

# ***Web 3.0: A 15 Years Analysis of Literature Growth in Library and Information Science Discipline (2000-2015)***

**Yanti Idaya Aspura M. K., Suzilianah S. & Noorhidawati A.**

Department Library and Information Sciences,

Faculty of Computer Science and Information Technology,

University of Malaya, Kuala Lumpur, MALAYSIA

E-mail: yanti@um.edu.my; noorhidawati@um.edu.my; suezee.sulaiman@gmail.com

## **ABSTRACT**

*The emergence of web 3.0 technologies has changed the technological developments in library and information science (LIS) field. Web 3.0 technology has been adopted in academic, public and special libraries particularly in library services but little are reported about its actual usage. Therefore this study is conducted to investigate the growth of literature on Web 3.0 technologies in LIS disciplines. The following research objectives were put forward: i) to identify countries producing a substantial number of Web 3.0 technologies in LIS discipline; ii) to identify journals producing a substantial number of Web 3.0 technologies in LIS discipline; iii) to analyze the most cited articles on Web 3.0 technologies in LIS discipline; iv) to identify what is the web 3.0 technology being utilized in LIS discipline. This study focused on to assess the publications of and citations to Web 3.0 in LIS discipline at country, publication and article level from 2000 to 2015 using bibliometrics approach based on Web of Science Core Collection. The finding of this study is essential for researchers in the field of LIS to be informed on the latest trends and literature growth of Web 3.0 in LIS field.*

**Keywords:** web 3.0, semantic web, library and information science, bibliometric

## **INTRODUCTION (Note: Author-date citation for references cited in text)**

Web 3.0 began to be heard about in the early 2000, as Semantics Web technologies started to replace the era of web 2.0. "Web 3.0" is naming suggested by John Markoff the reporter of the New York Times in November 2006 to represent the third generation of web (Markoff, 2006). The third generation internet-based service or "the intelligent Web" comprising of semantics web, microformats, natural language search, data-mining, machine learning, recommendation agents, and artificial intelligence technologies. According to Tim-Bernes Lee (2006), Semantic Web is the component of Web 3.0 and sometimes used as a synonym for Web 3.0. The Web 3.0 technologies comprises of Semantic Web technology (RDF, OWL, SWARL, SPARQL), Ontology, Open Technology (Open data), Open source software and Big Data technology.

The transition of this technologies web advancement from Web 1.0 to Web 2.0 leading to Web 3.0 contributes to the significant impacts of research in library technology

development. The technology also growth in Library and Information Science (LIS) research started from the emerging and development of digital library in early 1990s and followed by Semantic Digital Library. Use of digital information tools in libraries and web applications are changing the library environment and their services. According to Hendrix, 2010 Libraries should adopt new applications and tools to become more relative with technological information environment (Hendrix, 2010).

The best future of the library can only be succeeded through decent technological change and social planning (Connor & Au, 2008). Space and time are not a boundary to the future libraries to be more informatics and present information for their users. This technological advancements in libraries have transformed the ways for acquiring, storing, preserving and disseminating information on the web. Among the researchers, Web 2.0 technologies offered new potentials for digital them to connect the new technologies and offer limitless digital information contents through a single package (Garcia, Gomez, Colomo and Garcia, 2011). Then, in advanced, the Semantic Web offers to explore the web-based metadata usage and additional ways to manage resources and contents of digital libraries. It offers semantically annotated digital library contents that are interlinked with different resources and present new meaningful information in downloadable form. The advantages of semantic web will reduce the shortcomings of digital library and library services especially in acquiring, storing, retrieving and preserving technology. So that this study was conducted to see the trend of LIS research in Web technology advancement using bibliometric study. The bibliometric defined as a study of the process of information use by analyzing the characteristics of documents and their distribution by statistical methods (Roy, 1983).

## **AIMS AND OBJECTIVES**

The main purpose of this paper is to report the literature growth on Web 3.0 technologies in Library and Information Science (LIS) discipline from 2000 to 2016 and make a recommendation for researchers in LIS. Therefore the following research questions were put forward:

- i. To identify countries producing a substantial number of Web 3.0 technologies in LIS discipline
- ii. To identify journals producing a substantial number of Web 3.0 technologies in LIS discipline
- iii. To analyze the most cited articles on Web 3.0 technologies in LIS discipline
- iv. To identify what is the web 3.0 technology being utilized in LIS discipline

## **METHODOLOGY**

This bibliometric study addresses the research trends of Web 3.0 for the period of 15 years from 2000 to 2015 in Library and Information Science discipline. This period was chosen due to the evolution of Web 2.0 to Web 3.0 starts from the year of 2000 as reported by Radar Networks and Nova Spivack (Spivack, 2007). This study however, seeks to include all publications that include Web 3.0 technology usage in "Information Science Library Science" discipline only. In order to gather the data, the following keywords were use as the search terms: web 3.0; semantic web, ontology, open linked, web 3.0 technology and big data. These terms were the synonyms terms for Web 3.0

according to Tim Berners-Lee. The data were gathered from Web of Science core collection that includes journal articles and conference proceedings. As a result, a total of 1204 publications including journal articles and conference proceeding were collected. For the data analysis, Microsoft Excel and Tagul application was used.

## **ANALYSIS AND FINDINGS**

### **Growth of literature and citation analysis on Web 3.0 technologies in LIS discipline**

Since year 2000 there is an increasing numbers in scientific productivity of Web 3.0 in LIS discipline. Web 3.0 technologies have evolved with the development of the world technology (Table 1). From year 2000 to 2006, the publication on Web 3.0 is less than 100. This is the transition years between Web 2.0 to Web 3.0. The implication of publication also can be seen in LIS discipline. However, the research trend shows a gradual increase in a number of publications since 2005 in Web 3.0 LIS research. After 2007, we can perceive the publication trend increase sharply in this area of research. These results indicate that though Web 3.0 research gradually increased since 2000, it was the year 2007 when LIS researchers developed more interest in this area of research, and they started contributing a large number of publications. The most productive year was 2008 in which 176 papers (14.70%) were published. The development of Web 3.0 in the LIS discipline had evolved with the existence of open archive initiative, e-print, digital library management system, e-repository and open access (Candela et al. 2011).

The citation trend of publication on Web 3.0 in LIS discipline on the other hand has much variation. Papers published in 2007 received the highest number of citations (796) followed by the papers published in 2009 and 2008 with 694 and 652 citations respectively. In year 2001, the citation number also increase 100% from 157 to 304 times but then decrease to 136. Regarding citations per publication, 10 papers published in 2003 were highly cited at the rate of 13.4 citations per publication. Then followed by 30 papers published year 2006 with the citation rate 12 citations per publication.

Table 1: Citation trends of Web 3.0 in LIS disciplines from 2000 to 2015

| Years                                | Documents<br>(n = 1204) | Percentage     | Number of<br>Times Cited | Citations per<br>publication | % of Times<br>Cited |
|--------------------------------------|-------------------------|----------------|--------------------------|------------------------------|---------------------|
| 2000                                 | 21                      | 1.76%          | 157                      | 7.48                         | 2.96%               |
| 2001                                 | 26                      | 2.18%          | 304                      | 11.70                        | 5.73%               |
| 2002                                 | 14                      | 1.17%          | 136                      | 9.71                         | 2.56%               |
| 2003                                 | 10                      | 0.84%          | 134                      | 13.4                         | 2.52%               |
| 2004                                 | 18                      | 1.50%          | 195                      | 10.83                        | 3.70%               |
| 2005                                 | 48                      | 4.02%          | 258                      | 5.38                         | 4.90%               |
| 2006                                 | 30                      | 2.51%          | 360                      | 12.00                        | 6.78%               |
| 2007                                 | 129                     | 10.71%         | 796                      | 4.48                         | 10.80%              |
| 2008                                 | 176                     | 14.7%          | 652                      | 3.70                         | 12.30%              |
| 2009                                 | 125                     | 10.38%         | 694                      | 5.22                         | 12.10%              |
| 2010                                 | 103                     | 8.55%          | 577                      | 5.62                         | 10.80%              |
| 2011                                 | 84                      | 6.98%          | 389                      | 4.67                         | 7.30%               |
| 2012                                 | 97                      | 8.06%          | 475                      | 5.05                         | 8.95%               |
| 2013                                 | 101                     | 8.46%          | 224                      | 2.22                         | 4.22%               |
| 2014                                 | 118                     | 9.80%          | 157                      | 1.34                         | 3.00%               |
| 2015                                 | 106                     | 8.80%          | 78                       | 0.74                         | 0.15%               |
| <b>Total</b>                         | <b>1204</b>             | <b>100.00%</b> | <b>5595</b>              |                              | <b>100.00%</b>      |
| *Data retrieved up to July 2016 only |                         |                |                          |                              |                     |

**Top 20 Countries producing a substantial number of publications on Web 3.0 technologies in LIS discipline**

Table 2 shows the top 20 countries that producing a substantial number of publications on Web 3.0 technologies in LIS discipline. The top country is USA with 316 publication, with a total citation of 2550. Followed by Republic of China and England. The least country reported on Web 3.0 publication are Israel and Ireland with 11 and 14 publications respectively.

Table 2: Top 20 Countries Producing Publication on WEB 3.0 in LIS discipline

| No. | Country     | Publications<br>(n = 1204) | Total<br>Citations | Citations /<br>Publication |
|-----|-------------|----------------------------|--------------------|----------------------------|
| 1   | USA         | 316                        | 2550               | 8.07                       |
| 2   | China       | 116                        | 189                | 1.63                       |
| 3   | England     | 72                         | 627                | 8.71                       |
| 4   | Spain       | 60                         | 178                | 3.0                        |
| 5   | Germany     | 55                         | 228                | 4.15                       |
| 6   | South Korea | 55                         | 224                | 4.07                       |
| 7   | Italy       | 53                         | 53                 | 1                          |
| 8   | France      | 45                         | 116                | 2.58                       |
| 9   | Canada      | 43                         | 185                | 4.30                       |
| 10  | Taiwan      | 35                         | 100                | 2.86                       |
| 11  | Greece      | 34                         | 93                 | 2.74                       |
| 12  | Netherlands | 33                         | 261                | 7.91                       |
| 13  | Brazil      | 27                         | 52                 | 1.93                       |
| 14  | Australia   | 27                         | 95                 | 3.52                       |
| 15  | Singapore   | 27                         | 265                | 9.81                       |
| 16  | India       | 28                         | 21                 | 0.75                       |
| 17  | Austria     | 21                         | 165                | 7.86                       |
| 18  | Belgium     | 15                         | 77                 | 5.13                       |
| 19  | Ireland     | 14                         | 26                 | 1.86                       |
| 20  | Israel      | 11                         | 71                 | 6.45                       |

### Top 20 Publication producing a substantial number of Web 3.0 technologies in LIS discipline

Table 3 shows the top 20 journals contributing in Web 3.0 LIS research with citations number and citations per publication. The finding demonstrate that *Journal Of The American Society For Information Science And Technology* published by Wiley-Blackwell from USA has published the highest number of papers (89, 7.4%) on Web 3.0 in LIS research, followed by *Journal of the American Medical Informatics Association* and *Information Processing & Management*, that published 87 (7.2%) and 64 (5.31%) papers respectively. The citation analysis indicates that papers published in *Journal Of The American Society For Information Science And Technology* attracted the highest number of citations (926) followed by *Information Processing & Management* with 846 (15.12%) and 703 (12.56%) citations in *Journal of the American Medical Informatics Association* and *Information Processing*. The findings indicated the highest citations per publication is from *Information Processing & Management* with 13.21 citations followed by *Journal of the American Society for Information Science and Technology* (10.40) and *International Journal of Geographical Information Science* (10.35). From the findings, 7 out of 20 top publications are Q1 journal from Information Science & Library Science

categories with highest number of papers and citations per paper namely *Journal Of The American Society For Information Science And Technology (Q1)*, *Journal of the American Medical Informatics Association (Q1)*, *Journal Of Information Science (Q1)*, *International Journal Of Geographical Information Science (Q1)*, *Scientometrics (Q1)*, *International Journal Of Information Management (Q1)* and *Journal Of Information Technology (Q1)*. *Information Processing & Management (Q2)* is listed in the Q2 journal in Information Science & Library Science however, this publication among the top 3 publication in this list. This journal also received higher citation with 846 citation numbers. Then, 14 out of 20 publications have more than one category such as Computer Science and Information System, Computer Science, Interdisciplinary Applications, Information System, Theory & Methods, Business and Economics. From this top 20 publications, 5 publications are proceedings.

Table 3: Top 20 Publication Titles on WEB 3.0 in LIS discipline

| No. | Publication Title  | Papers Published (N = 1204) | Papers Published (%) | Citations (N=5595) | Citation (%) | Citations / Publication | WOS Category (Ranking)   |
|-----|--|-----------------------------|----------------------|--------------------|--------------|-------------------------|--|
| 1   | Journal Of The American Society For Information Science And Technology | 89                          | 7.4%                 | 926                | 16.55%       | 10.40                   | Computer Science, Information Systems (Q1)<br>Information Science & Library Science (Q1) |
| 2   | Journal Of The American Medical Informatics Association                | 87                          | 7.2%                 | 703                | 12.56%       | 8.08                    | Computer Science, Information Systems (Q1)<br>Information Science & Library Science (Q1) |
| 3   | Information Processing & Management                                    | 64                          | 5.31%                | 846                | 15.12%       | 13.21                   | Computer Science, Information Systems (Q2)<br>Information Science & Library Science (Q2) |
| 4   | Journal Of Information Science   | 51                          | 4.24%                | 419                | 7.49%        | 8.21                    | Computer Science, Information Systems (Q2)<br>Information Science & Library Science (Q1) |
| 5   | International Journal Of Geographical Information                      | 40                          | 3.32%                | 414                | 7.40%        | 10.35                   | Computer Science, Information Systems (Q1)   |

|    |   |    |       |     |       |      |  |
|----|---|----|-------|-----|-------|------|--|
|    | Science   |    |       |     |       |      | Information Science & Library Science (Q1)   |
| 6  | Online Information Review                               | 38 | 3.2%  | 160 | 2.86% | 4.21 | Computer Science, Information Systems (Q2)<br>Information Science & Library Science (Q2)             |
| 7  | Knowledge Organization                                  | 33 | 2.74% | 71  | 1.27% | 2.15 | Information Science & Library Science (Q3)   |
| 8  | Scientometrics  | 25 | 2.08% | 157 | 2.80% | 6.28 | Computer Science, Interdisciplinary Applications (Q2)<br>Information Science & Library Science (Q1)  |
| 9  | Electronic Library                                      | 25 | 2.08% | 114 | 2.04% | 4.56 | Information Science & Library Science (Q4)   |
| 10 | Metadata And Semantics Research , Mtsr 2007 Proceedings | 19 | 1.58% | 20  | 0.36% | 1.05 | Computer Science<br>Information Systems<br>Information Science & Library Science                     |
| 11 | Econtent  | 19 | 1.58% | 8   | 0.14% | 0.42 | Information Science & Library Science (Q4)   |
| 12 | Metadata And Semantics Research, Mtsr 2013 Proceedings  | 16 | 1.33% | 20  | 0.36% | 1.25 | Computer Science<br>Information Systems<br>Theory & Methods<br>Information Science & Library Science |
| 13 | International Journal Of Information Management         | 15 | 1.25% | 82  | 1.46% | 5.46 | Information Science & Library Science (Q1)   |
| 14 | Online  | 13 | 1.08% | 19  | 0.34% | 1.46 | Information Science & Library Science (Q4)   |
| 15 | Program-Electronic Library And                          | 12 | 1.00% | 7   | 0.12% | 0.58 | Computer Science, Information Systems (Q3)   |

|    |   |    |       |    |       |      |   |
|----|---|----|-------|----|-------|------|---|
|    | Information Systems   |    |       |    |       |      | Information Science & Library Science (Q2)  |
| 16 | Library Journal   | 12 | 1.00% | 2  | 0.04% | 0.16 | Information Science & Library Science (Q4)  |
| 17 | Proceedings of the 14th International Conference On Informatics In Economy (Ie 2015): Education, Research & Business Technologies | 12 | 1.00% | 2  | 0.04% | 0.16 | Business<br>Finance<br>Economics<br>Information Science & Library Science   |
| 18 | Business Information Systems Workshops  | 10 | 0.83% | 30 | 0.53% | 3.00 | Business<br>Computer Science<br>Information Systems<br>Information Science & Library Science                          |
| 19 | Ontoract 2008: First International Workshop On Ontologies In Interactive Systems, Proceedings                                     | 9  | 0.74% | 4  | 0.07% | 0.40 | Computer Science<br>Information Systems<br>Theory & Methods<br>Social Issues<br>Information Science & Library Science |
| 20 | Journal Of Information Technology   | 6  | 0.5%  | 3  | 0.14% | 0.42 | Computer Science, Information Systems (Q1)<br>Information Science & Library Science (Q1)                              |

### Top 20 most cited article on Web 3.0 technologies in LIS disciplines

Table 4 indicates that the article *“The Emerging Web 2.0 Social Software: An Enabling Suite of Sociable Technologies in Health and Health Care Education”* by Boulos and



Wheeler published in *Health Information and Libraries Journal* in year 2007 was the most cited paper with 223 times cited. The second highly cited paper is “*Business Intelligence and Analytics: From Big Data to Big Impact*” by Chen, Chiang and Storey published in *MIS Quarterly* in year 2012. Table 5 shows the 20 top cited articles on Web 3.0. The findings, indicated 5 out of 20 most cited articles were published in *Journal of the American Society for Information Science and Technology* (JASIST).

Table 4: Top 20 most cited article on Web 3.0 in LIS discipline  
Include year, authors use last Name.

| No. | Authors   | Article Title  | Journal Title  | Times Cited |
|-----|---|--|--|-------------|
| 1   | Boulos, M. N. K. & Wheeler, S. (2005)                                     | The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education | Health Information And Libraries Journal                               | 223         |
| 2   | Chen, Hsinchun; Chiang, Roger H. L.; Storey, Veda C. (2012)               | Business Intelligence And Analytics: From Big Data To Big Impact   | MIS Quarterly  | 190         |
| 3   | Bhagal, J.; Macfarlane, A.; Smith, P. (2007)                              | A review of ontology based query expansion   | Information Processing & Management                                    | 117         |
| 4   | Stvilia, Besiki; Twidale, Michael B.; Smith, Linda C.; Gasser, Les (2008) | Information quality work organization in Wikipedia   | Journal Of The American Society For Information Science And Technology | 86          |
| 5   | Laurent, Michael R.; Vickers, Tim J. (2009)                               | Seeking Health Information Online: Does Wikipedia Matter?  | Journal Of The American Medical Informatics Association                | 77          |
| 6   | Kuhn, W (2001)  | Ontologies in support of activities in geographical space  | International Journal Of Geographical Information Science              | 75          |
| 7   | Lutz, M; Klien, E (2006)  | Ontology-based retrieval of geographic information   | International Journal Of Geographical Information Science              | 69          |
| 8   | Fallis, Don (2008)  | Toward an epistemology of Wikipedia  | Journal Of The American Society For Information Science And Technology | 67          |
| 9   | Ding, Y; Foo, S (2002)  | Ontology research and development. Part I - a review of ontology generation  | Journal Of Information Science   | 63          |
| 10  | Holsapple, CW; Joshi, KD (2004)   | Formal knowledge management ontology: Conduct, activities, resources, and influences                                 | Journal Of The American Society For Information Science And Technology | 60          |

|    |   |   |  |    |
|----|---|---|--|----|
| 11 | Frank, AU (2001)  | Tiers of ontology and consistency constraints in geographical information systems                                       | International Journal Of Geographical Information Science              | 60 |
| 12 | Wimalasuriya, Daya C.; Dou, Dejing (2010)   | Ontology-based information extraction: An introduction and a survey of current approaches                               | Journal Of Information Science   | 59 |
| 13 | Musen, Mark A.; Noy, Natalya F.; Shah, Nigam H.; Whetzel, Patricia L.; Chute, Christopher G.; Story, Margaret-Anne; Smith, Barry (2012) | The National Center for Biomedical Ontology   | Journal Of The American Medical Informatics Association                | 50 |
| 14 | Zhou, Lina (2007)   | Ontology learning: state of the art and open issues   | Information Technology & Management                                    | 49 |
| 15 | Gilchrist, A (2003)   | Thesauri, taxonomies and ontologies - an etymological note  | Journal Of Documentation   | 49 |
| 16 | Lim, Sook (2009)  | How and Why Do College Students Use Wikipedia?  | Journal Of The American Society For Information Science And Technology | 46 |
| 17 | Ransbotham, Sam; Kane, Gerald C. (2011)   | Membership Turnover And Collaboration Success In Online Communities: Explaining Rises And Falls From Grace In Wikipedia | MIS Quarterly  | 45 |
| 18 | Forte, Andrea; Larco, Vanessa; Bruckman, Amy (2009)   | Decentralization in Wikipedia Governance  | Journal Of Management Information Systems                              | 44 |
| 19 | Ding, Y; Foo, S (2002)  | Ontology research and development. Part 2 - a review of ontology mapping and evolving                                   | Journal Of Information Science   | 43 |
| 20 | Chiu, Chao-Min; Chang, Chen-Chi; Cheng, Hsiang-Lan; Fang, Yu-Hui (2009)   | Determinants of customer repurchase intention in online shopping  | Online Information Review  | 43 |

### **The Web 3.0 technology applied in LIS discipline**

The analysis of Web 3.0 technologies that applied in LIS discipline was conducted based on word frequency in the articles' keyword. The findings shows the term *Semantic Web* contribute the highest frequency with 2019 and followed by *Ontology* with 1895 respectively. The least frequent technologies are Web 3.0 technology. On the other hand the other terms related to Web 3.0 appeared to be Bibliometric, DBpedia,

Wikipedia, Social Web, Digital Library, RDF, 3Di, Scientometrics, Open Linked, Library Services, Library and Big data.



## CONCLUSION

This paper present bibliometric analysis of research trend on Web 3.0 technologies in LIS discipline from 2000-2015. The finding shows some interesting trends in the development of Web 3.0 technology advancement in LIS field. The finding indicates that paper published in 2007 received the highest number of citations with 796 citation count followed by papers published in year 2009 and 2008 with 694 and 652 citation count respectively. The USA is prominent in term of number of publication (316) with a total citation numbers of 2550. Therefore USA is far ahead of other countries in term of publications and total number of citations received while China is the highest Asian country secured a position in the top 20 countries with 116 papers and 189 citations. South Korea is the second place in Asian country with 55 publications and 224 total citations. On the other hand Singapore received the highest citation per paper (9.81 per publication). *Journal of the American Society for Information Science and Technology (JASIST)* is the preferred platform for researchers to publish research work on Web 3.0 in LIS discipline added with its reputation as the Q1 journal ranking in Information Science & Library Science category. From the findings of top 20 most cited articles on Web 3.0, none of the article reflects the library fields (such as library services, library management system, library collection and library preservation). Instead, the majority of the articles are in Information Science discipline as reflected in the WOS category and Journal title as shown in Table 4 and 5 above. The analysis of Web 3.0 technology trends that emerged in LIS discipline shows *Semantic Web* and *Ontology* were among the most usable technology although other technologies such as *DBpedia*, *Wikipedia*, *Social Web*, *Digital Library*, *RDF*, *3Di*, *Scientometrics*, *Open Linked*, *Library Services*, *Library* and *Big data* also in place. This finding is important as a starting point for the LIS researchers to further conduct studies related on Web 3.0 technologies usage to benefit Library and Information domain as well as other disciplines.

## **REFERENCES**

- Berners-Lee, T., Hendler, J. and Lassila, O. 2001. The semantic web. *Scientific American*, 284(5), pp.28-37.
- Candela, L., Castelli, D. and Pagano, P. 2011. History, evolution, and impact of digital libraries. *E-publishing and digital libraries: legal and organizational issues*, pp.1-30
- García-Crespo, Á., Gómez-Berbís, J.M., Colomo-Palacios, R. and García-Sánchez, F. 2011. Digital libraries and web 3.0. The CallimachusDL approach. *Computers in Human Behavior*, 27(4), pp.1424-1430.
- Hendrix, J.C. 2010. Checking Out the Future. *Online. ALA Office for Information Technology Policy Brief*, (2).
- J. Markoff. 2006. Entrepreneurs See a Web Guided by Commonsense. *The New York Times, Business*, 12 Nov.
- O'Connor, S. and Au, L.C. 2009. Steering a future through scenarios: Into the academic library of the future. *The Journal of Academic Librarianship*, 35(1), pp.57-64.
- Spivack, Nova. 2007. How the WebOS Evolves? Blogs: [http://novaspivack.typepad.com/nova\\_spivacks\\_weblog/2007/02/steps\\_towards\\_a.html](http://novaspivack.typepad.com/nova_spivacks_weblog/2007/02/steps_towards_a.html)
- Victoria Shannon. 2006. A 'more revolutionary' Web. *International Herald Tribune*. 23 May 2006.
- Williams, P. 2005. Using information and computer technology with special education need students: the views of frontline professional. *Aslib Proceedings*, Vol. 57, no. 57: 539-553
- Wojahn, R. H. 2006. Everyone's invited: Ways to make your library more welcoming to children with special needs. *School Library Journal*, Vol. 5, no. 2: 46-48.