Hotspots and Frontier Research on Learning Investment in China-- Visual Analysis based on Citespace

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Abstract: In order to understand the current situation of domestic learning investment and research on hot topics, this paper adopts bibliometric analysis method, uses citespace software to perform cluster analysis on keywords, explores the current frontiers and hotspots in the field of domestic learning investment, and analyzes and summarizes the domestic scholars' learning investment in learning investment. The research done in this aspect provides some reference for the follow-up researchers and practitioners.

Keywords: Learning investment; Citespace

1. Research tools

CiteSpace is a program software developed by Dr. Chen Chaomei from Drexel University based on Java. This software is suitable for multivariate, time-sharing and dynamic network analysis. It can use network algorithms to convert relevant data of documents into intuitive graphs. The information mining can detect the dynamic development trend and hot frontier of a certain field or discipline.[1]

2. Data source and processing

The data comes from the China National Knowledge Infrastructure (CNKI) full-text database. The data download time ends on June 1, 2022. The author selects the "Advanced Search" type in CNKI, selects "subject" to search, sets the search conditions in the literature database to "Learning input", and selects the subject as "higher education". The time range is not limited. The time span of "2012-2022" was finally determined by searching, and a total of 323 related literatures were retrieved. Through manual screening, 317 valid literatures, such as reports and conference notices, were eliminated, and a total of 317 valid literatures were obtained. These literatures were exported as research specimens in Refworks format, and converted in Citespace to obtain a visual knowledge map.[2]

3. Research hotspots

Research hotspots refer to the content discussed by a certain number of papers and scholars in a certain period of time. Keyword is the author's highly condensed content of the article. The higher the frequency of the keyword, the better it can illustrate the research hotspot in this field. Using citespace software to conduct keyword clustering analysis on domestic learning engagement, we can intuitively see the current situation, problems and research hotspots in the field of Chinese college students' learning engagement. There are 11 cluster labels of "College students", "Teacher-student interaction", "Nursing", "Professional commitment", "Study style", "Medical freshmen", "Undergraduate training quality", "Teacher role" and "National college students' learning Engagement survey".[3]

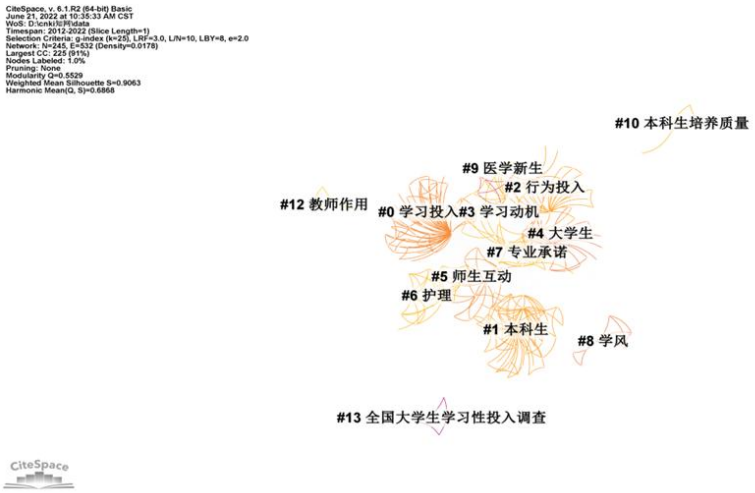

Figure 1. Cluster analysis diagram of learning investment keywords

The clustering analysis of keywords through CiteSpace software generates the learned keyword clustering knowledge map shown in Figure 1, and 13 categories are intercepted. On this basis, in the "Cluster" menu bar "Summarization of Clusters", the keyword co-occurrence network clustering table is obtained, and the results are shown in Table 1.[4]

Table 1. Keyword clustering table of domestic learning investment

Cluster number	Cluster size	Identifier words
0	48	Learning engagement; Curriculum teaching strategies; Professional commitment; Self-directed learning; Applied university/master students; Nanjing University; Online learning space; Entrepreneurial intention; Subjective initiative
1	43	Learning harvest; Learning input; Classroom silence; Employment quality; Ability development | Student development; Study experience; Undergraduate education; Student classification; "Double First-Class" University
2	30	Affective engagement; Behavioral engagement; Cognitive engagement; Learning engagement; Educational technology graduates | Influencing factors; Empirical analysis; Critical thinking level; Evaluation scale; Personal influencing factors
3	20	Learning engagement; Learning motivation; Academic performance; Academic development; Online learning | Online learning; Learning environment; Family background; Grade comparison; Sharpley decomposition
4	18	Educational quality; Learning engagement; NSSE; Educational assessment; Classroom teaching | Learning engagement; Classroom teaching; Five indicators; Constructivism; Classroom environment
5	17	Learning effect; Student engagement; Active learning; Process evaluation; Student-student interaction | Teacher-student interaction; Academic integration; Student-student interaction; Social integration; Social interpersonal interaction
6	15	Learning engagement; Perceived value; Career identity; Online learning space; Online academic emotion | Online learning space; Online learning engagement; Questionnaire; Online deep learning; Online academic emotion

7	13	Learning input; Professional commitment; Professional flexibility; Talent training model; Large-scale enrollment | Academic achievement; Agricultural colleges; Liberal arts college students; Xinjiang college students; Influencing factors
8	6	Learning input; Professional commitment; Professional flexibility; Talent training model; Large-scale enrollment | Academic achievement; Agricultural colleges; Liberal arts college students; Xinjiang college students; Influencing factors
9	5	Sources of stress; Coping styles; Learning engagement; Learning burnout; Medical freshmen
10	4	Discipline construction; Undergraduate training quality; Professional ability; Education discipline

According to the analysis of the keyword co-occurrence network cluster table in Figure 1 and Table 1, the research content of learning investment in the field of higher education in our country at this stage is classified into the following four aspects.[5]

3.1Study on the concept of learning engagement

The cluster word is #2 behavioral engagement, and the identifier words are, Emotional engagement; Behavioral engagement; Cognitive engagement.[6]

Kong Qiping opened a precedent for domestic research on learning investment. He believes that learning investment is an overall category that is composed of three dimensions: behavioral investment, emotional investment and cognitive investment. Lv Linhai believes that student engagement is also a process of student participation, which is learning engagement behavior and institution perception. Ni Shiguang and Wu Xinchun believe that learning engagement refers to an individual's learning-related state, accompanied by a positive, optimistic and full of mental state, which is the opposite of academic burnout. Liu Zaihua believes that learning engagement means that students face setbacks and challenges with an optimistic attitude in the process of learning, and actively participate in them, accompanied by positive emotional experience.[7]

3.2A study on the measurement dimension of learning engagement

The cluster word is #5 teacher-student interaction, and the identifier words are, Evaluation scale; Five major indicators; Process evaluation; Student-student interaction; Teacher-student interaction; Online deep learning, etc.[8]

Tsinghua University has localized the "National College Student Learning Engagement Survey" (NSSE) in the United States, generating the NSSE-China scale. Scholars often look at students' learning engagement from five dimensions, namely: academic challenge, active cooperation Learning level, teacher-student interaction, educational experience and supportive campus environment. Subsequently, Tsinghua University updated and improved it to form the Chinese College Students Learning and Development Tracking Survey Scale (CCSS), which also includes the above five dimensions. On the basis of previous studies, Shu Ziyu compiled a questionnaire for college students' learning engagement, which includes five dimensions: learning attitude, learning benefit, self-requirement, learning plan and focus. Fang Laitan et al. localized the UWES-S scale, and the revised scale includes three dimensions: vitality, dedication, and focus. Wang Wen concluded that college students' learning engagement consists of seven factors, which are: individual learning behavior, student-teacher interaction behavior, peer interaction behavior, deep learning strategies, feedback regulation strategies, positive learning emotions, and interpersonal feelings.[9]

3.3Empirical research on learning engagement

The clustering words are #13 National College Students' Learning Engagement Survey, and the identifiers words are, Empirical analysis; NSSE; Questionnaire survey; Educational evaluation, etc.[10]

Shi Jinghuan, Tu Dongbo and other scholars conducted an international comparative study of research universities in China and the United States, and found that there was no substantial difference in the "support of the campus environment" between the two countries in terms of the five major indicators; the school environment and the "educational experience richness" indicator of active interaction with the environment are basically at the same level; in terms of "active cooperative learning level" and "academic challenge", there are moderate and above differences in upper-class students between the two countries, and the performance of Chinese students is not as good as that of similar students in the United States; the biggest difference in performance between students between the two countries is "student-teacher interaction", which includes differences in cultural and quality levels.Wang Yashuang conducted an in-depth survey of undergraduates in 48 undergraduate colleges and universities in my country through the online survey platform of "National University Student Learning Situation Survey", and found that the scores of metacognitive strategies and teacher-student interaction were relatively low. With the increase of grade, the degree of investment shows a trend of "high-low-low-high". Wang Shu conducted a comparative study on the teaching of undergraduate courses in research universities in our country and the United States. The results show that there is a significant gap between Chinese research universities and similar institutions in the United States in terms of the achievement of higher-order cognitive goals and the integration of learning tasks. The encouragement and timely feedback of teachers in research universities to students' learning needs to be strengthened.[11]

3.4A study on the influencing factors of learning engagement

The cluster words are #5 teacher-student interaction, #12 teacher role, and the identifier words are, Curriculum teaching strategy; Subjective initiative; Influencing factors; Personal influencing factors; Learning motivation; Learning environment; Family background; Classroom environment, etc.[12]

Han Baoping conducted principal component analysis and binary Logistic model analysis on the questionnaire data of college students and found that acquired factors have a stronger influence than ascribed factors, among which, the three indicators of active cooperative learning, students' richness of learning experience and academic challenge have a significant impact on students' learning engagement. From the perspective of the importance of the impact, the most important is the students' active cooperative learning, the second is the students' learning experience, and the weakest is the academic challenge set by the school. Yang Lijun and Zhang Wei believe that the five variables of gender, subject, urban and rural areas, high school and socioeconomic status have different degrees of influence on learning investment, and gender and urban and rural factors have a greater impact on students' learning investment. Zhang Na's research believes that there are many factors that affect students' learning engagement, including teachers' attitudes and behaviors, peer support or peer pressure, class structure, cultural economy and educational development level.[13]

4. Research conclusion

This research analyzes the current research frontiers and hotspots of student learning engagement in China, which can provide some reference for readers and researchers who study learning engagement. Certain limitations may exist. On the one hand, the reference literature is not enough. On the other hand, although the keyword clustering map can reflect the hotspots and research topics in this field to a certain extent, the research tools themselves still have certain shortcomings. Follow-up research should continue to deepen on the basis of existing research, and constantly explore the research hotspots and development trends of learning investment.[14]

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