Trends in Categorization Research in Writing: A Systematic Review

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Abstract

Many researchers have argued that customized learning opportunities should be provided considering individual differences in the educational environment. The most effective way to consider students' individual differences is to find and classify specific patterns among them. In particular, considering that writing research ultimately provides basic information for effective writing instruction, it is required to derive learners' writing profiles and find suitable teaching methods according to those different types. For this purpose, the current study aims to analyze the trends in writing categorization research conducted in the domain of language learning. We adopted a systematic review as research methodology to examine research trends strictly and efficiently and analyzed writing categorization research in terms of its topic, method, purpose, etc. The research procedure based on systematic review was carried out according to the flow chart and the criteria for selecting and excluding literatures, suggested by the PRISMA group. First, a total of 1,026 research articles were collected from two representative research databases in the field and additional searches through reference review. Subsequently, we went through a step-by-step selection stage of deduplication, primary filtering, and secondary filtering under the selection and exclusion criteria. We then decided a final list of research articles that could be properly classified as categorization research in writing through abstract and full-text review. The content analysis technique was applied to the selected research articles. They were coded based on following 7 criteria: research methodology, participant, topic of research, research area, targeted/categorical variable, purpose of analysis, and whether there is a difference in quality/level between the subtypes of each categorical variable. From these coding results, we could investigate the overall trends of categorization research in writing and find the implications for the design of follow-up studies and the application of writing education.

Keywords: *Language Learning, Writing, Writing Education, Categorization, Profile, Research Trends*

1. Introduction

Customized learning in consideration of individual differences has frequently emerged as the most important keyword for future education in the era of the 4th industrial revolution [9]. The most effective way to consider individual differences in students in the educational field is to find and classify specific patterns among them [1]. In particular, in that writing research ultimately provides basic information for effective writing instruction, deriving a learner's writing style has great educational significance. Regarding writing instruction, there is very little research on individual differences in the writing process as well as discussion of individualized instruction. However, in order for customized writing learning to take place, it is fundamentally necessary to first identify what individual differences exist in the writing process or results.

In the existing writing research or education research, it is common to test the effectiveness of a specific teaching/learning strategy or to suggest an appropriate practice method, assuming that it will generally be effective. The existing methods of writing education have often assumed uniform and universal application rather than considering writers' individual differences. This assumption can be confirmed in the writing process model suggested by Hayes & Flower [4], which has been a representative model on the writing process, as well as Kellogg [5], van Wijk [8], Hayes [3], etc. All of the models tried to explain the writing process with a single universal modeling. Therefore, it is possible to make a richer description of the cognitive processes in writing with multiple or complex models when we catch and investigate writers' profiles. Considering that writing research ultimately provides basic information for effective writing instruction, it is required to derive learners' writing profiles and find suitable teaching methods according to them [6]. For these reasons, the current study

aims to confirm the international trends of the categorization research on writing since the last 10 years and find implications from them.

2. Method

2.1 Research design

We adopted a systematic review as research methodology to examine research trends strictly and efficiently and analyzed writing categorization research in terms of its theme, method, purpose, etc. The research procedure based on systematic review was carried out according to the flow chart and the criteria for selecting and excluding literatures, suggested by the PRISMA group [7]. Two researchers applied the same search and selection criteria throughout the entire process and adjusted their opinion at each stage.

2.2 Searching strategies

The COSI (Core, Standard, Ideal) model [2] provided by the National Library of Medicine was referred to as the criteria for selecting the search database: two databases (ScienceDirect and Taylor & Francis) were selected as the main databases for literature search. Both databases were found to cover accurate and reliable publications in accordance with this standard. In order to increase the sensitivity of the search results, various search terms and formulas were considered as much as possible. The search was performed limited to title, abstract, and keywords. After searching the literatures through the search terms, the selection and exclusion criteria were applied by reviewing the titles and abstracts of the selected ones. It was searched and reviewed one by one to check whether the selection criteria were met and whether there was any overlap.

A total of 1,026 research articles were collected through search terms from databases and additional searches. Among them, 158 papers were selected by reviewing the titles of the searched documents, and finally 46 papers were selected as a result of abstract and full-text review.

2.3 Selection procedure and assessing the risk of bias

Regarding selection procedure, we went through a step-by-step selection stage of deduplication, primary filtering, and secondary filtering under the selection and exclusion criteria. The criteria for inclusion and exclusion for each stage are as follows.

Table 1. Criteria for inclusion and exclusion

Stage	Criteria	Contents
Primary filtering	inclusion	abstract, key words, or title academic fields (social science, humanities, psychology, computer science, neuroscience) peer-reviewed journals or book chapters
	exclusion	duplicated research papers dissertations, articles, periodic publications, reviews, non-peer review journals, conference abstracts
Secondary filtering	inclusion	Studies with categorization-related variables Studies with variables related to writing process or outcome analysis Studies with variables related to writing context (education)
	exclusion	Studies of writing in units of paragraphs or less Studies without any categorization-related variable Studies without any writing-related variable Studies in which human writing is not a subject theoretical or conceptual studies

We then decided a final list of research articles that could be properly classified as writing categorization research through abstract and full-text review.

2.4 Analysis

The content analysis technique was applied to the selected research articles. The sellected papers were coded for each paper as a unit based on the following 7 criteria: research design (quantitative,

qualitative, mixed), research topic (process-cause, process-observation, evaluation, special needs, teaching and learning, linguistic traits), participant (elementary, secondary, adult), language (L1, L2, L1 and L2), target of categorization (writing process, writing output, psychological characteristics, teaching-learning patterns), type of categorization (differences in quality/level or not), and purpose of categorization (checking influences or not). According to the coding principle of content analyses, codes were prepared to be mutually exclusive and comprehensive. All research papers were assigned only one code for each of the 7 criteria. Coding was conducted independently by two researchers after pre-training.

3. Result

From the coding results, we could investigate the overall trends of writing categorization research as follows.

Table 2. Coding results

	Criteria	Description	Results
Research-related	Research design	According to the general classification of study design, research designs were classified into quantitative, qualitative, or mixed study design.	quantitative 26 cases, qualitative 8 cases, mixed 12 cases
	Research topic	Through inductive code derivation, research themes were classified into writing process (influencing factor), writing process (observation factor), evaluation, special needs, teaching and learning, or linguistic characteristics.	writing process (influencing factor) 8 cases, writing process (observation factor) 15 cases, evaluation 10 cases, special needs 2 cases, teaching and learning 1 case, linguistic characteristics 10 cases
	Participant	According to the subjects who performed the writing and participated in the study, they were classified into elementary school students, middle school students, or adults.	elementary school 4 cases, middle school 3 cases, adults 39 cases
	Language	According to whether or not participants wrote in their mother-tongue, studies were classified as L1 study, L2 study, or L1 and L2 mixed study.	L1 26 cases, L2 14 cases, L1 and L2 6 cases
Categorization-related	Target of categorization	According to what was categorized, studies were classified into writing process, writing result, psychological features, or teaching/learning pattern.	writing process 10 cases, writing result 22 cases, psychological feature 7 cases, teaching/learning pattern 7 cases
	Type of categorization	Depending on whether there is a difference in quality or level between the conditions of the categorical variable, studies were classified as having a level difference between subtypes, no level difference between subtypes, or unconfirmed.	level difference between subtypes 10 cases, no level difference between subtypes 34 cases, unconfirmed 2 cases
	Purpose of categorization	According to the purpose of categorization, studies were classified into a study that confirms whether the difference between subtypes affects other variables and a study that only checks categorization itself.	confirming whether differences affect other variables 23 cases, checking categorization itself 23 cases

4. Conclusion

From the results mentioned above, we found some implications as follows. First, categorization research in writing tends to be more quantitative, adult-centered, and L1-centered. Thus, more school-

based categorization research need to be conducted in writing research. Second, although many studies have been conducted focusing on topics related to the writing process, many of the actual variables used were extracted from writing results. Writing categorization research should be conducted by more actively utilizing the variables extracted from the actual writing process. Lastly, categorization research in writing has been performed in a relatively diverse way in terms of the types and purposes of categorization. Considering that there are many studies in which the difference between subtypes is not a difference in level is more meaningful in that they can contribute to examine genuine individual differences. From these results, we could find the implications for the design of follow-up studies and the application of writing education.

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