Student Perception of On-Line Lectures within a Blended Learning Environment

Motivation: How do we engage our students, from face-to-face to distance learning, and try and provide all our students with the same educational experience

- Overview of security and digital forensics teaching and research.
- Outline of the move towards blended learning.
- Show evidence of student perceptions.

Bill Buchanan
Re-enforcing...
Threat Analysis

- Understand the basic steps that an intruder might undertake in an intrusion.
- Provide a background in the usage of vulnerabilities, scanning.
- Outline key current threats, and their operation.
- Provide practical skills in vulnerability analysis.

Full on-line lecture (1-2hr)

Extensive use of key frames

Interesting ... and engaging graphics

Focus on key elements using highlighter

Two styles

Author: Prof Bill Buchanan
Fun tests

With the Internet model, which layer does RSVP correspond to:

- Transport
- Network
- Application
- Network Access

Deep Zoom

Hash cannot be reverse with an inverse algorithm.

Eve cannot guess the password from the hash.

MD5 encoded password.

Wide range of dynamic Web challenges

Engaging brochure

Bill's Security Material

HMAC is a message authentication code (MAC) and can be used to verify the integrity and authenticity of a message. It involves hashing a message with a secret key. As with any MAC, it can be used with standard hash functions, such as MD5 or SHA-1, which results in methods such as HMAC-MD5 or HMAC-SHA-1. As with any hashing function, it is a property of the hashing function, and the resulting number of bits in the secret key is a factor.

Message: test
Key: wr123

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Two styles
Integrated learning toolkit

Full lab demonstrations

Virtual environment for labs/tutorials

Use of simulator with unique challenges

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Camtasia used with keyframes … teaching elements can be reused in other content

Visio used to create engaging graphics

Colour coded … reusable elements

Two styles
Re-enforcing...

Why Blended Learning?
Re-enforcing...

An example...
Teaching pack is the focus of the module

Face-to-face lecture is the anchor for the module

ALL students receive the same experience (face-to-face, blended, distance and franchised)

Blended and distance learning scales from face-to-face teaching

On-line lectures re-enforce principles that were not quite understood in the face-to-face lecture

Provide full-versions of the lectures and the practical/lab work

Provide multiple ways to learn the same material

Make students feel proud about their module/programme/university

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Module Example

Full weekly lecture

On-line tutorial

Lab demos

Demos of principles

Unit 1: Fundamentals

- Notes.
- Lecture.
- Tutorial.

Lab 1: [Investigate Windows 2003 Services and start developing the Toolkit]
  - Accessing services on Windows 2003. This gives an overview of accessing important services, such as Telnet, FTP, SMTP, and so on, from Windows 2003 for Lab 1 (Page 176).
  - Toolkit 1 demo. This provides an overview of Toolkit 1 lab for Lab 1 (Page 182). Source code [here].

Associated software:
  - Toolkit. This is a program which can be used to investigate client/server applications [demo]. Run client.exe and it should have the client and server program in it. Also it contains a packet capture tab, where you can see the network connections.

Unit 2: Vulnerabilities and Threats

- Notes.
- Lecture.
- Tutorial.

Lab 2: [Investigate Unix Services, SQL Injection and further Toolkit]
  - Demo of Linux services. This gives an overview of accessing important services, such as Telnet, FTP, SMTP, and so on, from Linux.
  - Toolkit 2 demo. This provides an overview of Toolkit 2 lab for Lab 2 (Page 187). Source code [here].

Demos:
  - Demo of Nessus. Nessus is an excellent vulnerability scanner.
  - Cross scripting example. This shows an example of an SQL injection attack, which is an example of a cross-scripting threat.
  - IDS detecting ping and port scan. This shows a practical example of using IDS for detecting a ping on a host, and also in using the spoofing id function.
  - Snort example using ProFSIMS.
  - Hydra vulnerability scanning. The Hydra program allow administrators to scan their servers, such as FTP and Telnet, for vulnerabilities. This example shows a practical scan for a range of user names and passwords.
  - Hping vulnerability scanning. The hping program can be used to craft data packet which can be used for vulnerability testing.
Re-enforcing...

Some results
1. How useful is/were the on-line video versions of the lectures for your studies

2. Do you think that all modules should have associated on-line lectures?
3. Should on-line lectures replace traditional lectures?

4. For guidance in performing practical work in the lab, how useful are on-line step-by-step video captures of the lab?
6. Did you find that you did not attend a lecture, as you knew there was an on-line version?
7. How important is the match of the material in the on-line lecture to the actual lecture?

- There should be no match
- Not important
- Neural
- Important
- Extremely important

8. How important is a printable teaching pack in the delivery of a module?

- There should be no match
- Not important
- Neural
- Important
- Extremely important
10. On-line lectures should replace traditional lectures.
11. The traditional classroom lecture is the focus of a module, and on-line lectures should re-enforce this.

12. I often miss lectures as I know there is an on-line version.
13. The on-line lectures allow me to catch-up on things that I did not quite understand in the lecture.

14. I mainly use the on-line lectures to catch-up on material before an assessment.
15. I believe the on-line lectures enhance the reputation of my programme/university/School.

16. I find it difficult to watch on-line lectures.
17. I watch the full versions of the on-line lectures from start-to-finish.

18. I often just watch parts of the on-line lecture, which I am unsure about.
20. The most useful form of support to a lecture is:

- Video recording
- Playback of the PowerPoint with a voice-over
- Playback of the PowerPoint with no voice-over
- PDF of slides

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19. I never watch the on-line versions of the lectures, as I prefer to read the material from the teaching pack.
25. Did you find that you use the on-line lecture to:
- prepare before the actual lecture
- review after the actual lecture
- replace the actual lecture
Online lecture usage
Re-enforcing...

So what?

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Evolution

Traditional

Students record lectures

Staff record and students playback

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... in Conclusion

Motivation: Face-to-face lectures/labs and their scheduling are two important factors in structuring academic development in Higher Education ... how to we support them, and enhance with online lectures?

- Face-to-face Lecture, Lab/Tutorial and Teaching Pack are the core of any module. All associated material should support this.
- In this case, students fully engaged with the on-line material, while the majority feel that on-line lectures should not replace the face-to-face ones.

Key wins:
- Students feel supported after the lecture and before assessments.
- Every student is able to complete lab-based work.
- Model scales to blended, distance and franchised.
- Quality of the module stays consistent no matter of how it is studied and with multiple *modes/types* of study.

Prof Bill Buchanan