Direct Data Analysis

E-Learning Object Impact Study

School of Nursing, Midwifery and Physiotherapy

The University of Nottingham

July 2013

Prepared for:

The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

Contents

1. Introduction

The Health E-Learning and Media team based in the School of Nursing, Midwifery & Physiotherapy at the University of Nottingham provide expertise and support in the development, design, evaluation and research of technological and media based educational materials and interventions in health. Current areas of research include the design and reuse of open educational resources, e-learning self-efficacy and adoption, and participative design and the effectiveness of online healthcare interventions.

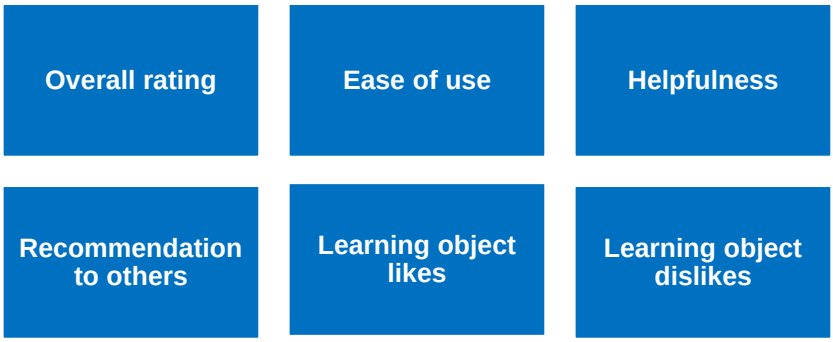
The e-learning resources are designed around the principles of the 'reusable learning object' or RLO. These are web-based resources that consist of a mixture of multimedia elements such as audio, text, images and video and which engage the learner in interactive learning through the use of activities and assessments. They represent approximately 15 minutes of learning activity.

The online learning objects are accessed by a wide range of individuals including; students, staff, and various healthcare professionals. In addition to students and staff from Nottingham University, the learning objects are accessed by individuals around the world.

Upon completion of the learning object, users are asked to complete a short feedback survey on their experience of the learning object. The School has been collecting this feedback for several years and this report provides details from the analysis of the feedback collected.

This report has been prepared by Direct Data Analysis on behalf of the School of Nursing, Midwifery & Physiotherapy at the University of Nottingham.

The feedback focuses on the following areas of user experience:



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2. Executive Summary

The results from this feedback show that the overwhelming majority of respondents accessing the Nursing, Midwifery and Physiotherapy, E-Learning Object, viewed the resource they accessed as a positive aid to enhance their learning of the subject in question.

When asked what they liked most about the learning object they accessed, over 10,000 of the 13,217 respondents provided further positive comments, with many commenting that the learning object was clear and easy to use.

Many of the respondents commented that the interactive content made learning the subject easier and gave them a greater understanding of the topic when compared to learning from a text book.

What did you like most about the learning object?	• "The information was presented in a way which was easy to understand compared to text books."

KEY FINDINGS

When asked about the Learning Object they accessed:

- **HOW WOULD YOU RATE IT? 97.9% of respondents rated the learning object they accessed as 'excellent or good', with 52.8% of those respondents providing an 'excellent' rating.**
- **HOW EASY WAS IT TO USE? 96.5% of respondents rated the learning object they accessed as 'very easy or easy' to use, with 65.6% of those respondents providing a 'very easy' rating.**
- **HOW HELPFUL WAS IT? 97.9% of respondents rated the learning object they accessed as 'very helpful or helpful' when learning their subject, with 59.5% of those respondents providing a 'very helpful' rating.**
- **WOULD YOU RECOMMEND IT TO OTHERS? 96.5% of respondents would recommend the learning object to others.**

• "I could go back and listen again until I understood. You cannot do this in class."	What did you like most about the learning object?

3. Survey Methods

This section of the report details respondent participation to the survey along with data collection and analysis of the results.

3.1 Survey Participation

Feedback data was provided from 13,217 respondents who had undertaken one or more of 71 E-Learning Resource, Learning Objects, provided by the School of Nursing, Midwifery and Physiotherapy, at Nottingham University. Feedback was provided over a period from May 2006 to July 2013.

Table 1 shows the breakdown of respondent type. The largest group of respondents were students, who made up for 67.4% of respondents, followed by staff that made up for 24.8% of respondents. Where the respondent was not a student or member of staff, they were asked to provide their job description. From the respondents who provided this additional information, some of the most common occupations were nurses (n=104), Doctor (n=36), Researcher (n=25), Pharmacist (n=10).

Table 1: Breakdown of respondent type

Student	8902
Staff	3275
Other	929
Unknown	111

Number of respondents

Respondents were asked to state which University or institution they were from, and this data was used to allocate a respondent to one of eight geographical regions, as shown in table 2.

Table 2: Geographical region of respondents

UK	8471
North America & Canada	1063
Australia & South Pacific	416
Europe	173
Asia	137
Africa	52
Middle East	51
South America & Caribbean	43
Unknown	2811

Number of respondents

Not all respondents provided a comment that allowed their University or institution to be allocated to a geographical region and these were recorded as unknown.

3.2 Data Collection and Analysis

Data was collected from respondents via an online questionnaire hosted by SurveyMonkey. The 71 individual survey files were downloaded and imported into a central database for analysis. Not all questions were asked by all surveys and appendix 2-5 list the individual learning objects where each question was asked.

Each learning object was allocated to a cluster (Pharmacology, Evidence Based Practice, Clinical Skills, and Biology Foundations) for further analysis by cluster type.

All percentages are rounded to 1 decimal place and therefore totals shown in this report and appendix may vary by ±0.1% when adding individual scores separately.

4. Learning Object Feedback

This section of the report provides the findings from respondents' views of the Nottingham University, School of Nursing, Midwifery and Physiotherapy, E-learning object they accessed.

For the questions in 4.1 – 4.4, we have provided an overall summary of respondent feedback, followed by a breakdown of the feedback by respondent type, cluster type, and a further breakdown by geographical region. We have also shown a comparison of feedback for each cluster on a year by year basis.

Questions 4.5 and 4.6 look at the main themes identified by respondent comments, along with a selection of comments made.

Where analysis is provided by geographical region, respondents where it was not possible to allocate to a region were excluded from this section of the analysis.

Students and staff referred to in this report are from locations worldwide and not just restricted to the University of Nottingham.

Not all questions were answered by all respondents and the total numbers of responses are shown in the table accompanying each question.

When comparing feedback by year, we use the calendar year (1st January to 31st December) and not the academic year. Furthermore, feedback for the year 2006 contains data from 16th May 2006 and feedback for the year 2013 contains data up to and including 15th July 2013. Feedback for the Clinical Skills clusters does not start until 2007.

4.1 How would you rate this learning object?

Respondents undertaking 61 out of the 71 modules were asked to rate the learning object they had completed. From the 9,959 responses, 97.9% rated the learning object they had completed as 'Excellent' or 'Good', while just 2.1% of respondents rated the learning object they had completed as 'Not Good', or 'Poor'.

*"Did not understand plasma protein binding until I used this resource – **excellent.**"*

66 NSN Plasma Proteins and Drug Distribution.

Figure 1 shows the overall respondent rating of the learning object they accessed.

Figure 1: How would you rate this learning object? – All respondents

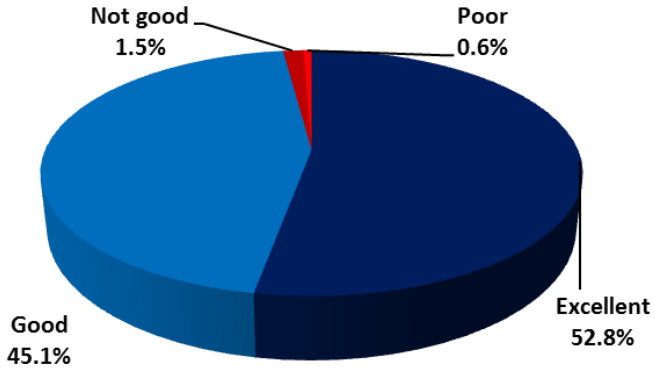


Table 3: How would you rate this learning object? – All respondents

Excellent	5261
Good	4496
Not good	146
Poor	56

Number of respondents

When broken down by respondent type, although considerably more 'Other' respondents rated the learning object they accessed as 'Excellent' (68.1%) when compared to staff and student ratings, there was very little difference (±1%) between respondent types rating the learning object as overall 'Excellent' or 'Good', as shown in figure 2.

Figure 2: How would you rate this learning object? – Breakdown by respondent type

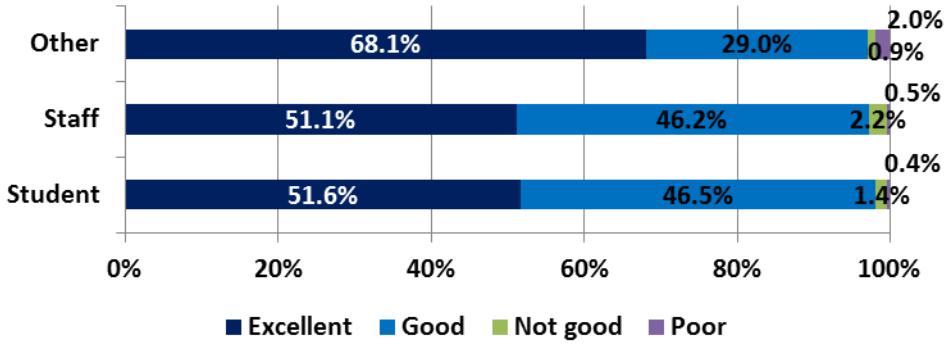


Table 4: How would you rate this learning object? – Breakdown by respondent type

Respondent type	Excellent	Good	Not good	Poor
Other	518	221	7	15
Staff	621	561	27	6
Student	4122	3714	112	35

Number of respondents

Rating by cluster group

Figure 3 shows respondents rating of the learning object they accessed, broken down by cluster type.

When comparing respondent satisfaction by cluster type, there was very little difference in satisfaction levels (excellent or good), with 98.9% of Clinical Skills respondents rating their learning object as 'Excellent' or 'Good', this being the highest combined satisfaction level, compared to 97.2% of Biology Foundations respondents, this being the lowest combined satisfaction level.

Figure 3: How would you rate this learning object? – Breakdown by cluster type

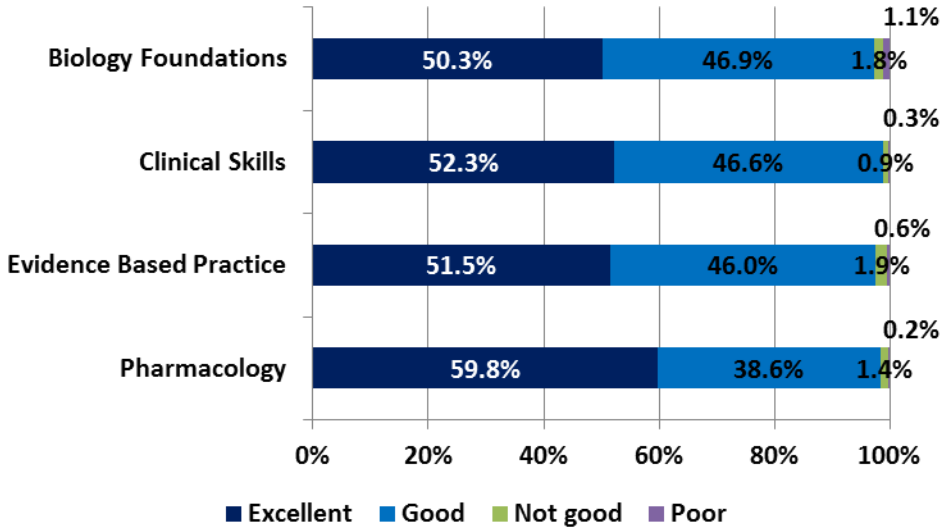


Table 5: How would you rate this learning object? – Breakdown by cluster type

Cluster	Excellent	Good	Not good	Poor
Biology Foundations	1083	1010	38	24
Clinical Skills	1592	1419	27	8
Evidence Based Practice	1615	1440	58	20
Pharmacology	971	627	23	4

Number of respondents

The vast majority of individual learning object resources achieved 'Excellent' or 'Good' percentage satisfaction sores in the mid to high 90's, with 14 resources achieving 100% satisfaction scores.

Appendix 2 lists the satisfaction scores for each individual learning object.

Rating by geographical location

Although there were considerable variations in the percentage of respondents who rated their learning object as 'Excellent' when compared by geographical region, ranging from 50.4% of UK respondents who rated their learning module as excellent, to 79.1% of Middle East repondents, there was little variation in the percentage between regions where respondents gave an overall rating as 'Exellent' or 'Good', with feedback ranging from 97.8% overall satisfaction from African respondents, to 100% overall satisfaction from respondents in the Middle East, South America and the Caribbean.

Figure 4 shows respondents rating of the learning object they accessed, by geographical location.

Figure 4: How would you rate this learning object – Breakdown by geographical region

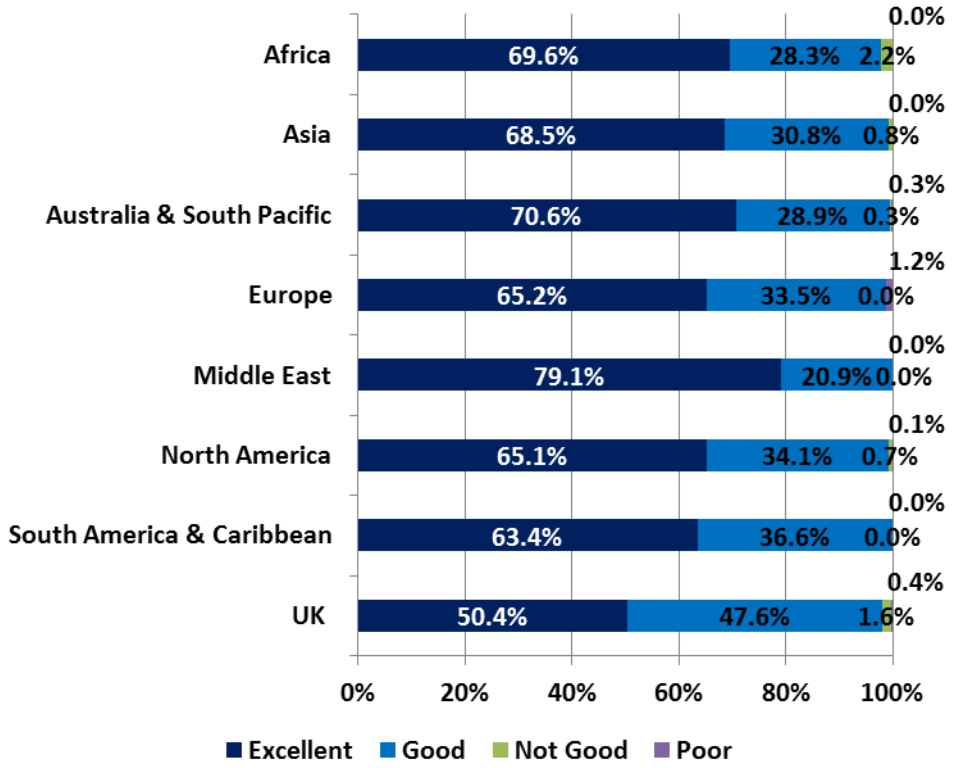


Table 6: How would you rate this learning object? – Breakdown by geographical region

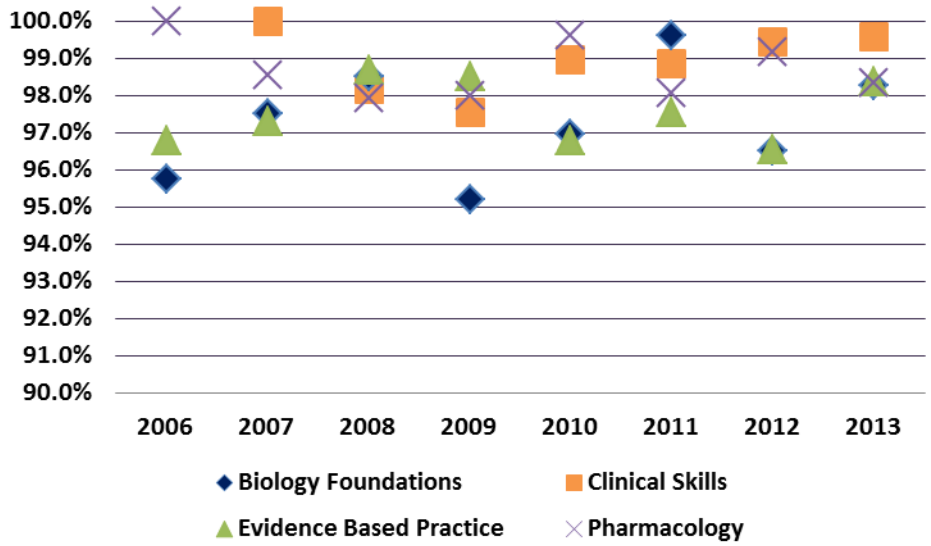
Location	Excellent	Good	Not good	Poor
Africa	32	13	1	0
Asia	89	40	1	0
Australia & South Pacific	279	114	1	1
Europe	105	54	0	2
Middle East	34	9	0	0
North America	554	290	6	1
South America & Caribbean	26	15	0	0
UK	3094	2925	98	24

Number of respondents (excludes respondents who could not be allocated to a geographical region)

Rating by year

All clusters received high percentages of respondents rating their learning object as 'Excellent' or 'Good' across all years reported, as shown in figure 5. Pharmacology received 100% satisfaction in 2006 with a minimum of 97.9% satisfaction in 2008, while Clinical Skills achieved 100% satisfaction in 2007, with a minimum of 97.5% satisfaction in 2009.

Figure 5: How would you rate this learning object – Breakdown by cluster and year



Percentage of respondents rating the learning object as excellent or good.

4.2 How easy was it to use the learning object?

Respondents undertaking 62 of the 71 modules provided feedback on how easy it was to use the learning object. From the 10,046 responses, 96.5% of respondents stated that the learning object they accessed was 'Very easy' or 'Easy' to use.

> *"**Easy** to understand in comparison to other resources. I now have a great understanding of antagonist and agonists."*
>
> *NUCL 52R Drug-receptor interaction.*

Figure 6 shows the overall respondent rating of ease of use.

Figure 6: How easy was it to use the learning object? – All respondents

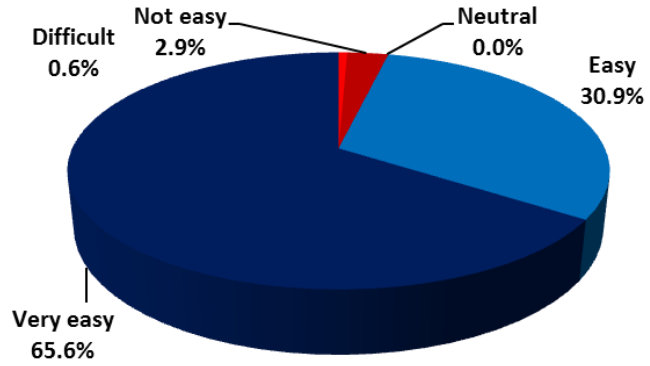


Table 7: How easy was it to use the learning object? – All respondents

Difficult	62
Not easy	295
Neutral	1
Easy	3102
Very easy	6586

Number of respondents

When broken down by respondent type, in line with the previous question, there were a higher percentage of 'Other' respondents who rated the learning object they accessed as 'Very easy' (76.0%) when compared to staff and student ratings. However, there was very little difference (±0.7%) between respondent types rating the learning object as 'Very easy' or 'Easy', overall as shown in figure 7.

Figure 7: How easy was it to use the learning object? – Breakdown by respondent type

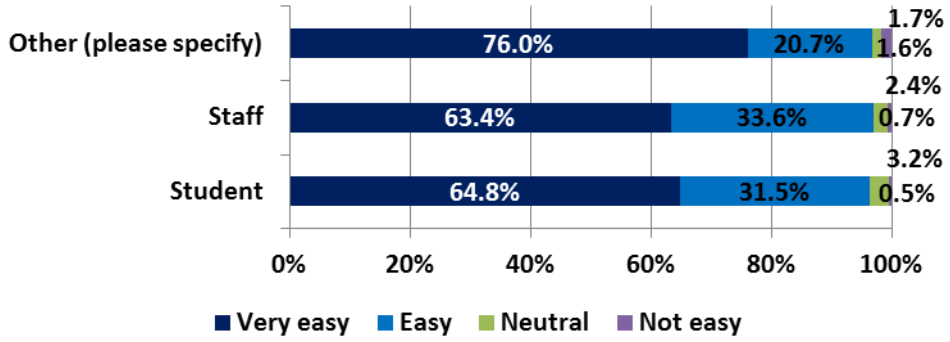


Table 8: How easy was it to use the learning object? – Breakdown by respondent type

Respondent type	Very easy	Easy	Not easy	Difficult
Other	577	157	12	13
Staff	770	408	29	8
Student	5172	2511	253	40

Number of respondents (excludes unknown respondent types)

Ease of use by cluster type

When comparing respondent satisfaction by cluster type, there was very little difference in overall satisfaction levels, as shown in figure 8, with 98.0% of Clinical Skills respondents rating their learning object as 'Very easy' or 'Easy', to use this being the highest combined satisfaction level, compared to 94.2% of Biology Foundations respondents, this being the lowest combined satisfaction level.

Figure 8: How easy was it to use the learning object? – By cluster type

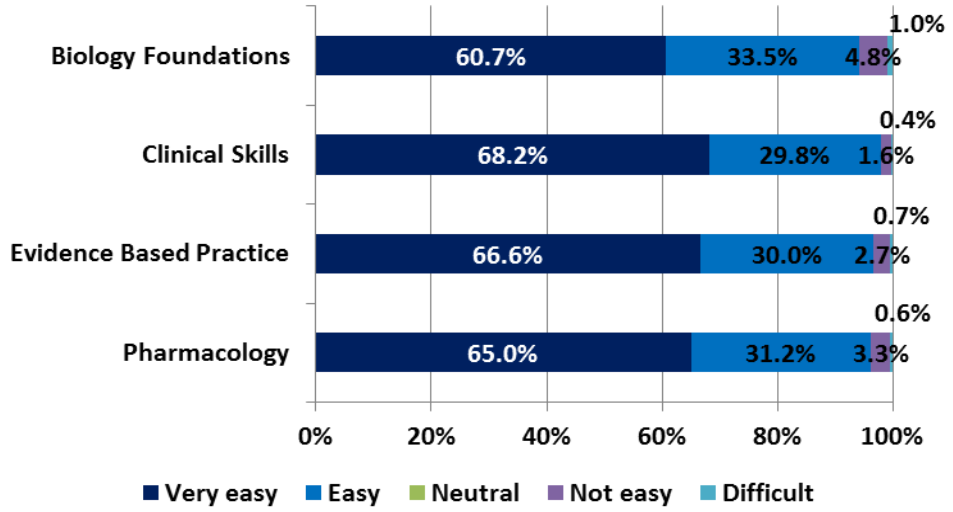


Table 9: How easy was it to use the learning object? – Breakdown by cluster type

Cluster	Very easy	Easy	Neutral	Not easy	Difficult
Biology Foundations	1303	720	0	103	21
Clinical Skills	2081	908	0	50	11
Evidence Based Practice	2147	968	1	88	21
Pharmacology	1055	506	0	54	9

Number of respondents

Seven individual learning objects achied 100% satisfaction scores with regards to being 'Very easy' or 'Easy' to use, with the vast majority of learning objects achieving overall percentage satisfaction scores in the mid to high 90's.

Two learning objects achieved less than 80% overall satisfaction, these being; *17 NCTL Atomic bonding*, which achieved 79.2% of respondents stating the learning object was 'Very easy' or 'Easy' to use, and *16 NCTL Elements that make up the human body*, which achieved 73.2% of respondents rating the leatning object as 'Very easy' or 'Easy'.

Appendix 3 lists the satisfaction scores for each learning object.

Ease of use by geographical location

Figure 9 shows the satisfaction level of learning object users, by geographical region. All geographical regions achieved over 90% of respondents finding the learning object 'Very easy' or 'Easy' to use, with satisfaction scores ranging from 90.7% of Middle Eastern users, through to 98.2% of European users.

Figure 9: How easy was it to use the learning object? – By geographical region

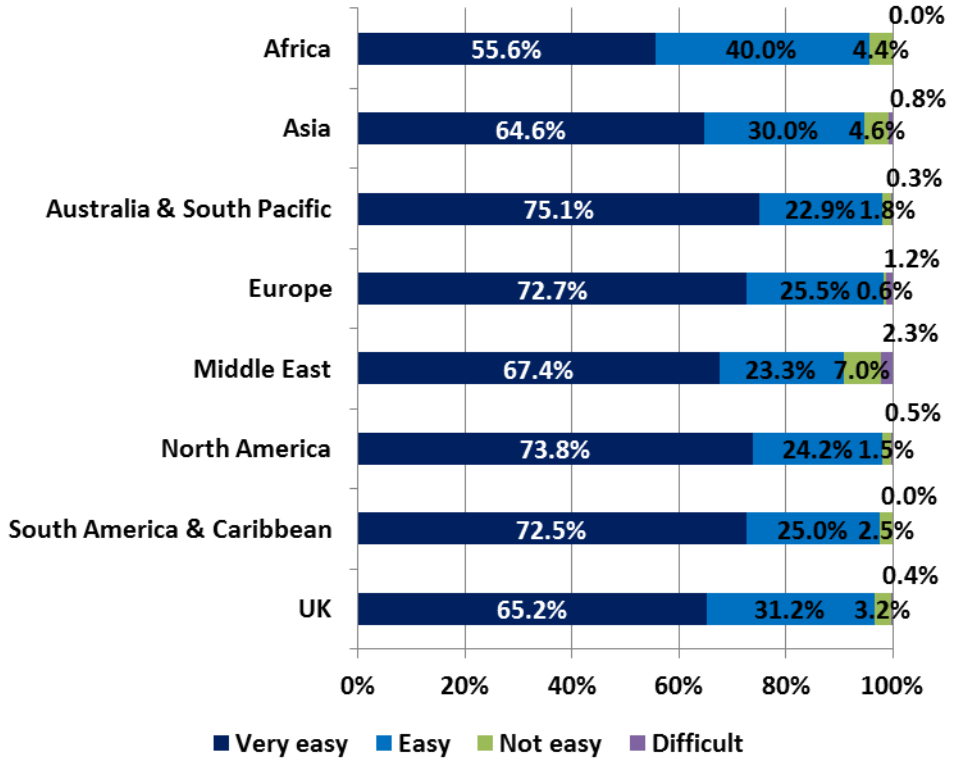


Table 10: How easy was it to use this learning object – Breakdown by geographical region

Location	Very easy	Easy	Not easy	Difficult
Africa	25	18	2	0
Asia	84	39	6	1
Australia & South Pacific	295	90	7	1
Europe	117	41	1	2
Middle East	29	10	3	1
North America	627	206	13	4
South America & Caribbean	29	10	1	0
UK	4005	1913	194	26

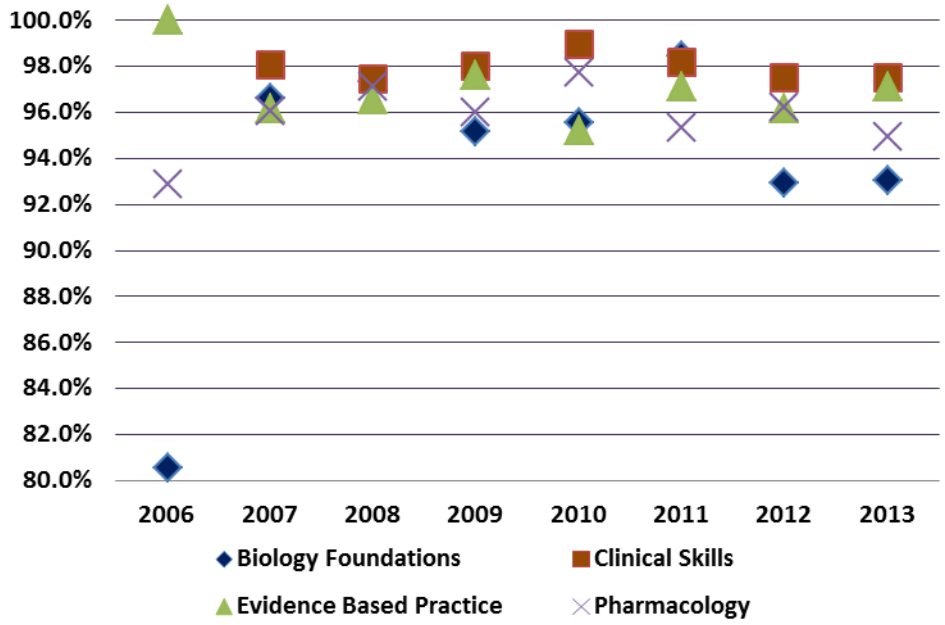
Number of respondents (excludes respondents who could not be allocated to a geographical region)

Ease of use by year

Figure 10 shows the yearly breakdown by cluster type of respondents who rated the learning object as 'Easy' or 'Very easy'. Other than 2006 which saw a range from 80.6% (Biology Foundations) to 100% (Evidence Based Practice) who rated the learning object as 'Easy' or 'Very easy', the remaining years saw little variation in the percentage of respondents rating the learning object as 'Easy' or 'Very easy'.

When looking at the low satisfaction score for Biology Foundations in 2006, no key themes were identified, other than respondents commenting they found the learning object difficult. However, the learning objects in the Biology Foundations rated as 'Not easy' were limited to 4 (*19 NCTL Acids and alkalis application, 17 NCTL Atomic bonding, 16 NCTL Elements that make up the human body, 15 NCTL Structure of the atom*).

Figure 10: How easy was it to use this learning object – Breakdown by cluster and year



Percentage of respondents rating the learning object as very easy or easy.

4.3 How helpful has the learning object been for learning this subject?

Respondents undertaking 70 of the 71 learning objects provided feedback on how helpful the learning object had been for learning their subject. From the 12,954 responses received, 97.9% of respondents rated the learning object 'Very helpful' or 'Helpful' in respect of learning the subject.

> *"It was really **helpful** seeing the different stages on screen rather than just reading it from a text book - it **helps** the information to sink in because you can then visualise it which also makes it easier to remember!"*
>
> *The menstrual cycle*

Figure 11 shows the respondent overall rating of the learning object helpfulness.

Figure 11: How helpful has the learning object been for learning this subject? – All respondents

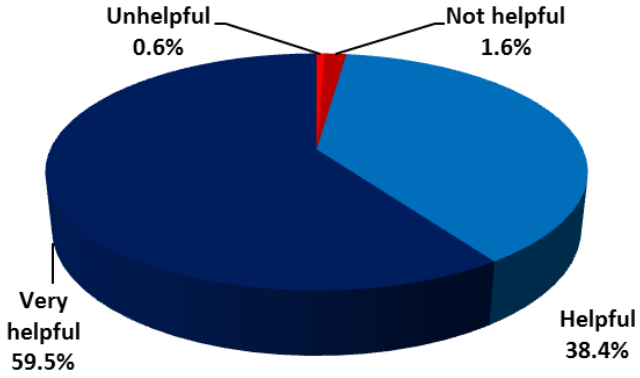


Table 11: How helpful has the learning object been for learning this subject? – All respondents

Unhelpful	74
Not helpful	202
Helpful	4970
Very helpful	7708

Number of respondents

Similar to previous questions, when broken down by respondent type, considerably more 'Other' respondents rated the learning object they accessed as 'Very helpful' (70.6%) when compared to staff and student ratings. However, similar to previous questions, there was very little difference (±0.5%) between respondent types rating the learning object as overall 'Very helpful' or 'Helpful', as shown in figure 12.

Figure 12: How helpful has the learning object been for learning this subject? – Breakdown by respondent type

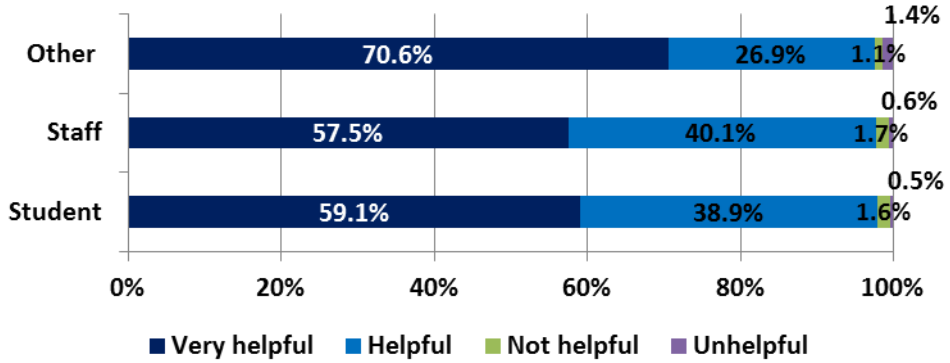


Table 12: How helpful has the learning object been for learning this subject? – Breakdown by respondent type

Respondent type	Very helpful	Helpful	Not helpful	Unhelpful
Other	649	247	10	13
Staff	1844	1287	55	20
Student	5210	3432	137	41

Number of respondents (excludes unknown respondent types)

Helpfulness by cluster type

Figure 13 shows respondent satisfaction levels for their learning object, grouped by cluster type. Although the percentage of respondents who found the learning object 'Very helpful' ranged from 51.3% to 66.4%, there were very little differences in satisfaction levels of repondents who though that overall, the learning object was 'Very helpful' of 'Helpful', with satisfaction percentages ranging from 96.8% of Biology Foundations respondents to 98.5% of Clinical Skills.

Figure 13: How helpful has the learning object been for learning this subject? – By cluster type

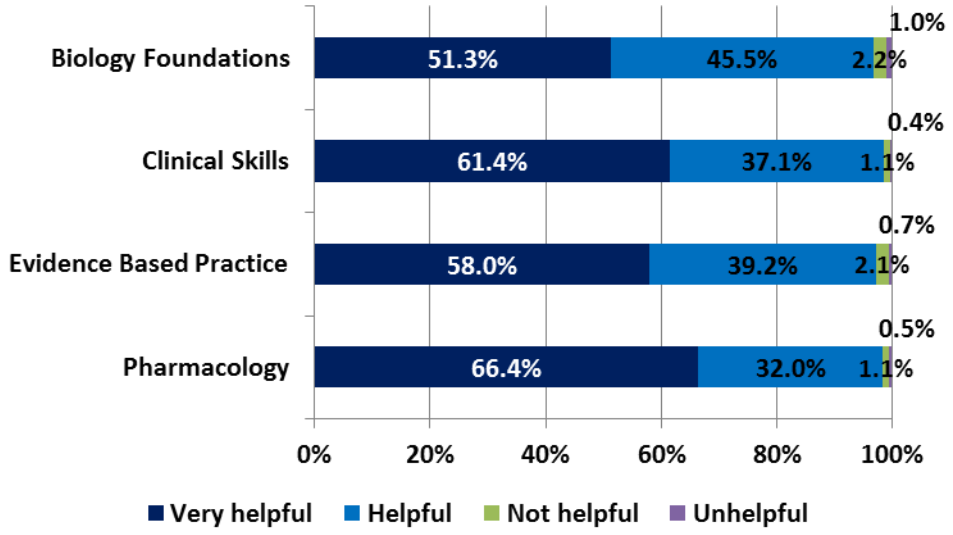


Table 13: How helpful has the learning object been for learning this subject? – Breakdown by cluster type

Cluster	Very helpful	Helpful	Not helpful	Unhelpful
Biology Foundations	1118	991	49	22
Clinical Skills	3338	2017	61	20
Evidence Based Practice	2027	1371	72	23
Pharmacology	1225	591	20	9

Number of respondents

Thirteen individual learning objects achieved 100% satisfaction with regards to respondents who thought that the learning object was 'Very helpful' or 'Helpful' in learning their subject. The vast majority of the remaining learning objects achieved overall satisfaction scores in the mid to high 90's, with only 2 learning objects achieving less than 90% of respondents who thought that the learning object was 'Very helpful' or 'Helpful' for learning their subject.

Appendix 4 lists the satisfaction scores for each learning object.

Helpfulness by geographical location

When comparing the helpfulness of the learning object by geographical location, figure 14 shows the satisfaction levels of respondents. All regions achieved high overall satisfaction scores, ranging from 96.1% of African respondents through to 100% of South American, Caribbean, and Middle Eastern respondents rating the learning object as 'Very helpful' or 'Helpful' for learning their subject.

Figure 14: How helpful has the learning object been for learning this subject? – By geographical region

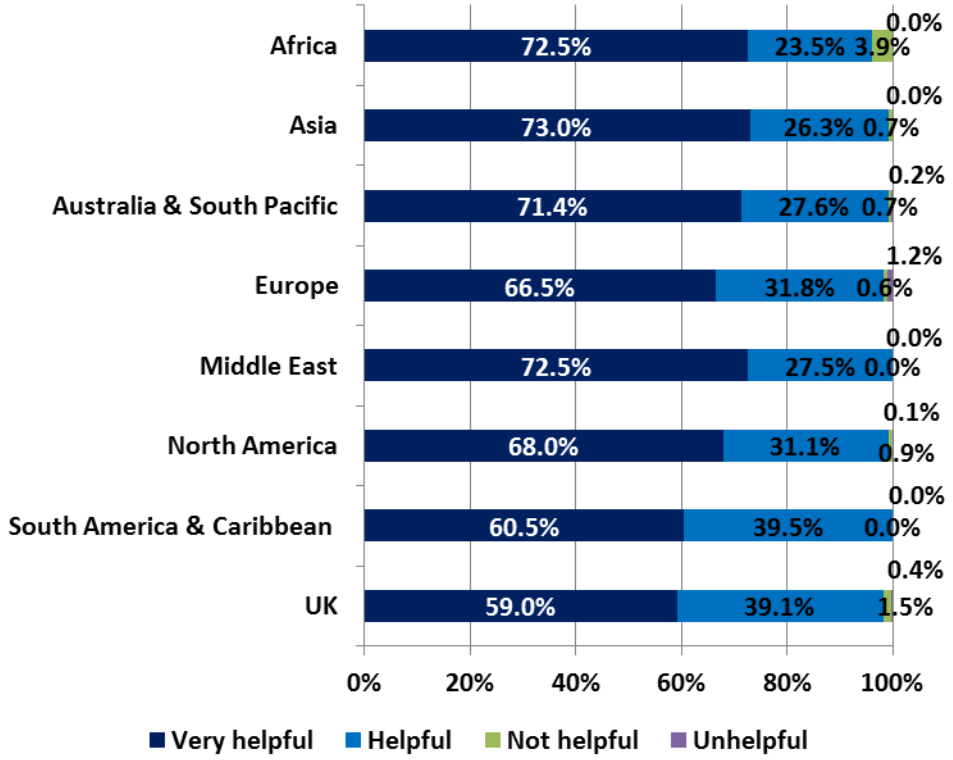


Table 14: How helpful has the learning object been for learning this subject? – Breakdown by geographical region

Location	Very helpful	Helpful	Not helpful	Unhelpful
Africa	37	12	2	0
Asia	100	36	1	0
Australia & South Pacific	297	115	3	1
Europe	115	55	1	2
Middle East	37	14	0	0
North America	716	327	9	1
South America & Caribbean	26	17	0	0
UK	4955	3280	123	35

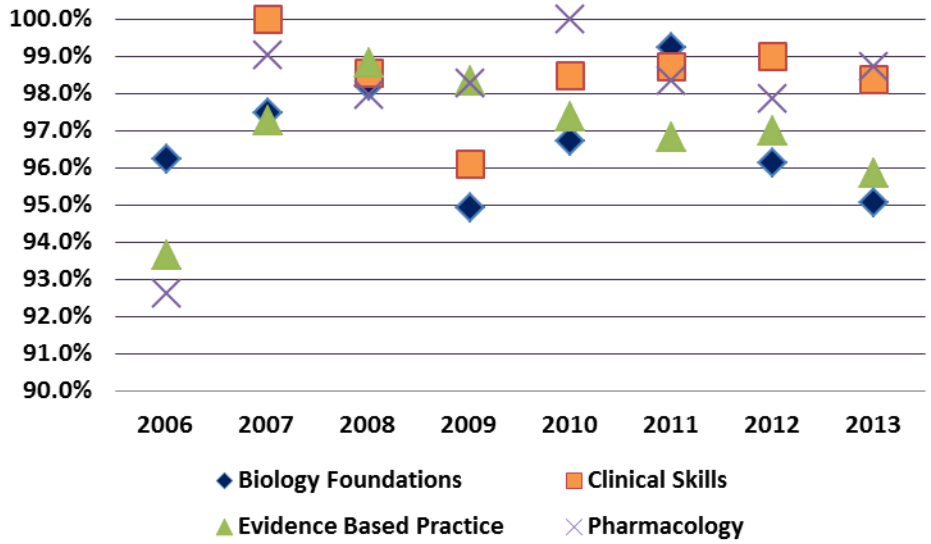
Number of respondents (excludes respondents who could not be allocated to a geographical region)

Helpfulness rating by year

Figure 15 shows the percentage of respondents by year who found the learning object 'Very helpful' or 'Helpful'. Other than 2006, satisfaction scores for all remaining years ranged from 95% to 100%.

Further analysis of the 2006 year outlier satisfaction scores for Pharmacology and Evidence Based Practice did not identify any reason why the satisfaction scores for these two clusters were lower than other years. However, both clusters had minimal number of respondents (Pharmacology n=27 and Evidence Based Practice n=63) in 2006 compared with significantly higher numbers of respondents for the following years.

Figure 15: How helpful has this learning object been? – Breakdown by cluster and year



Percentage of respondents rating the learning object as helpful or very helpful

4.4 Would you recommend the learning object to others?

Respondents undertaking all 71 learning objects provided feedback on their recommendation of the learning object to others. From the 13,026 responses received, 96.5% of respondents stated that they would recommend the learning object to others.

> *"Clear explanation with words illustrations and video to explain. Very clear and concise will **recommend** to students I mentor and friends."*
>
> *46 NLOL Aseptic Non-Touch Technique*

Figure 16 shows the overall percentage of respondents who would recommend the learning object.

Figure 16: Would you recommend this learning object to others? – All respondents

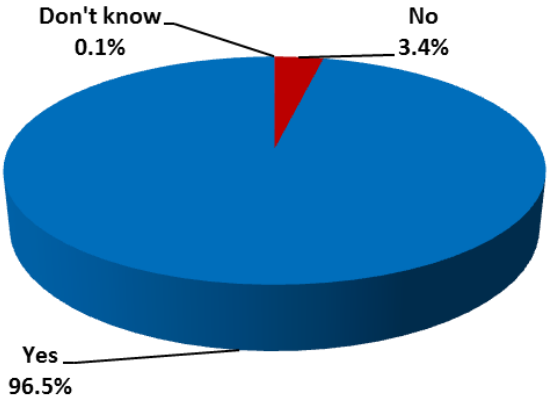


Table 15: Would you recommend the learning object to others? – All respondents

Don't know	6
No	449
Yes	12571

Number of respondents

When broken down by respondent type, there was very little difference between the percentage of students, staff or other respondents who would recommend the learning object, as shown in figure 17.

Figure 17: Would you recommend this learning object to others? – Breakdown by respondent type

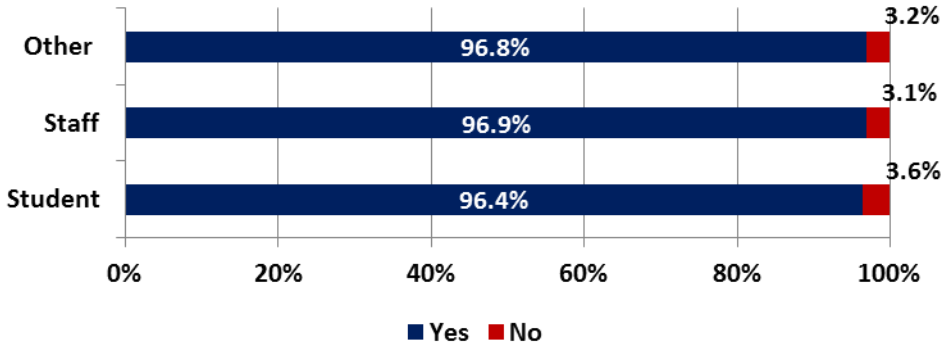


Table 16: Would you recommend the learning object to others? – Breakdown by respondent type

Respondent type	Yes	No
Other	883	29
Staff	3106	100
Student	8488	315

Number of respondens (excludes unknown respondent type)

Recommendation by cluster type

Figure 18 shows respondent recommendation for their learning object, groupled by cluster type. The overwhelming majority of respondents in each cluster stated that they would recommend the learning object to others.

Figure 18: Would you recommend this learning object to others? – Breakdown by cluster type

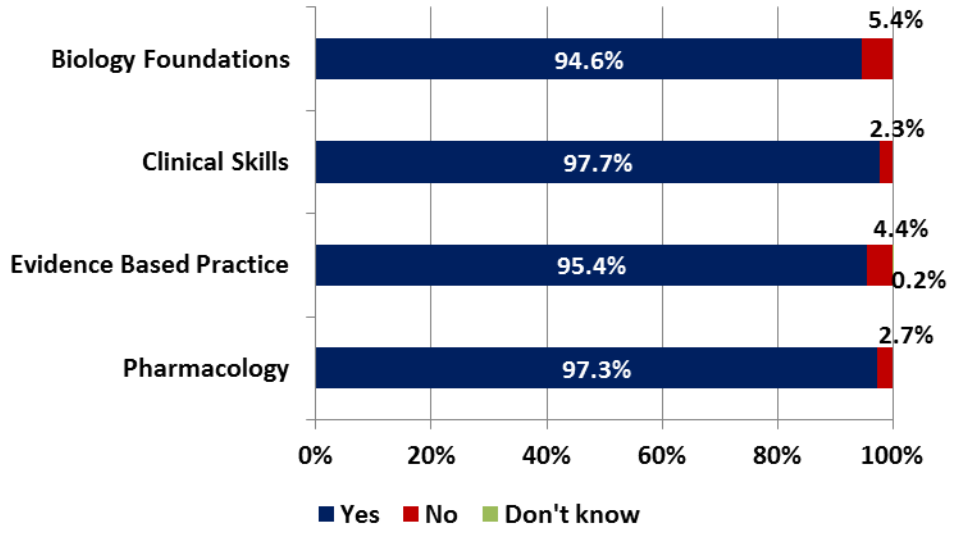


Table 17: Would you recommend the learning object to others? – Breakdown by cluster type

Cluster	Yes	No	Don't know
Biology Foundations	2055	118	0
Clinical Skills	5309	123	0
Evidence Based Practice	3417	158	6
Pharmacology	1790	50	0

Number of respondents

Seven individual learning objects achieved 100% of respondents who stated they would recommend the learning object to others, and in line with previous questions, the vast majority of learning objects achieved mid to high 90's percentage of respondents who would recommend the learning object to others.

Appendix 5 lists the satisfaction scores for each learning object.

Recommendation by geographical location

When comparing by geographical region, all regions achieved high percentages of respondents who would recommend the learning object, ranging from 96.1% in Africa, to 100% of respondents in South America and the Caribbean, as shown in figure 19.

Figure 19: Would you recommend this learning object to others? – Breakdown by geographical region

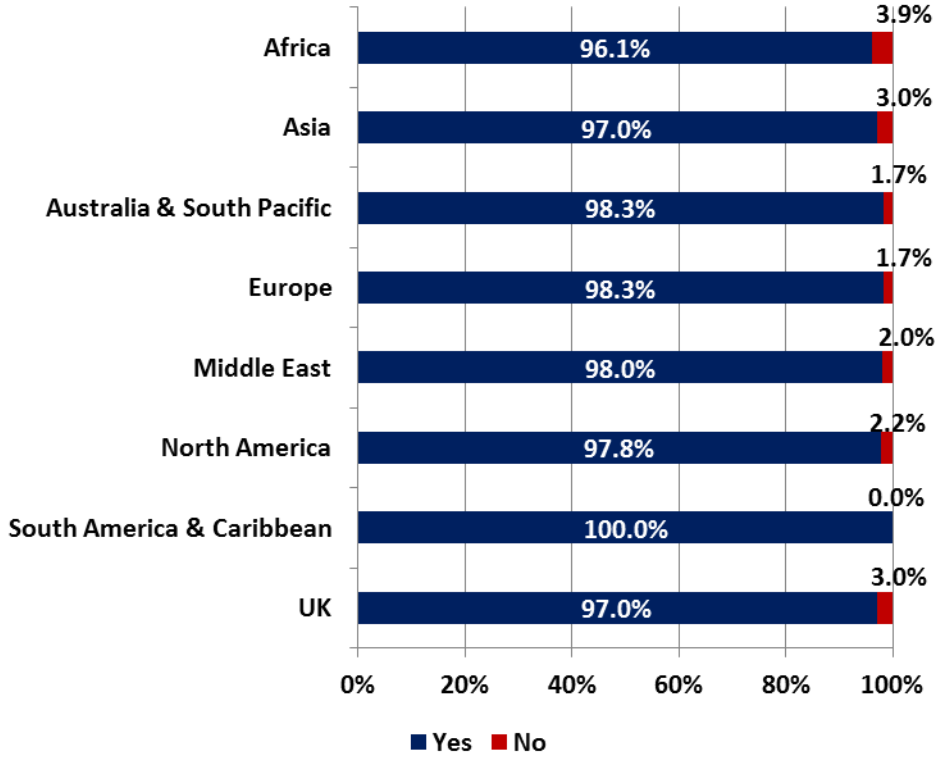


Table 18: Would you recommend the learning object to others? – Breakdown by geographical region

Location	Yes	No
Africa	49	2
Asia	129	4
Australia & South Pacific	406	7
Europe	169	3
Middle East	50	1
North America	1025	23
South America & Caribbean	43	0
UK	8145	252

Number of respondents (excludes respondents who could not be allocated to a geographical region)

Recommendation by year

While the percentage of respondents who would recommend the learning object remained consistently high (minimum 96%) year on year for Pharmacology and Clinical Skills clusters, there were wider variations in satisfaction levels from Biology Foundations and Evidence Based Practice respondents.

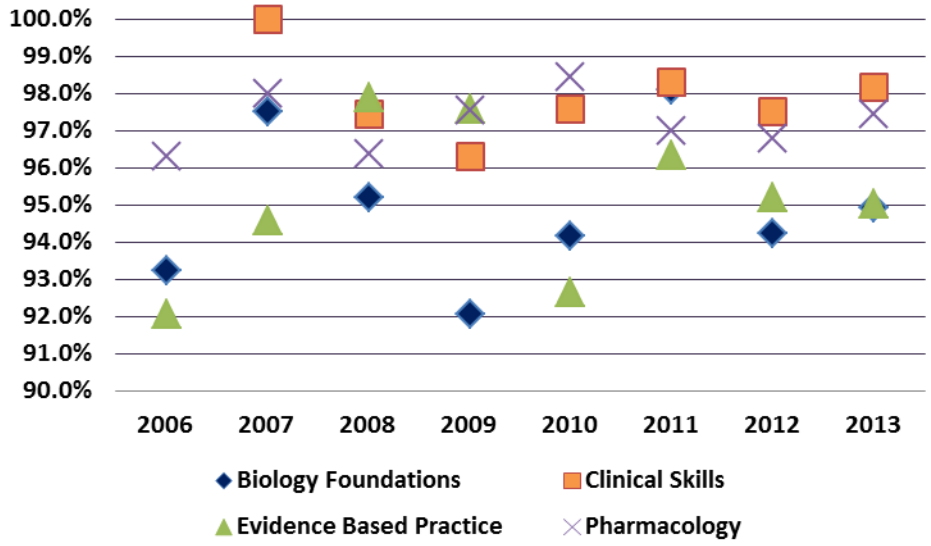
Further analysis was undertaken on the feedback years where Biology Foundations and Evidence Based Practice achieved less than 94% satisfaction to identify any issues, with findings as follows;

2006 feedback year – There were low numbers of respondents for Evidence Based Practice for this year and no individual learning object was identified as having significantly lower satisfaction levels. For Biology Foundations, the two learning objects that obtained the highest level of respondents who would not recommend the learning object were; *16 NCTL Elements that make up the human body* (8.9%) and *17 NCTL Atomic bonding* (10%).

2009 feedback year – Biology Foundations. The lowest satisfaction score was from *19 NCTL Acids and alkalis application*, in which 41.7% of respondents would not recommend the learning object. However, in the following years, all respondents who rated this learning object stated they **would** recommend it.

2010 feedback year – Two Evidence Based Practice learning objects had high percentages of respondents who would not recommend them when compared to other learning objects. *206 NSN* had 18.7% of respondents who would recommend the learning object, while *38NCTL Why critique research* had 17.9% of respondents who would not recommend it. However, for the remaining years, these two learning objects received significantly lower percentages of respondents who would not recommend them.

Figure 20: Would you recommend this learning object been? – Breakdown by cluster and year

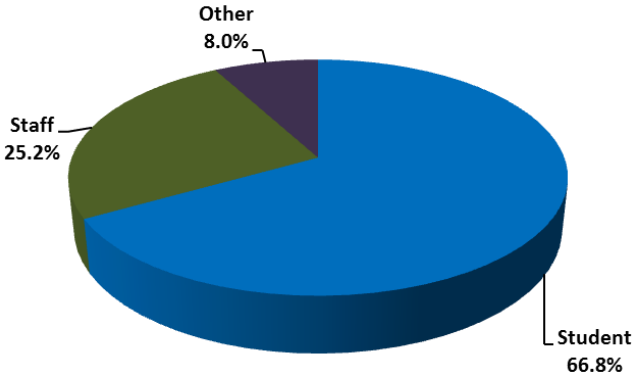


Percentage of respondents who would recommend the learning object

4.5 What do you like most about the learning object?

When asked what they liked most about the learning object they accessed, 10,045 respondents provided further comment. Figure 21 shows the profile of respondents providing further comment. Students accounted for 66.8% of comments made followed by staff with 25.2% of all comments and the remaining 8% of comments by others.

Figure 21: Respondent profile providing further comment on what they liked about the learning object?



"visual aids help to aid in faster learning and in much more detail than instructions."

176 NCTL Intramuscular injection by the Z track technique

Many of the respondents commented that using the e-learning object had been a positive experience in assisting their learning and understanding of the subject in question.

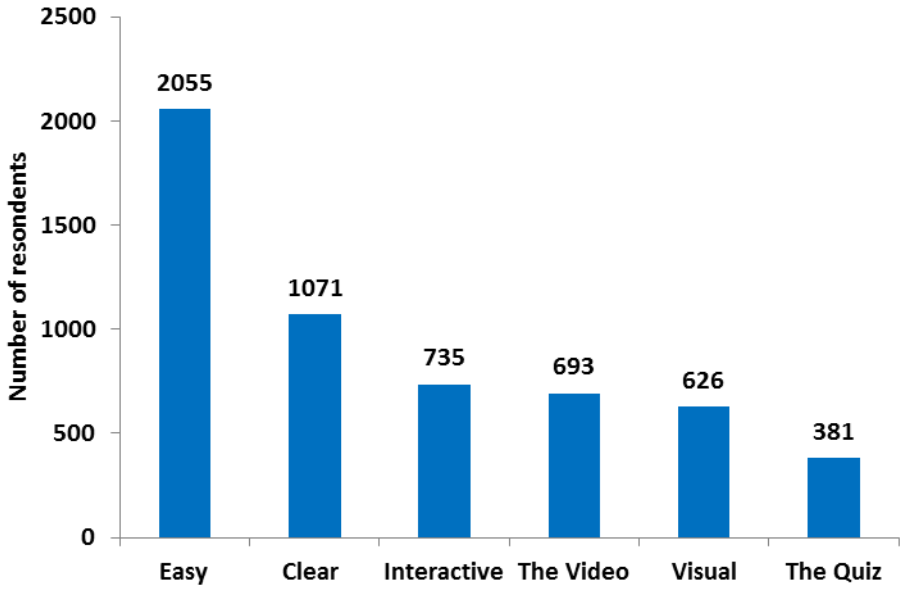
One group of respondents commented that the learning object had helped them gain a clearer understanding of the subject in question, whereas prior to accessing the resource they had been struggling. One respondent commented; "*It was really helpful seeing the different stages on screen rather than just reading it from a text book - it helps the information to sink in because you can then visualise it which also makes it easier to remember!* ".

Another group of respondents commented that the combination of visuals and audio really helped them understand the subject, with many commenting this method was far better than just reading text in a book, with comments such as; "*interesting to watch and listen to, rather than simply reading*", and "*I liked that it was e-learning based rather than a lecture as it was more interactive*".

There were a number of common themes identified by respondents' comments describing what they liked most about the learning object. The most frequently commented theme from respondents was ease of use of the learning object, which was commented on by 20.5% of respondents.

Figure 22 shows the most common appropriate key words identified, followed by a brief summary of respondents comments for each keyword.

Figure 22: Main key words used to describe what respondents liked most about the learning object



Ease of Use: 20.5% of respondents commented on the ease of use of the learning object. Many respondents commented that the learning object was easy to navigate with content which was easy to understand. One respondent commented that the learning object was "*To the point, informative, very clear, easy and user-friendly. A great resource!*". A number of respondents commented that by being short in length, the learning object made it easy for them to fit into an already busy day.

Clear: 10.7% of respondents commented on the clarity of the learning object they accessed, with many respondents commenting that this helped them understand the subject better. One respondent commented; "*it was very clear with easy to understand words and great diagrams-way better then I get in school!*" while another respondent commented that the learning object; "*was easy to work with clear and precise comments, making the information easy to absorb*". Several respondents commented on how the clarity of the information helped retain their interest and stopped them from getting bored.

Interactive: 7.3% of respondents liked the interactive aspect of the learning object, commenting that it made the information easier to follow and conveyed the relevant points in an interesting way. One respondent commented that this method; "*breaks up the usual monotony of studying*", while another respondent commented they preferred this method as they; "*do not learn well classically (i.e. reading from textbooks)".*

The Video: 6.9% of respondents liked use of the videos in the learning object to explain the subject and assist their understanding. Respondents commented that having the video enhanced their understanding of the subject. One respondent commenting that; "*The video demonstration was very helpful as I found it easier than watching a lecturer go through it quickly. With the video, I could rewind back to watch it again and again if need",* while another commented that they could; "*see what is going on rather than just having it explained in text".*

Visual: 6.2% of respondents liked the visual aids used by the learning object to explain the concept. A number of respondents commented that they liked how the learning object visually showed what was happening, rather than them trying to picture this in their head, with one respondent commenting; "*the course I am doing is all on the University's "Blackboard" web-site and by just reading I could not grasp it at all. So thank you*". A number of respondents commented that the use of visuals helped them retain information easier and obtain a clearer understanding of the subject.

The Quiz: 3.8% of respondents liked the quiz contained within the learning object as an aid to recap the subject and test their knowledge. Many respondents commented that the quiz helped them make sure the information they had learnt was correct, whilst others commented that the quiz reinforced their knowledge. *"the quiz at the end really ensured that I had understood the material"*.

Table 19 shows the percentage of respondents from each geographical region that used one of the keywords to describe what they liked most about the learning object.

Table 19: Percentage of respondents who used the keyword when describing what they most liked about the learning object – Breakdown by geographical location.

Geographical Region	Easy	Clear	Interactive	The video	Visual	The Quiz
Africa	9.6%	1.9%	1.9%	5.8%	1.9%	3.8%
Asia	13.9%	9.5%	1.5%	4.4%	3.6%	0.7%
Australia & South Pacific	14.4%	13.5%	8.7%	4.3%	7.7%	3.4%
Europe	7.5%	13.3%	4.6%	1.7%	5.2%	3.5%
Middle East	9.8%	2.0%	2.0%	2.0%	2.0%	5.9%
North America & Canada	10.6%	5.1%	9.4%	4.7%	7.6%	4.6%
South America & Caribbean	11.6%	7.0%	4.7%	11.6%	2.3%	2.3%
UK	17.7%	8.9%	5.8%	5.9%	4.7%	3.2%

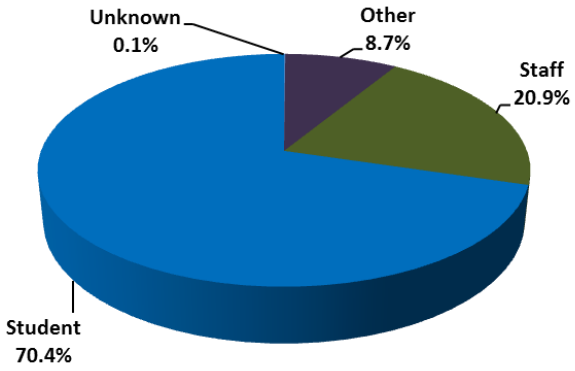
Percentage of ALL respondents for each geographical location [1]

1. Using Africa as an example: 52 respondents from Africa completed the survey, 30 respondents provided further comment on what they liked about the learning object, 5 of those respondents used the keyword "Easy". Therefore 9.6% (5 out of 52) of the African respondents used the keyword "Easy".

4.6 What did you not like about the learning object?

Respondents were asked to provide further comment on what they did not like about the learning object they had accessed. Although 6,738 respondents provided further comment, a large number of these respondents did not voice a dislike, but commented that there were no negative comments to be made. After excluding respondents who had not voiced a dislike, 4,103 provided a further comment or area for improvement. The majority of comments were from students as shown in figure 23.

Figure 23: Respondent profile providing further comment on what they did not like?



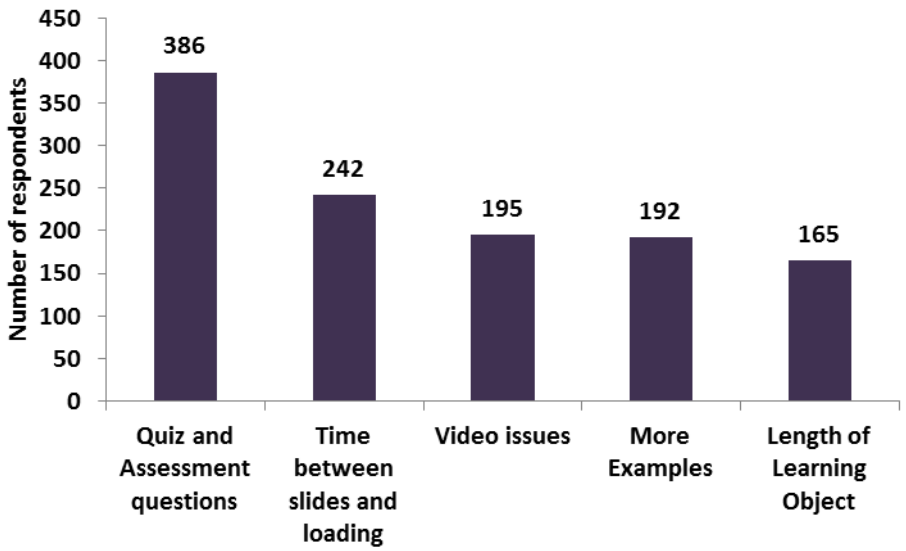
"It was a great learning model. Would love to see one longer with more information presented in the same fashion."

NUCL 52R Drug-receptor interaction

From the 4,103 respondents, there were very few who commented that they did not like the learning object. The majority of respondents commented that they liked the learning object and gave suggestions where in their opinion it could be improved.

A number of common themes on what respondents did not like or suggestions for improvement arose from comments, with the most frequently occuring themes being shown in figure 24.

Figure 24: Main themes used to describe what respondents did not like about the learning object, or would like to see improved



Quiz & Assessment Questions: 9.4% commented on the quiz and assessment areas of the learning object as an area for improvement, with the majority of respondents commenting that they would like more questions. Comments included; "*There weren't enough questions to test your knowledge*", and "*I would have liked to have even more questions to cover more of the objectives that were intended to be learned*".

Several respondents commented that it would be good to print out a certificate, with one respondent commenting as follows; "*Would be good to have a certificate to print off at the end to prove you have answered the questions correctly*".

Time between slides & loading: 5.9% of respondents commented on the length of time taken to progress from one slide to another and the length of time taken to load. The majority of comments related to the speed in which the learning object progressed with many of these respondents describing the pace as "*slow*".

A number of respondents commented there should be a button to allow the user to progress at their own pace, with one respondent commenting; "*too slow, maybe not for some; should be set up in such a way that participant has control over moving to next question*".

Video issues: 4.8% provided a wide range of comments in relation to issues they had with the video clips. The main theme from respondents was that the videos would not work with over 30 respondents unable to play the videos. Other issues raised included;

- No pause or rewind button. Several respondents commented that it would be good to be able to pause or rewind the video.
- Downloading the adobe / video player requirement. A number of respondents commented on the issues they had with downloading the flashplayer required to view the videos, with comments including: "*Provide a link to download the player! I couldn't play the video and had to search the web for a suitable player*", and "*it kept downloading flashplayer on each new section"*.

The video issues were not specific to any geographical region, as shown in table 20.

More Examples: 4.7% of respondents commented that they would like the learning object to contain more examples, with comments such as: "*A little more detail would have been helpful. Love examples maybe expand on some of the drug interaction examples a little more*", and "*limited examples used. Would be helpful to use more than one example*".

Length of Learning Object: 4.0% provided comments related to the length of the learning object they accessed. Almost all of these respondents commented that the learning object they accessed was in their opinion too short in length, with comments such as; "*too short need more examples*" and "*It could have gone into more detail and too short a presentation. However, it was useful. Thank you*". In contrast, several respondents commented that there was quite a lot of information to take in in such a short time.

Table 20 shows the percentage of respondents from each geographical region that used one of the themes to describe what they did not like about the learning object, or would like to see improved. None of the themes were specific to any given geographical location.

Table 20: Percentage of respondents who commented on each theme as an area they did not like, or would like to see improved. – By geographical location

Geographical Region	Quiz & Assessments	Time be-tween slides	Video issues	More examples	Length
Africa	1.9%	1.9%	0.0%	5.8%	5.8%
Asia	2.9%	1.5%	0.7%	4.4%	1.5%
Australia & South Pacific	3.8%	1.2%	1.7%	1.4%	1.4%
Europe	4.0%	1.7%	0.6%	1.7%	0.6%
Middle East	3.9%	0.0%	3.9%	7.8%	0.0%
North America & Canada	3.3%	1.9%	1.9%	1.4%	2.0%
South America & Caribbean	0.0%	2.3%	2.3%	2.3%	4.7%
UK	3.1%	2.0%	1.5%	1.3%	1.3%

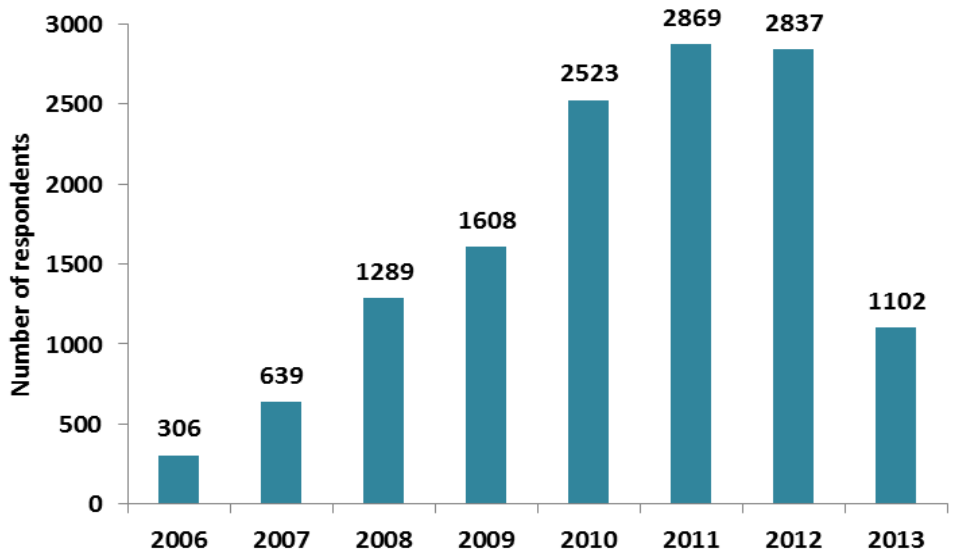
Percentage of ALL respondents for each geographical location (see point 1 table 19)

4.7 Usage of learning objects over time

Usage of the learning objects over time was measured by the number of survey questionnaires returned. The years 2006 and 2013 contain partial data. The year 2006 contains data from 16th May 2006, while the year 2013 contains data up to 15th July 2013. It is also worth noting that completion of the questionnaire was not compulsory, and therefore users of the learning objects are likely to be considerably greater than the numbers shown below.

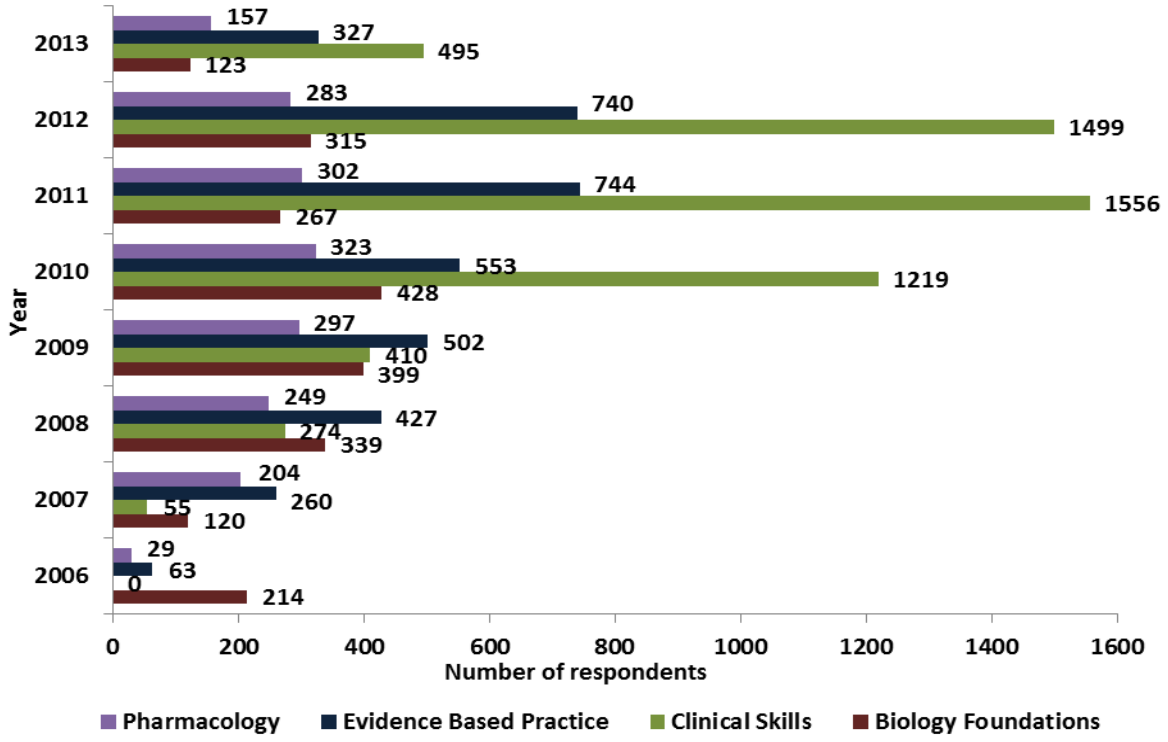
Figure 25 shows that there was a considerable increase in usage of the learning objects up to the year 2010 where usage appears to level out.

Figure 25: Usage of learning objects over time – All respondents



44 records were excluded due to date formatting issues.

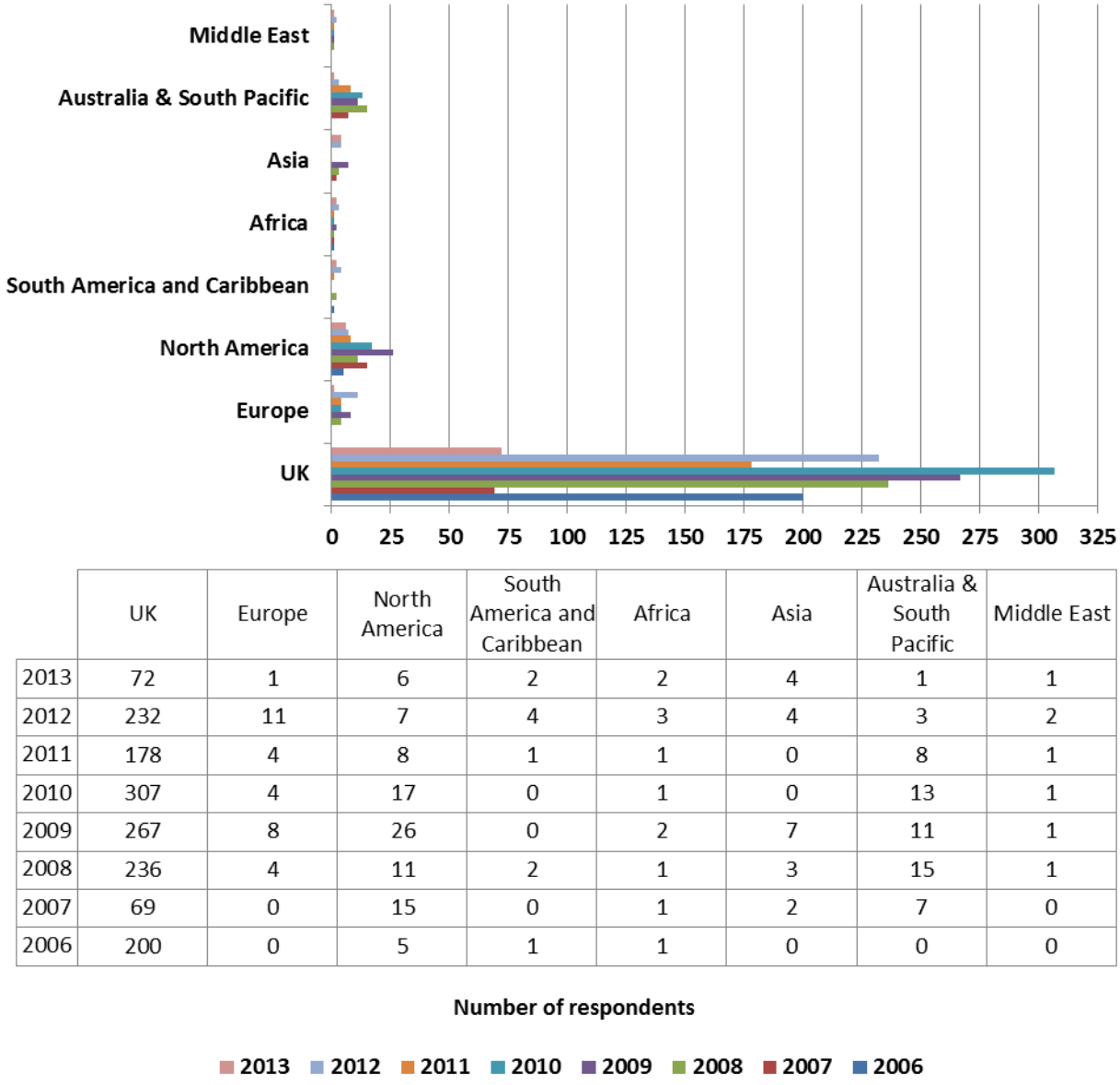
Figure 26: Usage of learning objects over time – Breakdown by cluster type



Geographical usage over time – Biology Foundations Cluster

Figure 27 shows the usage of the Biology Foundations cluster learning objects over time, by geographical location. The UK shows the highest usage, followed by North American respondents.

Figure 27: Usage of Biology Foundations Clusters learning objects over time – Breakdown by geographical location



	UK	Europe	North America	South America and Caribbean	Africa	Asia	Australia & South Pacific	Middle East
2013	72	1	6	2	2	4	1	1
2012	232	11	7	4	3	4	3	2
2011	178	4	8	1	1	0	8	1
2010	307	4	17	0	1	0	13	1
2009	267	8	26	0	2	7	11	1
2008	236	4	11	2	1	3	15	1
2007	69	0	15	0	1	2	7	0
2006	200	0	5	1	1	0	0	0

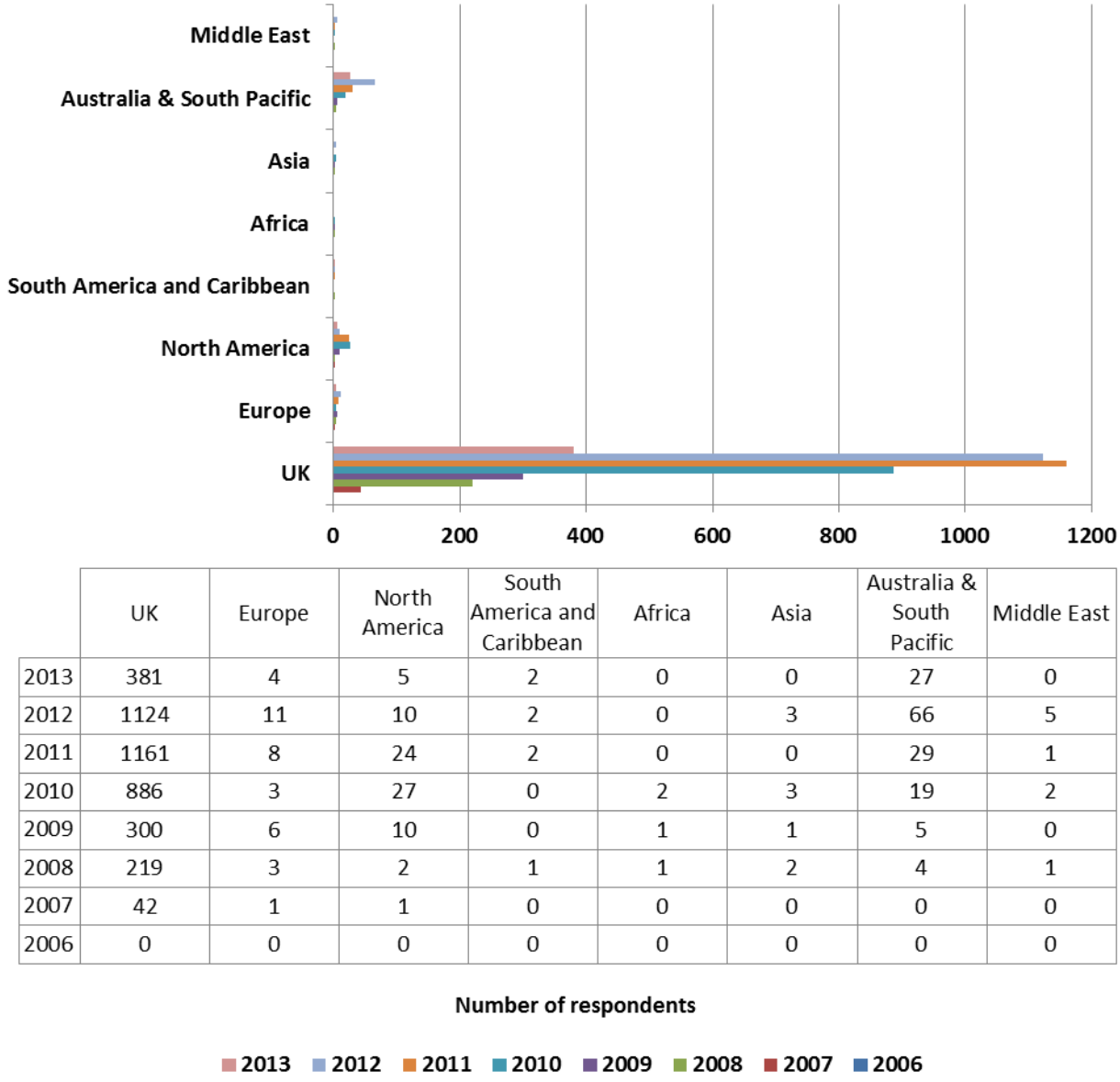
Excludes respondents from unknown geographical locations

Appendix 6 shows the number of respondents per year providing feedback for individual Biology Foundations learning objects.

Geographical usage over time – Clinical Skills Cluster

Figure 28 shows the usage of the Clinical Skills cluster learning objects over time, by geographical location. The UK shows the highest usage, followed by Australia and South Pacific respondents.

Figure 28: Usage of Clinical Skills Clusters learning objects over time – Breakdown by geographical location



	UK	Europe	North America	South America and Caribbean	Africa	Asia	Australia & South Pacific	Middle East
2013	381	4	5	2	0	0	27	0
2012	1124	11	10	2	0	3	66	5
2011	1161	8	24	2	0	0	29	1
2010	886	3	27	0	2	3	19	2
2009	300	6	10	0	1	1	5	0
2008	219	3	2	1	1	2	4	1
2007	42	1	1	0	0	0	0	0
2006	0	0	0	0	0	0	0	0

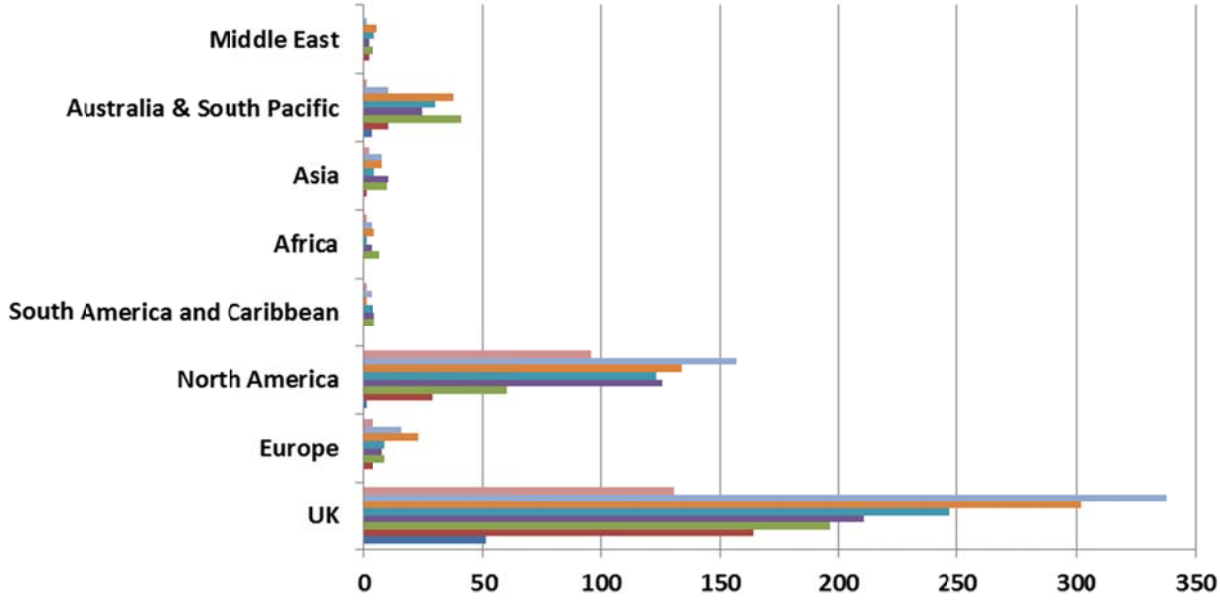
Excludes respondents from unknown geographical locations

Appendix 7 shows the number of respondents per year providing feedback for individual Clinical Skills learning objects.

Geographical usage over time – Evidence Based Practice Cluster

Figure 29 shows the usage of the Evidence Based Practice cluster learning objects over time, by geographical location. The UK shows the highest usage, followed by North American respondents.

Figure 29: Usage of Evidence Based Practice Clusters learning objects over time – Breakdown by geographical location



	UK	Europe	North America	South America and Caribbean	Africa	Asia	Australia & South Pacific	Middle East
2013	131	4	96	1	1	2	1	0
2012	338	16	157	3	3	8	11	1
2011	302	23	134	1	5	8	38	6
2010	247	9	123	4	1	5	30	5
2009	211	8	126	5	3	11	25	2
2008	197	9	60	5	7	10	41	4
2007	164	4	29	0	0	1	11	2
2006	51	0	1	0	0	0	3	0

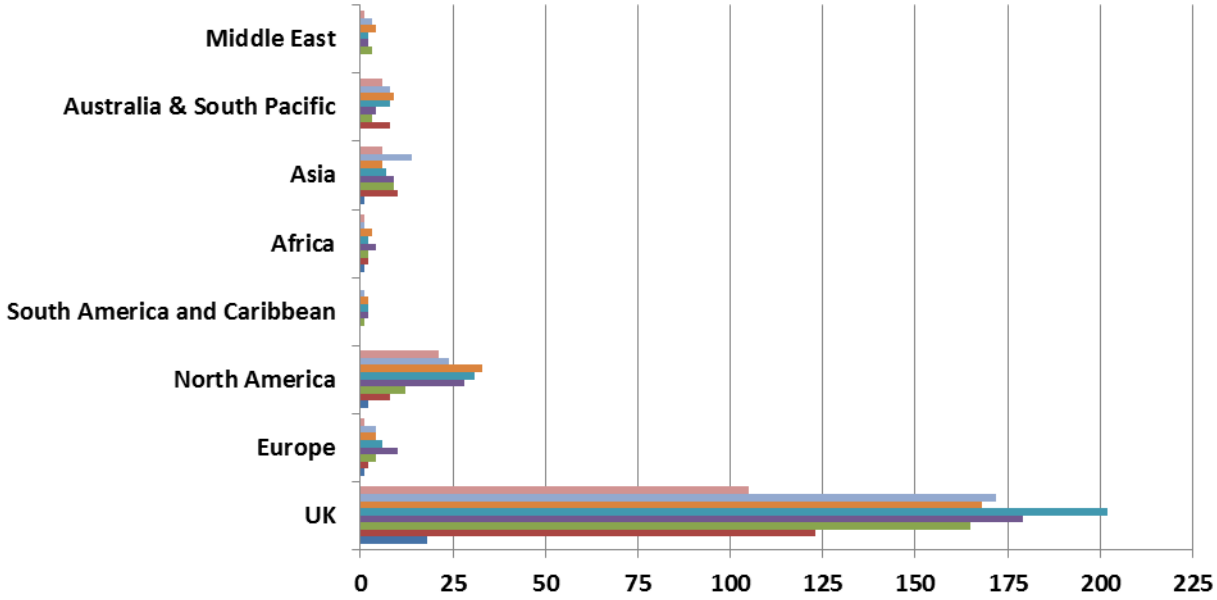
Excludes respondents from unknown geographical locations

Appendix 8 shows the number of respondents per year providing feedback for individual Evidence Based Practice learning objects.

Geographical usage over time – Pharmacology Cluster

Figure 30 shows the usage of the pharmacology cluster learning objects over time, by geographical location. The UK shows the highest usage, followed by North American respondents.

Figure 30: Usage of Pharmacology Clusters learning objects over time – Breakdown by geographical location



	UK	Europe	North America	South America and Caribbean	Africa	Asia	Australia & South Pacific	Middle East
2013	105	1	21	0	1	6	6	1
2012	172	4	24	1	1	14	8	3
2011	168	4	33	2	3	6	9	4
2010	202	6	31	2	2	7	8	2
2009	179	10	28	2	4	9	4	2
2008	165	4	12	1	2	9	3	3
2007	123	2	8	0	2	10	8	0
2006	18	1	2	0	1	1	0	0

Excludes respondents from unknown geographical locations

Appendix 9 shows the number of respondents per year providing feedback for individual Pharmacology learning objects.

5. Summary

Feedback provided by respondents accessing the School of Nursing, Midwifery and Physiotherapy, e-Learning Objects has shown that the e-Learning Objects are a worthwhile tool when it comes to learning the subject in question. Respondents commented that the e-Learning Object had helped them gain a better understanding of the subject.

Respondents liked the interactive aspect of the e-learning object, including the videos and audio, with many respondents commenting that this method held their attention better and was preferred to the traditional method of learning from a book. Respondents also liked the fact that they could learn at their own pace and revisit areas of the e-learning object if required.

Overall, almost all respondents thought the e-learning object was an excellent or good resource (97.9%), very easy or easy to use (96.5%), was very helpful or helpful for learning the subject in question (97.9%), and would recommend the e-learning object to others (96.5).

6. Appendix

Appendix 1: Copy of typical questionnaire used to obtain respondent feedback.

An introduction to receptor pharmacology

(NCTL_174)

1 How would you rate this learning object?

- Excellent
- Good
- Not good
- Poor

2 How easy was it to use the learning object?

- Very easy
- Easy
- Not easy
- Difficult

3 How helpful has the learning object been for learning this subject?

- Very helpful
- Helpful
- Not helpful
- Unhelpful

4 Would you recommend it to others?

- Yes
- No

5 What did you like most about this learning object?

6 What did you not like about this learning object?

7 * Are you a student or a member of staff?

- Student
- Staff
- Other (please specify)

8 Which module are you studying/teaching?

9 Which university/institution are you from?

- Cambridge
- LondonMet
- Nottingham
- Other (please specify)

10 If you would be willing to give more detailed feedback on this and other learning objects, please fill in your details

Name

Email address

Appendix 2: How would you rate this learning object? – Feedback for each learning object

Resource	Excellent	Good	Total Excellent and Good
57 NSN Home visiting	41.1%	58.9%	100.0%
NCTL178 Intramusclar injection sites for adults	45.3%	54.7%	100.0%
1 NCTL Probability associated with inferential statistics	58.3%	41.7%	100.0%
52 NUCL Drug-receptor interaction	59.0%	41.0%	100.0%
Measuring BMI (CCTL240)	61.5%	38.5%	100.0%
NCTL174 Introduction to receptor pharmacology	66.7%	33.3%	100.0%
Chronic Wound Assessment (231NSN)	69.4%	30.6%	100.0%
6 NCTL NNT NNH	70.7%	29.3%	100.0%
70 NSN Starling's Forces	71.3%	28.8%	100.0%
66 NSN Plasma Proteins and Drug Distribution	71.4%	28.6%	100.0%
35 NSN Presenting and interpreting meta-analyses	71.4%	28.6%	100.0%
10 NCTL Positive and predictive value of diagnostic tests	74.2%	25.8%	100.0%
87 NSN Midwife's abdominal examination in the antenatal period	78.9%	21.1%	100.0%
NCTL 213 Subcutaneous injection techniques	80.4%	19.6%	100.0%
48 NUCL Bioavailability	50.5%	49.1%	99.5%
55 NUCL Hand hygiene	45.9%	53.4%	99.3%
42 NSN Glomerular filtration	61.8%	37.5%	99.3%
9 NCTL Sensitivity and Specificity	76.5%	22.7%	99.2%
34 NSN Meta-analysis	62.2%	36.9%	99.1%
Food Hygiene	47.6%	51.4%	98.9%
3 NCTL Designing a questionnaire	25.0%	73.9%	98.9%
68 NSN Respiratory ventilation	65.9%	33.0%	98.9%
105 NLOL Introduction to drug clearance	66.7%	32.2%	98.9%
45 NLOL Glove use	49.9%	48.8%	98.7%
60 NUCL Levels of measurement	47.9%	50.7%	98.6%
46 NLOL Aseptic Non-Touch Technique	47.1%	51.5%	98.5%
5 NCTL Relative risk reduction and absolute risk reduction	68.6%	29.9%	98.5%
41 NCTL Advanced literature searching	41.8%	56.7%	98.5%
2 NCTL Qualitative and quantitative research	40.3%	58.2%	98.4%
What is evidence-based practice	18.3%	80.0%	98.3%
NCTL153 - Components of a respiratory assessment	55.0%	43.3%	98.3%
39 NLOL Inflammatory response (1)	64.5%	33.8%	98.3%
176 NCTL Intramuscular injection by the Z track technique	70.7%	27.6%	98.3%
The menstrual cycle	41.0%	57.2%	98.1%
NCTL79 Targets for drug action (2)	70.0%	28.0%	98.0%
47 NLOL Bacteria and viruses compared	51.8%	46.0%	97.8%
13 NCTL Descriptive statistics for interval and ratio scale data	61.9%	35.8%	97.8%
74 NUCL Understanding First Pass Metabolism	50.6%	47.1%	97.7%
184 NCTL Tissue Fluid Formation	59.5%	38.2%	97.7%
86 NLOL PPE	51.2%	46.5%	97.7%
44 NLOL Volume of Distribution	63.5%	34.0%	97.5%
18 NCTL Acids and alkalis introduction	58.4%	39.0%	97.4%

32 NSN Heart failure (1)	41.9%	55.4%	97.3%
15 NCTL Structure of the atom	35.3%	61.4%	96.7%
23 NCTL What are journals	34.5%	62.1%	96.6%
53 NUCL Exploring the synapse	58.6%	37.9%	96.6%
Asking the right question	34.5%	61.9%	96.5%
NCTL111 - Skin preparation prior to intramuscular and subcutaneous injections	57.1%	39.3%	96.4%
54 NUCL Half-life of drugs	64.1%	32.3%	96.4%
38NCTL Why critique research	25.3%	70.8%	96.1%
7 NCTL Confidence intervals	53.3%	42.7%	96.0%
64 NUCL Lock and Key Hypothesis	40.4%	55.3%	95.6%
101 NCTL How to conduct a literature search	42.3%	53.0%	95.2%
102 NLOL: Home Hazards	36.8%	57.9%	94.7%
40 NCTL Referencing your work using Harvard	70.5%	24.2%	94.7%
Qualitative data analysis	40.0%	53.3%	93.3%
NCTL161 Referencing Websites using Harvard	65.4%	27.1%	92.5%
59 NSN Kidney Physiology	66.1%	25.8%	91.9%
17 NCTL Atomic bonding	34.7%	55.6%	90.3%
19 NCTL Acids and alkalis application	39.1%	50.0%	89.1%
16 NCTL Elements that make up the human body	20.8%	68.1%	88.9%

Appendix 3: How easy was it to use the learning object? – Feedback for each learning object

Resource	Very Easy	Easy	Total easy and very easy
NCTL178 Intramusclar injection sites for adults	69.8%	30.2%	100.0%
NCTL174 Introduction to receptor pharmacology	69.0%	31.0%	100.0%
Measuring BMI (CCTL240)	86.8%	13.2%	100.0%
86 NLOL PPE	74.4%	25.6%	100.0%
6 NCTL NNT NNH	60.3%	39.7%	100.0%
32 NSN Heart failure (1)	63.5%	36.5%	100.0%
176 NCTL Intramuscular injection by the Z track technique	70.7%	29.3%	100.0%
87 NSN Midwife's abdominal examination in the antenatal period	79.9%	19.0%	99.0%
3 NCTL Designing a questionnaire	63.0%	35.9%	98.9%
68 NSN Respiratory ventilation	71.6%	27.3%	98.9%
105 NLOL Introduction to drug clearance	71.3%	27.6%	98.9%
46 NLOL Aseptic Non-Touch Technique	68.8%	30.0%	98.8%
70 NSN Starling's Forces	59.5%	39.2%	98.7%
10 NCTL Positive and predictive value of diagnostic tests	72.2%	26.5%	98.7%
101 NCTL How to conduct a literature search	74.7%	23.8%	98.5%
41 NCTL Advanced literature searching	52.2%	46.3%	98.5%
45 NLOL Glove use	66.5%	31.9%	98.4%
35 NSN Presenting and interpreting meta-analyses	76.5%	21.8%	98.3%
23 NCTL What are journals	53.4%	44.8%	98.3%
9 NCTL Sensitivity and Specificity	79.7%	18.3%	98.1%

NCTL 213 Subcutaneous injection techniques	84.5%	13.4%	97.9%
47 NLOL Bacteria and viruses compared	61.2%	36.7%	97.8%
48 NUCL Bioavailability	58.4%	39.4%	97.7%
Asking the right question	67.0%	30.4%	97.3%
57 NSN Home visiting	67.6%	29.7%	97.3%
5 NCTL Relative risk reduction and absolute risk reduction	66.4%	30.7%	97.1%
206 NSN	69.8%	27.1%	96.9%
The menstrual cycle	65.9%	30.8%	96.7%
74 NUCL Understanding First Pass Metabolism	62.4%	34.3%	96.7%
NCTL153 - Components of a respiratory assessment	64.5%	32.2%	96.7%
Qualitative data analysis	53.3%	43.3%	96.7%
66 NSN Plasma Proteins and Drug Distribution	68.0%	28.6%	96.6%
53 NUCL Exploring the synapse	78.9%	17.5%	96.5%
NCTL111 - Skin preparation prior to intramuscular and subcutaneous injections	75.0%	21.4%	96.4%
34 NSN Meta-analysis	70.3%	26.1%	96.4%
13 NCTL Descriptive statistics for interval and ratio scale data	65.7%	30.6%	96.3%
44 NLOL Volume of Distribution	67.9%	28.3%	96.2%
42 NSN Glomerular filtration	64.6%	31.3%	95.8%
40 NCTL Referencing your work using Harvard	69.5%	26.3%	95.8%
39 NLOL Inflammatory response (1)	74.7%	21.0%	95.7%
Food Hygiene	54.3%	41.4%	95.7%
38NCTL Why critique research	57.0%	38.6%	95.5%
2 NCTL Qualitative and quantitative research	54.4%	40.9%	95.3%
What is evidence-based practice	49.2%	45.9%	95.1%
55 NUCL Hand hygiene	58.2%	36.7%	94.9%
52 NUCL Drug-receptor interaction	69.2%	25.6%	94.9%
Chronic Wound Assessment (231NSN)	83.3%	11.1%	94.4%
60 NUCL Levels of measurement	63.4%	31.0%	94.4%
184 NCTL Tissue Fluid Formation	61.6%	32.4%	94.1%
18 NCTL Acids and alkalis introduction	61.7%	31.8%	93.5%
54 NUCL Half-life of drugs	62.7%	30.8%	93.5%
7 NCTL Confidence intervals	62.0%	30.7%	92.7%
15 NCTL Structure of the atom	45.6%	46.7%	92.3%
64 NUCL Lock and Key Hypothesis	56.1%	36.0%	92.1%
102 NLOL: Home Hazards	55.3%	36.8%	92.1%
59 NSN Kidney Physiology	64.5%	27.4%	91.9%
NCTL79 Targets for drug action (2)	71.4%	20.4%	91.8%
1 NCTL Probability associated with inferential statistics	66.7%	25.0%	91.7%
NCTL161 Referencing Websites using Harvard	72.6%	17.9%	90.6%
19 NCTL Acids and alkalis application	30.4%	52.2%	82.6%
17 NCTL Atomic bonding	34.7%	44.4%	79.2%
16 NCTL Elements that make up the human body	23.9%	49.3%	73.2%

Appendix 4: How helpful has this learning object been? – Feedback for each learning object

Resource	Very Helpful	Helpful	Total Very helpful & Helpful
35 NSN Presenting and interpreting meta-analyses	77.3%	22.7%	100.0%
6 NCTL NNT NNH	75.9%	24.1%	100.0%
87 NSN Midwife's abdominal examination in the antenatal period	75.5%	24.5%	100.0%
86 NLOL PPE	68.6%	31.4%	100.0%
NCTL174 Introduction to receptor pharmacology	65.9%	34.1%	100.0%
68 NSN Respiratory ventilation	65.5%	34.5%	100.0%
Measuring BMI (CCTL240)	65.4%	34.6%	100.0%
NCTL153 - Components of a respiratory assessment	65.0%	35.0%	100.0%
NCTL178 Intramusclar injection sites for adults	57.7%	42.3%	100.0%
NCTL31R Systematic review steps	56.4%	43.6%	100.0%
NCTL40R Referencing using modified Harvad	54.4%	45.6%	100.0%
57 NSN Home visiting	47.3%	52.7%	100.0%
NCTL38R Wht Critique Research	22.2%	77.8%	100.0%
66 NSN Plasma Proteins and Drug Distribution	76.0%	23.7%	99.7%
NUCL 52R Drug-receptor interaction	69.3%	30.3%	99.6%
48 NUCL Bioavailability	59.3%	40.3%	99.5%
10 NCTL Positive and predictive value of diagnostic tests	74.8%	24.5%	99.3%
5 NCTL Relative risk reduction and absolute risk reduction	76.6%	22.6%	99.3%
9 NCTL Sensitivity and Specificity	79.2%	20.0%	99.2%
NCTL 213 Subcutaneous injection techniques	82.3%	16.7%	99.0%
NCTL09R Sensitivity and Specificity	83.2%	15.8%	98.9%
105 NLOL Introduction to drug clearance	66.7%	32.2%	98.9%
70 NSN Starling's Forces	68.4%	30.4%	98.7%
45 NLOL Glove use	63.1%	35.6%	98.7%
55 NUCL Hand hygiene	58.2%	40.5%	98.6%
42 NSN Glomerular filtration	61.5%	37.1%	98.6%
60 NUCL Levels of measurement	56.3%	42.3%	98.6%
41 NCTL Advanced literature searching	59.7%	38.8%	98.5%
13 NCTL Descriptive statistics for interval and ratio scale data	66.9%	31.6%	98.5%
NSN211R SBAR	61.5%	37.0%	98.4%
2 NCTL Qualitative and quantitative research	51.7%	46.7%	98.4%
1 NCTL Probability associated with inferential statistics	61.0%	37.3%	98.3%
176 NCTL Intramuscular injection by the Z track technique	69.0%	29.3%	98.3%
54 NUCL Half-life of drugs	71.0%	27.2%	98.2%
53 NUCL Exploring the synapse	64.3%	33.9%	98.2%
23 NCTL What are journals	39.3%	58.9%	98.2%
46 NLOL Aseptic Non-Touch Technique	57.9%	40.3%	98.2%
NCTL02R Qualitative and Quantitative Research	58.2%	40.0%	98.2%
NCTL79 Targets for drug action (2)	72.9%	25.0%	97.9%
47 NLOL Bacteria and viruses compared	46.0%	51.8%	97.8%
3 NCTL Designing a questionnaire	33.7%	64.1%	97.8%

Food Hygiene	59.6%	38.3%	97.8%
The menstrual cycle	43.3%	54.3%	97.6%
44 NLOL Volume of Distribution	69.8%	27.7%	97.5%
52 NUCL Drug-receptor interaction	68.4%	28.9%	97.4%
18 NCTL Acids and alkalis introduction	56.6%	40.8%	97.4%
34 NSN Meta-analysis	69.4%	27.9%	97.3%
32 NSN Heart failure (1)	54.1%	43.2%	97.3%
Chronic Wound Assessment (231NSN)	75.0%	22.2%	97.2%
39 NLOL Inflammatory response (1)	65.7%	31.3%	97.0%
NCTL10R PPV and NPV	43.8%	53.1%	96.9%
What is evidence-based practice	19.7%	77.0%	96.7%
7 NCTL Confidence intervals	59.5%	37.2%	96.6%
64 NUCL Lock and Key Hypothesis	51.3%	45.1%	96.5%
74 NUCL Understanding First Pass Metabolism	57.8%	38.6%	96.4%
184 NCTL Tissue Fluid Formation	58.7%	37.6%	96.3%
NCTL111 - Skin preparation prior to intramuscular and subcutaneous injections	59.3%	37.0%	96.3%
15 NCTL Structure of the atom	40.2%	56.0%	96.2%
101 NCTL How to conduct a literature search	52.0%	43.5%	95.5%
Different types of Epithelia (244NSN)	51.3%	43.6%	94.9%
40 NCTL Referencing your work using Harvard	71.6%	23.2%	94.7%
102 NLOL: Home Hazards	47.4%	47.4%	94.7%
Asking the right question	42.5%	52.2%	94.7%
38NCTL Why critique research	29.2%	65.3%	94.5%
16 NCTL Elements that make up the human body	31.0%	63.4%	94.4%
59 NSN Kidney Physiology	61.3%	30.6%	91.9%
17 NCTL Atomic bonding	36.1%	55.6%	91.7%
NCTL161 Referencing Websites using Harvard	68.3%	23.1%	91.3%
19 NCTL Acids and alkalis application	35.6%	51.1%	86.7%
Qualitative data analysis	30.0%	50.0%	80.0%

Appendix 5: Would you recommend this learning object to others? – Feedback for each learning object

Resource	Yes
NCTL31R Systematic review steps	100.0%
Measuring BMI (CCTL240)	100.0%
86 NLOL PPE	100.0%
70 NSN Starling's Forces	100.0%
6 NCTL NNT NNH	100.0%
35 NSN Presenting and interpreting meta-analyses	100.0%
10 NCTL Positive and predictive value of diagnostic tests	100.0%
87 NSN Midwife's abdominal examination in the antenatal period	99.7%
66 NSN Plasma Proteins and Drug Distribution	99.5%
48 NUCL Bioavailability	99.1%
NCTL09R Sensitivity and Specificity	98.9%

NUCL 52R Drug-receptor interaction	98.7%
NCTL40R Referencing using modified Harvad	98.5%
5 NCTL Relative risk reduction and absolute risk reduction	98.5%
23 NCTL What are journals	98.3%
176 NCTL Intramuscular injection by the Z track technique	98.2%
NCTL178 Intramusclar injection sites for adults	98.1%
9 NCTL Sensitivity and Specificity	98.0%
NSN211R SBAR	97.9%
NCTL 213 Subcutaneous injection techniques	97.9%
45 NLOL Glove use	97.8%
68 NSN Respiratory ventilation	97.7%
105 NLOL Introduction to drug clearance	97.7%
NCTL174 Introduction to receptor pharmacology	97.6%
NCTL153 - Components of a respiratory assessment	97.5%
52 NUCL Drug-receptor interaction	97.4%
57 NSN Home visiting	97.3%
46 NLOL Aseptic Non-Touch Technique	97.3%
Chronic Wound Assessment (231NSN)	97.1%
41 NCTL Advanced literature searching	97.0%
13 NCTL Descriptive statistics for interval and ratio scale data	97.0%
55 NUCL Hand hygiene	96.9%
NCTL10R PPV and NPV	96.9%
Food Hygiene	96.8%
3 NCTL Designing a questionnaire	96.7%
1 NCTL Probability associated with inferential statistics	96.6%
NCTL02R Qualitative and Quantitative Research	96.4%
42 NSN Glomerular filtration	96.4%
54 NUCL Half-life of drugs	96.4%
34 NSN Meta-analysis	96.4%
2 NCTL Qualitative and quantitative research	96.2%
NCTL111 - Skin preparation prior to intramuscular and subcutaneous injections	96.2%
60 NUCL Levels of measurement	95.7%
39 NLOL Inflammatory response (1)	95.7%
47 NLOL Bacteria and viruses compared	95.7%
44 NLOL Volume of Distribution	95.6%
64 NUCL Lock and Key Hypothesis	95.5%
18 NCTL Acids and alkalis introduction	95.4%
74 NUCL Understanding First Pass Metabolism	95.1%
15 NCTL Structure of the atom	95.1%
Different types of Epithelia (244NSN)	94.9%
53 NUCL Exploring the synapse	94.7%
40 NCTL Referencing your work using Harvard	94.7%
102 NLOL: Home Hazards	94.7%
7 NCTL Confidence intervals	94.6%
32 NSN Heart failure (1)	94.6%
The menstrual cycle	94.5%

NCTL38R Why Critique Research	94.4%
Asking the right question	93.7%
NCTL79 Targets for drug action (2)	93.6%
184 NCTL Tissue Fluid Formation	93.6%
101 NCTL How to conduct a literature search	92.5%
What is evidence-based practice	91.8%
38NCTL Why critique research	90.5%
59 NSN Kidney Physiology	90.0%
17 NCTL Atomic bonding	90.0%
16 NCTL Elements that make up the human body	88.7%
206 NSN	88.5%
NCTL161 Referencing Websites using Harvard	87.9%
19 NCTL Acids and alkalis application	86.7%
Qualitative data analysis	79.3%

Appendix 6: Number of respondents per year providing feedback for individual **Biology Foundations** learning objects

Learning Object	2006	2007	2008	2009	2010	2011	2012	2013
15 NCTL Structure of the atom	66	8	20	31	34	15	4	5
16 NCTL Elements that make up the human body	50	3	0	8	6	1	3	2
17 NCTL Atomic bonding	35	4	5	12	10	3	2	1
18 NCTL Acids and alkalis introduction	36	19	28	29	16	12	12	3
19 NCTL Acids and alkalis application	14	5	7	13	4	2	1	1
32 NSN Heart failure (1)	0	0	2	13	14	31	11	3
39 NLOL Inflammatory response (1)	2	26	40	42	49	26	34	15
42 NSN Glomerular filtration	3	12	36	29	25	24	12	4
47 NLOL Bacteria and viruses compared	0	6	20	19	18	13	50	13
59 NSN Kidney Physiology	1	10	10	13	9	6	11	1
68 NSN Respiratory ventilation	1	9	11	17	12	8	25	5
70 NSN Starling's Forces	6	18	14	10	16	1	10	5
The menstrual cycle	0	0	146	151	164	65	47	18
184 NCTL Tissue Fluid Formation	0	0	0	12	51	55	64	39
Different types of Epithelia (244NSN)	0	0	0	0	0	5	29	8

Number of respondents providing feedback

Appendix 7: Number of respondents per year providing feedback for individual **Clinical Skills** learning objects

Learning Object	2006	2007	2008	2009	2010	2011	2012	2013
102 NLOL: Home Hazards	0	2	17	7	7	4	2	1
45 NLOL Glove use	0	18	41	42	52	141	66	16
46 NLOL Aseptic Non-Touch Technique	0	14	173	215	258	386	263	78
55 NUCL Hand hygiene	0	17	17	24	56	132	34	17
57 NSN Home visiting	0	4	6	8	14	15	27	
87 NSN Midwife's abdominal examination in the antenatal period	0	0	21	29	52	75	75	42
NCTL111 - Skin preparation prior to intramuscular and subcutaneous injections	0	0	0	1	20	5	9	
176 NCTL Intramuscular injection by the Z track technique	0	0	0	43	4	4	8	
NCTL178 Intramusclar injection sites for adults	0	0	0	41	4	3	6	
NCTL153 - Components of a respiratory assessment	0	0	0	0	21	23	53	29
NSN211R SBAR	0	0	0	0	727	676	775	252
Food Hygiene	0	0	0	0	1	37	105	44
NCTL 213 Subcutaneous injection techniques	0	0	0	0	3	21	61	12
Measuring BMI (CCTL240)	0	0	0	0	0	34	15	4

Appendix 8 : Number of respondents per year providing feedback for individual **Evidence Based Practice** learning objects

Learning Object	2006	2007	2008	2009	2010	2011	2012	2013
1 NCTL Probability associated with inferential statistics	6	8	16	12	3	8	5	2
10 NCTL Positive and predictive value of diagnostic tests	0	8	20	35	30	22	24	12
101 NCTL How to conduct a literature search	0	13	24	55	61	37	84	63
13 NCTL Descriptive statistics for interval and ratio scale data	20	16	15	20	25	21	13	4
2 NCTL Qualitative and quantitative research	10	35	34	39	31	86	61	24
23 NCTL What are journals	4	3	3	14	4	12	16	2
3 NCTL Designing a questionnaire	2	3	12	21	10	23	8	13
34 NSN Meta-analysis	5	22	9	10	11	24	29	1
35 NSN Presenting and interpreting meta-analyses	6	25	13	17	11	18	22	11
38NCTL Why critique research	1	45	62	54	79	53	54	30
40 NCTL Referencing your work using Harvard	3	16	15	12	16	21	10	4
41 NCTL Advanced literature searching	0	0	9	10	11	17	14	6
5 NCTL Relative risk reduction and ab-	6	29	25	16	13	26	22	8

solute risk reduction								
6 NCTL NNT NNH	0	6	10	11	7	12	4	9
60 NUCL Levels of measurement	0	2	4	11	13	15	19	4
7 NCTL Confidence intervals	0	13	12	18	18	13	40	31
9 NCTL Sensitivity and Specificity	0	16	92	30	63	61	65	34
NCTL09R Sensitivity and Specificity	0	0	37	34	9	12	2	3
NCTL161 Referencing Websites using Harvard	0	0	9	16	29	33	17	3
NCTL31R Systematic review steps	0	0	7	13	15	17	22	6
NCTL02R Qualitative and Quantitative Research	0	0	0	2	18	16	19	1
NCTL10R PPV and NPV	0	0	0	28	17	18	1	0
NCTL38R Wht Critique Research	0	0	0	5	7	3	3	2
NCTL40R Referencing using modified Harvad	0	0	0	2	3	47	16	0
206 NSN	0	0	0	12	17	20	37	9
86 NLOL PPE	0	0	0	5	1	16	58	5
Asking the right question	0	0	0	0	16	51	27	19
Qualitative data analysis	0	0	0	0	1	15	8	6
What is evidence-based practice	0	0	0	0	15	21	13	12
Chronic Wound Assessment (231NSN)	0	0	0	0	0	6	27	3

Appendix 9 : Number of respondents per year providing feedback for individual **Pharmacology** learning objects

Learning Object	2006	2007	2008	2009	2010	2011	2012	2013
44 NLOL Volume of Distribution	0	1	18	11	30	51	36	12
48 NUCL Bioavailability	9	36	33	29	36	33	33	13
52 NUCL Drug-receptor interaction	2	11	26	0	0	0	0	
53 NUCL Exploring the synapse	0	12	9	11	6	10	8	2
54 NUCL Half-life of drugs	2	26	21	27	11	18	20	22
64 NUCL Lock and Key Hypothesis	5	17	30	20	17	14	9	4
66 NSN Plasma Proteins and Drug Distribution	8	53	54	61	51	58	68	28
74 NUCL Understanding First Pass Metabolism	3	48	46	53	66	40	38	14
NUCL 52R Drug-receptor interaction	0	0	7	44	58	44	42	37
105 NLOL Introduction to drug clearance	0	0	6	15	23	13	10	20
NCTL174 Introduction to receptor pharmacology	0	0	0	12	12	10	11	1
NCTL79 Targets for drug action (2)	0	0	0	14	13	12	8	4