

# E-LEARNING - THE STUDENTS' CHOICE?

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## ABSTRACT

*Recently, e-learning (particularly e-learning strategies) has become a popular topic for discussion particularly in Institutions where virtual learning environments have been imposed on a willing (or unwilling) staff. The benefits of these systems, while well rehearsed, seem to be based more on "hope" than on any evidence that the students – the consumers of our efforts – actually want it or even appreciate it. Lecturers are encouraged to place learning materials on the web, and to provide audio- or video-recordings of lectures for students. Do full-time students want this? The authors believe that the provision of web-based learning will eventually prove to be capable of helping to provide an enhanced learning experience. But before the provision is designed, and all the effort is expended, a human-oriented requirements analysis should be undertaken. The students should be involved in the overall design of their learning environment. To this end, a study of computer science student learning preferences has been undertaken and early results are reported in this paper.*

## Keywords

*E-learning, lectures, learning styles.*

## 1. INTRODUCTION

Institutions providing web-based learning systems offer students a one-stop location for integrated access to: course material, virtual discussion rooms, and examination question training. They are available all day, every day and are accessible off-campus, allowing students to structure their day according to their life-styles. Academic activity can be checked so that students showing signs of

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difficulty can be detected and helped.

It appears that the existence of the World-Wide Web has enabled computer-based learning to break free from the computer terminal room. But:

- What if students cope less well when their day is unstructured? Do they want their day to be structured for them?
- What if the freedom offered encourages them to take a full-time job as well as be a full-time student; will their examination success suffer as a result?
- What if it isolates students by encouraging them to stay in their campus bedrooms so that they do not practise the skill of oral (not written) argument and debate?
- What if students want face-to-face contact with their teachers and peers simply because they need the help to formulate the questions they want answered?
- What if students do not want to sit in front of a computer screen for forty (and more) hours per week?

In previous work [2, 4], the authors found that by far the majority of students would prefer to attend live lectures and problem classes than do the equivalent learning on-line.

Lecturers are being encouraged to put their course notes into web-based learning systems; given that much of this material is already generated on a computer, this in itself is not much of a problem. Doing so, however, means that the system provides an information repository not a learning support environment. To provide this, lecturers have to exploit those computer functions (audio, video, animation) that are simply unavailable to the paper-based alternative, and in this way, it is hoped, provide an enhanced learning experience. Creating this experience is very time consuming [9]. But having done so, the lecturer is free to embark on other academic activity.

It is a widely held belief that on-line teaching and learning will be the saviour of the educational system. The question is, will the enhancement in learning be worth the enhancement in effort, or is

this simply a Government inspired fashion that has to be followed until the evidence is overwhelmingly negative and it is abandoned?

## 2. THE SURVEY

For everyone, the amount learnt is proportional to the amount of time we spend learning and our individual preferred ways of learning. This paper reports upon an investigation within the computing departments of the universities of Kent, York and Portsmouth.

### 2.1 Questionnaire Design

The questionnaire asks students to respond to several sets of questions. The majority of the questions are 5-point Likert scale attitude statements about learning; strongly disagree through to strongly agree. Each degree of agreement is given a numerical value from one to five for calculation purposes. The remainder of the questions ask students to rank, in order of importance to them, sets of statements about ways to learn.

### 2.2 Questionnaire Administration

The questionnaire was administered on paper during timetabled sessions at the three institutions. Each author targeted one student group using the following criteria:

- Core subject
- Students in their first year of a computing degree course
- The lecture was taught by one of the authors

The actual groups of students completing the questionnaire comprised those who fulfilled all of the criteria below:

- Were registered for, or attending the chosen unit
- Attended the actual session where the questionnaire was administered
- Agreed to complete the questionnaire

It should be noted that the responders to the questionnaire are to an extent self-chosen. For Kent and Portsmouth students, the questionnaire was administered during a lecture. Since lectures are not compulsory, some students absented themselves, thus opting not to learn by that method. At York the questionnaire was run during a laboratory session at which attendance was compulsory.

## 3. THE RESPONSES

A total of 154 students responded to the survey. This comprises 48 from the University of Kent, 58 from the University of York and 54 from the University of

Portsmouth. 12% of respondents were female, 12% were aged 21 or over at the time of registration and 13% were overseas students. Analysis suggests that there are no statistically significant differences between the responses of these different groups of students. There are, however, differences between students studying at the different institutions.

### 3.1 I Like to Learn

Before investigating the ways in which our students like to learn it was necessary to establish that they do actually like to learn. Figure 1 shows the percentage responses to the statement "I like to learn". This establishes that almost all (91%) of the students want to learn, with only 1% overall disagreeing with the statement.

	Kent	York	Ports.
Strongly disagree	0%	0%	0%
Disagree	0%	2%	0%
Neutral	6%	7%	13%
Agree	46%	48%	54%
Strongly agree	48%	43%	33%

Figure 1: I like to learn

### 3.2 How do I Like to Learn?

Now that we have established that our students (at least the students that completed the questionnaire) actually like to learn we need to determine *how* they like to learn.

Students were asked to rank eleven different methods of learning by order of preference.

The ranks are shown here:

1. doing practical examples
2. attending lectures
3. using a computer
4. discussing with peers
5. investigation
6. doing past exam papers
7. discovery
8. doing assessments
9. reviewing lecture material
10. doing non-assessed work
11. lecturing to myself

In this paper we are mostly concerned with students' opinions about face-to-face and on-line learning. Both were ranked highly by our students. Learning by attending lectures ranks just above using a computer, but both are beaten to the top slot by learning by doing practical examples. It may

be the case that the rankings would differ for students studying within a different discipline.

### 3.2.1 By Attending Lectures

Students were asked to rank the statement “I like to learn by going to lectures” on a 5-point Likert scale. The results are shown in Figure 2.

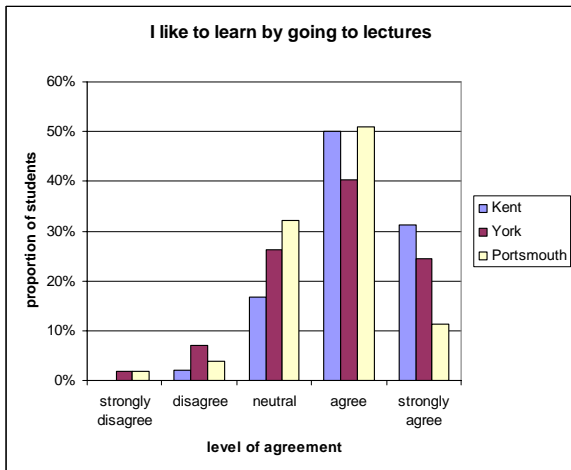


Figure 2: I like to learn by attending lectures

Overall 69% agree and only 6% disagree with the statement. This does not, however, attach any degree of success to this method of learning.

Figure 3 shows the proportion of respondents at each institution that ranked “learning by attending lectures” in each of the 11 positions.

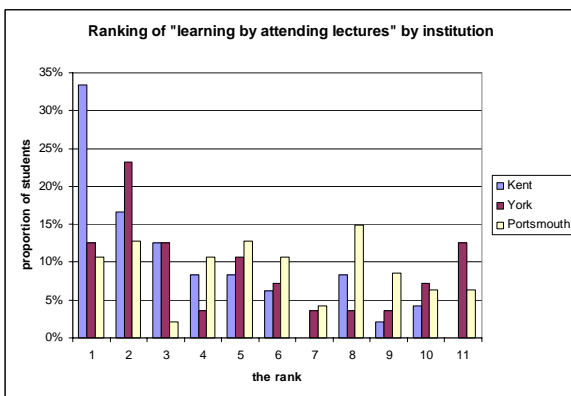


Figure 3: Ranking of “learning by attending lectures”

There is a marked difference between the preferences of Kent students and Portsmouth students, with approximately one third of Kent students ranking lectures as the most preferred. The York students follow a bimodal distribution, with students either considering lectures to be one of the most or the least important, whilst the Portsmouth distribution is much more uniform.

Even at Kent, it is still the case that the majority of students did not rank attending lectures as the most preferred method of learning. Is there something else that a majority agree upon?

### 3.2.2 By Using a Computer

Students were also asked to rank the statement “I like to learn by using a computer” on a 5-point Likert scale. The results are shown in Figure 4.

The results, (perhaps) not surprisingly for Computer Science students, show that students agree with the statement that they like to learn by using computer-based materials. The distribution (75% agreement and 3% disagreement), however, is very similar to that in Figure 2.

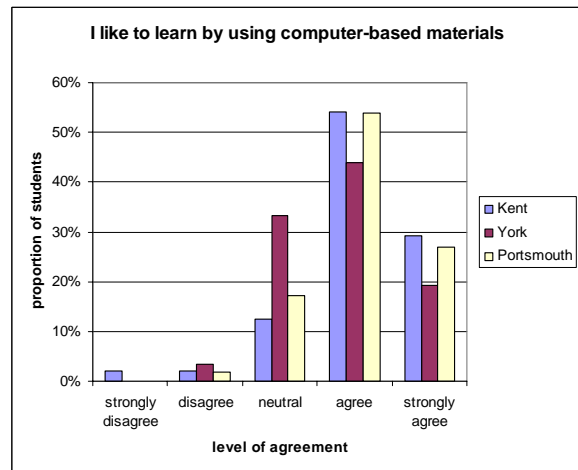


Figure 4: I like to learn by using computer-based materials

A cursory glance at the order of preference ranking for “learning using a computer”, shown in Figure 5, suggests greater agreement between Kent and Portsmouth students this time, but a marked difference for York students. Closer inspection shows that after an initial group of Kent students ranking it highly, the distributions for Kent and York are again similar.

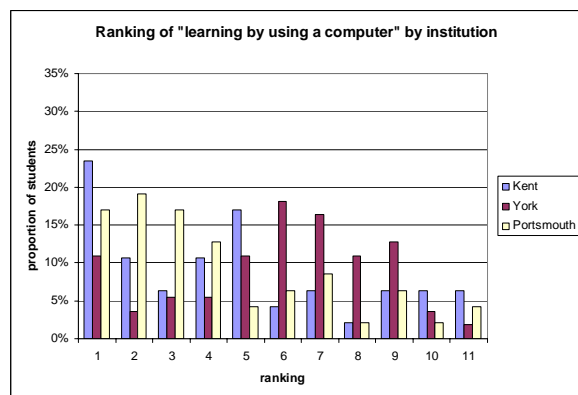
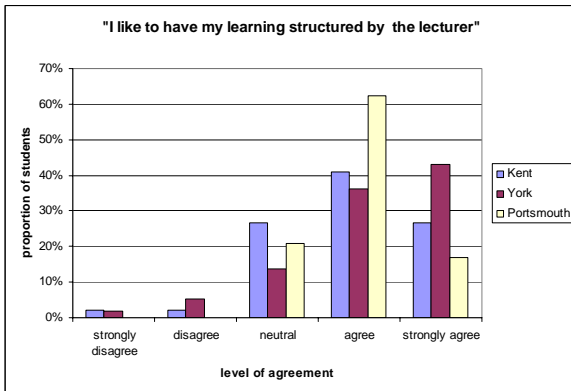


Figure 5: Ranking of “learning by using a computer”

### 3.3 Structuring Learning

Our students may like attending lectures, or they may prefer to learn using computer-based materials, but do they like to structure their own learning or have it structured for them? At this point it must be borne in mind that the respondents are

only part way through their first year at university. These results may differ if the question were to be repeated with, say, final year students. Figure 6 shows that the majority (76%) of students agree with the statement that they want their learning to be structured for them by teaching staff.



**Figure 6: I like to have my learning structured by the lecturer**

Structuring the learning experience for our students is something that we can do regardless of the mechanism by which they learn.

### 3.4 Using a Computer to Learn

There are many different aspects to learning on-line, and our students may not have experienced, or even be aware of, some of them.

The students were asked a series of six questions about different on-line learning experiences they may have encountered, and how they rated them. The results in Figure 7 show the proportion of students that have used a computer to perform the tasks listed.

(%) I have used a computer to...	No	Yes
read documents	0	100
do multiple choice questions	7	93
do an internet search for specific information	1	99
listen to an explanation	34	66
watch a video or animated explanation	28	72
chat to people about a course topic	31	69

**Figure 7: Proportion of respondents using a computer to perform specified learning tasks**

After determining the proportion of students that had tried each different type of experience we wanted to know whether they enjoyed the experience or not. Figure 8 shows that our students find that reading documents on-line is the least enjoyable of the experiences, whilst Internet searches, chatting about course topics and watching explanations are the most enjoyable of the experiences.

(%) used a computer to...	Didn't enjoy it	It was OK	Enjoyed it
read documents	10	67	23
multiple choice questions	4	48	48
internet search	3	40	57
listen to an explanation	8	60	32
watch an explanation	4	43	53
chat about a course topic	5	41	54

**Figure 8: Level of enjoyment**

## 4. DISCUSSION

Do students prefer a computer or a human to teach them? The proportion of our students that like to learn by attending lectures suggests that they would not prefer to learn solely by using a computer; research suggests that students initially find a machine too impersonal and a disincentive to learning [8]. The most popular reason for attending lectures is to listen to explanations, and indeed this is also the most popular way of learning after doing practical examples. Of course lecturers must ensure that they add value to electronic slides and not simply repeat what is written on them. A VLE (Virtual Learning Environment) must support this aural mode of learning, either as a fully integrated video of a live lecture (not simply a window on top of the VLE) or as a fully integrated on-line lecture/teaching object [1].

One of the advantages of VLEs is that in general, they provide a facility that supports discussion groups. The evidence from this study indicates a desire to engage with this mode of learning. Our students rank discussion fourth in their list of preferred ways of learning and only 5% of students that had participated in on-line discussion about course topics did not enjoy the experience. A note of caution must be inserted here. A learning system should not disadvantage any identifiable portion of users and it is well documented that, for example, male and female students pursue electronic debates in subtly different fashions [7]. Designing on-line activities that reward typical male behaviour and punish typical female behaviour [5] should be avoided.

## 5. CONCLUSION

The results of our survey suggest that our students like to take advantage of the many different types of learning experience that are offered to them; this includes on-line learning opportunities and face-to-face lectures.

It has been suggested that the majority of university level courses offer a similar experience to each student taking them [6]; this is complicated by the increasingly widely differentiated past experiences that students bring to university.

Virtual learning environments should be able to provide an experience that is suited to the needs of each individual student, but they have evolved according to what can be easily achieved with the technology, and academics' concerns about reliability and security [3]. They have not evolved according to the needs of students; they do not yet completely fulfil the needs of students. Their provision, however, should help to create an enhanced learning experience that complements rather than replaces the learning opportunities our students currently enjoy.

## 6. ACKNOWLEDGEMENTS

The authors are grateful for the financial assistance from the HE Academy-ICS development fund.

And, of course, the investigation would not have been possible without the contribution from the participating students – our thanks to them.

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