. Rank order of selections for NDG (Individuals - 10)*

Figure 4. Comparisons of rank order of topics selected by the SOEC and NDG groups

(Note: Horizontal Axis = Rank order of NDG topics 1-22; Vertical Axis = Rank order of NDG topics by SOEC, pairs and groups; Zero (0) values along the horizontal axis indicate that this topic was not ranked by SOEC, pairs or groups)

3.2 Natural Design – Pairs (7)

When the participants formed into 7 pairs, the total number of topics selected was reduced to 73 out of a possible selection of 117 topics (100 original plus 17 new). 5 out of the 7 pairs selected one common topic - Designing with Nature - and the range of UI's in individual topics ranged from 80 to 5. A total of 1400 (7 x 200) UI's was available for allocation in this part of the experiment. Figure 5 displays the descending rank order in UI's for the selection of topics by pairs. The first 22 topics are displayed to match the number selected from individuals but this now means that the last ranking occurs at 20 UI's (12 credits) rather than 30 UI's. Two of the top ranked six topics - Designing with Nature and Research Methods are also found in the top six of the individual selections. Figure 4 also compares the rank order of topics chosen by individuals in the NDG with the rank order from the selection by pairs.
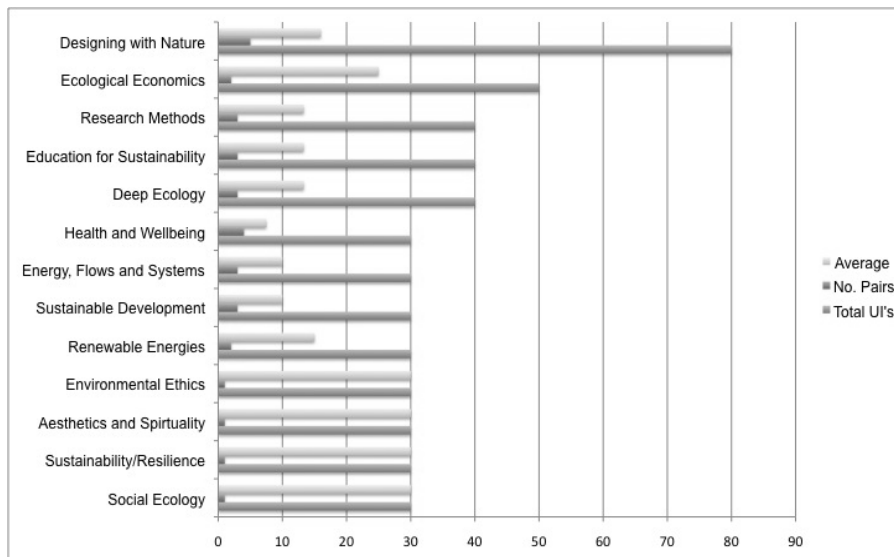

Figure 5. Rank order of selections for pairs (7)

3.3 Natural Design – Groups (2)

In the group exercise, only 20 topics were selected, a reduction from a potential list of 117 and compared to 93 for all individuals and 73 for pairs. Both groups independently selected three common topics - Designing with Nature, Research Methods and Principles of Ecology. Only 400 UI's (200 x 2) were available in this exercise and the choice of investment in the 20 topics ranged from 40 to 10 UI's.

Figure 6 displays the descending rank order histogram in UI's for the group selection of topics. All the 20 selected topics are shown and the last ranked topic is now worth 10 UI's (6 credits). Figure 4 also compares the rank order of topics chosen by the groups (2) with the rank order chosen by the individuals in the NDG group (10). Table 1 shows the top ranked 6 topics for individuals (SOEC, NDG, and combined), pairs and groups.
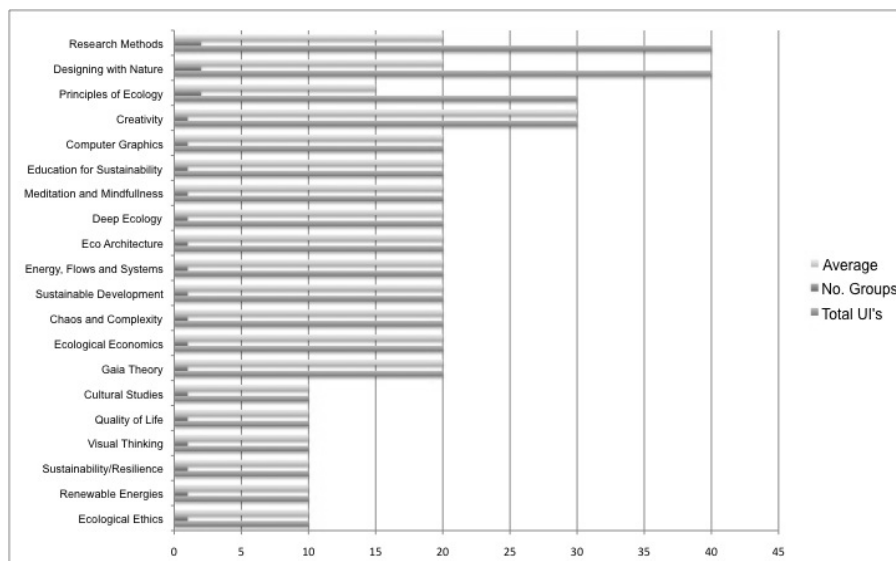

Figure 6. Rank order of selections for groups (2)

Table 1. Top Ranked Topics (in descending order) by Individuals, Pairs and Groups

Individuals			Other	
SOEC (5) 1*	*NDG (10)* 2*	**Combined (15)** 3*	**Pairs (7)** 4*	**Groups (2)** 5*
Principles of Ecology	Designing with Nature	Sustainability & Resilience	Designing with Nature	Research Methods
Wood, Trees & Forests	Learning with Nature	Learning with Nature	Ecological Economics	Designing with Nature
Wild & Wilderness	Sustainability & Resilience	Designing with Nature	Research Methods	Principles of Ecology
Sustainability & Resilience	Sustainable Development	Principles of Ecology	Education for Sustainability	Creativity
Creativity	Principles of Ecology	Sustainable Development	Deep Ecology	Computer Graphics
Renewable Energy	Research Methods	Education for Sustainability	Health & Wellbeing	Education for Sustainability

1* 2 other topics were ranked 6th equal (25 UI's) with Renewable Energy i.e. Conflict Management and Practical Craft.

2* 2 other topics were ranked 6th equal (60 UI's) with Research Methods i.e. Education for Sustainability and Futures Methodologies.

3* 1 other topic was ranked 6th equal (70 UI's) with Education for Sustainability i.e. Renewable Energies.

4* 7 other topics were ranked 6th equal (30 UI's) with Health & Wellbeing i.e. Energy, Flows and Systems; Sustainable Development; Renewable Energies; Environmental Ethics; Aesthetics & Spirituality; Sustainability/Resilience; and Social Ecology.

5* 8 other topics were ranked 5th equal (20 UI's) with Computer Graphics i.e. Meditation and Mindfulness; Deep Ecology; Eco-Architecture; Energy, Flows and Systems; Sustainable Development; Chaos and Complexity; Ecological Economics; and Gaia Theory.

4   DISCUSSION

The basic structure of a modular, credit based Masters course at The University of Dundee is 6 equal modules each of 20 credits associated with a further 60 additional credits for dissertation, reports and so on (180 credits in total). If we assume that the NDG (10) are likely to be the most knowledgeable of the groups in the experiment because of their years of research work in an area called "Natural

Design" then, after adjusting UI's to credits, the credit weighting of the top six ranked topics can be compared to the basic course structure. In this simple way, the relative weighting of the top six ranked topics is compared with the equal weightings of the standard modular courses, thereby suggesting that in standard course design, although all modules receive equal credits, some are more significant than others. If however, we assume that agreement and consensus through working in pairs and groups is likely to arrive at a more balanced selection, then the topics would be as listed in the appropriate columns of Table 1. Even if this latter strategy is adopted, 4 topics appear to be of great importance to a possible course called MSc Natural Design and these are - Designing with Nature, Research Methods, Principles of Ecology and Education for Sustainability. Other data from this experiment, to be published in later papers will suggest how the same topic selections were influenced by changing the title of the course to MSc Sustainable Futures or indeed allowing participants to select a title based on their accumulated selection of topics. Individuals, for example, suggested 14 alternative course titles including: Visual Ecology, Sustainable Conversations, Life Explorations, Planetary Ethics. Pairs selected 5 out of these 14 alternative titles and groups reduced this to the use of 2 of these alternative 14 titles. The SOEC group suggested three alternative titles - Global Community Life Studies, Planetary Ethics and Outdoor Learning.

Many of the topics in the original list of 100 were the result of a deconstruction from either composite modules or chapters in two of the original sources. So, although this paper has focused on the top six ranked subjects it would be wrong to assume that other topics, lower ranked and perhaps some aspects of all topics could not be embraced in the reconstruction of new titled modules. We are already exploring which topics can be readily clustered together to form the curricula of the six modules and the additional 60 credits of dissertations. By doing so, we can also compare these latest suggestions from this experiment with the original MSc Ecological Design course launched in 1992/93 at RGU, noting any differences and seeking explanations perhaps of an evolutionary character that are now topical. As individuals progressed through pairs then groups their original choice of topics was subject to negotiation, agreement and consensus. Although such negotiations often led to the final choice of term being one which had already been selected by an individual, this was not necessarily so. For example, in seeking agreement on a single term, pairs or groups might decide to select an alternative term from the original list which now appeared to better express their combined interpretations. Additionally of course, as individuals progressed through the experiment, learning was enhanced and minds were changed. The most significant difference, and one which might be expected between the choice of the SOEC and NDG groups is the ratio of practical to theoretical interpretations of the topics. SOEC tending towards the more practical, consistent with their jobs. The name of the topics selected also reflects these different positions. For example, the SOEC participants who are always working outdoors, readily selected topics like Wood, Trees and Forests. The more academic NDG group tended to dabble in intriguing topics like Salutogenic Design. This small experiment together with other parts not yet published has produced much useful, rich data and we are now in a position to develop the study further by enlarging the sample size and exploring the composition of other control and experimental groups.

ACKNOWLEDGMENTS

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[3]   Foster, J. *The Sustainability Mirage.* (Earthscan, London, 2008, 69-111).
[4]   Baxter, S-H. and Bruce, F-S. *Steps to an Ecology of Product Innovation.* In Clarke, A., Evatt, M., Hogarth, P., Lloveras, J. and Pons, L., eds. *New Perspectives in Design Education*, pp. 353-358 (Artyplan Global Printers Ltd, Barcelona, 2008).
[5]   The three sources for the selection of the 100 terms were: (1) The curricula of the original RGU MSc Ecological Design; (2) The PhD Thesis of Dr. Daniel Wahl, a former scholar at NDG; and (3) a small section of new terms featured in conversations at CSND in the last year or so.