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Timetabling and Space Consultants

The assessment of university research programmes[1]

Research is a very important priority in a university and the associated investment must be carefully assessed.

1. Universities invest substantial fundings in research activities.

The investment can involve the provision of specialist facilities, such as laboratories. It can also take the form of providing academic staff with periods of time during which no teaching is scheduled.

The substantial investment of resources made by universities is based on the desire to achieve certain goals. These include increasing institutional prestige, resulting in an improved ability to recruit students and staff, and obtaining inward investment in the form of competitively won research grants.

1.1 Research time

Many timetablers provide research days free of classes so that individual lecturers may pursue research studies. The cost of providing research time is suggested in the following table. The calculations are based on the average salaries for lecturers in different institutions and departments. The release of a single day for research if based on an average gross salary of £40,000 is £8,000. This represents an investment per 1000 staff of £8 million. Dividing this figure by £40,000 gives the equivalent of 200 full time staff involved in research activities.

Figure 1: Research investment based on different average salaries for academic staff

Research effort	Av gross academic salary	Investment per 1000 staff	Investment in research per av lecturer	Staff fte equivalent
20%	£40,000	£8 million	£8,000	200
20%	£30,000	£6 million	£6,000	200
20%	£20,000	£4 million	£4,000	200

The purpose of the table is to offer all staff an indication of research investment based on average academic salaries. On the basis of the table individual institutions can estimate their own assessment of research investment.

1.2 Research space

A research workplace of 8 square metres supported by a similar space for non-research space represents an investment of approximately £3,200 per year based on average university space costs of approximately £200 per square metre per year. Specialist facilities such as a clinical laboratory could involve double these annual space costs.

[1] I am very grateful for the generous help of Dr Geraint B Rogers, Director of Microbiome Research, Head of SAHMRI Centre, School of Medicine, Flinders University, Adelaide, Australia.

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2. Research evaluation

The amount invested in research activities makes it essential there are arrangements to formally evaluate projects.

2.1 A research assessment group could consider the research plans of individual members of staff and agree a planned study programme. As many as two research periods, each of 4 hours, could be agreed by the research assessment group with the relevant timetabling staff.

2.2 Staff will submit annual reports on research activities. Individuals must be available for examination by the research assessment group or its faculty representatives. An annual report would not be considered complete without a critical review by a supervisory member of staff. The assessment group would be responsible for the allocation of further research time by timetablers.

2.3 Given the successful completion of study programmes an academic member of staff could be allocated a research day free of teaching groups.

The most popular days for research activities are at the beginning and end of the week. The relative absence of staff on these days reduces classes and space utilisation levels. The timetablers would allocate research days that would not necessarily be Mondays or Fridays.

2.4 Research needs to be defined to include the types of activities associated with all subject areas. Studies can include:

- peer-reviewed publications;
- conference abstracts;
- action research in teaching areas;
- exhibitions and conferences;
- book publications;
- evaluation of course developments.

Research associated with teaching evaluation, course planning and the financial standing of courses gives an essential visibility to the designing and implementing of high quality study programmes.

The subjective nature of research assessment is a disadvantage, especially in highly specialised fields. The use of objective and widely accepted output metrics can offer substantial benefits. Examples of these metrics include the h-index[2] and the i10-index.

[2] The index was suggested by Jorge Hirsch as a tool for determining the relative quality of theoretical physicists. The h-index is sometimes called the Hirsch index or Hirsch number.

3. The h-index: an assessment of refereed publications

3.1 The h-index may be used to measure the productivity and impact of the published works of an academic member of staff in a university. A research paper with an index of h has published h papers each of which has been cited in other papers at least h times. The index works most successfully when comparing scientists working in the same field. The i10-index assesses the number of publications that have been cited in other publications at least ten times. In both cases, the timeframe over which the assessment is made can be defined.

3.2 Research output norms can vary significantly between fields. The scientific disciplines listed in the Thomson Reuters Essential Science Indicators Citation Thresholds identify the following citation numbers linked with the most frequent publications by discipline. It is, therefore, important when applying such metrics such as the h-index or i10-index, that they are compared against norms for a particular research area.

The numbers of citations vary by discipline. The following disciplines have the highest and lowest number of citations based on the period from January 2000 to February 2010.

Figure 2: Disciplines with least citations

Disciplines	Citations
Environment/ecology	390
Social services	154
Computer science	149
Multidisciplinary science	147

Figure 3: Disciplines with most citations

Disciplines	Citations
Space science	2236
Physics	2073
Clinical medicine	1390
Molecular biology & genetics	1229

In addition to considering the field in which a member of staff works, it is also important that their career stage is taken into consideration. A staff member who has been research active for many years may find it easier to generate research output, and will be more likely to have compiled a substantial body of work which can be cited by other researchers.

3.3 The output of an individual researcher in different periods can be compared to evaluate the impact of their studies.

Figure 4: A few highly cited papers low h index
A few highly cited reports giving a lower h index for a successful researcher.

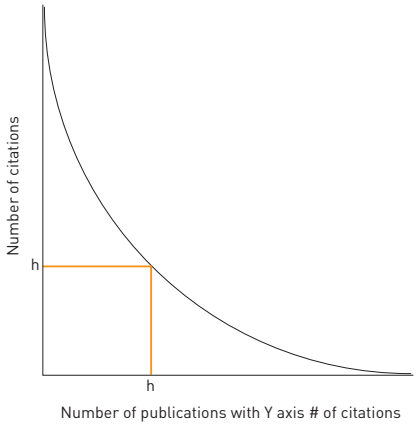
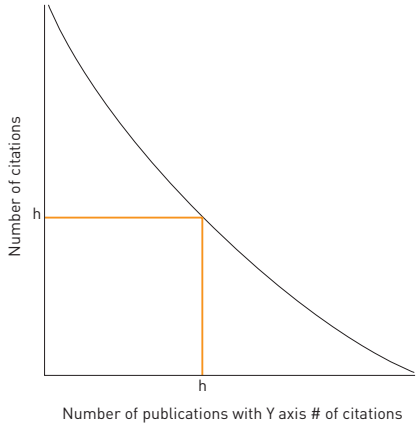


Figure 5: A large number of highly cited papers high h index
A large number of highly cited papers gives a higher h index.



The feedback on the papers of a successful researcher is helpful for associated research students and the host institution.

3.4 A number of considerations may affect the assessment of an h index for an individual researcher. The index is of considerable value but a number of factors should be recognised.

3.4.1 The h-index is bounded by the total number of publications. Researchers with a short career are at an inherent disadvantage regardless of the importance of their discoveries. Hirsch indicated in his original paper that the index is intended to be a tool to evaluate researchers at the same stage of their careers. It is not a basis for making an historical comparison of researchers.

3.4.2 The h-index does not take into account the typical number of citations in different disciplines.

3.4.3 The h-index does not differentiate between positive and negative references or identify fraudulent or retracted work. Books and articles are given equal weight. In the humanities books are a major means of transferring accumulated knowledge.

3.4.4 The h-index does not take into account the number of authors involved in the production of a paper or the inclusion of authors for complementary reasons.

A number of papers have been produced seeking to adapt the index or to describe the distribution of the output by an individual researcher.

4. Research is desirable. It reflects the involvement of staff in aspects of their specialist knowledge and the desire to enhance their expertise. In some cases investigations can enhance their disciplines in ways that can generate research income. The importance of research emphasises the need to organise resources in ways that support the cost-effective development of enquiries. Stellae has extensive experience of timetabling research by staff as part of the overall scheduling of student, room and staff timetables.