**Project**: Bibliometric Study of the Literature Relating to Attendees Participation in Workshops

**Project Summary**

**Methodology**: 727 attendees who attended the 24 workshops were comprehensively checked against the Georef and Science citation database for the year 1998-2008 to identify references relating to the areas of education identified. Some participants were also checked against the Geobase and Compendex databases.

Over 2000 documents were identified. Because many of the participants collaborated on several articles, duplicate and triplicate records were removed from the list. 1129 documents were identified and used in the analysis.

**Structure of the database**

Several tables were defined using the Access Database to be used for the analysis. Descriptions of the important ones follow:

**Articles** - this table contains the bibliographic citations for the 1129 references identified. When items were identified in both Georef and Science Citation Index, the entry from Georef was retained for consistency, unless the other had more complete information.

**Article Authors**: this table contains all the 3073 authors from all the papers. **Attendee Aliases** was developed to be used as a tool to identify only the listed attendees from all the authors in all the papers.

**Workshop Attendees** and **Workshops** were tables that were created based on the information provided by the researchers.

**Article document types:** this tableidentifies the type of documents in four categories, namely journal articles, conference attendance, books and technical publications that were assigned based on the citations.

**Article keywords – education only:** this table includes theassigned keywords to each document. The keywords are based on broadly defined areas in the field of education that were provided by the researchers.

**Queries and Analysis**

14 queries are listed and active in the Access databases. These will be described and referred to in this analysis where appropriate.

**Query 01 in the Access database** shows the type of material in which participants published by year of publication.

The **table 0** below shows a breakdown of **Query 01**. Overall, 70 percent of the attendees publications are conference presentations, 30 percent are in journals, less than one percent from books and technical publications.

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| Table 0 - Types of Publication (1998-2008) |
|   | 1998-2008 | 1998-2008 |
| Document Types | Total |  % of total |
| Books | 3 | 0.27 |
| Conference Presentations | 797 | 70.59 |
| Journals | 326 | 28.88 |
| Technical Publications | 3 | 0.27 |
| Total | 1129 | 100.00 |

**Table 0** is further broken down by number of publications - 1998-2001 – pre-workshop and 2002-2008 – post-workshop and shown below in **Table 0.1**. **(**Information from **Query 02 in Access Database)**

Table 0.1 below shows the average number of articles published each year - pre- workshop attendance and post-workshop attendance.

The data was normalized to find percentage difference after workshop attendance by using the following equation:

Where x1 is the avg/year (2002-2008 – post -workshop) and x2 is the avg/year (1998-2001 – pre- workshop).

The normalized data (from table 0.1 below) shows that there is 61.61 percent increase in conference presentations and 77 percent increase in journal publications after workshop attendance.

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| Table 0.1 |
|   | 1998-2001 (4 yrs) | 2002 - 2008 (7 yrs.) | % Difference after workshops |
| Document Types | Total | % of total | Avg./Year | Total | Avg./Year |   |
| Books | 2 | 0.79 | 0.5 | 1 | 0.14 | -111.11 |
| Conference Presentations | 185 | 72.83 | 46.25 | 612 | 87.43 | 61.61 |
| Journals | 66 | 25.98 | 16.5 | 260 | 37.14 | 76.96 |
| Technical Publications | 1 | 0.39 | 0.25 | 2 | 0.29 | 13.33 |
| Total | 254 | 100.00 | 63.5 | 875 | 125.00 |   |

Table 0.2 below shows the publication patterns and the percent difference post-workshop. The information for this analysis is found in the following tables in the Access Database: **Query 3.0 – publication types by workshop in Access Database; Query 05: Attendees total publications – Pre and Post- Workshops; and Query 06: Attendance/workshops - Total Publications pre and post- workshops.**

The data above shows that in all but two workshops (i.e. 87 percent of the workshops ), the average number of publications per year increased after workshop attendance. [N.B. When % difference is positive, this shows increase, when negative, it shows percent decrease]

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| **Table 0.2** |
|   | Years | Total |
| Workshop Name | Pre Wshp | PostWshp | Pre- Avg Publns/yr | Post- Avg Publns/yr | % Diff\*\* |
| aguviz04 | 6 | 5 | 3.33 | 3.60 | 7.69 |
| biocomplexity03 | 5 | 6 | 3.20 | 4.50 | 33.77 |
| coursedesign02 | 4 | 7 | 5.25 | 9.71 | 59.67 |
| coursedesign03 | 5 | 6 | 6.40 | 13.00 | 68.04 |
| coursedesign04 | 6 | 5 | 7.00 | 12.40 | 55.67 |
| coursedesign05f2f | 7 | 4 | 1.14 | 1.25 | 8.96 |
| coursedesign05onl | 7 | 4 | 0.29 | 0.50 | 54.55 |
| coursedesign06f2f | 8 | 3 | 3.75 | 8.33 | 75.86 |
| earlycareer03 | 5 | 6 | 4.60 | 10.33 | 76.79 |
| earlycareer04 | 6 | 5 | 3.17 | 7.20 | 77.81 |
| earlycareer05 | 7 | 4 | 1.29 | 3.00 | 80.00 |
| earlycareer06 | 8 | 3 | 3.00 | 4.67 | 43.48 |
| geochemistry05 | 7 | 4 | 1.29 | 3.75 | 97.87 |
| globaldatasets02 | 4 | 7 | 3.25 | 9.00 | 93.88 |
| health04 | 6 | 5 | 4.67 | 10.40 | 76.11 |
| hydrogeology05 | 7 | 4 | 7.29 | 14.50 | 66.23 |
| mars06 | 8 | 3 | 5.63 | 7.33 | 26.37 |
| oceansystem05 | 7 | 4 | 4.71 | 2.50 | -61.39 |
| petrology03 | 5 | 6 | 10.20 | 25.00 | 84.09 |
| publicpolicy06 | 8 | 3 | 6.63 | 5.00 | -27.96 |
| seds06 | 8 | 3 | 8.75 | 14.33 | 48.38 |
| structgeo04 | 6 | 5 | 10.17 | 26.20 | 88.18 |
| stuassmntv205 | 7 | 4 | 23.29 | 31.00 | 28.42 |
| web03 | 5 | 6 | 8.80 | 13.00 | 38.53 |

\*\* %Diff =( Avg Post/year – Avg Pre/year)/((Avg. Post/year +Avg Pre/year)/2)\*100

The information in Table 0.2 above is further broken down to show the percentage difference relating to conference presentations and journal articles. This is presented in Table 0.3 below. The data shows that conference presentations increased on average per year after workshop attendance in all but one case (i.e. 96 percent of the workshops). However, the number of journal articles on average per year increased in 15 workshops (or 62 percent of the workshops) after workshop attendance.

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| Table 0.3 |
|   | No. of Years | Conf | Journal |
| Workshop Name | Pre | Post | Pre- avg publn/yr | Post- avg publn/yr | % Diff\*\* | Pre - avg publn/yr | Post - avg publn/yr | % Diff\*\* |
| aguviz04 | 6 | 5 | 2.17 | 2.20 | 1.53 | 1.17 | 1.40 | 18.18 |
| biocomplexity03 | 5 | 6 | 1.40 | 2.67 | 62.30 | 1.80 | 1.83 | 1.83 |
| coursedesign02 | 4 | 7 | 3.75 | 7.29 | 64.08 | 1.50 | 2.43 | 47.27 |
| coursedesign03 | 5 | 6 | 4.00 | 11.00 | 93.33 | 2.40 | 2.00 | -18.18 |
| coursedesign04 | 6 | 5 | 4.67 | 9.60 | 69.16 | 2.33 | 2.80 | 18.18 |
| coursedesign05f2f | 7 | 4 | 0.57 | 0.75 | 27.03 | 0.57 | 0.50 | -13.33 |
| coursedesign05onl | 7 | 4 | 0.14 | 0.50 | 111.11 | 0.14 | 0.00 | -200.00 |
| coursedesign06f2f | 8 | 3 | 3.00 | 6.00 | 66.67 | 0.75 | 2.33 | 102.70 |
| earlycareer03 | 5 | 6 | 2.20 | 7.00 | 104.35 | 2.40 | 3.33 | 32.56 |
| earlycareer04 | 6 | 5 | 2.33 | 5.40 | 79.31 | 0.83 | 1.80 | 73.42 |
| earlycareer05 | 7 | 4 | 0.86 | 2.00 | 80.00 | 0.43 | 1.00 | 80.00 |
| earlycareer06 | 8 | 3 | 1.88 | 3.67 | 64.66 | 1.13 | 1.00 | -11.76 |
| geochemistry05 | 7 | 4 | 0.71 | 2.75 | 117.53 | 0.57 | 1.00 | 54.55 |
| globaldatasets02 | 4 | 7 | 3.25 | 5.57 | 52.63 | 0.00 | 3.43 | 200.00 |
| health04 | 6 | 5 | 3.50 | 5.60 | 46.15 | 1.17 | 4.80 | 121.79 |
| hydrogeology05 | 7 | 4 | 5.57 | 11.75 | 71.34 | 1.57 | 2.75 | 54.55 |
| mars06 | 8 | 3 | 4.38 | 7.33 | 50.53 | 1.25 | 0.00 | -200.00 |
| oceansystem05 | 7 | 4 | 2.71 | 2.00 | -30.30 | 2.00 | 0.50 | -120.00 |
| petrology03 | 5 | 6 | 7.60 | 17.17 | 77.25 | 2.40 | 7.33 | 101.37 |
| publicpolicy06 | 8 | 3 | 3.88 | 4.33 | 11.17 | 2.75 | 0.67 | -121.95 |
| seds06 | 8 | 3 | 7.38 | 12.67 | 52.81 | 1.38 | 1.67 | 19.18 |
| structgeo04 | 6 | 5 | 5.67 | 23.20 | 121.48 | 4.33 | 3.00 | -36.36 |
| stuassmntv205 | 7 | 4 | 17.43 | 23.75 | 30.70 | 5.86 | 7.25 | 21.25 |
| web03 | 5 | 6 | 6.80 | 9.50 | 33.13 | 2.00 | 3.50 | 54.55 |

**Query 4 in Access Database – Count of Article by Publication Titles**

Table 0.4 below (**based on Query 4 in Access Database**) shows a ranked listing of the title of publications, the number of articles that relates to each, percentage of total publications, broken down by number of publications, pre (1998-2001) and post (2002 -2008) workshops attendance.

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| Table 0.4 |
| Title | Document Type | # Articles | % | <2002 (1998-2001) | >=2002 (2002-2008) |
| Geological Society of America, Abstracts with Programs | Conference | 771 | 68.29 | 173 | 598 |
| Journal of Geoscience Education | Journal | 167 | 14.79 | 43 | 124 |
| EOS, Transactions, American Geophysical Union | Journal | 104 | 9.21 | 3 | 101 |
| Computers & Geosciences | Journal | 9 | 0.80 | 6 | 3 |
| Lunar and Planetary Science Conference, Abstracts of Papers | Conference | 7 | 0.62 | 2 | 5 |
| Seismological Research Letters | Journal | 7 | 0.62 | 4 | 3 |
| GeoTimes | Journal | 5 | 0.44 | 3 | 2 |
| American Chemical Society, Abstracts of Papers | Conference | 3 | 0.27 | 2 | 1 |
| Elements | Journal | 3 | 0.27 |   | 3 |
| Geochimica et Cosmochimica Acta | Journal | 3 | 0.27 |   | 3 |
| Proceedings of the Geoscience Information Society | Journal | 3 | 0.27 |   | 3 |
| Earth's dynamic systems | Book | 2 | 0.18 | 1 | 1 |
| Geological Society of America, Special Paper | Conference | 2 | 0.18 |   | 2 |
| Ground Water | Journal | 2 | 0.18 |   | 2 |
| GSA Today | Journal | 2 | 0.18 | 1 | 1 |
| International Journal of Science Education | Journal | 2 | 0.18 |   | 2 |
| Journal of Geography | Journal | 2 | 0.18 | 1 | 1 |
| Journal of the Virtual Explorer | Journal | 2 | 0.18 |   | 2 |
| New Mexico Geology | Journal | 2 | 0.18 | 1 | 1 |
| New York State Geological Association, Meeting Guidebook | Conference | 2 | 0.18 | 1 | 1 |
| The Professional Geologist | Journal | 2 | 0.18 |   | 2 |
| AAAS Annual Meeting | Conference | 1 | 0.09 | 1 |   |
| AAPG Bulletin | Journal | 1 | 0.09 |   | 1 |
| Abstracts of Papers Submitted to the Lunar and Planetary Science Conference | Conference | 1 | 0.09 | 1 |   |
| American Association of Petroleum Geologists, Annual Meeting Expanded Abstract | Conference | 1 | 0.09 | 1 |   |
| American Zoologist | Journal | 1 | 0.09 | 1 |   |
| Association of Engineering Geologists, Annual Meeting | Conference | 1 | 0.09 |   | 1 |
| Astrobiology | Journal | 1 | 0.09 |   | 1 |
| California Journal of Science Education | Journal | 1 | 0.09 |   | 1 |
| Environmental geology; an Earth system science approach | Book | 1 | 0.09 | 1 |   |
| General Meeting of the International Mineralogical Association, Abstracts | Conference | 1 | 0.09 |   | 1 |
| Geological Association of Canada; Mineralogical Association of Canada: Joint Annual Meeting, Program with Abstracts | Conference | 1 | 0.09 | 1 |   |
| Geological Association of New Jersey, Annual Field Conference | Conference | 1 | 0.09 | 1 |   |
| Geological Society of America, Southeastern Section, Guidebook | Conference | 1 | 0.09 | 1 |   |
| International Geological Congress, Abstracts--Congres Geologique Internationale, Resumes | Conference | 1 | 0.09 |   | 1 |
| Journal of Environmental Science and Health Part A-Toxic hazardous Substances & Environmental Engineering | Journal | 1 | 0.09 |   | 1 |
| Journal of the North Carolina Academy of Science | Journal | 1 | 0.09 |   | 1 |
| Leading Edge (Tulsa, OK) | Journal | 1 | 0.09 | 1 |   |
| Michigan Academician | Journal | 1 | 0.09 | 1 |   |
| New departures in structural geology and tectonics, Denver, CO | Technical Publication | 1 | 0.09 |   | 1 |
| New England Intercollegiate Geological Conference, Annual Meeting | Conference | 1 | 0.09 | 1 |   |
| Nova Hedwigia | Journal | 1 | 0.09 |   | 1 |
| Occasional Papers of the Geological Institute of Hungary | Conference | 1 | 0.09 |   | 1 |
| Proceedings of SAGEEP | Conference | 1 | 0.09 |   | 1 |
| Reservoir | Journal | 1 | 0.09 |   | 1 |
| Scientific Investigations Report | Technical Publication | 1 | 0.09 |   | 1 |
| Technical Publication Series - American Water Resources Association | Technical Publication | 1 | 0.09 | 1 |   |
| The Ohio Journal of Science | Journal | 1 | 0.09 | 1 |   |
| Total: | 48 | 1129 | 100.00 | 254 | 875 |

The information in Table 0.4 above is further analyzed by pre and post-workshop attendance as shown below in Tables 0.41 and 0.42 respectively. All three tables are summarized in Table 0.43.

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| Table 0.41 – Pre-workshop attendance |
| Title | Document Type | <2002 (1998-2001) | % Pre Wrkshop | % Total |
| Geological Society of America, Abstracts with Programs | Conference | 173 | 68.11 | 15.32 |
| Journal of Geoscience Education | Journal | 43 | 16.93 | 3.81 |
| Computers & Geosciences | Journal | 6 | 2.36 | 0.53 |
| Seismological Research Letters | Journal | 4 | 1.57 | 0.35 |
| EOS, Transactions, American Geophysical Union | Journal | 3 | 1.18 | 0.27 |
| GeoTimes | Journal | 3 | 1.18 | 0.27 |
| American Chemical Society, Abstracts of Papers | Conference | 2 | 0.79 | 0.18 |
| Lunar and Planetary Science Conference, Abstracts of Papers | Conference | 2 | 0.79 | 0.18 |
| AAAS Annual Meeting | Conference | 1 | 0.39 | 0.09 |
| Abstracts of Papers Submitted to the Lunar and Planetary Science Conference | Conference | 1 | 0.39 | 0.09 |
| American Association of Petroleum Geologists, Annual Meeting Expanded Abstract | Conference | 1 | 0.39 | 0.09 |
| American Zoologist | Journal | 1 | 0.39 | 0.09 |
| Earth's dynamic systems | Book | 1 | 0.39 | 0.09 |
| Environmental geology; an Earth system science approach | Book | 1 | 0.39 | 0.09 |
| Geological Association of Canada; Mineralogical Association of Canada: Joint Annual Meeting, Program with Abstracts | Conference | 1 | 0.39 | 0.09 |
| Geological Association of New Jersey, Annual Field Conference | Conference | 1 | 0.39 | 0.09 |
| Geological Society of America, Southeastern Section, Guidebook | Conference | 1 | 0.39 | 0.09 |
| GSA Today | Journal | 1 | 0.39 | 0.09 |
| Journal of Geography | Journal | 1 | 0.39 | 0.09 |
| Leading Edge (Tulsa, OK) | Journal | 1 | 0.39 | 0.09 |
| Michigan Academician | Journal | 1 | 0.39 | 0.09 |
| New England Intercollegiate Geological Conference, Annual Meeting | Conference | 1 | 0.39 | 0.09 |
| New Mexico Geology | Journal | 1 | 0.39 | 0.09 |
| New York State Geological Association, Meeting Guidebook | Conference | 1 | 0.39 | 0.09 |
| Technical Publication Series - American Water Resources Association | Technical Publication | 1 | 0.39 | 0.09 |
| The Ohio Journal of Science | Journal | 1 | 0.39 | 0.09 |
| Total: | 26 | 254 |   | 22.50 |

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| Table 0.42 Post-workshop attendance |
| Title | Document Type | >=2002 (2002-2008 | % Post Wrkshp | % Total |
| Geological Society of America, Abstracts with Programs | Conference | 598 | 68.34 | 52.97 |
| Journal of Geoscience Education | Journal | 124 | 14.17 | 10.98 |
| EOS, Transactions, American Geophysical Union | Journal | 101 | 11.54 | 8.95 |
| Lunar and Planetary Science Conference, Abstracts of Papers | Conference | 5 | 0.57 | 0.44 |
| Computers & Geosciences | Journal | 3 | 0.34 | 0.27 |
| Elements | Journal | 3 | 0.34 | 0.27 |
| Geochimica et Cosmochimica Acta | Journal | 3 | 0.34 | 0.27 |
| Proceedings of the Geoscience Information Society | Journal | 3 | 0.34 | 0.27 |
| Seismological Research Letters | Journal | 3 | 0.34 | 0.27 |
| Geological Society of America, Special Paper | Conference | 2 | 0.23 | 0.18 |
| GeoTimes | Journal | 2 | 0.23 | 0.18 |
| Ground Water | Journal | 2 | 0.23 | 0.18 |
| International Journal of Science Education | Journal | 2 | 0.23 | 0.18 |
| Journal of the Virtual Explorer | Journal | 2 | 0.23 | 0.18 |
| The Professional Geologist | Journal | 2 | 0.23 | 0.18 |
| AAPG Bulletin | Journal | 1 | 0.11 | 0.09 |
| American Chemical Society, Abstracts of Papers | Conference | 1 | 0.11 | 0.09 |
| Association of Engineering Geologists, Annual Meeting | Conference | 1 | 0.11 | 0.09 |
| Astrobiology | Journal | 1 | 0.11 | 0.09 |
| California Journal of Science Education | Journal | 1 | 0.11 | 0.09 |
| Earth's dynamic systems | Book | 1 | 0.11 | 0.09 |
| General Meeting of the International Mineralogical Association, Abstracts | Conference | 1 | 0.11 | 0.09 |
| GSA Today | Journal | 1 | 0.11 | 0.09 |
| International Geological Congress, Abstracts--Congres Geologique Internationale, Resumes | Conference | 1 | 0.11 | 0.09 |
| Journal of Environmental Science and Health Part A-Toxic hazardous Substances & Environmental Engineering | Journal | 1 | 0.11 | 0.09 |
| Journal of Geography | Journal | 1 | 0.11 | 0.09 |
| Journal of the North Carolina Academy of Science | Journal | 1 | 0.11 | 0.09 |
| New departures in structural geology and tectonics, Denver, CO | Technical Publication | 1 | 0.11 | 0.09 |
| New Mexico Geology | Journal | 1 | 0.11 | 0.09 |
| New York State Geological Association, Meeting Guidebook | Conference | 1 | 0.11 | 0.09 |
| Nova Hedwigia | Journal | 1 | 0.11 | 0.09 |
| Occasional Papers of the Geological Institute of Hungary | Conference | 1 | 0.11 | 0.09 |
| Proceedings of SAGEEP | Conference | 1 | 0.11 | 0.09 |
| Reservoir | Journal | 1 | 0.11 | 0.09 |
| Scientific Investigations Report | Technical Publication | 1 | 0.11 | 0.09 |
| Total: | 35 | 875 |   | 77.50 |

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| Table 0.43 – Scatter of Publications |
|   | 1998-2008 | <2002 | >=2002 |
| No of Unique Publication titles | 48 | 26 | 35 |
| No of Publications/conference presentations | 1129 | 254 | 875 |
| Top 3 publication titles account for  | 92.29% | 87.40% | 94.06% |
| Remaining publication titles | 45 | 23 | 32 |
| Remaining publication titles account for  | 7.71% | 12.60% | 5.94% |

Table 0.43 above shows that most of the materials published or presented by workshop participants are concentrated in three publications/conference titles. These three publications/conference titles account for 92.3% of all materials overall (i.e. all publications for 1998-2008), 87.4% relating to pre-workshop attendance and 94% post-workshop attendance. Overall, 7.71 percent of publications are scattered in 45 publications/conference titles, for pre-workshop, 12.6 percent are scattered in 23 publications/conference titles and for post-workshop attendance, 5.94 percent are scattered in 32 publications/conference titles.

The results presented above seem in line with the various iterations of the Laws of Scattering of information. Generally, a small percentage of journals [materials] normally accounts for a large percentage of articles [materials] in any given field (Kanasy 1975 and Subramanyam 1975, Encyclopedia of Library and Information Science, vol. 14 and 26 respectively).

Law of Scattering of literature predicts that about 80 percent of the citations will come from about 20 percent of the material cited (Tobias 1975, J. of Academic Librarianship, Vol. 1(1), p14-16.

**Access Table : Query 7: Collaborators: Pre and Post**

The data from this query is further analyzed in Table 0.5 below . It shows that before 2002 (i.e. 1998-2001 – pre-workshop), there are 101 articles/presentations that contain one author, 71 that contain 2 authors, 35 that contain 3 authors and so on. Similarly, after 2002 (i.e. 2002-2008 – Post-workshop), 258 articles/presentations have one author, 244 have 2 authors, 155 have 3 authors, etc.

The third column shows the average number of papers per year pre-workshop with the corresponding number of collaborators in the first column, while the fifth column shows the average number of papers per year post-workshop with the corresponding number of collaborators in the first column.

The last column shows the percentage difference in the number of collaborators post-workshop. This is calculated (post avg/year – pre avg/year)/((post avg /yr+ pre avg/yr)/2) \*100

With the exception of the first column (for single authors) and the last three columns, the percentage difference in collaborators increased in every case, some substantial, for between 2-11 collaborators.

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| Table 0.5 - Collaborators |
| Number of Collaborators | Pre 2002 (4 yrs) | Avg/Yr - Pre 2002 | Post 2001 (7 yrs) | Av /yr Post 2001 | % Difference |
| 1 | 101 | 25.3 | 258 | 36.9 | 37.4 |
| 2 | 71 | 17.8 | 244 | 34.9 | 65.0 |
| 3 | 35 | 8.8 | 155 | 22.1 | 86.7 |
| 4 | 26 | 6.5 | 83 | 11.9 | 58.4 |
| 5 | 5 | 1.3 | 42 | 6.0 | 131.0 |
| 6 | 5 | 1.3 | 36 | 5.1 | 121.8 |
| 7 | 7 | 1.8 | 19 | 2.7 | 43.2 |
| 8 |   | 0.0 | 10 | 1.4 | 200.0 |
| 9 | 1 | 0.3 | 7 | 1.0 | 120.0 |
| 10 | 2 | 0.5 | 17 | 2.4 | 131.7 |
| 11 |   | 0.0 | 2 | 0.3 | 200.0 |
| 12 |   | 0.0 | 1 | 0.1 | 200.0 |
| 13 | 1 | 0.3 |   | 0.0 | -200.0 |
| 18 |   | 0.0 | 1 | 0.1 | 200.0 |

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| **Table 0.51 (Data from Access Table 8: Collaborators – pre and post - all workshops)** |
| Workshop Name | Workshop Year | # Pre WS Years | # Post WS Years  | # Authors | Pre Wshp - # Papers | Pre Ave/yr | Post Wshp - # Papers | Post Ave/yr | % Diff |
| aguviz04 | 2004 | 6 | 5 | 1 | 1 | 0.2 | 6 | 1.2 | 151.2 |
| aguviz04 | 2004 | 6 | 5 | 2 | 7 | 1.2 | 3 | 0.6 | -64.2 |
| aguviz04 | 2004 | 6 | 5 | 3 | 4 | 0.7 | 7 | 1.4 | 71.0 |
| aguviz04 | 2004 | 6 | 5 | 4 | 7 | 1.2 | 1 | 0.2 | -141.5 |
| aguviz04 | 2004 | 6 | 5 | 5 |   | 0.0 | 1 | 0.2 | 200.0 |
| aguviz04 | 2004 | 6 | 5 | 6 | 1 | 0.2 |   | 0.0 | -200.0 |
| biocomplexity03 | 2003 | 5 | 6 | 1 | 8 | 1.6 | 3 | 0.5 | -104.8 |
| biocomplexity03 | 2003 | 5 | 6 | 2 | 3 | 0.6 | 10 | 1.7 | 94.1 |
| biocomplexity03 | 2003 | 5 | 6 | 3 | 3 | 0.6 | 4 | 0.7 | 10.5 |
| biocomplexity03 | 2003 | 5 | 6 | 4 | 1 | 0.2 | 4 | 0.7 | 107.7 |
| biocomplexity03 | 2003 | 5 | 6 | 5 |   | 0.0 | 2 | 0.3 | 200.0 |
| biocomplexity03 | 2003 | 5 | 6 | 6 |   | 0.0 | 1 | 0.2 | 200.0 |
| biocomplexity03 | 2003 | 5 | 6 | 8 |   | 0.0 | 1 | 0.2 | 200.0 |
| biocomplexity03 | 2003 | 5 | 6 | 10 | 1 | 0.2 | 1 | 0.2 | -18.2 |
| biocomplexity03 | 2003 | 5 | 6 | 18 |   | 0.0 | 1 | 0.2 | 200.0 |
| coursedesign02 | 2002 | 4 | 7 | 1 | 7 | 1.8 | 27 | 3.9 | 75.2 |
| coursedesign02 | 2002 | 4 | 7 | 2 | 7 | 1.8 | 21 | 3.0 | 52.6 |
| coursedesign02 | 2002 | 4 | 7 | 3 | 1 | 0.3 | 8 | 1.1 | 128.2 |
| coursedesign02 | 2002 | 4 | 7 | 4 | 4 | 1.0 | 4 | 0.6 | -54.5 |
| coursedesign02 | 2002 | 4 | 7 | 6 | 1 | 0.3 | 1 | 0.1 | -54.5 |
| coursedesign02 | 2002 | 4 | 7 | 7 | 1 | 0.3 | 1 | 0.1 | -54.5 |
| coursedesign02 | 2002 | 4 | 7 | 8 |   | 0.0 | 2 | 0.3 | 200.0 |
| coursedesign02 | 2002 | 4 | 7 | 9 |   | 0.0 | 2 | 0.3 | 200.0 |
| coursedesign02 | 2002 | 4 | 7 | 10 |   | 0.0 | 2 | 0.3 | 200.0 |
| coursedesign03 | 2003 | 5 | 6 | 1 | 19 | 3.8 | 19 | 3.2 | -18.2 |
| coursedesign03 | 2003 | 5 | 6 | 2 | 10 | 2.0 | 22 | 3.7 | 58.8 |
| coursedesign03 | 2003 | 5 | 6 | 3 | 2 | 0.4 | 14 | 2.3 | 141.5 |
| coursedesign03 | 2003 | 5 | 6 | 4 | 1 | 0.2 | 10 | 1.7 | 157.1 |
| coursedesign03 | 2003 | 5 | 6 | 5 |   | 0.0 | 2 | 0.3 | 200.0 |
| coursedesign03 | 2003 | 5 | 6 | 6 |   | 0.0 | 2 | 0.3 | 200.0 |
| coursedesign03 | 2003 | 5 | 6 | 7 |   | 0.0 | 3 | 0.5 | 200.0 |
| coursedesign03 | 2003 | 5 | 6 | 9 |   | 0.0 | 2 | 0.3 | 200.0 |
| coursedesign03 | 2003 | 5 | 6 | 10 |   | 0.0 | 4 | 0.7 | 200.0 |
| coursedesign04 | 2004 | 6 | 5 | 1 | 19 | 3.2 | 19 | 3.8 | 18.2 |
| coursedesign04 | 2004 | 6 | 5 | 2 | 12 | 2.0 | 14 | 2.8 | 33.3 |
| coursedesign04 | 2004 | 6 | 5 | 3 | 4 | 0.7 | 14 | 2.8 | 123.1 |
| coursedesign04 | 2004 | 6 | 5 | 4 | 6 | 1.0 | 4 | 0.8 | -22.2 |
| coursedesign04 | 2004 | 6 | 5 | 5 |   | 0.0 | 3 | 0.6 | 200.0 |
| coursedesign04 | 2004 | 6 | 5 | 6 |   | 0.0 | 3 | 0.6 | 200.0 |
| coursedesign04 | 2004 | 6 | 5 | 8 |   | 0.0 | 1 | 0.2 | 200.0 |
| coursedesign04 | 2004 | 6 | 5 | 10 |   | 0.0 | 4 | 0.8 | 200.0 |
| coursedesign04 | 2004 | 6 | 5 | 13 | 1 | 0.2 |   | 0.0 | -200.0 |
| coursedesign05f2f | 2005 | 7 | 4 | 1 |   | 0.0 | 2 | 0.5 | 200.0 |
| coursedesign05f2f | 2005 | 7 | 4 | 2 | 2 | 0.3 | 1 | 0.3 | -13.3 |
| coursedesign05f2f | 2005 | 7 | 4 | 3 | 2 | 0.3 | 2 | 0.5 | 54.5 |
| coursedesign05f2f | 2005 | 7 | 4 | 4 | 2 | 0.3 |   | 0.0 | -200.0 |
| coursedesign05f2f | 2005 | 7 | 4 | 8 | 1 | 0.1 |   | 0.0 | -200.0 |
| coursedesign05f2f | 2005 | 7 | 4 | 10 | 1 | 0.1 |   | 0.0 | -200.0 |
| coursedesign05onl | 2005 | 7 | 4 | 1 | 1 | 0.1 | 1 | 0.3 | 54.5 |
| coursedesign05onl | 2005 | 7 | 4 | 6 | 1 | 0.1 |   | 0.0 | -200.0 |
| coursedesign05onl | 2005 | 7 | 4 | 7 |   | 0.0 | 1 | 0.3 | 200.0 |
| coursedesign06f2f | 2006 | 8 | 3 | 1 | 12 | 1.5 | 3 | 1.0 | -40.0 |
| coursedesign06f2f | 2006 | 8 | 3 | 2 | 4 | 0.5 | 5 | 1.7 | 107.7 |
| coursedesign06f2f | 2006 | 8 | 3 | 3 | 5 | 0.6 | 5 | 1.7 | 90.9 |
| coursedesign06f2f | 2006 | 8 | 3 | 4 | 5 | 0.6 | 6 | 2.0 | 104.8 |
| coursedesign06f2f | 2006 | 8 | 3 | 5 | 1 | 0.1 | 3 | 1.0 | 155.6 |
| coursedesign06f2f | 2006 | 8 | 3 | 6 | 2 | 0.3 |   | 0.0 | -200.0 |
| coursedesign06f2f | 2006 | 8 | 3 | 7 | 1 | 0.1 |   | 0.0 | -200.0 |
| coursedesign06f2f | 2006 | 8 | 3 | 8 |   | 0.0 | 2 | 0.7 | 200.0 |
| coursedesign06f2f | 2006 | 8 | 3 | 10 |   | 0.0 | 1 | 0.3 | 200.0 |
| earlycareer03 | 2003 | 5 | 6 | 1 | 2 | 0.4 | 7 | 1.2 | 97.9 |
| earlycareer03 | 2003 | 5 | 6 | 2 | 10 | 2.0 | 19 | 3.2 | 45.2 |
| earlycareer03 | 2003 | 5 | 6 | 3 | 5 | 1.0 | 16 | 2.7 | 90.9 |
| earlycareer03 | 2003 | 5 | 6 | 4 | 4 | 0.8 | 8 | 1.3 | 50.0 |
| earlycareer03 | 2003 | 5 | 6 | 5 | 2 | 0.4 | 4 | 0.7 | 50.0 |
| earlycareer03 | 2003 | 5 | 6 | 6 |   | 0.0 | 2 | 0.3 | 200.0 |
| earlycareer03 | 2003 | 5 | 6 | 7 |   | 0.0 | 2 | 0.3 | 200.0 |
| earlycareer03 | 2003 | 5 | 6 | 9 |   | 0.0 | 1 | 0.2 | 200.0 |
| earlycareer03 | 2003 | 5 | 6 | 10 |   | 0.0 | 3 | 0.5 | 200.0 |
| earlycareer04 | 2004 | 6 | 5 | 1 | 4 | 0.7 | 8 | 1.6 | 82.4 |
| earlycareer04 | 2004 | 6 | 5 | 2 | 8 | 1.3 | 10 | 2.0 | 40.0 |
| earlycareer04 | 2004 | 6 | 5 | 3 | 2 | 0.3 | 4 | 0.8 | 82.4 |
| earlycareer04 | 2004 | 6 | 5 | 4 | 2 | 0.3 | 3 | 0.6 | 57.1 |
| earlycareer04 | 2004 | 6 | 5 | 5 | 1 | 0.2 | 1 | 0.2 | 18.2 |
| earlycareer04 | 2004 | 6 | 5 | 6 |   | 0.0 | 2 | 0.4 | 200.0 |
| earlycareer04 | 2004 | 6 | 5 | 7 | 2 | 0.3 | 5 | 1.0 | 100.0 |
| earlycareer04 | 2004 | 6 | 5 | 8 |   | 0.0 | 1 | 0.2 | 200.0 |
| earlycareer04 | 2004 | 6 | 5 | 10 |   | 0.0 | 2 | 0.4 | 200.0 |
| earlycareer05 | 2005 | 7 | 4 | 1 | 2 | 0.3 | 2 | 0.5 | 54.5 |
| earlycareer05 | 2005 | 7 | 4 | 2 | 3 | 0.4 | 3 | 0.8 | 54.5 |
| earlycareer05 | 2005 | 7 | 4 | 3 | 1 | 0.1 | 2 | 0.5 | 111.1 |
| earlycareer05 | 2005 | 7 | 4 | 4 | 1 | 0.1 | 2 | 0.5 | 111.1 |
| earlycareer05 | 2005 | 7 | 4 | 5 |   | 0.0 | 1 | 0.3 | 200.0 |
| earlycareer05 | 2005 | 7 | 4 | 7 |   | 0.0 | 1 | 0.3 | 200.0 |
| earlycareer05 | 2005 | 7 | 4 | 9 |   | 0.0 | 1 | 0.3 | 200.0 |
| earlycareer05 | 2005 | 7 | 4 | 10 | 2 | 0.3 |   | 0.0 | -200.0 |
| earlycareer06 | 2006 | 8 | 3 | 1 | 7 | 0.9 | 5 | 1.7 | 62.3 |
| earlycareer06 | 2006 | 8 | 3 | 2 | 8 | 1.0 | 7 | 2.3 | 80.0 |
| earlycareer06 | 2006 | 8 | 3 | 3 |   | 0.0 | 1 | 0.3 | 200.0 |
| earlycareer06 | 2006 | 8 | 3 | 4 | 4 | 0.5 |   | 0.0 | -200.0 |
| earlycareer06 | 2006 | 8 | 3 | 6 | 3 | 0.4 |   | 0.0 | -200.0 |
| earlycareer06 | 2006 | 8 | 3 | 7 |   | 0.0 | 1 | 0.3 | 200.0 |
| earlycareer06 | 2006 | 8 | 3 | 10 | 2 | 0.3 |   | 0.0 | -200.0 |
| geochemistry05 | 2005 | 7 | 4 | 1 | 2 | 0.3 | 2 | 0.5 | 54.5 |
| geochemistry05 | 2005 | 7 | 4 | 2 | 2 | 0.3 | 3 | 0.8 | 89.7 |
| geochemistry05 | 2005 | 7 | 4 | 3 | 3 | 0.4 | 6 | 1.5 | 111.1 |
| geochemistry05 | 2005 | 7 | 4 | 5 | 1 | 0.1 |   | 0.0 | -200.0 |
| geochemistry05 | 2005 | 7 | 4 | 7 |   | 0.0 | 2 | 0.5 | 200.0 |
| geochemistry05 | 2005 | 7 | 4 | 8 | 1 | 0.1 |   | 0.0 | -200.0 |
| geochemistry05 | 2005 | 7 | 4 | 10 |   | 0.0 | 2 | 0.5 | 200.0 |
| globaldatasets02 | 2002 | 4 | 7 | 1 | 3 | 0.8 | 16 | 2.3 | 101.2 |
| globaldatasets02 | 2002 | 4 | 7 | 2 | 5 | 1.3 | 17 | 2.4 | 64.1 |
| globaldatasets02 | 2002 | 4 | 7 | 3 |   | 0.0 | 8 | 1.1 | 200.0 |
| globaldatasets02 | 2002 | 4 | 7 | 4 | 2 | 0.5 | 6 | 0.9 | 52.6 |
| globaldatasets02 | 2002 | 4 | 7 | 5 | 2 | 0.5 | 4 | 0.6 | 13.3 |
| globaldatasets02 | 2002 | 4 | 7 | 6 | 1 | 0.3 | 3 | 0.4 | 52.6 |
| globaldatasets02 | 2002 | 4 | 7 | 7 |   | 0.0 | 3 | 0.4 | 200.0 |
| globaldatasets02 | 2002 | 4 | 7 | 8 |   | 0.0 | 1 | 0.1 | 200.0 |
| globaldatasets02 | 2002 | 4 | 7 | 9 |   | 0.0 | 3 | 0.4 | 200.0 |
| globaldatasets02 | 2002 | 4 | 7 | 10 |   | 0.0 | 2 | 0.3 | 200.0 |
| health04 | 2004 | 6 | 5 | 1 | 16 | 2.7 | 17 | 3.4 | 24.2 |
| health04 | 2004 | 6 | 5 | 2 | 6 | 1.0 | 19 | 3.8 | 116.7 |
| health04 | 2004 | 6 | 5 | 3 | 1 | 0.2 | 9 | 1.8 | 166.1 |
| health04 | 2004 | 6 | 5 | 4 | 3 | 0.5 | 5 | 1.0 | 66.7 |
| health04 | 2004 | 6 | 5 | 5 |   | 0.0 | 1 | 0.2 | 200.0 |
| health04 | 2004 | 6 | 5 | 8 |   | 0.0 | 1 | 0.2 | 200.0 |
| health04 | 2004 | 6 | 5 | 9 | 1 | 0.2 |   | 0.0 | -200.0 |
| health04 | 2004 | 6 | 5 | 10 | 1 | 0.2 |   | 0.0 | -200.0 |
| hydrogeology05 | 2005 | 7 | 4 | 1 | 15 | 2.1 | 11 | 2.8 | 24.8 |
| hydrogeology05 | 2005 | 7 | 4 | 2 | 11 | 1.6 | 4 | 1.0 | -44.4 |
| hydrogeology05 | 2005 | 7 | 4 | 3 | 10 | 1.4 | 12 | 3.0 | 71.0 |
| hydrogeology05 | 2005 | 7 | 4 | 4 | 5 | 0.7 | 7 | 1.8 | 84.1 |
| hydrogeology05 | 2005 | 7 | 4 | 5 | 2 | 0.3 | 3 | 0.8 | 89.7 |
| hydrogeology05 | 2005 | 7 | 4 | 6 | 3 | 0.4 | 2 | 0.5 | 15.4 |
| hydrogeology05 | 2005 | 7 | 4 | 7 | 3 | 0.4 | 8 | 2.0 | 129.4 |
| hydrogeology05 | 2005 | 7 | 4 | 10 | 2 | 0.3 | 10 | 2.5 | 159.0 |
| hydrogeology05 | 2005 | 7 | 4 | 11 |   | 0.0 | 1 | 0.3 | 200.0 |
| mars06 | 2006 | 8 | 3 | 1 | 15 | 1.9 | 6 | 2.0 | 6.5 |
| mars06 | 2006 | 8 | 3 | 2 | 9 | 1.1 |   | 0.0 | -200.0 |
| mars06 | 2006 | 8 | 3 | 3 | 4 | 0.5 | 2 | 0.7 | 28.6 |
| mars06 | 2006 | 8 | 3 | 4 | 10 | 1.3 | 3 | 1.0 | -22.2 |
| mars06 | 2006 | 8 | 3 | 5 | 2 | 0.3 | 2 | 0.7 | 90.9 |
| mars06 | 2006 | 8 | 3 | 6 | 1 | 0.1 | 7 | 2.3 | 179.7 |
| mars06 | 2006 | 8 | 3 | 7 | 1 | 0.1 |   | 0.0 | -200.0 |
| mars06 | 2006 | 8 | 3 | 8 | 2 | 0.3 | 1 | 0.3 | 28.6 |
| mars06 | 2006 | 8 | 3 | 10 |   | 0.0 | 1 | 0.3 | 200.0 |
| mars06 | 2006 | 8 | 3 | 18 | 1 | 0.1 |   | 0.0 | -200.0 |
| oceansystem05 | 2005 | 7 | 4 | 1 | 9 | 1.3 | 2 | 0.5 | -88.0 |
| oceansystem05 | 2005 | 7 | 4 | 2 | 16 | 2.3 | 6 | 1.5 | -41.5 |
| oceansystem05 | 2005 | 7 | 4 | 3 | 4 | 0.6 | 1 | 0.3 | -78.3 |
| oceansystem05 | 2005 | 7 | 4 | 4 | 2 | 0.3 |   | 0.0 | -200.0 |
| oceansystem05 | 2005 | 7 | 4 | 5 | 1 | 0.1 |   | 0.0 | -200.0 |
| oceansystem05 | 2005 | 7 | 4 | 7 |   | 0.0 | 1 | 0.3 | 200.0 |
| oceansystem05 | 2005 | 7 | 4 | 8 | 1 | 0.1 |   | 0.0 | -200.0 |
| petrology03 | 2003 | 5 | 6 | 1 | 14 | 2.8 | 43 | 7.2 | 87.6 |
| petrology03 | 2003 | 5 | 6 | 2 | 17 | 3.4 | 40 | 6.7 | 64.9 |
| petrology03 | 2003 | 5 | 6 | 3 | 8 | 1.6 | 36 | 6.0 | 115.8 |
| petrology03 | 2003 | 5 | 6 | 4 | 2 | 0.4 | 9 | 1.5 | 115.8 |
| petrology03 | 2003 | 5 | 6 | 5 | 4 | 0.8 | 4 | 0.7 | -18.2 |
| petrology03 | 2003 | 5 | 6 | 6 | 1 | 0.2 | 5 | 0.8 | 122.6 |
| petrology03 | 2003 | 5 | 6 | 7 | 1 | 0.2 | 3 | 0.5 | 85.7 |
| petrology03 | 2003 | 5 | 6 | 8 | 1 | 0.2 |   | 0.0 | -200.0 |
| petrology03 | 2003 | 5 | 6 | 9 |   | 0.0 | 1 | 0.2 | 200.0 |
| petrology03 | 2003 | 5 | 6 | 10 | 2 | 0.4 | 9 | 1.5 | 115.8 |
| petrology03 | 2003 | 5 | 6 | 13 | 1 | 0.2 |   | 0.0 | -200.0 |
| publicpolicy06 | 2006 | 8 | 3 | 1 | 17 | 2.1 | 2 | 0.7 | -104.5 |
| publicpolicy06 | 2006 | 8 | 3 | 2 | 17 | 2.1 | 7 | 2.3 | 9.3 |
| publicpolicy06 | 2006 | 8 | 3 | 3 | 6 | 0.8 | 2 | 0.7 | -11.8 |
| publicpolicy06 | 2006 | 8 | 3 | 4 | 7 | 0.9 | 1 | 0.3 | -89.7 |
| publicpolicy06 | 2006 | 8 | 3 | 5 | 1 | 0.1 | 2 | 0.7 | 136.8 |
| publicpolicy06 | 2006 | 8 | 3 | 6 | 1 | 0.1 |   | 0.0 | -200.0 |
| publicpolicy06 | 2006 | 8 | 3 | 7 | 3 | 0.4 | 1 | 0.3 | -11.8 |
| publicpolicy06 | 2006 | 8 | 3 | 8 | 1 | 0.1 |   | 0.0 | -200.0 |
| seds06 | 2006 | 8 | 3 | 1 | 21 | 2.6 | 15 | 5.0 | 62.3 |
| seds06 | 2006 | 8 | 3 | 2 | 19 | 2.4 | 11 | 3.7 | 42.8 |
| seds06 | 2006 | 8 | 3 | 3 | 10 | 1.3 | 2 | 0.7 | -60.9 |
| seds06 | 2006 | 8 | 3 | 4 | 9 | 1.1 | 7 | 2.3 | 69.9 |
| seds06 | 2006 | 8 | 3 | 5 |   | 0.0 | 1 | 0.3 | 200.0 |
| seds06 | 2006 | 8 | 3 | 6 | 2 | 0.3 | 4 | 1.3 | 136.8 |
| seds06 | 2006 | 8 | 3 | 7 | 2 | 0.3 | 1 | 0.3 | 28.6 |
| seds06 | 2006 | 8 | 3 | 8 |   | 0.0 | 1 | 0.3 | 200.0 |
| seds06 | 2006 | 8 | 3 | 9 | 2 | 0.3 |   | 0.0 | -200.0 |
| seds06 | 2006 | 8 | 3 | 10 | 3 | 0.4 |   | 0.0 | -200.0 |
| seds06 | 2006 | 8 | 3 | 12 |   | 0.0 | 1 | 0.3 | 200.0 |
| seds06 | 2006 | 8 | 3 | 13 | 1 | 0.1 |   | 0.0 | -200.0 |
| seds06 | 2006 | 8 | 3 | 18 | 1 | 0.1 |   | 0.0 | -200.0 |
| structgeo04 | 2004 | 6 | 5 | 1 | 15 | 2.5 | 17 | 3.4 | 30.5 |
| structgeo04 | 2004 | 6 | 5 | 2 | 19 | 3.2 | 23 | 4.6 | 36.9 |
| structgeo04 | 2004 | 6 | 5 | 3 | 9 | 1.5 | 11 | 2.2 | 37.8 |
| structgeo04 | 2004 | 6 | 5 | 4 | 9 | 1.5 | 7 | 1.4 | -6.9 |
| structgeo04 | 2004 | 6 | 5 | 5 | 4 | 0.7 | 2 | 0.4 | -50.0 |
| structgeo04 | 2004 | 6 | 5 | 6 | 2 | 0.3 | 10 | 2.0 | 142.9 |
| structgeo04 | 2004 | 6 | 5 | 7 | 2 | 0.3 | 14 | 2.8 | 157.4 |
| structgeo04 | 2004 | 6 | 5 | 8 | 1 | 0.2 | 8 | 1.6 | 162.3 |
| structgeo04 | 2004 | 6 | 5 | 10 |   | 0.0 | 39 | 7.8 | 200.0 |
| stuassmntv205 | 2005 | 7 | 4 | 1 | 35 | 5.0 | 18 | 4.5 | -10.5 |
| stuassmntv205 | 2005 | 7 | 4 | 2 | 55 | 7.9 | 35 | 8.8 | 10.8 |
| stuassmntv205 | 2005 | 7 | 4 | 3 | 54 | 7.7 | 26 | 6.5 | -17.1 |
| stuassmntv205 | 2005 | 7 | 4 | 4 | 6 | 0.9 | 13 | 3.3 | 116.5 |
| stuassmntv205 | 2005 | 7 | 4 | 5 | 1 | 0.1 | 13 | 3.3 | 183.2 |
| stuassmntv205 | 2005 | 7 | 4 | 6 | 2 | 0.3 | 10 | 2.5 | 159.0 |
| stuassmntv205 | 2005 | 7 | 4 | 7 | 1 | 0.1 | 2 | 0.5 | 111.1 |
| stuassmntv205 | 2005 | 7 | 4 | 8 | 1 | 0.1 |   | 0.0 | -200.0 |
| stuassmntv205 | 2005 | 7 | 4 | 9 | 2 | 0.3 | 3 | 0.8 | 89.7 |
| stuassmntv205 | 2005 | 7 | 4 | 10 | 5 | 0.7 | 2 | 0.5 | -35.3 |
| stuassmntv205 | 2005 | 7 | 4 | 11 | 1 | 0.1 |   | 0.0 | -200.0 |
| stuassmntv205 | 2005 | 7 | 4 | 12 |   | 0.0 | 2 | 0.5 | 200.0 |
| web03 | 2003 | 5 | 6 | 1 | 17 | 3.4 | 20 | 3.3 | -2.0 |
| web03 | 2003 | 5 | 6 | 2 | 16 | 3.2 | 23 | 3.8 | 18.0 |
| web03 | 2003 | 5 | 6 | 3 | 8 | 1.6 | 15 | 2.5 | 43.9 |
| web03 | 2003 | 5 | 6 | 4 | 1 | 0.2 | 7 | 1.2 | 141.5 |
| web03 | 2003 | 5 | 6 | 5 | 2 | 0.4 | 2 | 0.3 | -18.2 |
| web03 | 2003 | 5 | 6 | 6 |   | 0.0 | 4 | 0.7 | 200.0 |
| web03 | 2003 | 5 | 6 | 7 |   | 0.0 | 1 | 0.2 | 200.0 |
| web03 | 2003 | 5 | 6 | 8 |   | 0.0 | 1 | 0.2 | 200.0 |
| web03 | 2003 | 5 | 6 | 9 |   | 0.0 | 2 | 0.3 | 200.0 |
| web03 | 2003 | 5 | 6 | 10 |   | 0.0 | 3 | 0.5 | 200.0 |

Table 0.51 above (**derived from Query 8 in the Access database**) shows the data that relates to each workshop. The third and fourth columns show the number of years - pre and post - for each workshop. The information in these two columns was used to normalize the data and find the average number of articles/presentations/year pre and post workshops and to calculate the percentage difference for each workshop.

General analysis of the data is presented in Table 0.51 below. The column #% difference shows that collaborators have increased in that many workshops.

For instance, for publications/presentations with one author, 16 workshops had an increase in single authorship after workshop attendance, 18 workshops had an increase in 2 authors per publication/presentations, 17 workshops had an increase in 3 authors, etc.

**Table 0.52 – Analysis of 0.51**

|  |  |  |  |
| --- | --- | --- | --- |
| # Collaborators | # Workshops+ % diff | # Workshops -% diff | N/A |
| 1 | 16 | 7 | 1 |
| 2 | 18 | 4 | 2 |
| 3 | 17 | 4 | 3 |
| 4 | 13 | 6 | 5 |
| 5 | 8 | 3 | 13 |
| 6 | 7 | 1 | 16 |
| 7 | 6 | 2 | 16 |
| 8 | 2 | 0 | 22 |
| 9 | 1 | 0 | 23 |
| 10 | 2 | 2 | 20 |
| 11 | 0 | 0 | 24 |
| 12 | 0 | 0 | 24 |
| 13 | 0 | 0 | 24 |
| 18 | 0 | 0 | 24 |

**Access query #12 - Collaboration within workshops and Access Query #13 - intra-workshop collaboration by workshop.**

**Access Query 12** shows the top level table with collaboration within workshops. It includes articles for all years studied (1998-2008). It shows that 2 attendees in any of the workshops authored or presented together 91 times, 3 attendees in any workshop authored or presented together 7 times. **Access Query #13 -intra-workshop collaboration by workshop.** This table shows the intra-workshop collaboration for individual workshop.

**Access Query 9 (Count of Subjects – pre and post) and Query 10 (Count of subjects by workshop – pre and post)**

**Access Query 9** shows the number of times a keyword is assigned to each document. This is further divided by pre and post workshop attendance. **Access Query 10** is further broken down by workshops.

When Access **Query 9** data is normalized as shown in the table below, in 42 of the 47 assigned keywords (89 percent), the number of papers relating to defined education topics increased. This is reflected by a positive value in the % difference column. Similar analysis can be done for data using data in **Access Query 10** which will reflect data for each workshop based on the date of the workshop.

|  |
| --- |
| Table 9 - Assigned subjects pre and post workshop attendance |
| Keywords | Total Publns | 1998-2001 Publns | Avg/yr (4 years) | 2002-2008 Publns | Avg/yr (7 years) | % diff |
| college-level education | 890 | 205 | 51.3 | 685 | 97.9 | 62.5 |
| curricula | 568 | 110 | 27.5 | 458 | 65.4 | 81.6 |
| instructional strategies | 295 | 59 | 14.8 | 236 | 33.7 | 78.3 |
| instructional materials | 287 | 92 | 23.0 | 195 | 27.9 | 19.1 |
| learning environments | 223 | 55 | 13.8 | 168 | 24.0 | 54.3 |
| instructional methods | 219 | 54 | 13.5 | 165 | 23.6 | 54.3 |
| k-12 education | 205 | 45 | 11.3 | 160 | 22.9 | 68.1 |
| assessment and evaluation | 177 | 34 | 8.5 | 143 | 20.4 | 82.5 |
| field studies | 172 | 40 | 10.0 | 132 | 18.9 | 61.4 |
| student research | 165 | 42 | 10.5 | 123 | 17.6 | 50.4 |
| technology | 152 | 43 | 10.8 | 109 | 15.6 | 36.6 |
| teacher education | 147 | 30 | 7.5 | 117 | 16.7 | 76.1 |
| world wide web | 104 | 51 | 12.8 | 53 | 7.6 | -51.0 |
| visualization | 69 | 14 | 3.5 | 55 | 7.9 | 76.7 |
| outreach to the general public | 67 | 9 | 2.3 | 58 | 8.3 | 114.6 |
| laboratory studies | 50 | 14 | 3.5 | 36 | 5.1 | 38.0 |
| education for targeted audiences | 46 | 4 | 1.0 | 42 | 6.0 | 142.9 |
| graduate-level education | 43 | 10 | 2.5 | 33 | 4.7 | 61.4 |
| quantitative analysis | 42 | 8 | 2.0 | 34 | 4.9 | 83.3 |
| learning goals | 40 | 7 | 1.8 | 33 | 4.7 | 91.7 |
| active learning | 33 | 8 | 2.0 | 25 | 3.6 | 56.4 |
| recruitment and retention | 31 | 5 | 1.3 | 26 | 3.7 | 99.3 |
| national science education standards | 28 | 9 | 2.3 | 19 | 2.7 | 18.7 |
| scientific literacy | 25 | 4 | 1.0 | 21 | 3.0 | 100.0 |
| disabilities support services | 18 | 6 | 1.5 | 12 | 1.7 | 13.3 |
| distance learning | 17 | 9 | 2.3 | 8 | 1.1 | -65.3 |
| case studies | 16 | 3 | 0.8 | 13 | 1.9 | 84.9 |
| departmental reform | 16 | 3 | 0.8 | 13 | 1.9 | 84.9 |
| earth system science | 16 | 3 | 0.8 | 13 | 1.9 | 84.9 |
| research on learning | 16 |   | 0.0 | 16 | 2.3 | 200.0 |
| databases | 15 | 3 | 0.8 | 12 | 1.7 | 78.3 |
| faculty professional development | 15 |   | 0.0 | 15 | 2.1 | 200.0 |
| mars | 12 | 2 | 0.5 | 10 | 1.4 | 96.3 |
| global change | 11 | 4 | 1.0 | 7 | 1.0 | 0.0 |
| technical writing | 10 | 3 | 0.8 | 7 | 1.0 | 28.6 |
| qualitative analysis | 8 |   | 0.0 | 8 | 1.1 | 200.0 |
| museums | 7 | 1 | 0.3 | 6 | 0.9 | 109.7 |
| information literacy | 6 | 1 | 0.3 | 5 | 0.7 | 96.3 |
| public health | 6 |   | 0.0 | 6 | 0.9 | 200.0 |
| affective domain | 5 | 1 | 0.3 | 4 | 0.6 | 78.3 |
| cognitive domain | 2 | 2 | 0.5 |   | 0.0 | -200.0 |
| digitization | 2 | 1 | 0.3 | 1 | 0.1 | -54.5 |
| standardization | 2 | 1 | 0.3 | 1 | 0.1 | -54.5 |
| cyberinfrastructure | 1 |   | 0.0 | 1 | 0.1 | 200.0 |
| cybermapping | 1 |   | 0.0 | 1 | 0.1 | 200.0 |

 **Access Query #14 – Number of workshop attendance vs productivity**

This query answers the question: Does attendance at more workshops contribute to more publications?

As shown in Table 0.6 below, in the first row, 605 attendees attended one workshop, overall (1998-2008) these attendees publish/presented 1079 papers. Of these 474 were before workshop attendance which is an average of 0.8 per attendee. 605 of these publications were after attendees attend their first workshops, which is an average of 1.0 publication per attendee. The percent difference in publication post-workshop is 24.3, etc. The percent difference in the average number of publications post-workshop increased in four of the six cases based on increasing number of participation.

Overall, the percentage difference in the number of publications increased for post-workshop participants in all cases except one, when attendees attend more than one workshop.

|  |
| --- |
| Table 0.6 - No .of Workshop Attendance vs Productivity |
| Workshop(s) Attended | # Attendees | # Publications/ presentations | Total Publns Before First Workshop | Avg Publ/attendee before 1st wkshp | Total Publns After First Workshop | Avg Publ/attendee after 1st wkshp | % diff |
| 1 | 605 | 1079 | 474 | 0.8 | 605 | 1.0 | 24.3 |
| 2 | 95 | 246 | 73 | 0.8 | 173 | 1.8 | 81.3 |
| 3 | 20 | 82 | 17 | 0.9 | 65 | 3.3 | 117.1 |
| 4 | 5 | 36 | 15 | 3.0 | 21 | 4.2 | 33.3 |
| 5 | 1 | 8 | 1 | 1.0 | 7 | 7.0 | 150.0 |
| 6 | 1 | 6 | 5 | 5.0 | 1 | 1.0 | -133.3 |
|   | 727.00 | 1457\*\* | 585 |   | 872.00 |   |   |
|   |   |   |   |   |   |   |   |
|  | \*\* Workshop attendees may have co-authored papers with others, so publications are counted more than once.  |  |  |

Submitted by Lutishoor Salisbury

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lsalisbu@gmail.com