# Technology-Related Research in Academy of Human Resource Development (AHRD) Publications: A Review between 2000 and 2004

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*The growth of technology has influenced human resource development (HRD) practitioners to embrace technology for both training and non-training interventions. This study examined technology-related articles in Academy of Human Resource Development (AHRD) publications in order to understand what these articles address and the future needs of technology research in HRD. The study found that most AHRD technology research was published in the conference proceedings, in which a large percentage focused on educational technology (84%).*

Keywords: Technology, AHRD Publications, Content Analysis

Information technology (IT) has grown exponentially during the past two decades, leading to changes in nearly every field of practice. One definition of human resource development (HRD) is "a process for developing and unleashing human expertise through organization development and personnel training and development for the purpose of improving performance" (Swanson & Holton, 2001, p. 4). Conn and Gitonga (2004) highlight that successful HRD professionals often utilize both training and non-training interventions to achieve this goal. In formal training programs, there has been an increased emphasis on the use of technology, as reported in three American Society for Training and Development (ASTD) studies (*ASTD 2004 State of the Industry Report*, 2004). These studies found that 29% to 35% of all formal learning in organizations was delivered via technology. On the other hand, the use of technology in non-training or informal situations also needs attention. Technology-related examples of interventions in these settings include IT tools such as databases, collaboration systems, and instant messaging for performance enhancement and organizational development and change (Benson, Johnson, & Kuchinke, 2002).

As technology's influence in HRD escalates, an examination of technology-related studies in HRD publications becomes a worthwhile endeavor. Researchers should be aware of whether technology is being addressed by HRD, how it is being researched, where it is being researched, and who is researching it. Additionally, scholars should reflect on whether technology research agendas need to be reexamined within HRD. Conn and Gitonga (2004) conducted a study that examined the presence of workplace training and performance articles in the journals of an educational technology organization, the Association for Educational Communications and Technology (AECT). In this study, we seek to replicate parts of the Conn and Gitonga study by examining the presence of technology-related studies in the publications of the Academy of Human Resource Development (AHRD). AHRD serves as one of the primary academic organizations dedicated to workplace learning and performance research. AHRD publications were used in this study to provide an indication of the presence of technology-centered research in the HRD field (or lack thereof). Studies in these publications examine interventions ranging from individual-centered learning to organization-wide change.

The purpose of this study was to explore what technology-related papers in AHRD publications address and help determine future technology-related research needs. The following questions guided our study:

1. How much technology-related research is available in AHRD publications—*Advances in Developing Human Resources (ADHR)*, *Human Resource Development International (HRDI)*, *Human Resource Development Quarterly (HRDQ)*, *Human Resource Development Review (HRDR)*, and *Proceedings of Academy of Human Resource Development Conference (Proceedings)*?
2. What are the technology-related papers addressing?
3. What fields/departments do the lead authors represent?
4. What types of methodologies are used?
5. What types of organizational settings are represented in the research?

**Methodology**

This research utilized a content analysis approach to answer the research questions. Patton (2002) defined content analysis as the process of "identifying, coding, and categorizing the primary patterns in the data" (p. 463). The following paragraphs describe a detailed account of this analysis.

*Assignment and Scope*

The authors of this paper shared different assignments. Four researchers gathered data by examining studies related to the broad theme of technology in the 2000-2004 AHRD publications (except for the *HRDR* journal that was being published since 2002). Each researcher volunteered to check specific conference proceedings and examined one set of journals for the years covered. The researchers followed specific guidelines while examining the different documents. By reading each abstract in the respective publications, the researchers decided, first individually and later as a group, whether the different articles fell under the scope of the broad theme of technology. "Technology" included topics such as information technology, learning technology, and knowledge management. In addition to manually reading each abstract, articles were searched using specific keywords (i.e., technology, virtual, web-based, online, IT, knowledge management, distance education, e-learning, electronic communication, and blended learning).

*Exclusion of Articles*

In this study, the researchers included only empirical and/or theory-based manuscripts. Consequently, articles such as book reviews, editorials, "soap boxes," forums, interviews, innovative sessions, panel discussions, and pre-conference sessions were not considered as "full manuscripts" and thus were excluded. Studies ambiguously related to technology were further examined to determine the extent to which they addressed the technology theme. These ambiguous papers were categorized "not included" if they had a minor relationship to technology (e.g., only one section of the article was dedicated to technology or technology was broadly included, but not the main focus of the article). The researchers collaboratively discussed several papers where studies were ambiguous in their relationship to technology or where one researcher could not determine whether a particular article contained a sufficient amount of technology-related material.

*Categorization*

A major focus of this study was to thematically categorize the technology-related articles. The four researchers' initial review of the technology-related articles resulted in four separate lists of categories. Approximately 100 specific categories emerged through an inductive content analysis. One researcher reconciled the four separate lists of categories from each researcher, compiled them into one list of categories, and classified them into themes. Twelve major themes emerged from those categories. Intercoder reliability was emphasized to ensure that the researchers' classifications were consistent since multiple individuals were engaged in the coding process (Miles & Huberman, 1994). To refine the twelve categories, determine the accuracy of the researchers' coding, and to help ensure intercoder reliability, the authors collectively coded 56 technology related articles. Through a series of meetings, the researchers compared individual categorization of these 56 identical articles and discussed how (1) the studies should be placed into specific categories and (2) how to reconcile different codings and classifications (Bierema & Cseh, 2003). The categories were refined throughout this iterative process. The final categorization of these 56 articles was completed before each person performed a final categorization of their assigned articles.

The following categories and definitions emerged as working definitions for the final categorization process:

*Educational technology*. Learning processes or tools that use information technology to facilitate learning in workplaces, higher education courses, and other settings (includes e-learning, distance learning, and classroom technology).

*Information technology (IT) workers*. IT professionals impacted by HRD issues such as training, competency development, continuing professional development, skills certification, and organizational commitment in order to survive in the fast-paced IT field.

*Knowledge management (KM)*. Tools that enable management and development of information and data that people need to be effective in their jobs. KM research is focused on technology-enabled management of knowledge and information (outside formal, facilitated courses), using groupware, collaboration tools, data warehousing, data mining, tools for generating new knowledge, intranets, and electronic document management (Ardichvili, 2002).

*Technological change, transfer, and implementation*. The adoption of an innovation in a different setting from which it was developed, organizational issues surrounding the introduction of technologies and tools, and implementation of new technologies.

*Virtual teams*. Teams whose members share a common purpose and use technology to cross time zones, distance, and boundaries of organizations and/or cultures (Kim, 2004).

*Other*.  Topics such as e-business, e-commerce, coaching through computer-mediated communication, transfer of training with e-learning, email, technology-related research methodology, and information technology (general scope).  These topics did not fit in the other five categories, given the working definitions listed above.

*Fields of Authors*

To determine the home department of the lead author of each technology-related article, the researchers used information provided by AHRD, as found at the end of journal articles or in the AHRD directory included with the conference proceedings. If the department of the lead author was not listed, researchers performed Internet searches to find the lead author's affiliation at the time the paper was published.  A final categorization of the different lead authors' departments was compiled after department names were found for all but three authors.

*Methodologies*

The researchers examined the general methodology or approach used in each of the technology related articles. These methodologies were categorized as empirical research, literature review, or theory development.  The first two categories were adopted from the study conducted by Conn and Gitonga (2004).  The third category, theory development, described articles that provided "a set of interrelated constructs, definitions, and propositions that present a rational view of phenomena by explaining or predicting relationships among those elements" (Camp, 2001, p. 11).  This additional category was added because of AHRD's emphasis on theory development, evidenced by the creation of *HRDR* in 2002.  *HRDR* focuses on development of theory in HRD.  Additionally, calls for more theory development regularly occur in HRD publications (e.g., see Lynham, 2000; Swanson & Holton, 2001).

*Organizational Settings*

For the technology-related empirical articles, the researchers modified organizational setting categories used by Conn and Gitonga (2004) to fit the types of articles identified for this study.  Categories used were: business, government/military, higher education courses, higher education professional development for faculty/staff, non-profit, and other.  "Higher education courses" included studies that examined for-credit courses, non-credit courses, or community outreach programs in colleges/universities. The "professional association/consortium" category emerged later, after finding that several studies examined groups that coordinate learning and performance programs for companies and other organizations.

## Results and Discussion

*Technology-Related Research*

The amount of technology-related research varied greatly among AHRD publications.  Table 1 displays the total percentages of technology-related articles in each AHRD publication.  It is understandable that with the large number of papers included in the *Proceedings*, that this publication would have the highest number of technology-related research papers.  However, the *Proceedings* also had the highest percentage of its papers addressing technology issues (12.79%).  Interestingly, the percentage growth rate of technology-related articles in the *Proceedings* was 132.83% [(16.88-7.25)/7.25 X 100] from 2000 to 2004.  On the other hand, it was startling to discover that *HRDQ* did not contain any technology-related research.  Recognizing the interdisciplinary nature of the field, more technology research was expected.  Of the four *journals*, *ADHR* published the most technology-related articles (8.61%).

Table 1. *Total Percentage of Technology-Related Articles in AHRD Publications From 2000 to 2004*

|  | ADHR | HRDI | HRDQ | HRDR | Proceedings | Total % tech-related articles in AHRD publications[a] |
|---|---|---|---|---|---|---|
| 2000 | 0 | 12 | 0 | n/a | 7.25 | 6.19 |
| 2001 | 0 | 3.85 | 0 | n/a | 9.56 | 6.54 |
| 2002 | 34.48 | 3.57 | 0 | 9.52 | 10.37 | 11.39 |
| 2003 | 6.67 | 3.03 | 0 | 0 | 20 | 12.17 |
| 2004 | 2.94 | 9.68 | 0 | 0 | 16.88 | 11.58 |
| Total % tech-related articles in 5 years[b] | 8.61 | 6.29 | 0 | 3.45 | 12.79 | |

[a]For Year X = No. of tech-related articles/Total No. of articles published X 100
[b]For Publication Y= No. of tech-related articles/Total No. of articles published X 100

Technology-related research increased steadily from 2000 to 2004 in the AHRD publications. From 2001 to 2002, the number of articles increased from 14 to 27 (Figure 1).
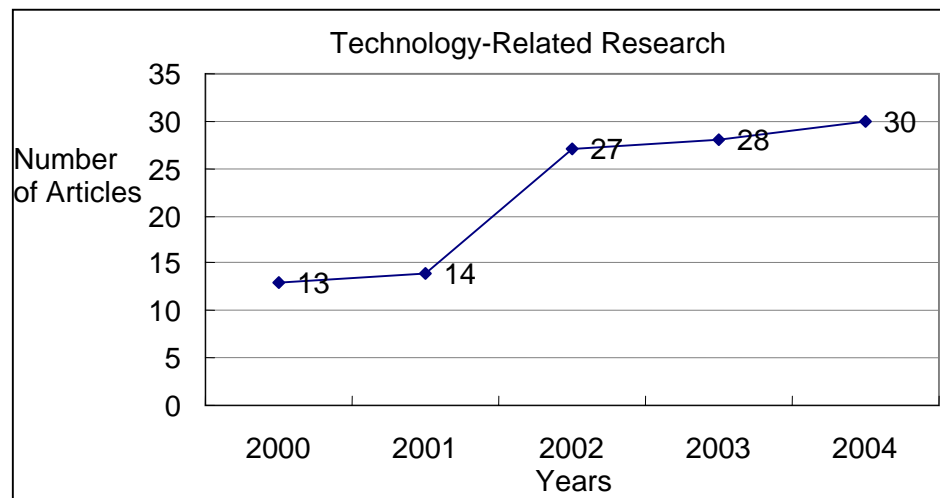


Figure 1. *Technology-related research from 2000 to 2004.*

As mentioned earlier, most technology-related papers were published in the *Proceedings* (Table 2). In 2000, ten out of thirteen technology articles came from the *Proceedings*; the other three articles were published in *HRDI*. However, in 2002, the distribution changed substantially. Forty-four percent of the technology-related articles were published in the journals and 56% were published in the *Proceedings*. The reason for the increase was the introduction of an *ADHR* issue in 2002, which focused on *Information and Learning Technologies in HRD*. In the following year, a decrease to two technology-related articles was observed in *ADHR*, while only one article was published in *HRDI*. Overall, a very slight increase in technology-related articles was seen from 2002 to 2004 (Table 2).

The journals varied in their consistency of publishing technology research. *HRDQ* had no articles primarily related to technology throughout these five years. *HRDR* published two articles in 2002 and *ADHR* included technology articles during three of the five years. Of the journals, *HRDI* was the most consistent publisher of technology-related research. However, throughout the five years examined, 78.57% of the technology articles were published in the *Proceedings* (12.79% of all papers included in the *Proceedings* from 2000-2004). The number of papers related to technology has grown each year in the *Proceedings*.

Table 2. *Number of Technology-Related Research Papers*

|       | ADHR | HRDI | HRDQ | HRDR | Proceedings | Total |
|-------|------|------|------|------|-------------|-------|
| 2000  | 0    | 3    | 0    | n/a  | 10          | 13    |
| 2001  | 0    | 1    | 0    | n/a  | 13          | 14    |
| 2002  | 10   | 1    | 0    | 2    | 14          | 27    |
| 2003  | 2    | 1    | 0    | 0    | 25          | 28    |
| 2004  | 1    | 1    | 0    | 0    | 26          | 30    |
| Total | 13   | 9    | 0    | 2    | 88          | 112   |

*Topics Addressed in Technology-Related Papers*

In looking at the publications separately, most technology articles from the *Proceedings* addressed educational technology (53), followed by virtual teams (12), and technology change, transfer and implementation (11) (Table 3). Other categories (i.e., IT workers, knowledge management, and other) had less than ten articles each. Among the journal publications, the most popular technology theme was educational technology. *HRDI* and *ADHR* both had five articles addressing educational technology. The *HRDR* had two technology-related articles—both were categorized under technological change, transfer and implementation. A summary of the number of articles under each of the categories is found in Table 3.

In publications of an organization dedicated to workplace learning and performance, it is not surprising that a large proportion (56%) of these papers addressed learning technologies (educational technology), most of which were found in the *Proceedings*. The enormous attention attributed to educational technology is understandable given that more organizations and institutions incorporate technology or aspects of it into training, face-to-face learning, or blended learning.  Only two of the four AHRD journals addressed educational technology, *ADHR* and *HRDI*. However, the wide-variety of topics in the journals' technology articles illustrate the growing importance of non-training interventions in HRD.

Table 3. *Number of Articles Published Related to Technology Research*

| Technology-related Topic | *ADHR* | *HRDI* | *HRDQ* | *HRDR* | *Proceedings* | Total |
|---|---|---|---|---|---|---|
| Educational Technology | 5 | 5 | 0 | 0 | 53 | 63 |
| Technological Change, Transfer, and Implementation | 3 | 0 | 0 | 2 | 11 | 16 |
| Virtual Teams | 1 | 1 | 0 | 0 | 12 | 14 |
| Knowledge Management | 3 | 2 | 0 | 0 | 2 | 7 |
| Other | 1 | 0 | 0 | 0 | 6 | 7 |
| IT Workers | 0 | 1 | 0 | 0 | 4 | 5 |
| Total | 13 | 9 | 0 | 2 | 88 | 112 |

*Fields/Departments of the Lead Authors*

Not surprisingly, most lead authors of technology-related articles came from HRD/Human Resource Education (41.1%), with the other 59.9% from a wide-variety of fields (see Table 4) such as academic departments of educational technology, adult/higher education, and business.  Presumably, some of these individuals specialize in HRD, but are employed in other fields (e.g., an HRD specialist working in a college of business).

Table 4.  *Fields/Departments for Lead Authors of Technology-Related Research*

| Field/Department | Number | % |
|---|---|---|
| Human Resource Development/Education | 46 | 41.1 |
| Educational Technology | 9 | 8.0 |
| Adult/higher education | 8 | 7.1 |
| Business | 8 | 7.1 |
| Miscellaneous | 7 | 6.3 |
| Private consulting (non-academic departments) | 6 | 5.4 |
| Educational Technology/HRD (non-academic departments) | 5 | 4.5 |
| Leadership | 5 | 4.5 |
| Technology | 4 | 3.6 |
| Agriculture/Agriculture Education | 3 | 2.7 |
| Human Resource Management | 3 | 2.7 |
| Behavioral sciences | 2 | 1.8 |
| Technology research center | 2 | 1.8 |
| University-based training provider (non-academic departments) | 2 | 1.8 |
| No information | 2 | 1.8 |
| Total | 112 | 100 |

*Methodologies Used in the Papers*

As described earlier, articles were categorized into one of three methodology categories: literature review, empirical, or theory development.  Out of 112 technology-related articles, 18.8% were literature reviews, 65.2% were empirical studies, and 12.5% were theory development pieces.  3.6% of the technology-related articles were

placed in a category called *Other*. This category included four articles found in *ADHR*, where the papers did not fit any of the three categories because (1) they provided informal case studies/scenarios from companies/programs/software to illustrate ideas and assertions, (2) no form of data collection was presented, and (3) they did not contain a significant review of literature, (i.e., included minimal citations or references to literature). Essentially, when looking at the three methodology categories, the articles in the *Other* category were somewhere in-between.

*Organizational Settings*

As seen in Table 5, most of the papers (46.4%) dealt with business organizations. Among the AHRD journals, *ADHR* had the highest number (12) in this setting. From another perspective, a sizable number of all technology-related articles dealt with higher education courses (33%). This setting was used mostly for technology-related research published in the *Proceedings*. None of the AHRD journals published research from settings related to higher education courses. Under-represented organization types included non-profit and government/military organizations, among others.

Table 5. *Organizational Settings Represented in Technology-Related Research*

| Organizational setting | *HRDQ* | *ADHR* | *HRDI* | *HRDR* | *Proceedings* | Total (%) |
|---|---|---|---|---|---|---|
| Business | 0 | 12 | 3 | 1 | 36 | 52 (46.4%) |
| Higher Education Courses | 0 | 0 | 0 | 0 | 37 | 37 (33%) |
| Professional Associations/Consortiums | 0 | 0 | 3 | 0 | 2 | 5 (4.5%) |
| Government/Military | 0 | 0 | 2 | 0 | 2 | 4 (3.6%) |
| Higher Education professional development for faculty/staff | 0 | 0 | 0 | 0 | 1 | 1 (0.9%) |
| Non-Profit Organizations | 0 | 0 | 0 | 0 | 1 | 1 (0.9%) |
| Other | 0 | 0 | 1 | 0 | 3 | 4 (3.6%) |
| No organizational setting | 0 | 1 | 0 | 1 | 6 | 8 (7.1%) |

**Conclusion, Recommendations, and Implications for HRD**

The purpose of this study was to explore what technology-related papers in AHRD publications address and help contribute new knowledge to HRD by assisting in the development of a future agenda for technology-related research. Conclusions, recommendations, and implications for HRD researchers and professionals outline the fulfillment of this goal.

There is need for more inclusion of technology-related research in AHRD journals. As seen in the findings, most technology-related research was found in the *Proceedings*. In AHRD journals, technology-related research was irregular or non-existent (Table 2). This pattern is understandable since all AHRD publications pursue different missions for the benefit of the HRD field. Nonetheless, technology is a major force influencing organizations today and permeates many aspects of HRD practice. HRD professionals and researchers need to articulate and adequately represent this impact in the publications.

Additionally, other technology-related topic areas need to be explored. Educational technology in higher education courses took center stage in the technology-related research in AHRD publications (Table 3). HRD professionals and researchers should explore organizational-focused technology-related research in areas such as technology transfer, virtual teams, knowledge management systems, and other unidentified technology areas affecting HRD practice.

The presence of HRD research conducted by researchers from other fields builds a case for the significance of HRD. One of the striking findings of this study is the high percentage of lead authors outside HRD departments who publish technology-related research in AHRD publications (59%). This wide representation illustrates the interdisciplinary nature of the HRD field. HRD researchers should be encouraged to explore technology-related research with scholars in other fields to enhance the quality of future research.

Different methodologies are also needed in technology-related research. From our findings, most technology-related research was done empirically (65.2%). As an emergent and constantly changing field, technology needs to be explored further through theory development pieces. HRD researchers should collaborate with practitioners to develop new theories in the field of technology.

There is also a need for a broader spectrum of organizational settings to be examined in AHRD technology-related research. Although businesses were well represented, other organization types were largely ignored in these papers, particularly non-profit and government/military organizations. Additionally, higher education courses were

over-represented. This finding was surprising since AHRD is an organization dedicated to employee and organizational development (Academy of Human Resource Development, 2005). A primary reason for the large percentage of papers using higher education courses as a setting is that academics have easy access to these courses for empirical studies on educational technology. However, higher education courses have much different dynamics and characteristics than learning that occurs in workplace settings. AHRD researchers need to seek out more opportunities to conduct technology research in workplace settings.

An overall concern from this study is that technology-related papers in the *Proceedings* are not making it to the journals. This problem could be due to several reasons such as (1) technology-related research not being submitted to AHRD journals, (2) bias against technology-related research on the part of journal reviewers, (3) inadequate quality of technology-related papers submitted to the journals, or (4) lack of suitability of articles submitted for the journals, due to the dominant focus on higher education courses. Whatever the reasons, it is especially troubling to discover the complete absence of articles focusing on technology in AHRD's premier journal, *HRDQ*. HRD professionals should engage in dialogue with editors and reviewers to discuss ways more articles can be published in the AHRD journals.

One final agenda for this study was to disseminate information about AHRD's technology research to individuals from other professional organizations interested in the use of technology in workplace learning and performance (Githens, Dirani, Gitonga, Teng, & Benson, 2005). Overall, in comparing these findings with Conn and Gitonga's (2004) study of AECT's training and performance articles, AHRD researchers have used business settings much more than AECT researchers. AECT has a strong base of individuals interested in HRD, as is evidenced by its *Training and Performance Division*. These individuals could benefit from AHRD's technology research. Many AECT members are unaware of AHRD and its publications. In the words of an AECT division president, AHRD is "off the radar" (A.D. Benson, personal communication, May 2005). Further collaboration between members of the two groups would benefit both organizations and the HRD field since the two groups are quite complementary (especially in their focus on workplace learning). In addition, AHRD advocates a broadly focused HRD approach, which includes non-training interventions and AECT brings a strong emphasis on learning technologies and a growing emphasis on performance improvement. Based on this study, technology-related research in AHRD publications comes from diverse departments and fields. This diversity seems to support further collaboration with AECT members.

With the continuing growth of technology-related research in AHRD publications, we remain hopeful that these publications will become known to others who study technology in workplaces. Collaboration with those currently outside of AHRD is essential. Additionally, a more specific focus on the use of technology in *workplaces* will help AHRD achieve its mission and become known as an appropriate source for workplace-centered technology research.

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