

JISC User Behaviour Observational Study

**Working paper on scholarly digital use and information
seeking behaviour in business and economics**

CIBER
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Table of Contents

1.0 General Aims	4
2.0 Literature review	6
3.0 Results from National E-books Observatory (NEBO) for Business and Management	8
3.1 Introduction.....	8
3.2 Results of log analysis (concerning the 5 JISC sponsored titles)	8
3.3 Questionnaire analysis	14
4.0 Journal data from the Research Information Network funded project ‘Evaluating the usage and impact of e-journals in the UK’	19
4.1 ScienceDirect	19
Usage profiles (Table 5).....	19
Information seeking behaviour (Tables 9 -10).....	23
Journals used (Tables 11 - 13)	26
4.2 Oxford Journals.....	30
Use over time (Tables 15-17)	31
Information seeking behaviour (Tables 18 -19).....	33
Journals used.....	35
References.....	37

List of Figures and Tables

Figure 1: Percentage share of subject usage for eight universities	10
Table 1: Universities ranked by MyiLibrary e-book use	11
Table 2: Use of JISC business titles by month for Cranfiel (2008)	11
Table 3: Use of JISC business titles by month for LSE (2008)	12
Table 4: Use of JISC business titles by month for Middlesex (2008)	12
Figure 2: Monthly use of Management Concepts & Practices by three universities.....	13
Figure 3: Percentage use share of book viewed by Liverpool across month – Media JISC sponsored titles only -	14
Table 5: Summary of key economics usage metrics.....	20
Table 6: Use over time (percentage of monthly page views)	21
Table 7: Use over time: (average day of the week percentage page views).....	21
Table 8: Use over time (average hourly pay views)	22
Table 9: Method of access and navigation (sessions).....	24
Table 10: Content viewed (sessions)	26
Table 11: Economics journal title use and scatter	27
Table 12: Economics top twenty journals.....	28
Table 13: Journals featuring in the top five ranked lists of two or more institutions	30
Table 14: Summary of key subject usage metrics	31
Table 15: Use over time (monthly percentage of page views)	32
Table 16: Use over time: (average day of the week page views)	32
Table 17: Use over time (average hourly page views)	33
Table 18: Method of access and navigation (sessions).....	34
Table 19: Content viewed (sessions)	35
Table 20: Top twenty journals	35

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1.0 General Aims

The basic aim of the CIBER complementary and supplementary study was to inform and provide context for the observational study of business information use and information seeking by employing the huge evidence base built up during the National e-books observatory (NEBO) project and other relevant CIBER studies.

The data sources:

1. **Detailed digital footprints (logs) of scholars from over 100 UK universities in respect to their use and information seeking in connection with 5 e-business management books.**

These footprints include information on: a) volume and duration of use; b) where use took place; c) book titles used; d) date and time of searching; e) type of page viewed; f) where the user arrived from (referrer link). The uniqueness of business management usage and seeking is established through comparisons with other subject fields. Diversity is explored through a number of individual university comparisons.

2. **Tabulated data for thousands of business e-book users** generated from the NEBO questionnaires on: a) degree of e-book use; b) propensity to buy/source from a library/surf the net, etc; c) screen/paper preferences; d) session length; e) amount of text read (e.g. whole chapter/book or skim); f) frequency of e-book use and whether it is growing; g) frequency of use of library (physical / virtual) and purposes of visit; h) satisfaction levels with hard copy provision; i) off campus use of the digital library. Data segmented by type of university, age, gender and status (in regard to latter, differentiating between staff and student behaviours)
3. **Raw insights into the e-book behaviour and attitudes of business students and faculty** from an analysis of the thousands of free text comments furnished as part of the questionnaire survey conducted as part of E-books Observatory (to be reported later).

4. Log data from relevant studies of other scholarly material, especially e-journals.

CIBER have excellent recent data on use of economics journals and websites. This data largely comes from a RIN funded study, E-journals: their use impact and value. It is supplemented with data drawn from the JISC funded Google Generation, OhioLINK and related CIBER studies (some data to be reported later).

5. An integration of the above datasets to form a close-fit report for the Observational study (this will constitute the main report)

2.0 Literature review

Generally, in the published literature, business is among the most used subject in terms of e-book usage. Thus:

- A survey of a representative sample of 470 full-time American students chosen from 250 colleges showed that 26.9% of respondents from the subject category of “Business, Economics, Finance, Engineering, Math” agreed with the statement “I use the library e-book collection occasionally” (Primary Research Group Inc., 2009)
- Levine-Clark (2007) found some subject differences in terms of frequency of use; humanities (13.8 percent), business (13.3 percent) and social science (13 percent) faculty were the most frequent users of e-books than science faculty (11.8 percent).
- A study of usage data of NetLibrary for Auburn University Montgomery between 2000 and 2004 showed that books in the subject “Business, Economics and Management” were the most used titles with 1580 total accesses during the period. In total, 703 individual business titles were used (Bailey, 2006).
- A survey of 2084 students and staff at two Australian universities showed that 62% respondents from business said they used e-books. (Borchert et al., 2008)
- Dillon (2001a, b) at the University of Texas Austin examined usage reports for electronic books and found that books on Economics and Business received higher usage than electronic books in most other subject areas. The study also found that these results were consistent across the various collections.
- Langston’s (2003) study concerned an electronic book pilot project in cooperative collection building undertaken by the California State University (CSU) system. Covering a total of 23,000 NetLibrary titles in two collections (one leased and the other purchased), the study found that the most accessed subject area in the leased collection was economics and business, which accounted for 39% of all accesses.
- And examination of reports that NetLibrary supplied to Simmons College over the period (2001–2006) showed that the top six disciplines and subjects

included business, economics, and management (1,785 visits); general social sciences (1,558); medicine (705); computer science (660); literature (559); and library science and publishing (537) (Hernon et al., 2007).

- A study of e-book usage statistics supplied by three e-book providers (including NetLibrary and Ebrary) at the University of Idaho in 2008 showed that the highest usage of e-books occurred in the category “Business/Economics”. 1186 titles in this subject were used (total 3425 uses), which was equal to 17.4% of all titles in the subject that the library held. It should also be said that the library held 6836 titles in this subject category which was more than library’s holdings in any other subject. (Hunter and Sprague, 2009)

In regard to use of e-journals by Business/management students the following are the key findings from the published literature:

- A CIBER study (2007) of use of OhioLINK e-journals by four American universities showed that 69% of views to Business and Economics journals were to articles and 31% to abstracts. Average view time for abstracts was 20 seconds and for articles it was 60 seconds. In terms of the age of the pages viewed, the majority of views in Business and Economics were to items 1-3 years old (41%); this was followed by items 4-7 years old (25%), those over 7 years old (18%) and then those up to 1 year old (16%).
- A study of the use of Elsevier journals of business authors (Nicholas, Huntington and Jamali, 2006) found that: a) articles in press (pre-prints) were particularly popular; b) browsing was a favoured method for locating material; c) they tended to be more loyal in terms of returning to the Science Direct site; d) they favoured PDF displays less than other subject groups; e) they viewed abstracts more than other subjects; f) were more interested in current material. Business users as we have already seen were particularly interested in articles in print, hence currency seems to be important.

3.0 Results from National E-books Observatory (NEBO) for Business and Management¹

3.1 Introduction

Data were collected during the period November 2007 to March 2009 for business students by three methods: 1) log analysis; 2) questionnaires; 3) focus groups (to be reported later). Data were collected in regard to general digital use and information seeking as well as that regarding specific Business e-books that JISC provided for the purposes of observation. These books were:

1. The Dynamics of Employee Relations
2. Marketing Strategy & Competitive Positioning
3. Organisational Behaviour and Analysis: An Integrated Approach
4. Integrated Marketing Communication
5. Management Concepts & Practices

3.2 Results of log analysis (concerning the 5 JISC sponsored titles)

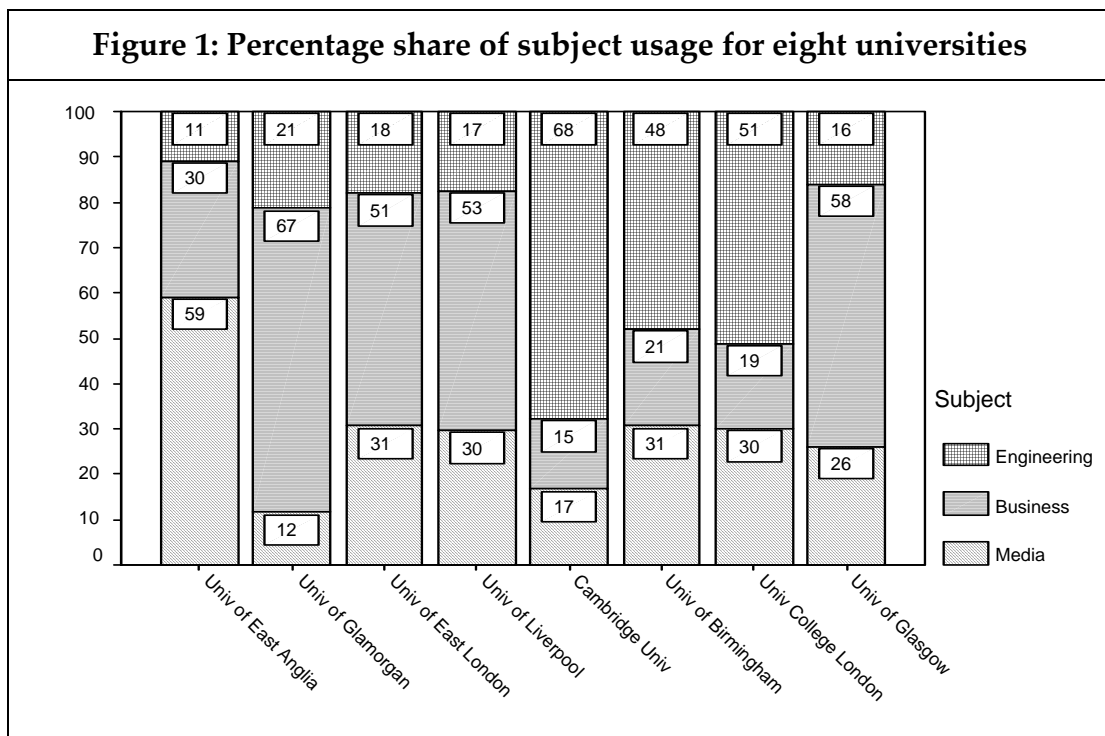
- a) **Business e-books were the most popular.** Of the three subjects covered (the two other subjects were Media studies and Engineering) Business e-books received the highest volume of use. The five Business titles (constituting 20% of the JISC e-books) accounted for 45% of page views; this represented around 342,450 views. Their popularity could be put down to a number of factors: a) the books were more attractive to university users; b) the nature of business studies means that e-books are especially attractive; c) staff and librarians promote them more.
- b) **The most popular JISC title was in fact a business title *Organisational Behaviour and Analysis: an Integrated Approach*, which attracted 82,787 page views in the 14 month survey period.** The third, fourth and fifth most used titles were also Business titles and all attracted more than 74,000 views. The book that increased

¹ For the NEBO study business and business management were the topics covered; this did not include economics.

its use most over the survey period was *Integrated Marketing Communication*, its use increased from about 14% of business use (December 2007) to 37% (May 2008).

- c) **Use was unusually strong in August.** In relative terms Business e-book usage was strongest in August 2008 when they accounted for 63% of all JISC e-book use and was weakest between February and April 2008 and accounted for less than 40% of views. Normally use of e-books are tied to teaching but perhaps not so in the case of Business?
- d) **Business books were viewed for a relatively longer time.** Most e-book pages were viewed for less than a minute but a higher proportion of Business pages (17%) were viewed for more than a minute.
- e) **Business online sessions tended to feature a high number of views and lasted longer.** Nearly a third (31%) of sessions recorded significant levels of use with 11 or more pages being viewed. Sessions where Business titles only were viewed were longer: 59% lasted more than 12 minutes compared to 51% for sessions where Engineering and Media studies books were viewed. Fewer Business sessions lasted under 30 seconds, which probably meant most users were finding something of interest.
- f) **Cover pages**, unexpectedly, were viewed for the longest time and perhaps this was what we might call dwell time, where users were making a relevant judgement or trying to get a fix.
- g) **Much e-book use occurred off campus.** A much higher proportion of Business e-book sessions were conducted off-campus. Thus, while a third (32%) of UK on-campus sessions viewed a Business title this was true of nearly two-thirds (61%) of off campus (UK) and three quarters of overseas use.
- h) **Business users like searching for e-books.** Thus sessions viewing a Business title were about twice as likely to have used a search expression. In general those using the search facility were more likely to view more than one e-book in a session and were also more likely to view more content pages in a session; the two tend to go hand in hand. Sessions using a search facility were more likely to view over 20 pages in a session.

- i) **Business users accessed e-books via virtual learning environments (VLE)** much more frequently than users from other subjects: 305 sessions arose from a VLE as opposed to 74 for Engineering and just 50 for Media Studies.
- j) **The big Business users.** Figure 1 gives the subject share of usage for eight case study universities. At Glamorgan two thirds (67%) of usage were to Business titles. The University of Glasgow followed with (58%), and at both the University of East London (51%) and the University of Liverpool (53%) over half of use was to Business titles.



k) Performance of user observational case study universities.

Of the three universities participating in the user observational case study, Cranfield, with 7074 page views, was by far the heaviest user of JISC e-books (Table 1); LSE was the heaviest user of MyiLibrary e-books generally (and the second heaviest in the UK); Middlesex hardly registered at all in terms of use.

Table 1: Universities ranked by MyiLibrary e-book use

	Non-JISC e-book		JISC e-books	
	Usage	Rank by usage where 1 is highest	Usage	Rank by usage where 1 is highest
Cranfield University	2033	77	7074	21
London School of Economics and Political Science	212845	2	4426	40
Middlesex University	57	108	722	107

If we just concentrate on the Business title use at the above institutions we find the following²:

- Marketing strategy and competitive planning proved to be the most popular book except in the case of Cranfield where Integrated Marketing Communications is the most used title;
- Use for individual titles peaked in different months and this was different for each of the three universities – no pattern in other words. Thus, take Marketing strategy and competitive planning, in the case of Cranfield most use took place in August, for LSE it's January and in the case of Middlesex it is July.

Table 2: Use of JISC business titles by month for Cranfield (2008)

Title	J	F	M	A	M	J	J	A	S	O	N	D	Total
Dynamics of Employee Relations	47	4	0	0	6	5	0	1	0	0	1	0	64
Integrated Marketing Communications	27	207	7	0	0	3	0	0	0	7	1724	143	2118
Management Concepts and Practices	15	26	73	19	28	7	10	8	1	7	84	43	321
Marketing Strategy and Competitive Positioning	3	43	0	5	5	4	1	105	0	14	18	63	261
Organisational Behaviour and Analysis	2	29	31	9	21	1	0	3	62	4	8	3	173

² These are COUNTER figures and note the figures on cover 12 months

Table 3: Use of JISC business titles by month for LSE (2008)

Title	J	F	M	A	M	J	J	A	S	O	N	D	Total
Dynamics of Employee Relations.	0	3	0	0	2	0	0	0	3	34	20	27	89
Integrated Marketing Communications	6	1	97	8	20	2	14	20	0	0	0	0	168
Management Concepts and Practices	0	0	0	0	50	0	0	0	0	0	1	21	72
Marketing Strategy and Competitive Positioning	427	0	201	0	1	0	2	0	0	15	218	182	1046
Organisational Behaviour and Analysis	0	8	10	0	0	7	36	44	0	5	36	0	146

Table 4: Use of JISC business titles by month for Middlesex (2008)

Display Title	J	F	M	A	M	J	J	A	S	O	N	D	Total
Dynamics of Employee Relations	0	0	0	0	0	0	0	38	0	0	0	0	38
Integrated Marketing Communications	0	0	0	0	4	0	5	0	0	18	0	0	27
Management Concepts and Practices	0	0	0	4	0	0	0	12	0	4	19	15	54
Marketing Strategy and Competitive Positioning	0	8	6	25	0	0	50	0	0	7	0	4	100
Organisational Behaviour and Analysis	1	0	14	0	0	0	0	11	0	1	3	4	34

- l) **There was quite a high concentration of use.** Thus, in the case of Management Concepts & Practices the top 10 (of 127) universities accounted for 36% of its use. The University of Glamorgan was the biggest user by some distance and viewed the title 3455 times (8% of all views).
- m) **E-book use tends to be related to and restricted by the teaching rhythms of the year** and these clearly differ from university to university, according, for instance, to when particular modules run. Figure 2 demonstrates this by showing the monthly use of Management Concepts & Practices by three universities: Liverpool (3rd biggest user), Queen Mary (5th) and Manchester Metropolitan (2nd). For Liverpool use was more spread out over the period and peaked in December 2008. Use at Queen Mary was high January and February 2008, dropped considerably until December 2008. Manchester Metropolitan hardly registered any use until October 2008 when it went through the roof; use then continued at more modest, but still significant levels.

Figure 2: Monthly use of Management Concepts & Practices by three universities

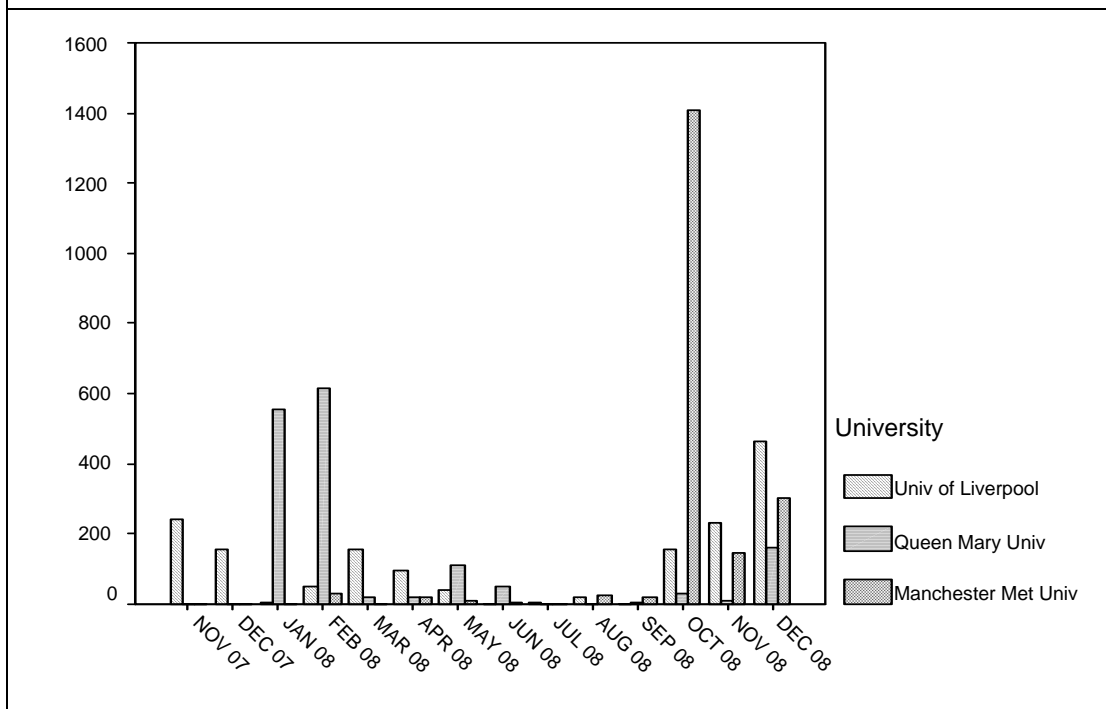
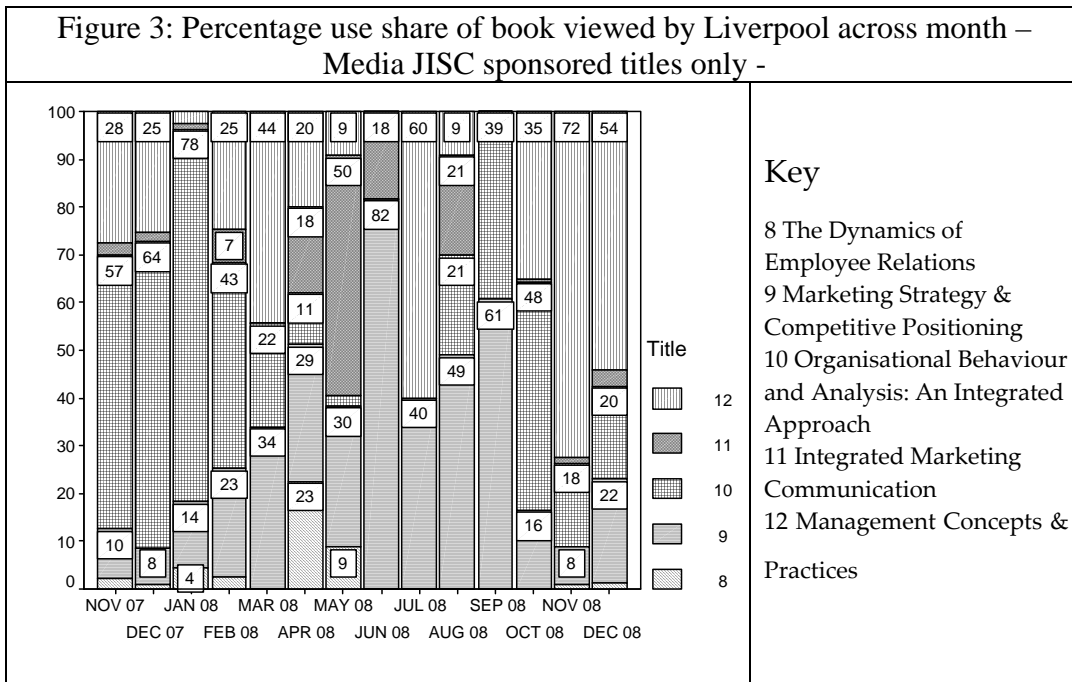


Figure 3 shows the variation in use of business titles for the University of Liverpool. Organisational Behaviour and Analysis made up over half of business title use between November 2007 and February 2008. Integrated Marketing Communication made up half of use in May while Management Concepts & Practices made up half of use in November 2008 and December 2008.



3.3 Questionnaire analysis

An ‘entry’ questionnaire survey was undertaken at the beginning of the study during January/February 2008 and this was followed by an ‘exit’ survey in January/February 2009. Altogether 52,156 academics (staff and students) responded to the two questionnaires. We do not know whether the people filling in the first questionnaire also filled in the second questionnaire. The data were analysed using SPSS. We have pulled together the data for the two studies in the following analysis.

Who is using the Business and Management books and recommending them?

Fourteen percent (5,519) of students who took part in the combined entry and exit survey described their subject interests as Business and Management. They accounted for virtually all (96%) of the use of the five Business and Management books.

Ten percent (394) of the university staff who took part in the surveys described their teaching interests as Business and Management. Recommendations for the

individual JISC Business titles from staff ranged from 11.4% and 21.1%. (See later for individual title data). Ninety-nine percent of recommendations of the five Businesses and Management texts came from staff describing their teaching interests as Business and Management.

Are Business and Management students and staff distinctive in their use of e-books?

Sixty nine percent of the Business and Management students from the surveys said they had used e-books against 68% for engineering, 63% for Media Studies and other subjects and 56% for Medicine. Not only were Business students more likely to use e-books, their use of them is increasing at a higher rate. Thus, take-up of e-books increased from 66.6%-71.4% (a growth rate of nearly 5%) between the two surveys. In comparison the growth figures for the other subjects were as follows:

- Engineering - growth rate 1.1%
- Media studies – growth rate 3.5%
- Medicine – growth rate minus 0.6%
- Other subjects – growth rate 2.9%

Interestingly, Business staff on the other hand use e-books less than their academic colleagues in other subjects. Thus 59% had used e-books while the figure for Media studies was 70%; only medical academics used them less (53%). Business staff's use of e-books, however, increased by nearly 5% between the two surveys; even so this growth level was eclipsed by that of medical staff (nearly 7%).

Universities

The three JISC user observational case study institutions performed pretty poorly in the questionnaire studies regarding response rates of business staff and students: LSE (1), Cranfield (28) and Middlesex (2). This could be due to the fact that the questionnaire was not promoted as much as at other universities or academics in these universities were less interested in e-books.

The Business and Management texts

In the exit survey 13.8% of business and management students (n=2,892) said they had used one of the JISC business and management texts in e-book form.³

The performance of the individual titles is as follows:

The Dynamics of Employee Relations

Used by 511 students in entry survey and 572 in the exit survey. The title was recommended by 11.4% of Business and Management staff with 6% strongly recommending it. Recommendations increased by 2.2% between surveys, strong recommendations by 4.3%

Marketing Strategy and Competitive Positioning

Used by 559 students in entry and 870 in exit survey. The title was recommended by 13.8% of Business and Management staff with 7.5% strongly recommending it. Recommendations increased 10% between surveys, strong recommendations by 7.6%

Organisational Behaviour and Analysis

This was the top book: used by 955 students in entry and 1,068 in exit survey. It was also the most strongly recommended. Thus, it was recommended by 21.1% of Business and Management staff with 11.2% strongly recommending it. Recommendations increasing 6.8% between surveys, strong recommendations by 3.6%

Integrated Marketing and Communication

Used by 660 students in entry and 737 in exit survey. It was recommended by 16.2% Business and Management staff with 9.7% strongly recommending it. Recommendations increasing 5% between surveys, strong recommendations by 4.5%

³ the entry survey did not ask this question

Management Concepts and Practises

Used by 667 students in entry and 740 in exit survey. It was recommended by 16% of Business and Management staff with 8.6% strongly recommending it. Recommendations increased by 0.7% between surveys, strong recommendations by 2.9%

General e-book information seeking behaviour.

Big users of e-books. Business and Management students were the most frequent users of e-books with 19.4% reading more than 5 titles in the past month as opposed to 19.2% for engineering students, 15.9% for Media Studies, 11.7% for Medicine and 15.2% for Other.

Time spent viewing e-books. Business and Management students shared information seeking habits with other subjects in terms of time spent reading e-books with 39.2% from Business and Management and other students alike saying they spend more than 20 minutes a time. Similarities were shared across the scale with around 35% spending 11-20 minutes, with down to 1.4% at less than 3 minutes.

Amount of e-book used. Business and Management students showed some difference in terms of the proportion of e-books read. The whole book was read by around 5% for both Business and Management and other students. For whole chapters however, Business and Management students showed a higher proportion at 22.6% compared to 18.5% for other student who, in turn, showed higher rates in reading one chapter or dipping in and out of several.

Obtaining e-books. Business students were the least likely to have bought their own copy or to have obtained one from the open web. They showed the strongest tendency of any of the subject groups to use library-provided e-books. This tendency was noted before the national e-books observatory project took wing, so e-books appear to satisfy a real need. In general terms business students are very frequent visitors to their university digital library.

General demographics of Business students. Female students outnumber men in business studies, as in many other subjects today, by a significant margin. As might be expected, given the nature of the subject, business studies courses contain a relatively high proportion of part time students: to a much greater extent than the three other subjects covered by the JISC Collections e-books experiment.

Hard-copy use. Business students were much more likely to feel dissatisfaction with the level of print textbooks available to them. Whether this is a perception (they are keen library users) or a more objective reality we cannot say from the survey alone.

Location of access. As might be expected given the high proportion of part time business students represented in the survey, business students prefer to access their university's digital offerings mostly or entirely from home.

4.0 Journal data from the Research Information Network funded project ‘Evaluating the usage and impact of e-journals in the UK’

This was a study of use and information seeking behaviour of 151 Economics journals from ScienceDirect and Oxford Journals. It was conducted during 2007/8. It was a log based study and covered researchers from 10 UK research institutions, mostly universities. None were JISC user observational case study institutions (see Table 1 for the full list).

4.1 ScienceDirect

Usage profiles (Table 5)

- Economics followed a similar pattern to those of the scientific fields, with the top institution accounting for a third of all use. Manchester proved the biggest user (it has a business school), accounting for around a third of all use according to all the metrics.
- UCL was the only institution to obtain a 5* ranking in the RAE (2001) but even so ranked only around 4 in usage ranking terms.
- Cambridge conducted the shortest sessions, 119 seconds, and Bangor the longest ones (403 seconds).

Use over time (Tables 6 - 8)

- There was greater variation between monthly use than we have previously witnessed and this often exceeded 10%. The busiest months proved to be February and March.
- A good deal of use occurred over the weekends and, for Aberdeen, this accounted for 17% of all use.

- Similarly much use occurred out of normal office hours; in fact, at Bangor the figure exceeded 50%. This usage proved not to be mechanical or robotic, perhaps a security guard, studying economics part-time?

Table 5: Summary of key economics usage metrics

Institution	Total page views		Total full-text views		Total HTML views		Total PDF views		Session numbers		Session time
	N	%	N	%	N	%	N	%	N	%	<i>Ave. in seconds</i> ⁴
Aberdeen	4966	4	2078	4	820	7	1258	3	1403	4.5	168
Bangor	7325	6	4079	8	600	5	3479	8	1208	3.9	403
Cambridge	23540	19	8922	17	1517	13	7405	18	5958	19.1	119
Edinburgh	15494	12	5865	11	1111	9	4754	11	3478	11.2	169
Manchester	40880	33	18015	34	3917	34	14098	34	10202	32.8	149
Strathclyde	12108	10	6146	12	1301	11	4845	11	2938	9.4	267
Swansea	2976	2	1305	2	422	3	883	2	814	2.6	196
UCL	12844	10	4433	8	1193	10	3240	8	3574	11.5	111
CEH	12	0	2	0	2	0	0	0	7	.0	251
Rothamsted	22	0	13	0	5	0	8	0	9	.0	326

⁴ Huber's M-Estimator

Table 6: Use over time (percentage of monthly page views)

		Jan	Feb	Mar	Apr
Aberdeen	%	20	28	26	26
Bangor	%	25	28	29	19
Cambridge	%	22	30	28	21
Edinburgh	%	26	29	24	20
Manchester	%	24	25	27	26
Strathclyde	%	24	27	26	25
Swansea	%	20	21	30	29
UCL	%	25	28	27	21
CEH	%	26	26	30	17
Rothamsted	%	28	23	15	34

Table 7: Use over time: (average day of the week percentage page views)

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Aberdeen	%	20	19	16	16	14	7	9
Bangor	%	19	18	18	16	14	7	8
Cambridge	%	19	18	16	17	17	6	8
Edinburgh	%	18	17	17	18	15	7	8
Manchester	%	18	18	16	19	15	6	7
Strathclyde	%	19	18	20	19	13	5	7
Swansea	%	19	19	16	18	16	5	8
UCL	%	18	18	18	18	15	6	8
CEH	%	22	19	23	18	17	1	1
Rothamsted	%	16	18	21	19	20	3	2

Table 8: Use over time (average hourly pay views)

		12-5am	6-8am	9-11am	12-2pm	3-5pm	6-8pm	9-11 pm
Aberdeen	<i>N</i>	134	79	904	1395	1472	591	391
	%	2.7	1.6	18.2	28.1	29.6	11.9	7.9
Bangor	<i>N</i>	1524	912	1410	1106	778	639	956
	%	20.8	12.5	19.2	15.1	10.6	8.7	13.1
Cambridge	<i>N</i>	1196	559	4583	5463	5851	3316	2572
	%	5.1	2.4	19.5	23.2	24.9	14.1	10.9
Edinburgh	<i>N</i>	904	412	2609	4168	4111	2002	1288
	%	5.8	2.7	16.8	26.9	26.5	12.9	8.3
Manchester	<i>N</i>	2716	1362	6822	9936	10295	5454	4295
	%	6.6	3.3	16.7	24.3	25.2	13.3	10.5
Strathclyde	<i>N</i>	511	234	2776	3493	2811	1392	891
	%	4.2	1.9	22.9	28.8	23.2	11.5	7.4
Swansea	<i>N</i>	46	99	336	820	1031	437	207
	%	1.5	3.3	11.3	27.6	34.6	14.7	7.0
UCL	<i>N</i>	556	361	2239	3113	3117	2059	1399
	%	4.3	2.8	17.4	24.2	24.3	16.0	10.9
CEH	<i>N</i>	0	0	4	4	4	0	0
	%	0	0	33.3	33.3	33.3	0	0
Rothamsted	<i>N</i>	0	6	10	5	0	1	0
	%	0	27.3	45.5	22.7	0	4.5	0

Information seeking behaviour (Tables 9 -10)

Method of access

- Unsurprisingly, the levels of gateway (third party) access were considerably down on what we have seen previously in the case of Biomedicine, reaching over a quarter of sessions only in the case of Aberdeen.
- Swansea recorded the greatest use of Google and GoogleScholar – used in 5% of all sessions - and this might be explained by library training programmes.

Navigation

- Menu (tables of contents and other lists) use was generally high, and very high at Edinburgh where menus were viewed in three quarters of all sessions;
- Swansea used the advanced search facility the most;
- Bangor recorded the highest levels of basic searching, around 5% of sessions saw it employed;
- Manchester recorded the greatest use of the citation facility, around 5% of all sessions saw it utilized;
- Abstracts proved popular and at Aberdeen, Cambridge, Rothamsted and UCL were viewed in more than one in three sessions.

Table 9: Method of access and navigation (sessions)

		Gateway access ⁵	Google access	Google scholar	PubMed access	Athens access	Menu use	Advanced search	Basic search	Citation function
Aberdeen	N	494	22	0	12	7	857	2	39	28
	% ⁶	25.2	2.8	0	1.5	0.9	61.0	0.1	2.8	2.0
Bangor	N	170	8	0	1	38	896	2	63	16
	%	14.0	0.8	0	0.1	3.7	74.0	0.2	5.2	1.3
Cambridge	N	740	156	0	8	373	3675	7	108	105
	%	12.4	3.3	0	0.2	8.0	61.6	0.1	1.8	1.8
Edinburgh	N	474	30	2	10	10	2636	11	108	48
	%	13.6	1.5	0.1	0.5	0.5	75.8	0.3	3.1	1.4
Manchester	N	2198	38	5	6	1361	6480	20	338	472
	%	21.5	0.5	0.1	0.1	18.3	63.4	0.2	3.3	4.6
Strathclyde	N	560	17	0	0	509	2050	6	134	25
	%	19.1	0.8	0	0	25.3	69.8	0.2	4.6	0.9
Swansea		175	31	23	3	17	562	9	37	7
		21.5	5.7	4.2	0.6	3.1	69.0	1.1	4.5	0.9
UCL	N	763	67	0	6	5	2186	3	86	32
	%	21.8	2.7	0	0.2	0.2	61.1	0.1	2.4	0.9
CEH	N	2	0	0	0	0	5	0	1	0
	%	28.6	0	0	0	0	71.4	0	14.3	0

⁵ Gateway sites are third party sites, like PubMed Central and Google and does not include library gateways

⁶ percentage of all session for that subject

Rothamsted	N	3	0	0	0	0	6	0	1	0
	%	33.3	0	0	0	0	66.7	0	11.1	0

Content viewed

- Bangor recorded the busiest sessions, which averaged 5.1 page views and 2.4 articles. [The CEH data were too low to count]. Edinburgh though viewed the most unique journals in a session (2.4).
- In regard to universities, abstract viewing was greatest at Aberdeen where more than a third of sessions saw an abstract and lowest at Edinburgh and Bangor, where abstracts were viewed in less than a quarter of sessions.
- Cambridge, Edinburgh, Manchester and Strathclyde all viewed articles aged 1700 days or older.
- Bangor and Swansea recorded the highest proportions of their sessions viewing an AIP, around 1 in 10 sessions did so.
- Generally, the Impact Factors of the journals viewed were on the low side with the relative factor dropping below the key 1.0 mark for Cambridge and Swansea. The high score for Strathclyde stands out (1.4) and is unexplained.

Table 10: Content viewed (sessions)

Subject	Volume			Form	Age/currency			Impact	
	<i>Ave. no. of pages viewed</i>	<i>Ave. no. of articles viewed</i>	<i>Ave. no. of journals viewed</i>		<i>% viewing an abstract</i>	<i>Ave. age of article viewed (days)</i>	<i>Alerts %</i>	<i>% viewing an AIP⁷</i>	<i>Ave. impact factor of journal viewed</i>
Aberdeen	3.9	1.6	1.4	35.9	1049	0.1	7.7	1.4	1.0
Bangor	5.1	2.4	1.4	24.3	1471	0	9.8	1.4	1.0
Cambridge	3.6	1.3	1.1	34.0	1756	0.1	4.5	1.3	0.9
Edinburgh	4.4	1.6	1.2	24.9	1736	0.1	5.9	1.4	1.1
Manchester	3.7	1.5	1.1	28.0	1746	0	5.1	1.5	1.0
Strathclyde	4.4	1.8	1.3	32.5	1731	0.1	8.9	2.0	1.4
Swansea	4.2	1.6	1.3	30.1	1431	0.2	9.8	1.2	0.8
UCL	3.3	1.0	1.1	33.4	1266	0	5.1	1.4	1.0
CEH	5.7	1.8	n/a	28.6	729	0	0	1.5	1.1
Rothamsted	5.3	3.6	n/a	44.4	1011	0	22.0 ⁸	0.7	0.5

Journals used (Tables 11 - 13)

- High levels of concentration were found at Bangor where two thirds of use was accounted for by 5% of journals. There was quite a different picture at Swansea where 5% of journals accounted for just 40% of use.
- Excluding the laboratories, where figures were too small to be counted, the highest number of journals was viewed at Manchester (127) and lowest at Swansea (83).

articles in press – accepted manuscripts, uncorrected proofs and corrected proofs;

⁸ Based on just 4

Table 11: Economics journal title use and scatter

	Scatter ⁹			Unique journals viewed	As a proportion of subject journals available (132)
	Top 5% of journals viewed account for % use	Top 25% of journals viewed account for % use	Top 50% of journals viewed account for % use		
				<i>N</i>	%
Aberdeen	40	77	93	99	75
Bangor	66	88	96	91	69
Cambridge	47	86	96	117	89
Edinburgh	46	85	97	111	84
Manchester	59	89	97	127	96
Strathclyde	56	86	96	102	77
Swansea	40	79	93	83	63
UCL	46	84	95	113	86
CEH¹⁰	n/a	n/a	n/a	6	5
Rothamsted¹¹	n/a	n/a	n/a	8	6

- World Development was clearly the most popular journal in the field, ranked first by six of the eleven institutions.

⁹ Based on unique session views; thus multiple views to the same journal not counted

¹⁰ just 6jnl's viewed

¹¹ just 2jnl's viewed

Table 12: Economics top twenty journals

Rank	Aberdeen	Bangor	Cambridge	Edinburgh	Manchester
1	J. of Health Economics	J. of Econometrics	World Development	World Development	World Development
2	Critical Perspectives on Accounting	J. of Environmental Economics & Management	J. of Financial Economics	J. of Financial Economics	J. of Financial Economics
3	Management Accounting Research	J. of Banking & Finance	J. of Econometrics	Research Policy	Research Policy
4	World Development	World Development	J. of Monetary Economics	J. of Development Economics	J. of Banking & Finance
5	J. of Financial Economics	J. of Financial Economics	J. of Development Economics	J. of Banking & Finance	Management Accounting Research
6	J. of Urban Economics	J. of Monetary Economics	European Economic Review	Management Accounting Research	J. of Accounting & Economics
7	J. of Accounting & Economics	Food Policy	J. of Public Economics	J. of Public Economics	Int. J. of Production Economics
8	J. of Econometrics	J. of Economics & Business	Research Policy	J. of Health Economics	J. of Development Economics
9	Regional Science & Urban Economics	J. of Accounting & Economics	Explorations in Economic History	China Economic Review	Critical Perspectives on Accounting
10	J. of Int. Accounting Auditing & Taxation	Economics Letters	J. of Economic Theory	J. of Monetary Economics	European Economic Review
11	European Economic Review	European Economic Review	Economics Letters	Food Policy	J. of Econometrics
12	J. of Economic Behavior & Organization	Emerging Markets Review	J. of Economic Dynamics & Control	J. of Economic Behavior & Organization	J. of Monetary Economics
13	J. of Macroeconomics	J. of Int. Money & Finance	J. of Banking & Finance	J. of Comparative Economics	J. of Int. Economics
14	J. of Int. Money & Finance	J. of Multinational Financial Management	Int. J. of Production Economics	European Economic Review	Economics Letters
15	J. of Banking & Finance	J. of Int. Financial Markets Institutions & Money	J. of Int. Economics	J. of Int. Economics	J. of Int. Money & Finance
16	Int. J. of Production Economics	Economics of Education Review	J. of Environmental Economics & Management	J. of Environmental Economics & Management	J. of Economic Behavior & Organization
17	Research Policy	J. of Economic Behavior & Organization	J. of Economic Behavior & Organization	J. of Econometrics	Structural Change & Economic Dynamics
18	Food Policy	Quarterly Review of Economics & Finance	Int. J. of Industrial Organization	Critical Perspectives on Accounting	J. of Economic Dynamics & Control
19	J. of Policy Modeling	J. of Financial Intermediation	Games & Economic Behavior	Economics Letters	J. of Public Economics
20	J. of Economic Psychology	J. of Econometrics	J. of Health Economics	Explorations in Economic History	J. of Economic Psychology

Rank	Strathclyde	UCL	CEH	Rothamsted	Swansea
1	J. of Financial Economics	World Development	Research Policy	World Development	World Development
2	Critical Perspectives on Accounting	J. of Public Economics	World Development	Economics of Education Review	J. of World Business
3	Management Accounting Research	J. of Econometrics		Economic Modelling	Economics Letters
4	Research Policy	J. of Development Economics		Economics Letters	J. of Banking & Finance
5	J. of Banking & Finance	Handbook of Labor Economics		China Economic Review	J. of Financial Economics
6	World Development	J. of Economic Theory		Food Policy	Food Policy
7	J. of Accounting & Economics	Handbook of Econometrics			J. of Development Economics
8	J. of Corporate Finance	J. of Monetary Economics			J. of Public Economics
9	Int. J. of Production Economics	European Economic Review			J. of Health Economics
10	J. of Econometrics	Games & Economic Behavior			J. of Econometrics
11	J. of Int. Economics	J. of Economic Behavior & Organization			J. of Economic Psychology
12	J. of Monetary Economics	J. of Health Economics			J. of Economic Behavior & Organization
13	European Economic Review	J. of Int. Economics			European Economic Review
14	J. of Int. Money & Finance	J. of Economic Psychology			J. of Int. Economics
15	J. of World Business	Labour Economics			Research Policy
16	J. of Economics & Business	Economics Letters			J. of Monetary Economics
17	J. of Development Economics	Research Policy			Labour Economics
18	J. of Empirical Finance	J. of Urban Economics			Insurance: Mathematics & Economics
19	Review of Financial Economics	J. of Banking & Finance			J. of Economic Dynamics & Control
20	J. of Financial Economics	J. of Comparative Economics			World Development

Table 13: Journals featuring in the top five ranked lists of two or more institutions

Economics titles	Number of Universities
World Development	10
J. of Financial Economics	7
J. of Banking & Finance	5
Research Policy	4
Management Accounting Research	3
J. of Development Economics	3
J. of Health Economics	2
Critical Perspectives on Accounting	2
J. of Econometrics	2
Economics Letters	2

4.2 Oxford Journals (OJ)

The RIN study of OJ featured Economics, and also covered Life Sciences and History. Some comparative data for these latter two subjects are provided here also.

- Life Sciences proved to be a giant in terms of usage, accounting for over 80% of all the page views to the three case study subjects covered. Admittedly, Life Sciences were pitted against subjects which had relatively small journal populations.
- What stood out most in terms of the use metrics was the much higher viewing of articles in HTML format in the Life Sciences, and the strong showing of History, where usage compared well with Economics, which had about three-quarters more journals.
- Page view times were around 97 seconds, with History recording a slightly lower figure of 94 seconds.

Table 14: Summary of key subject usage metrics

Subject	Total page views		Total full-text views		Total HTML views		Total PDF views		Sessions		
	N	%	N	%	N	%	N	%	N	%	Ave. in secs
Life Sciences (51% of journals)	509457	80.7	240037	84.3	101094	94.9	138943	78.0	192724	82.6	262
Economics (31% of journals)	66827	10.6	25099	8.8	2567	2.4	22532	12.6	24490	11.5	261
History (18% of journals)	54857	8.7	19598	6.9	2921	2.7	16677	9.4	16154	6.9	262
All case study subjects (61 journals)	631141	100.0	284734	100.	106582	100	178152	100	233368	100	

Use over time (Tables 15-17)

- In the cases of Economics and History, November proved to be the month in which most use took place (nearly 15% of annual use). For these two subjects, respectively, September and August were the quietest months when less than 5% of use occurred.

Table 15: Use over time (monthly percentage of page views)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Life Sciences	%	8.9	8.9	10.0	7.8	8.9	7.0	7.2	7.3	6.8	10.6	10.4	6.3
Economics	%	8.8	10.7	9.9	8.7	10.2	4.7	4.3	5.2	4.2	11.4	14.7	7.2
History	%	9.5	9.9	9.7	7.1	8.8	5.9	4.2	3.4	4.7	13.9	14.9	7.9
All case study subjects	%	9.0	9.2	9.9	7.8	9.0	6.7	6.6	6.7	6.3	10.9	11.2	6.6

Table 16: Use over time: (average day of the week page views)

		2007	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Life Sciences	N	509,457	96,422	99,558	96,044	94,379	80,269	20,561	22,224
	%	100	18.9	19.5	18.9	18.5	15.8	4.0	4.4
Economics	N	66,827	11,776	11,909	11,066	10,754	9,620	5,861	5,841
	%	100	17.6	17.8	16.6	16.1	14.4	8.8	8.7
History	N	54,857	9,964	10,323	9,238	10,052	7,951	3,536	3,793
	%	100	18.2	18.8	16.8	18.3	14.5	6.4	6.9
All case study subjects	N	631,141	118,162	121,790	116,348	115,185	97,840	29,958	31,858
	%	100	18.7	19.3	18.4	18.3	15.5	4.7	5.0

Table 17: Use over time (average hourly page views)

		12-6am	6-8am	9-11am	12-2pm	3-5pm	6-8pm	9-11 pm
Life Sciences	N	12706	9471	112670	150338	152975	50254	21043
	%	2.5	1.9	22.1	29.5	30.0	9.9	4.1
Economics	N	4379	1301	10195	17417	18365	9394	5776
	%	6.6	1.9	15.3	26.1	27.5	14.1	8.6
History	N	1760	820	9949	17185	15968	5719	3456
	%	3.2	1.5	18.1	31.3	29.1	10.4	6.3
All case study subjects	N	18845	11592	132814	184940	187308	65367	30275
	%	4.5	2.8	31.8	44.3	44.8	15.6	7.2

Information seeking behaviour (Tables 18 -19)

Navigation

- Oxford Journals have been open to Google for some years now, and it showed. Around 40% of sessions arose from a Google search, a figure very similar to that for Physics in ScienceDirect, a subject which had been opened to Google the longest. Google access proved particularly popular with Historians, 45% of their sessions arose from a Google search. Google Scholar proved more popular too, and especially in the case of Economics, where 22% of sessions originated from Scholar.
- Advanced searching proved a little more popular than was the case with Elsevier, with, for instance, 2% of History sessions seeing it employed. Basic (internal) searching proved a little more popular, but nowhere near as popular as web engine searching. Historians proved to be the biggest users of the facility, with 10% of sessions seeing it employed.
- As with ScienceDirect, menus provided the most popular way of finding content once in the database, although they did not prove quite so popular, and

platform differences might well account for this. They proved most popular in the case of Historians, 43% of sessions featured a view of a menu.

Table 18: Method of access and navigation (sessions)

Subject		Access		Search		Browse
		Google access	Google scholar	Advanced search	Basic search	Menus
Life Sciences	N	74230	3291	3904	13118	79392
	% ¹²	39%	2%	1%	3%	16%
Economics	N	8980	5332	757	3115	22341
	%	37%	22%	1%	5%	33%
History	N	7325	1313	1170	5293	23755
	%	45%	8%	2%	10%	43%
All case study subjects	N	90535	9936	5831	21526	125488
	%	39%	4%	1%	3%	20%

Content viewed

- Despite the fact that a good proportion of History journals had abstracts, very few Historians viewed an abstract in a session. Three times as many Life Science and Economics sessions saw an abstract viewed.
- The average number of pages viewed in a session was within the parameters of what we have seen in Elsevier, there was just less variation in the case of Oxford Journals. Page number counts were quite similar for Life Sciences but a little less for Economics. The average number of articles viewed was the same for all fields and in line with what was found for ScienceDirect.

¹² percentage of all session for that subject

Table 19: Content viewed (sessions)

Subject	Volume	Form	Age/currency	
			Ave. no. of pages viewed	Ave. no. of articles viewed
Life Sciences	2.7	1.1	16.0	
Economics	2.7	1.1	18.3	
History	2.8	1.1	5.2	

Journals used

Table 20 lists the most used journals for economics.

Table 20: Top Economics journals

Rank	Economics
1	Oxford Review of Economic Policy
2	Cambridge J. of Economics
3	Review of Finance
4	Industrial and Corporate Change
5	Oxford Economic Papers
6	World Bank Economic Review
7	World Bank Research Observer
8	J. of Economic Geography
9	J. of Financial Econometrics
10	European Review of Agricultural Economics
11	Contributions to Political Economy
12	J. of Financial Econometrics
13	Socio-Economic Review
14	J. of Competition Law and Economics
15	CESifo Economic Studies
16	American Law and Economics Review
17	Review of Finance
18	Review of Environmental Economics and Policy

5.0 Conclusions

Only tentative and draft conclusions are offered here because the study is ongoing and more data are to be evaluated. However, on the basis of the data we have evaluated it is clear that Business/Economics stands out in regard to e-book use in that:

1. these subjects are major and significant users of e-books in that they view them more, spend longer viewing titles and undertake much busier and intensive sessions;
2. their e-book users tend to search off campus and are more likely to access the books via VLEs
3. a high proportion of e-book use comes from the newer universities (this is true for other subjects too)

In regard to e-journals, where a good deal more data evaluation has to be completed, it appears that Economists:

1. are significant users, especially so the ones from universities with big business schools
2. tend to search more out of hours and on weekends
3. have a strong preference for tables of contents and abstracts
4. read relatively low impact factor journals and have a tendency to favour current material

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