Improving Teacher Education in Nigeria

A Festschrift of Professor A. I. Joe

Edited by

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CHAPTER

3

Improving the Attitudes of Teacher Trainees in Practical Computer Studies

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Introduction

This chapter describes the attitudes of teacher trainees in practical computer studies, and discusses the ways of improving the attitudes for a better teacher/trainee relationship to enhance learning in a computer-based learning and assessment. The results give an invaluable insight into real trends in some key areas, which may prove useful for future module planning.

Poor Trainee Background in Computer Science Practicals

A sample survey of Information Science (IS) students in 1991 revealed that 22% of the intake had no keyboarding experience at all and that experience with databases and spreadsheets was low (Stephens & Rowland, 1993). A decade later there appears to be a particular expectation among both Information Science and Computing Science staff regarding the level of IT experience of each new undergraduate intake. It is assumed by many that each year will see an increase in the student level of experience and confidence with computers and knowledge of software packages for word-processing, spreadsheets and databases. According to a more recent study, (McMahon, *et al*, 1999) students, once at university, expressed disappointment that Teachers and support staff felt they had sufficient information to make a good attempt at 'teaching themselves'. Indeed, it was found

that only half of the sampled undergraduate students entering university from 1994-1997 had previously received computer training at school. In fact, home use played a significant part in providing their IT experience. The survey concluded that university staff felt that sufficient initial IT training was available whereas students did not agree. This raises the issue of computer access in households without computers, especially given the government's expressed policy of widening access to higher education from all sections of society.

The implications for mature students who obviously are less likely to have received IT training in school also need to be addressed. Although IT skills are often given as one of the key outcomes of university education it is apparent that higher education must take into account what students initially bring to the training institution. In addition, issues need to be raised regarding IT support whenever teachers modify existing programmes or design new ones that do not include an introductory IT element.

Academic staff and central support services have often surveyed first year undergraduates regarding their perceived level of IT experience. This is usually to ascertain whether there are implications for trainee support, the teaching of IT specific modules or modules with a high level of IT in them. Trainers often use trainee perceptions of their own knowledge and ability to 'stream' them into appropriate groups. A review of the relevant literature reveals that several issues have been raised over the years regarding trainees and computer studies. These include prior experience, attitudes toward computers, computer anxiety and trainee confidence.

In a cross cultural study of 3,000 students in 23 countries anxiety was identified as an inhibitor to students' use of computers (Weil & Rosen, 1995). Good experiences with IT can have a lasting effect on students over time. Moon (1994) concluded that word-processing experience contributed to higher confidence levels and more positive attitudes to computers and these were culture-free constructs. Other research have indicated that home experience with IT was associated with a greater liking for computers among females, greater confidence among males and less anxiety for both sexes (Colley, *et al*, 1994). In particular, gender had been identified as a veiy important consideration, as males and females have different views and approaches to computers (Koohang, 1989). This aspect may have an increasing importance as higher education moves toward an increasingly on-line learning environment, in information science education for example (Main, 1998). Indeed, it has been suggested that females could be disadvantaged both in higher education and in employment.

Todman (2000) has suggested that since only 16% of students on computer science degrees are female that this will act as an employability factor inhibiting female job prospect, inspite of the fact that, until GCSE level, females do, at least, as well as males in computer studies. Todman's study indicates that females were experiencing much greater computer anxiety than males, over a period from 1992 to 1998.

In order to identify the extent of student prior IT experience and their attitude toward computers studies, a longitudinal study was conducted on a research by Temple & Lips (1989). Their results had indicated key differences regarding student attitudes toward computer studies, computers and self-confidence between school leavers and mature students for example. This was done by distributing questionnaires at the start of each academic year to new trainees on induction day and the data obtained properly analysed. The two methods used in this investigation are briefly highlighted below.

i. Questionnaires

- Rapidly capture the opinions of a large group of people.
- Information travels in one direction only.
- Difficult to 'cross-examine' and to resolve 'conflicting messages'.
- Easier to quantify and treat statistically.

ii. Interviews

- Can only sample a relatively small sample compared with questionnaires, as it takes longer to obtain the responses.
- However, it is possible to cross-examine, to enter a dialogue and try to resolve contradictions and to allow people to structure their own responses.
- The results are harder to quantify and treat statistically.
- Far more fluid and the questions can evolve during the study.

Overall the decision to find out student attitudes by interview was won over by the opportunity to study in depth and try to probe the learning culture of some students and to somehow engage with their learning processes.

General Outcome of the Analysis

A worrying trend is the increasingly negative attitude toward science by schoolleavers. One impression when talking to trainees is that there appears to be many contradictions in their statements. This is not a comment on their thinking processes but on the complexity of the learning system. For example, an often-heard statement is that "reading from a computer screen hurts my eyes"; "there are too many trainees per computer"; "the computers are not working"; "computers are difficult to work with" ... and the likes.

General Impediments on the Trainees' Attitude

- poor computer skills and background even among science students, there are many that say they 'hate computers';
- fear of computers;
- lecture halls are often too crowded with too many trainees at a time;
- "scared of doing things on the internet"; sometimes pressing a link takes them somewhere they don't want to go; the idea of sending something off and it just disappears;
- "logging in can be tricky". There are problems with logging on: they have wrong username/password, can't remember their details, type it in incorrectly. Any slight hurdle can cause them to become frustrated and give up. These include the following:
  - "annoying when modules don't have material";
  - "hate it when lecture materials are not available or too expensive";
  - impression that lecturers are not bothered about trainees' predicaments;
  - long wait for computers to perform assignments in laboratories;
  - often, there are not many functional computers in the laboratories;
  - laboratory manpower is grossly inadequate compared to number of trainees;
  - there is less contact time during lectures and practicals;
  - fewer practical lectures per semester;
  - more students in lecture venues than available seats;
  - more students with a wider range of abilities;
  - trainees have a large number of hours self-directed study; and
  - many students have poor time management abilities.

Proposed Remedy

From years of valuable experiences in guiding students to set up and run practical sessions, the following have been observed:

1. Exposure to frequent practical demonstrations allowed students to have a hands-on experience of setting up fairly complex equipment. It has freed up time for demonstrators to concentrate on troubleshooting and maintenances rather than covering the basic concepts. The tutorials have also provided background information on a need to know the basis. This can therefore be re-enforced to develop positive attitude in the trainees.
2. There should be well-presented lecture material by adding depth to coverage. Time has moved on very far from the days in which handouts were produced using Gestener duplicating machines.
3. Web-tutorials have allowed lecture materials to be supported by use of further information, animations, simulation and so on.
4. Allowing students to test their understanding by taking formative interactive tests which are marked automatically and returned instantly, enables many students to be attended to within a time limit. This is perhaps one of the most powerful features. With so many students, it is difficult to give time to all due to availability of materials. With these tests students are able to test their own knowledge and understanding and taught materials.
5. Setting assignments to share work with peers. A recent innovation has been to share marked assignment work among students so they can learn from their peers.
6. Skills available for laboratory staff is somewhat limited. This may be enhanced by in-house training so as to help in laboratory supervision.
7. Trainees need to be told about tutorials, practical assignments and tested from time to time.
8. It is rewarding to set practical-based assignment on what has been treated in theory, make them compulsory and force them to use it.
9. There should be routine or regular testing of in-coming trainees to assess their real computer needs and not rely on possibly false perceptions that all students will have the required level of IT ability.
10. The introduction of specific measures to address possible computer anxiety early in the first year is quite helpful.
11. Increased emphasis on ensuring that the right level of support is available as introductory IT modules become extinct.
12. Attention should be given to the differences exhibited by males and females, especially where the demographics of a department or degree programme are changing substantially.
13. There should be further research into trainees' views on the use of computers to access learning materials and on being assessed using computer assisted assessment.
14. Clearly defined instructional objectives are crucial as research indicates that boys in particular benefit from tightly well focused lessons that have an obvious purpose and that are tied to the achievement of clear goals. In the teaching of concepts, highly structured, scaffolded, and explicit instructional strategies are powerful tools for motivating trainees and encouraging them to respond.
15. It is helpful to deliver highly structured lessons. Most trainees do not cope well with vague instructions and long explanations; they require a much more structured approach to learning. For example, allow students three minutes to complete an introductory activity, then five minutes for instruction or discussion in pairs, and so on. Clearly define assessment tasks so that trainees, particularly those who are underachieving, understand the steps they must take to complete the work (West, 2000, p. 4; Booth, 2002, p. 61).
16. Reciprocal teaching is also recommended. Duke recommends "reciprocal teaching" as one approach to teaching multiple strategies simultaneously. In this approach, the teacher explicitly teaches and models the use of four comprehension strategies: asking questions, summarizing, clarifying, and making predictions. Trainees then take turns using these strategies, with help from the teacher and peers. Eventually, trainees acquire the ability to use the strategies on their own (Duke, 2004, p. 42).
17. Trainers should on their own make learning purposeful and problem-centred, because learners need the opportunity to observe, invent and practise. They need to build learning around trainees' interests and abilities, and situations they would find authentic; offer students various models of expertise – "the expertise of masters (teachers and other experts) and apprentices (other students)" – as benchmarks against which they can measure their progress or as alternative ways of solving the problem at hand; and give students

opportunities to work with one another, particularly where there is a social reward for improving their skills (e.g. receiving the applause of their classmates) (Wilhelm, 2004, pp. 102-103).

18. Re-teaching is a major tool in enhancing trainee attitude in practical classes. Individual teachers automatically "re-teach" information by checking for understanding immediately after providing instruction, conducting a frequent review for about five minutes into a period; and after major practical tests or alternatives, having students correctly answer all the items that they missed on the test (Bell, 2002/2003, p. 33).
19. Harness trainees attraction to computers to stimulate their literacy development. Educators and parents may have been too quick to dismiss boys' preoccupation with computers as a diversion from their own book-based literacy, not recognizing the computer's capacity to empower users to gain access to, and control of information. It is imperative that educators and parents be aware of the impact of the multi-media world, and understand the positive ways in which these new languages and cultures can be harnessed as adjuncts to book-based literacy (Millard, 1997, p. 46).
20. Involve trainees in setting new targets and celebrate their achievement (Wilson, 2003, p. 19).
21. Trainers should be in trainees shoe; research on effective literacy instruction conducted by Alvermann (2001) at the University of Georgia has shown that teachers enhance trainees' sense of competence and self-worth when they are able to convince trainees that they care about them as individuals and want them to learn. Teacher input, stimulation, and encouragement are important factors in helping them develop skills.

Conclusion

Student experience of general office software is increasing and a significant increase in internet experience is apparent. However, prior experience with programming is not increasing in IS students. Incoming IS undergraduates also see themselves as having less ability with programming than with most other computing skills. Males rate their ability more highly than females and mature students are less likely to rate themselves highly than school leavers.

Indeed Orr (2001) points out that computer competency is no longer a skill to be learned only by students majoring in technology related fields. All individuals must acquire basic computer literacy to function successfully.

In the foregoing therefore, it is pertinent to:

1. Move from self-directed study to directed study;
2. Provide trainees with a weekly plan of practical activities; and
3. Ensure regular practice are organised to build positive performance which would be better and attitudes will change.

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