Addressing student retention and engagement using new technology

Peña-Fernández A., Evans MD., Peña MA.

Antonio.pena-fernandez@dmu.ac.uk
Outline

✓ Student retention and progression in the HE
✓ 2016/17 BMS action plan to enhance retention and progression
✓ Development and introduction to the DMU e-Biology package
✓ Preliminary conclusions
Student retention and progression in Higher Education

University student retention and progression → major issues in HE.

HEIs → minimise student drop-out rates and maximise student potential.

✓ Financial and reputational reasons.
✓ Personal/academic development.
✓ Financial considerations of students → in debt early in their adult life.
✓ Entry in an undergraduate degree programme → academically capable, with adequate support → can attain degree.

BBC News website (2017). Available at: https://www.bbc.co.uk/news/education-40641971
University student drop out: reasons?

University student drop out (UK National Audit Office report, 2007):

- personal
- institutional/course-related issues
- financial

First year University students challenges:

- Information overload
- Poor individual attention
- Minimal interaction with their peers
- Barriers such as socio-economical, etc.

Available at: https://www.tandfonline.com/doi/full/10.1080/0309877X.2017.1311994?scroll=top&needAccess=true

Articles

Introduction of a peer mentoring scheme within biomedical sciences education – easing the transition to university life
Clare Foy & Aisling Keane
Pages 733-741 | Received 19 Nov 2015, Accepted 06 Nov 2016, Published online: 31 May 2017

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Student retention and progression in BSc Biomedical Science (DMU)

BSc Biomedical Science (Hons) at De Montfort University (DMU, UK) → failed due to academic circumstances after year 1:

- 17.6% in 2013/14
- 19% and 2014/15

(Source: DMU reporting software, Tableau).

Tackled to improve retention & progression
Plan to improve BMS student retention and progression

Strategies to improve retention and progression BMS (DMU, UK) in 2016/17:

- Intensive induction week with social and networking events with academics.
- Increased the number of lectures on foundation in STEM.
- More tutorials and creation of “surgery” hours (weekly drop-in sessions) in each module.

Preliminary strategies might have translated into a trend in the reduction of drop outs due to academic circumstances after year 1

Level 4 BMS student drop outs due to academic reasons (Source: DMU reporting software, Tableau, January 2019).

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BMS students require basic support in STEM subjects → *e.g.* BTEC routes.

Microbiology and chemistry/biochemistry modules → particularly challenging and often causing stress.

**DMU e-Biology**

→ developing a complete e-learning package designed to enhance learning and underpin the fundamental concepts of biology and biochemistry

→ Available on the DMU website in 2020 here (Image courtesy of DMU; Peña-Fernández A, 2019):

http://parasitology.dmu.ac.uk/ebiology/index.htm

Overview of the **DMU e-Biology** home page (Image courtesy of DMU; Peña-Fernández et al., 2019).

Available at: http://parasitology.dmu.ac.uk/ebiology/index.htm
DMU e-Biology: development

DMU e-Biology → development

DMU graphic designers are collaborating with academics and biomedical scientists registered by the HCPC (UK Health and Care Professions Council).

Development started in summer of 2017 → will cover the specifications for AS and A level described by the Assessment and Qualifications Alliance (AQA, 2017) for human biology.

Methods used → similar to those described to develop DMU e-Parasitology (Peña-Fernández et al., 2017).

Creating a Model Module for the Novel Resource DMU E-Parasitology

A. Peña-Fernández¹, M.D. Ollero², S. Fenoy², A. Merchant², F. Izquierdo², M.A. Peña³, F. Bornay⁴, L. Acosta⁴, L.A. Parker⁴, T. Sgamma⁴, C. Del Águila²

Available at: https://library.iated.org/view/PENAFLERANDEZ2017CRE
DMU e-Biology has the following modules [More details have been described in Peña-Fernández et al. (2017)]:

- A theoretical module with mini e-learning units that cover the basic Biology/Chemistry and related concepts delivered across our programmes.
- A virtual laboratory module with engaging and interactive units about different biomedical techniques.
- A virtual microscope module with virtual histology slides.
- A module with virtual clinical case studies.
Overview of the DMU e-Biology’s theoretical module (Image courtesy of DMU; Peña-Fernández et al., 2019).
Available at: http://parasitology.dmu.ac.uk/ebiology/index.htm
Overview of two e-learning units in the DMU e-Biology’s Theoretical Module displaying a formative assessment (Images courtesy of DMU; Peña-Fernández et al., 2019).

Available at: [http://parasitology.dmu.ac.uk/ebiology/units/Nervous%20System/story_html5.html](http://parasitology.dmu.ac.uk/ebiology/units/Nervous%20System/story_html5.html) and [http://parasitology.dmu.ac.uk/ebiology/units/excretory-system/story_html5.html](http://parasitology.dmu.ac.uk/ebiology/units/excretory-system/story_html5.html)
Virtual laboratory module

Units developed so far related to medical histology.

Overview of the DMU e-Biology Virtual Laboratory module (Image courtesy of DMU; Peña-Fernández et al., 2019).

Available at: http://parasitology.dmu.ac.uk/ebiology/biologyLaboratory_units.htm

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Overview of the DMU e-Biology Histology Technique unit and H&E unit (Images courtesy of DMU; Peña-Fernández et al., 2019). Available at: http://parasitology.dmu.ac.uk/ebiology/biologyLaboratory_units.htm

HISTOLOGY RESOURCES FOR PROMOTING BLENDED LEARNING

A. Peña-Fernández¹, I. Ramos¹, C. Young¹, D. Gray¹, M. Evans¹, M. Randles¹, L. Zhu¹, M.C. Lobo-Bedmar²

¹De Montfort University, Faculty of Health and Life Sciences (UNITED KINGDOM) ²IMIDRA, Departamento de Investigación Agroambiental (SPAIN)

Available at: https://library.iated.org/view/PENAFERNANDEZ2018HIS

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Overview of a digitised histology slide in the DMU e-Biology (Image courtesy of DMU; Peña-Fernández et al., 2019). Available at: [http://parasitology.dmu.ac.uk/ebiology/biologyLaboratory_units.htm](http://parasitology.dmu.ac.uk/ebiology/biologyLaboratory_units.htm)

x40 stained using immunohistochemistry for smooth muscle alpha actin (Mouse Uterus). This staining methods distinguishes the muscular myometrium (brown) from the endometrium (haematoxylin/blue).

(Credit: DMU eBiology Group, De Montfort University)
Overview of the **DMU e-Biology Virtual Case Studies module** (Images courtesy of DMU; Peña-Fernández et al., 2019). Available at: [http://parasitology.dmu.ac.uk/ebiology/units/case-study01/story_html5.html](http://parasitology.dmu.ac.uk/ebiology/units/case-study01/story_html5.html)
Overview of the DMU e-Biology HCPC section (Images courtesy of DMU; Peña-Fernández et al., 2019). Available at: http://parasitology.dmu.ac.uk/ebiology/ebiology_HCPC.htm
Conclusions

Preliminary outcomes:

1) Virtual laboratory → theoretical/practical methods for the performance of biomedical techniques such as histology.

2) Developed by academics and Biomedical Scientists HCPC registered.

3) Case studies → encourage self-learning and autonomous work (e.g. alcohol abuse and biomarkers of disease in clinical samples).

4) The availability of this resource prior to students starting their course may enable earlier engagement and improve student retention.

Human cells. Artworks created for the DMU e-Biology (Images courtesy of DMU; Peña-Fernández A., 2019).
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