Visualizing Learning for the Next Generation: Visual and Media Literacy Research, 2000-2014

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Descriptors: Visual literacy, Media literacy

Introduction

Technology allows information to be gathered by a push of a button or stroke on a keyboard. A world of information can be easily accessed from a phone that fits in the palm of one’s hand. Today, every aspect of life is flooded with images and diverse forms of media. The ability to “discriminate and interpret the visible actions, objects, symbols, natural or man-made … to communicate with others” (Debes, 1969, p. 27), has become an increasingly important skill set for learners in and out of the classroom. The goal of this paper is to explore and identify the current trends of research pertaining to visual and media literacy. The researchers hope to show how research on visual and media literacy has evolved in the last fifteen years.

Literature review

Initially, the researchers explored past studies on visual and media literacy. Research-based articles focusing on visual and media literacy (VML) published between 2000 and 2014 were collected. The researchers identified a total of 129 articles to be included and reviewed for this study. Each article was reviewed for its content from 1) research question, 2) population studies, 3) methodologies, and 4) findings.

Comparison of research questions

The researchers identified similarities among research questions found in the 129 articles selected for the study. A common trend on the use of concept maps in education was identified. Twelve articles examined the classroom use of concept map and its effectiveness (Blunt & Karpickle, 2014; Chang & Chang, 2008; Harris & Zha, 2013; Marculcu, Karakuyu & Dogan, 2013; Wahidin & Meerah, 2013). A majority of these articles found that visual component of concept maps helped facilitate learning. Another trend of inquiry focused on how learners use technology effectively in the classroom. Most articles looked into how students use technology in the classroom (Breman & Hassell, 2014; Dias & Trumpy, 2014; Lawanto, Santoso, Lawanto & Goodridge, 2014; Lee & So, 2014; Luckhardt, 2014).

Several articles focused on how digital and media literacy could help improve students’ learning. This includes the influence of technology in the perception of popular media (Barden, 2014; Babad, Peer & Hobbs, 2012), and enhanced understanding of content with the integration of technologies (Ashley, Lyden & Fasbinder, 2012; Garcia-Ruiz, Ramierz-Garcia & Rodriguez-Rosell, 2014; Nakagaw & Arzubiaga, 2014; Schmidt, 2013; Sur, Unal & Iseri, 2014). A number of research articles focused on the connection between visual literacy and:

1) Level of understanding of visual literacy among students (Aslan & Nalinci, 2014; Brante, Olander & Nystrom, 2013; Brumberger, 2011; Jefferies, 2007; Mayall & Robinson, 2009);
2) Improving learning abilities through visual literacy (Leigh, 2012; McTigue & Croix, 2010; Wang & Lee, 2014; Willis & Locke, 2009; Yeh & Lohr, 2010); and
3) Using various tools to improve visual literacy skills (Baker, 2010; Coleman, 2010; Hattwig, Bussert, Medaille & Burgess, 2013; Prior, Willson & Martinez, 2012; Sosa, 2009).
Other articles examined the use of visuals and demonstration of visual interpretation. Examples of visuals examined included graphic novels (Gavigan, 2011; Valerie & Abed, 2013), picture books (Maderazo, Martens, Croce, Martens, Doyle, Aghalarov & Noble, 2010; Yu, 2009), and other images (Farha, 2009; Jin & Boling, 2010; Kovalik & Williams, 2011; Mahmood & Fernely, 2006). These research articles examined how students’ interpret visual content to facilitate better communication.

Comparison of population studied

The articles reviewed covered different populations. At least four different populations or sources of data have been identified, including

1) Educators (Craig, 2013; Ismail, Bokhare, Azizan & Azman, 2013; Lane, 2013; Nakagawa & Arzubiaga, 2014; Parkhill & Davey, 2014),
2) General population (Boyle & Cook, 2001; Brown, Hardaker & Higgett, 2000; Brumberger, 2011; Newfield, 2011),
4) Articles from past studies (Breman & Hassell, 2014; Coleman, 2010; Efaw, Hampton, Martinez & Smith, 2004; Kurtz, Beaudoin & Sagee, 2004; Mayall & Robinson, 2009).

Comparison of methodologies

Two types of methodologies were used for gathering the data: qualitative and quantitative. Qualitative data collection involved: comparison (Ke, Lin, Ching & Dwyer, 2006; Newfield, 2011; Parkhill & Davey, 2014; Schwarz & Crenshaw, 2011; Sutton, 2014), discussion (Baker, 2013; Luckhardt, 2014; Nakagawa & Arzubiaga, 2014; Rye, Landenberger & Warner, 2013; Wichadee, 2014), interviews (Heilmann, 2012; Schulte, 2010; Sur, Unal & Iseri, 2014; Redmond, 2012; Valerie & Abed, 2013), and observations (Barden, 2014; Gavigan, 2011; Kenny, 2011; Lee & So, 2014; Young, 2012). The data collected were coded and organized for content analysis by cluster or comparison.

The research articles used generated data using the following collection strategies: 1) online surveys (Heilmann, 2012; Sur, Unal & Iseri, 2014), 2) Likert scale surveys (Dinet, Marquet & Nissen, 2003; Gavigan, 2011; Grzeda & Miller, 2009; Wichadee, 2014), 3) pre- and post- test (Kenny, 2011; Valerie & Abed, 2013), and 4) open-ended questionnaire (Arend, 2009; Hilbert & Renkl, 2008; Freeman & Jessup, 2004; Scull & Kupersmidt, 2010; Shaikh & Macaulay, 2001). Surveys were often collected online and had both open and closed questions.

Comparison of findings

Four common themes were identified in the findings, including (a) the need for teaching VML (Garcia-Ruiz, Ramirez-Garcia & Rodriguez-Rosell, 2014; Marulcu, Karakuyu & Dogan, 2013; Redmond, 2012; Schmidt, 2013; Sur, Unal & Iseri, 2014); (b) the use of visuals and media helps to facilitate critical thinking (Blunt & Karpickle, 2014; Harris & Zha, 2013; Parkhill & Davey, 2014; Rye, Landenberger & Warner, 2013; Schwarz & Crenshaw, 2011); (c) Visuals can improve a student’s performance (Chang & Chang, 2008; Ke, Lin, Ching & Dwyer, 2006; Nesbit & Adesope, 2006; Percival & Percival, 2009; Wahidin & Meerah, 2013); and (d) Visuals can motivate students (Barden, 2014; Gavigan, 2011; Kenny, 2011; Leigh, 2012; Valerie & Abed, 2013).

All articles found for this exploratory study support the use of visuals and media in the classroom. Most studies supported the idea that VML is important in furthering the development of technology-supported classrooms. Similarly, Sosa (2009) argued in her work that “the results of this study indicate that visual literacy truly is the missing piece of many technology integration courses” (p. X). These articles as sources of data for our study will help in exploring how VML research changed since 2000 and will better informed the directions of current and future research practices and needs.
Methods

This paper is an exploratory study of research-based articles pertaining to VML published between the years 2000 and 2014. The purpose of this paper is to show how VML is currently being researched and how that research has changed in the past fifteen years. The sources of data used included a population of 129 peer-reviewed articles collected from forty-one journals. These articles were published between the years 2000 and 2014. The primary method in collecting these peer-reviewed articles involved searching the online databases and journal archives. Printed copies of peer-reviewed journal articles provided by peers and colleagues were also used. Articles found meeting the stated requirements were printed or pulled, and later organized for analysis.

In this exploratory study, the researchers reviewed each article included in the study. An article’s content was coded using four categories: (a) research question, (b) population studied, (c) methodologies, and (d) findings. For analysis, similarities within categories were identified as well as relationships between categories. Qualitative data was quantified to better facilitate a comparative approach among the articles. Using an Excel spreadsheet, the articles’ content was compared using the following indicators: a) date of publication, b) journal title, c) key words, d) location of the study, and e) primary author(s).

Findings

The data analysis generated the following findings: 1) peer-reviewed journals publishing visual and media literacy research, 2) research article productivity by publication year, 3) top keywords in peer-reviewed articles related to VML research, 4) relationship journals and keywords, and

Journal publications

Four peer-reviewed journals published more research articles directly or indirectly related to VML --- *Journal of Educators Online* (JEO), *Research in Learning Technology* (RLT), *Journal of Visual Literacy* (JVL), and *Journal of Media Literacy Education* (JMLE). Table 1 illustrates the relationship of the number of VML research articles published in a journal and publication year. Out of the four top journals, RLT, started publishing VML research articles in 2000 but has barely published one in the last five years. However, the journal contributed about 17% of articles used in this study. The JEO has increased its frequency of publishing VML research since 2004. This journal supplied forty research-based articles related to VML research, totaling about 30% of all the articles used in this study.

JVL was the third highest publisher of research-based articles relating to VML research. However, this journal only published 11 research-based articles. The researchers expected more research-based articles but discovered that, though it had published extensively on visual and media literacy, the majority of the articles focused on defining the VML as a field of study, and less on research.
Table 1. Frequency of VML Article Publication from 2000-2014 by Peer-Reviewed Journals

<table>
<thead>
<tr>
<th>Journal</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>09</th>
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<th>05</th>
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<th>Total</th>
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<tbody>
<tr>
<td>Journal of Educators Online (JEO)</td>
<td>10</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
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<td>40</td>
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<tr>
<td>Research in Learning Technology (RLT)</td>
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<td>3</td>
<td>6</td>
<td>4</td>
<td>23</td>
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<tr>
<td>Journal of Visual Literacy (JVL)</td>
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<td>11</td>
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<tr>
<td>Journal of Media Literacy Education (JMLE)</td>
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<td>3</td>
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<td>Communicar</td>
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<tr>
<td>Merlot Journal of Online Learning &amp; Teaching (JOLT)</td>
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<td>EDUCAUSE Quarterly</td>
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<td>Instructional Science (IS)</td>
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<tr>
<td>Journal of Computer-Assisted Learning (JCAL)</td>
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<tr>
<td>Language Arts</td>
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<tr>
<td>TechTrends</td>
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<td>2</td>
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<tr>
<td>Turkish Online Journal of Educational Technology (TOJET)</td>
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<td>2</td>
</tr>
</tbody>
</table>

Further, the overall review of the data collected revealed that the publication of VML research continued to increase after 2008. Table 2 illustrates the number of VML research articles published annually. Most articles were published in 2010, 2013, and 2014. This fact helps support the earlier statement that research on VML has been slowly increasing, especially within the last seven years.

Table 2. Frequency of Article Published on VML Research by Publication Year

<table>
<thead>
<tr>
<th>Year of Publication</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>09</th>
<th>08</th>
<th>07</th>
<th>06</th>
<th>05</th>
<th>04</th>
<th>03</th>
<th>02</th>
<th>01</th>
<th>00</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of VML</td>
<td>21</td>
<td>15</td>
<td>9</td>
<td>9</td>
<td>12</td>
<td>9</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>129</td>
</tr>
</tbody>
</table>

Journal productivity

The researchers identified 2-3 keywords based on the content of the article. Table 3 illustrates the range of keywords identified by the researchers from the articles in the span of fifteen years. In completing this task, the researchers used the keywords identified by the author(s) in the articles. For those articles with no keywords identified, the researchers generated some by determining the article’s main focus. For example, if an article was researching on the effectiveness of concept maps, then researchers would choose “concept maps” as one of the keywords.
Table 3. Top keywords in journals that publish VML research articles by year of publication

<table>
<thead>
<tr>
<th>Keyword</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>09</th>
<th>08</th>
<th>07</th>
<th>06</th>
<th>05</th>
<th>04</th>
<th>03</th>
<th>02</th>
<th>01</th>
<th>00</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Education</td>
<td>10</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
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<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>47</td>
</tr>
<tr>
<td>Visual Literacy</td>
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<td>3</td>
<td>3</td>
<td>2</td>
<td>9</td>
<td>3</td>
<td>--</td>
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<td>--</td>
<td>1</td>
<td>--</td>
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<td>--</td>
<td>27</td>
</tr>
<tr>
<td>Technology Integration</td>
<td>2</td>
<td>1</td>
<td>--</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>--</td>
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<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Media Literacy</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>--</td>
<td>2</td>
<td>--</td>
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<td>--</td>
<td>18</td>
</tr>
<tr>
<td>Concept Maps</td>
<td>1</td>
<td>4</td>
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<td>--</td>
<td>--</td>
<td>2</td>
<td>1</td>
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<td>--</td>
<td>--</td>
<td>12</td>
</tr>
</tbody>
</table>

Keywords

The top five keywords identified in selected VML research articles were Concept Maps, Media Literacy, Online Education, Technology Integration, and Visual Literacy. In the span of 15 years, “Online Education” was the top keyword identified from 47 VML research articles. “Visual Literacy” was the next frequently mentioned keyword. Most of the research on visual literacy focused on how well students and teachers understand and interpret visuals. The majority of research on this topic tried to determine if visual literacy is being taught and understood well within classrooms. Table 3 illustrates the trends of keywords as well as demonstrates how research activities on related topics seem to have increased since 2000.

“Technology Integration” is another keyword that researchers found heavily mentioned in VML research articles. However, a gap spanning from 2005 until 2008 seems evident and could be attributed to shifting ideas or research activities over time. However, even with this gap in research activities, the researchers identified twenty-one articles that studied how technology is being used in education. The majority of research articles examined the types of technologies being used in the classroom and their effectiveness.

Other top keywords included “Media Literacy” and “Concept Maps”. Most of the research activities focusing on media literacy occurred after 2008 while for concept maps, many activities occurred between 2006 and 2008. Table 3 also showed that trends of VML research activities have changed since 2000. Online Education is the only keyword that was able to demonstrate some staying power --- slow but increasing popularity since the early 2000s.

The researchers were interested in examining if there is a relationship between the top ten journals and the top five keywords. In using the top keywords from Table 3, researchers connected the types of research projects undertaken for the last 15 years, and published in top journals. The top ten journals are JEO, RLT, JVL, JMLE, Communicar, Merlot JOLT, EDUCAUSE Quarterly, JCAL, Language Arts, and Instructional Science. Cumulative totals from the study were posted in Table 4.

Table 4. Relationship between journals publishing VML research articles and keywords

<table>
<thead>
<tr>
<th>Keywords</th>
<th>JEO</th>
<th>RLT</th>
<th>JVL</th>
<th>JMLE</th>
<th>Communicar</th>
<th>Merlot JOLT</th>
<th>EDUCAUSE Quarterly</th>
<th>JCAL</th>
<th>LA</th>
<th>IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Education</td>
<td>32</td>
<td>10</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>Visual Literacy</td>
<td>1</td>
<td>--</td>
<td>9</td>
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<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Technology Integration</td>
<td>2</td>
<td>9</td>
<td>--</td>
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<tr>
<td>Media Literacy</td>
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<td>8</td>
<td>2</td>
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</tr>
<tr>
<td>Concept Maps</td>
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<tr>
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<td>8</td>
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<td>2</td>
<td>2</td>
<td>1</td>
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</tr>
</tbody>
</table>

Journal productivity and keywords

“Online Education” was the top keyword found among 44 articles (34.1%) and reflected a trend in visual and media literacy research. JEO and RLT were the two journals that published more VML research articles with this keyword in the last 15 years. JEO published 32 (24.8%) articles while RLT had 10 (7.75%).
“Visual literacy” was the second most common keyword identified from the study. JVL published nine (6.9%) articles with this keyword given the same timeline. RLT published nine (6.9%) articles for “technology integration” keyword while JMLE had eight (6.2%) for “media literacy”.

Further, with the number of articles identified for this study, the researchers wanted to know where research activities are undertaken and who are authoring them. Table 5 provided information on the location of the VML research studies. Researchers examined articles published in the United States and Canada separately. Europe was also scrutinized and identified which countries produce VML studies.

Table 5. Region or country where the research on visual and media literacy was completed

<table>
<thead>
<tr>
<th>Region or Country</th>
<th>United States</th>
<th>Caribbean Region</th>
<th>Canada</th>
<th>Europe</th>
<th>Asia</th>
<th>Africa</th>
<th>Australia</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>81</td>
<td>1</td>
<td>6</td>
<td>28</td>
<td>10</td>
<td>1</td>
<td>2</td>
<td>129</td>
</tr>
</tbody>
</table>

Authorship

In identifying the authors of the articles, the researchers expected to find multiple articles published by the same author. However, the results informed the researchers that most authors published only once as a primary or lead author. There were a small number of cases where a primary author served as secondary author for another article, but for the most part they only published once. Only one author was found to have published twice as the primary author. It seems that the lack of repeat publications of similar if not related research articles by an author indicate a potential lack of interest in researching and publishing in VML.

Region or country

Two regions or countries have been identified as places where VML research was conducted: United States and Europe. A majority of research studies took place in the United States. Eighty-one studies (60%) were completed in America. The second region or country that produced a great number of studies is Europe with 28 (20%) studies on visual and media literacy. Most studies done in Europe were from the United Kingdom. Asia was the third highest publishing region with ten studies. Six published studies originated from Canada and two from Australia. One article each came from Africa and the Caribbean.

Most research studies took place in the United States and the United Kingdom. This fact was not surprising since both countries are technologically advanced compared to other. So it is expected that both would be leading research activities focusing on VML.

Implications

This exploratory study shows that research on VML is lacking if not minimal in the last 15 years. However, there is an indication that research interest in this area has been slowly growing. In reviewing the content of articles published in early 2000s, it seems there is a shift among authors to research more on the value, benefit or impact of VML rather than simply trying to define the field. This study also shows that research on VML is interdisciplinary or multidisciplinary. An example would be the integration of VML with online education or technology integration. While these questions do not always pertain to visual and media literacy, it was observed that a large amount of data gathered sought to answer questions that pertained to those subjects.

This study also shows that research on VML is taking place over a wide range of disciplines, not simply education or mass communication. Several of the journals have articles pertaining to other disciplines, such as, science, language arts, and history. What this means is that research on VML encompasses multiple fields of study. Finally, VML research studies are taking place all over the world. However, the majority of VML studies are completed in the United States and Europe.
Limitations and Recommendations

Given the exploratory nature of this study, the researchers are aware of several limitations. One hundred twenty-nine articles on VML were collected for this study using online databases, journal archives, and printed materials. Some articles may not have been available or accessible to the researchers given the limited time and resources. This could have impacted the analysis and interpretation of the results for making any generalization. Given the number of research articles from the United States and Europe and the limited amount from Asia or other regions of the world, the researchers believe there is a potential of bias towards Western thinking for this field of study. Also, researchers recommend the identification of more articles to be included in a follow up study especially from research activities completed beyond North America and Europe.

Conclusions

This exploratory study identified current trends of VML research. The findings provided information on journals publishing VML research including increased productivity from 2000 to 2014. Also, the findings demonstrated the interdisciplinary or multidisciplinary nature of VML research, and the increased use and integration of technology, especially in online education, that continues to support VML research. Visuals and media will continuous influence or impact everyday life. This makes VML research important to those who teach how to interpret and use visuals and media in order to communicate with others. VML knowledge and skills are necessity to those engage in all levels of education.

References


