

Effects of Web 2.0-Based L2 Instruction on the Korean EFL Context: A Meta-Analysis

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Abstract

This paper presents the result of a quantitative meta-analysis on Web 2.0-based L2 instruction in the Korean EFL context. To synthesize these research results, 9 studies and 48 individual experimental research results were collected through an electronic database and analyzed by meta-analysis software, Comprehensive Meta-Analysis. Average effect size of Web 2.0-based studies is .347, which means that Web 2.0-based L2 instruction has a relatively small effect.

Keywords: Web 2.0, Meta-analysis, Research Synthesis, Systematic Review, Social Network, Blog, Wiki, YouTube

1. Introduction

Technology can indeed assist the process of teaching and learning in various aspects. Since the advent of Web 2.0, there have been many attempts to use Web 2.0 tools in foreign language teaching such as blogging, social networking, podcasting, and so on. Web 2.0 technologies can enable students to engage through greater customization and choice of topics, along with less distraction from their peers [1]. Also, the self-publishing aspects as well as the speed with which their work becomes available for consumption allow teachers to give students the control they need over their learning [2].

Recently, a number of studies have been conducted to investigate whether the use of Web 2.0 technologies or tools can enhance foreign language proficiency, as well as how it can achieve this [3,4]. The present meta-analysis attempted to synthesize research on Web 2.0-based L2 learning and teaching.

2. The Concept and Procedure of Meta-analysis

Meta-analysis refers to "the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings" [5]. Thus, it is often called *research synthesis* or *systematic review*.

The basic steps of a quantitative meta-analysis are as follows [6]:

- (1) sampling of primary studies,
- (2) coding of primary studies, and
- (3) analyzing and interpreting effects.

3. Methods

The electronic databases of RISS, DBpia, NEWnonmun, and Kyoboscholar were searched in order to obtain related studies for the present meta-analysis. To capture all the possible related studies, various key- and subject-terms were used as search words like Web 2.0, social media, blog, twitter, podcast, etc. This search process resulted in the identification of 9 potentially relevant studies (including 48 individual research results), all marked by an asterisk in the attached reference list.

The basis for making comparisons across studies was to use the codes representing different conditions among the studies. Table 1 shows the variables and codes used in this study.

Table 1. Variables and Codes

| Experimental Methodology Variables | Codes |
|------------------------------------|---|
| A. Dependent Variable | 1. Writing 2. Reading 3. Vocabulary 4. Attitude / Motivation 5. Anxiety 6. Intercultural Sensitivity |
| B. Total Time of Experiment | 1. Zero to Eight Weeks 2. More than Nine Weeks |
| C. Web 2.0 Tool | 1. Blog 2. Wiki 3. YouTube 4. MicroBlog |
| D. Comparison Type | 1. Pre-Post 2. Experimental-Comparison |

4. Results and Discussions

4.1. Coding Results

48 unique samples from the 9 study reports were included in the meta-analysis. Of the resulting 48 effect sizes, twenty-three involved pre-to-post-test contrasts and another 25 involved experimental-versus-control contrasts. The variables' codes and effect sizes of individual studies are shown in Table 2.

Table 2. Variables Codes and Effect Sizes

| Study Sample | A | B | C | D | ES(<i>d</i>) |
|-----------------------|---|---|---|------|----------------|
| Choi & Lee (2010) [8] | 5 | 2 | 1 | 1 | .525 |
| | 5 | 2 | 1 | 1 | .557 |
| | 5 | 2 | 1 | 1 | .485 |
| | 5 | 2 | 1 | 1 | .157 |
| | 1 | 2 | 1 | 1 | .285 |
| Kim (2011) [9] | 1 | 1 | 1 | 1 | 1.176 |
| | 1 | 2 | 1 | 1 | .976 |
| | 1 | 1 | 1 | 1 | .279 |
| | 1 | 2 | 1 | 1 | .285 |
| | 1 | 1 | 1 | 1 | .592 |
| Kim (2012) [10] | 1 | 2 | 1 | 1 | .219 |
| | 1 | 1 | 1 | 2 | -.137 |
| | 1 | 1 | 1 | 2 | .000 |
| | 1 | 1 | 1 | 2 | .104 |
| | 1 | 1 | 1 | 2 | -.087 |
| | 1 | 1 | 1 | 2 | -.114 |
| | 1 | 1 | 1 | 2 | .758 |
| | 1 | 1 | 1 | 2 | -.282 |
| 1 | 1 | 1 | 2 | .423 | |
| 1 | 1 | 1 | 2 | .000 | |

| | | | | | |
|--------------------------|---|---|---|---|-------|
| | 1 | 1 | 1 | 2 | .370 |
| | 1 | 1 | 1 | 2 | .220 |
| | 1 | 1 | 1 | 2 | .000 |
| Moon & Kim (2011) [11] | 1 | 1 | 1 | 1 | .037 |
| | 1 | 1 | 1 | 1 | .394 |
| | 1 | 1 | 1 | 1 | .671 |
| | 1 | 1 | 1 | 1 | .747 |
| | 1 | 1 | 1 | 1 | .075 |
| | 1 | 1 | 1 | 1 | .181 |
| Pae (2007) [12] | 1 | 1 | 2 | 1 | .300 |
| | 1 | 1 | 2 | 1 | .540 |
| | 1 | 1 | 2 | 1 | .592 |
| | 5 | 1 | 2 | 1 | .111 |
| Chang & Kang (2013) [13] | 6 | 2 | 3 | 2 | .520 |
| | 6 | 2 | 3 | 2 | .392 |
| | 6 | 2 | 3 | 2 | .122 |
| | 6 | 2 | 3 | 2 | .179 |
| | 6 | 2 | 3 | 2 | .132 |
| | 4 | 2 | 3 | 2 | .201 |
| | 4 | 2 | 3 | 2 | .175 |
| | 4 | 2 | 3 | 2 | .178 |
| | 4 | 2 | 3 | 2 | .129 |
| | 4 | 2 | 3 | 2 | .575 |
| | 2 | 2 | 3 | 2 | .363 |
| Jang & Kim (2012) [14] | 1 | 2 | 4 | 1 | 1.204 |
| | 1 | 2 | 4 | 1 | 1.040 |
| Kim & Lee (2012) [15] | 3 | 2 | 4 | 2 | .134 |
| Park & Kim (2011) [16] | 1 | 2 | 4 | 2 | .716 |

4.2. Average Effect Size

The overall fixed-effects effect size of the Web 2.0 technologies on foreign language learning was ‘.347’ with homogeneity among studies ($Q = 56.672$; $p = .158$). This indicates that foreign language instruction with Web 2.0 technologies has slightly less effect than the medium effect ($d = 0.5$) [7]. Also, similar studies reported higher effect size than this study [17, 18].

4.3. Linguistic vs. Affective Domains

The effect sizes were calculated to find out whether there is the difference between linguistic competence and affective domain or not. The effect size in linguistic competence was slightly below moderate effect ($d=.418$, $p=.000$), whereas there was a smaller effect in the affective domain ($d=.286$, $p=.000$). There is, however, no statistically significant difference between them ($Q=3.040$, $df=1$, $p=.081$).

Table 3. Effect Size Across Dependent Variables

| Group | <i>k</i> | <i>d</i> | SE | 95% CI Lower Limit | 95% CI Upper Limit | <i>p</i> |
|-----------------------|----------|----------|------|--------------------|--------------------|----------|
| Linguistic Competence | 33 | .418 | .056 | .310 | .527 | .000 |
| Affective Domains | 15 | .286 | .052 | .185 | .387 | .000 |

4.4. Types of Web 2.0 Tools

As you can see in Table 4, four effect sizes were calculated according to types of Web 2.0 tools. The effect of utilizing microblogs like Twitter and Facebook was the highest ($d=.615$, $p=.000$) one, and it was somewhat bigger than the moderate effect size ($d=.50$). Wiki ($d=.383$, $p=.038$), blog ($d=.381$, $p=.000$), and YouTube ($d=.268$, $p=.000$) immediately followed, and these results were a bit smaller than the moderate effect. There is no statistically significant difference among the types of Web 2.0 tools ($Q=6.671$, $df=3$, $p=.083$).

Table 4. Effect Size Across Web 2.0 Tools

| Group | <i>k</i> | <i>d</i> | SE | 95% CI Lower Limit | 95% CI Upper Limit | <i>p</i> |
|-----------|----------|----------|------|--------------------|--------------------|----------|
| Blog | 29 | .381 | .060 | .264 | .498 | .000 |
| Microblog | 4 | .615 | .130 | .360 | .870 | .000 |
| Wiki | 4 | .383 | .185 | .021 | .744 | .038 |
| YouTube | 11 | .268 | .055 | .159 | .376 | .000 |

4.5. Length of Treatment

The studies meta-analyzed were grouped into two categories in terms of length of treatment. The first group implemented their experiment for less than 8 weeks. Another group, on the other hand, carried out their experiment for more than 9 weeks. The effect size of the first group (less than 8 weeks) was .347 ($p=.000$), and the second group reported nearly the same effect ($d=.349$, $p=.000$). There is no statistically significant difference between them ($Q=.001$, $df=1$, $p=.977$).

Table 5. Effect Size Across Treatment Length

| Group | <i>k</i> | <i>d</i> | SE | 95% CI Lower Limit | 95% CI Upper Limit | <i>p</i> |
|-----------|----------|----------|------|--------------------|--------------------|----------|
| 1-8 Weeks | 23 | .347 | .044 | .261 | .433 | .000 |
| 9+ Weeks | 24 | .349 | .074 | .204 | .495 | .000 |

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