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Citation: STEIN, G., 1995. Improving practice in initial teacher education: assessing student perceptions of their design and technology capability. IDATER 1995 Conference, Loughborough: Loughborough University

Additional Information:

- This is a conference paper.

Metadata Record: https://dspace.lboro.ac.uk/2134/1527

Publisher: © Loughborough University

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Improving practice in initial teacher education: assessing student perceptions of their design and technology capability

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Abstract

Students registered for the BA (QTS) Primary Programme at Roehampton Institute London, are required to undertake a six week foundation module in Design and Technology in the National Curriculum [DFE, 1995]. The students enter the module with a variety of different experiences. For many students this is the only opportunity they will be given to develop their knowledge, skills and understanding of design and technology within the modular Initial Teacher Education (ITE) programme.

This short-term cohort study involved 98 undergraduate students. The students were required to grade their pre- and post-module perceptions of their design and technology capability [Stephenson and Weil, 1992]. Throughout the period of study, the student's perception of their personal academic growth was matched against clearly defined course criteria.

This paper raises issues connected with the possible relevance of quantifying students' perceptions of their learning to the planning, implementation and evaluation of design and technology, in order to improve practice in ITE [Gibbs, 1992].

Quality is a concept which has been much used in relation to public services for more than a decade. It is neither precise in its formulation nor free of values. It has much to do with the robustness of systems that can assure quality; equally it has much to do with perceptions and measures of 'value-added' in the educational context. In the latter sense the use of performance indicators within Higher Education (HE) is significant, since these have to do with the relationship between entry characteristics and exit status of students [Ashworth and Harvey, 1994]. Whilst formal assessment arrangements provide data to inform the institutional performance measures, relatively little use is made of students' own perceptions of their personal academic growth against clearly expressed course criteria. By this is meant, that in much HE, the students' own perceptions of the extent to which they have demonstrated the intended learning outcomes have relatively little impact upon ways of deriving assessment data : ironically throughout the state school system, a persuasive rhetoric operates which seeks to engage children in the evaluation of their work.

Aim

This paper is concerned to raise issues connected with the possible relevance of students' perceptions of their learning to the planning, implementation and evaluation of design and technology.

Background

Students registered for the BA (QTS) Primary Programme at Roehampton Institute London, are required to undertake a six week foundation module in Design and Technology in the National Curriculum [DFE, 1995]. The module is offered in Year 2 of the four year programme. It consists of 18 hours of contact time, and 32 hours of directed time. The contact time is arranged into six consecutive weeks of three hourly sessions. During the directed time, students are required to undertake a 'design and make' assignment.

The students enter the foundation module with a variety of different experiences. Some students have been directly involved in a specific field of design, and previously earned their living by design; other students have had...
very limited experiences of design and technology activity generally. Also, the student’s individual programme of study is controlled through a complex time tabling process, which does not juxtapose relevant experiences.

For many students this is the only opportunity they will be given to develop their knowledge, skills and understanding of design and technology within the modular Initial Teacher Education (ITE) programme. They will of course have opportunities to try out newly acquired skills during their school experience.

Quantifying student perceptions
This short-term cohort study involved 98 undergraduate students. The students were organised into five study groups. There were approximately 18 - 20 students in each group.

In week one, of the six week module, the students were formally introduced to Design and Technology in the National Curriculum [DFE, 1995]. They were given the opportunity to discuss their previous experiences of design and technology in relation to the intended learning outcomes of the module.

The students were also given:
• a module booklet [Stein, 1994];
• a catalogue of the materials, tools and equipment;
• the opportunity to examine the materials, tools and equipment;
• an introductory talk from the technician concerning procedures for accessing the resources in the Design and Technology Centre;
• the opportunity to examine books and journals.

During the formal introduction, it became apparent to the students that they had diverse experiences and identifiable needs. A pre-module perception profile was distributed (Fig 1). The students were asked to grade their perceptions of their current capability (Fig 2) on the profile.

Materials, tools and equipment

<table>
<thead>
<tr>
<th>paper</th>
<th>reclaimed materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>textiles</td>
<td>food</td>
</tr>
<tr>
<td>construction kits</td>
<td>mechanisms</td>
</tr>
<tr>
<td>control</td>
<td>structures</td>
</tr>
</tbody>
</table>

Issues in design and technology.

<table>
<thead>
<tr>
<th>health and safety</th>
<th>starting points for D &amp; T</th>
</tr>
</thead>
<tbody>
<tr>
<td>managing resources</td>
<td>D &amp; T in the nursery</td>
</tr>
<tr>
<td>special educational needs</td>
<td>equal opportunities</td>
</tr>
<tr>
<td>assessment and record keeping</td>
<td></td>
</tr>
</tbody>
</table>

The students retained their pre-module profile to inform their planning during the module. The completed profiles were copied, and the student perception grades were immediately transferred into a spreadsheet. The pre-module perception grades were used to create a picture of the individual (Fig 3) and collective needs (Fig 4), of the students.

<table>
<thead>
<tr>
<th>5: very confident</th>
<th>4: confident</th>
<th>3: adequate</th>
<th>2: lacking confidence</th>
<th>1: poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>expert knowledge</td>
<td>thorough knowledge</td>
<td>adequate knowledge</td>
<td>limited knowledge</td>
<td>little/no knowledge</td>
</tr>
<tr>
<td>extensive experience</td>
<td>varied experience</td>
<td>adequate experience</td>
<td>limited experience</td>
<td>little/no experience</td>
</tr>
</tbody>
</table>

Fig 1: Pre-module perception profile

Fig 2: Perception grades and performance indicators
Fig 3: An individual pre-module perception profile

Fig 4: The total of all students pre-module perceptions
The students used their pre-module profile to construct their individual programme of study. Throughout the module, the students worked in teams, in pairs, and individually to address their perceived needs in relation to the intended learning outcomes of the module. The management and organisation differed from group to group, as the students adopted different management of learning strategies.

Generally, the students worked individually, or in small groups on their chosen practical tasks. The outcomes from the practical activities varied greatly, as students worked with different materials, tools and equipment. The students used their time effectively to address the needs they had specifically identified in their pre-module profile. Students who had elected to work with some resources and not others, were able to observe the progress of other students designing and making products. All of the artefacts remained in the design and technology centre, and therefore the different study groups benefited from seeing what other groups of students had produced.

Most student groups elected to work in pairs on a paper relating to an issue in design and technology. However, this was also a team effort, as the students wanted to ensure that they had gained knowledge and information relating to all of the named areas described in Fig 1. To meet this demand, the students produced papers for dissemination and distribution to other students in their group. Also, the papers were copied and collated into study packs for use by students in different study groups. The study packs remained in the design and technology centre.

Throughout the module, student motivation was high. The students arrived early for the contact sessions, and although they had the freedom to study elsewhere, if necessary, they generally remained in the design and technology centre. Many of the students asked if they could take resources from the centre, in order that they could continue their work at home.

During this period, informal discussions took place with the students. Some students indicated that they had never before been given the opportunity to manage and organise their own programme of study; some students said they preferred to be told exactly what to do in a module. They explained that they preferred being told what to do, as it was easier; they did not have to think for themselves.

Although some of the students initially found self-directed study perplexing, by the end of week three, the majority of students indicated that they welcomed the freedom they had been given. Also, the less confident students expressed a view that the structure of the module had enabled them to talk informally about their personal interests and concerns.

Throughout the module, all of the students were required to keep a log of the activities they were undertaking, in order that their progress, in relation to the intended learning outcomes of the module, could be continually monitored by the students and their tutor.

During week six, a post-module perception profile containing the same areas as the pre-module perception profile (Fig 1), was distributed for completion by the students. The students were asked to grade their perceptions of their capability. The post-module perception grades were entered into a spreadsheet, to give an indication of the individual (Fig 5), and collective (Fig 6) pre- and post-module perceptions of the students.

The pre-and post-module perception grades indicated that the individual and collective perceptions of the student groups had changed during their programme of study. In most cases, and in all areas (Fig 1), the student perceptions of their capability was rated higher from when they entered the module.

The entry characteristics of the individual students differer greatly, and a wealth evidence exists to show that the exit status of the students, in terms of the intended learning outcomes, had been met. However, it was clear from talking with the students during the module, that they perceived the experience to be valuable in several different ways.
Fig 5: An individual pre- and post-module perception profile

Fig 6: Total of all students pre- and post-module perceptions
This was confirmed during the final session. The students were required to complete an anonymous module evaluation form. The students commented that they particularly like:

- the atmosphere in the design and technology centre. It was relaxed and informed in a very positive way.
- being able to try out the materials I wanted to use.
- the free-time; as the amount you put in equals the amount you get out. I put in more time.
- easy access to a range of materials.
- being able to develop my own ideas and time to gain confidence in my work.
- the booklets we designed - they will be useful in school.
- being able to work with different people.
- the open atmosphere.
- experimenting with different materials.
- the freedom to learn.
- being given a choice of how, when and where to learn.

Although student perceptions are recognised as playing an important role in informing Institutional performance measures, generally this tends to involve collecting information after modules have been taken. The method used for quantifying student perception described in this study, made it possible for the information to be systematically organised to:

- inform immediate practice;
- determine the programme of study for individual students;
- design a programme of study to meet the needs of specific groups of students;
- identify specific areas of concern across student groups;
- inform immediate and long-term planning;
- make effective use of the resources;
- create an information profile for internal and external assessment purposes;
- maximise the use of student time;
- make efficient use of tutor time;
- make effective use of technical support;

Adopting suitable strategies that actively encourage students to participate in the planning, implementation and evaluation of design and technology is vital at a time when HE Institutions are being subjected to close inspection. It is essential that Institutions recognise that student perceptions can make a significant contribution to improving practice in Initial Teacher Education.

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