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Investigation and Research on Graduation Thesis Writing of Big Data Majors in Universities

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Abstract: Based on the questionnaire survey results of 153 undergraduates from the 2024 cohort and 157 from the 2025 cohort majoring in Big Data in universities, combined with practical teaching data, this study conducts a follow-up investigation on the problems encountered by college students in graduation thesis writing and the impact of practical teaching on thesis writing. It analyzes and identifies the root causes affecting the quality of graduation thesis writing for Big Data majors, and draws the following conclusions: the design and implementation of practical teaching links urgently need improvement; college students' training in graduation thesis writing is seriously insufficient; scientific and reasonable practical teaching arrangements can significantly improve the quality of college students' graduation thesis writing.

Keywords: Big Data Major; Graduation Thesis; Practical Teaching; Writing Ability; Teaching Reform.

1. Introduction

Under the background of emerging engineering education construction, the Data Science and Big Data Technology major has been offered by more than 600 universities and colleges nationwide since its first enrollment in 2016. As the final comprehensive training link in the undergraduate stage, the graduation thesis (design) is not only a test of students' four-year professional learning achievements but also an important indicator to measure the quality of professional teaching. However, the Big Data major is characterized by "difficulty in data acquisition, rapid algorithm updates, and deep interdisciplinary integration". It is an emerging interdisciplinary engineering major that emphasizes both theory and practice[1], making the traditional graduation thesis paradigm for computer-related majors difficult to fully apply. Graduates majoring in Big Data in universities generally face problems such as empty topic selection, weak technical application, and insufficient empirical analysis in thesis writing. Existing studies mostly focus on technical teaching, lacking empirical analysis on the correlation between writing ability and teaching links. This study takes two consecutive cohorts of graduates (2024 and 2025) as samples, combines questionnaire surveys and analysis of practical teaching files, to systematically sort out the difficulties in writing and their practical teaching roots, providing evidence-based support for the reform of graduation theses for Big Data majors.

2. Research Methods

To address the problem of low quality in undergraduates' graduation theses, the teaching reform project team mainly targeted undergraduates majoring in Big Data at Guangdong University of Science and Technology, conducted a large-scale questionnaire survey, and collected valid responses from 104 students (153 from the 2024 cohort and 157 from the 2025 cohort). The research team comprehensively identified various problems existing in the practical teaching process and students' graduation thesis writing process.

3. Research Findings

3.1. Questionnaire Survey Analysis Report

The research team designed 5 key questions closely related to students' participation in practical teaching activities and graduation thesis writing, requiring students to answer objectively and earnestly. The team carefully sorted out and analyzed the feedback from the questionnaire survey.

3.1.1. Have You Written a thesis? Have You Published Any Papers?

Taking the Big Data major as an example, analysis of 153 questionnaires from the 2024 cohort shows that there are 104 valid responses. Regarding whether they have written a thesis, about 32% of the students reported having experience in writing papers, while about 68% had no such experience. Regarding whether they have published papers, only about 1% of the students had publicly published papers, and 99% had not.

3.1.2. What is the Direction of Your Graduation Thesis Topic?

The topic selection of the graduation thesis is a very important link in the graduation project. The quality of the graduation thesis topic will directly affect the cultivation of students' innovative awareness and ability, the quality of students' graduation design, and the improvement of students' knowledge level[2]. Regarding the direction of graduation thesis topics, 62.5% of Big Data students chose Data Analysis and Visualization; 27.5% chose Data Analysis and Visualization Systems; 7.5% chose Big Data Development; 2.5% chose Machine Learning or Data Mining; and 0% chose Recommendation Systems.

3.1.3. What do you Think is the Most Difficult Part of the Graduation Thesis or Design?

For this question (see Figure 1), 80% of Big Data students believed that the project implementation part was the most difficult; 15% thought the thesis writing part was the most difficult; and 5% considered other aspects of thesis writing as the most difficult. The above data phenomenon is due to the following reasons: students usually do not receive systematic

literature retrieval and reading training during their undergraduate studies, and only a few students have participated in training or lectures organized by the school library, resulting in unsystematic and incomplete learning content. In addition, supervisors pay more attention to the core content during the thesis (design) process, while neglecting the cultivation of students' literature retrieval and analysis abilities [3].

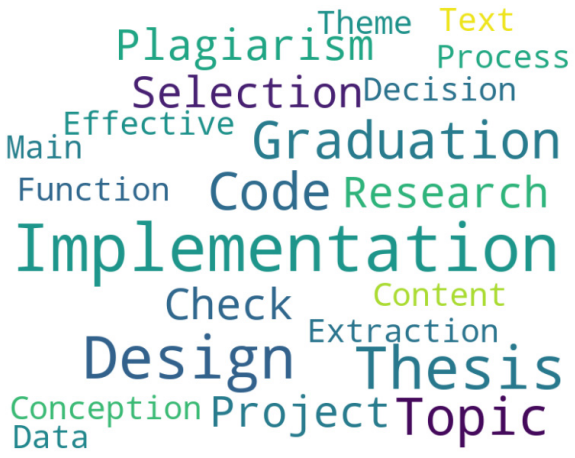


Figure 1. Correlation Word Cloud of Difficulties in Graduation Thesis Design for Big Data Major

3.1.4. Your Favorite Courses, Most Useful Courses, and Which Professional Courses Support Your Thesis?

Regarding favorite and most useful courses, among 153 students of the 2025 Big Data cohort: 29.87% chose Python; 15.58% chose Data Mining; 11.69% chose Hadoop; 10.39% chose Java; 9.09% chose Thesis Writing; 6.49% chose Machine Learning; 6.49% chose Hive; 5.19% chose Kafka; 5.19% chose Spark; 3.90% chose Data Visualization; 3.90% chose Linux; 3.90% chose C Language; 2.60% chose Distributed Computing Framework; and 18.18% chose other courses such as "NoSQL", "Situation and Policy", and "Query Analysis and Computing".

Regarding professional courses that support the thesis, among the 153 surveyed students of the 2025 Big Data cohort: 24.68% chose Python; 19.48% chose Data Mining; 9.09% chose Java; 6.49% chose Hive; 6.49% chose Hadoop; 6.49% chose Spark; 5.19% chose Thesis Writing; 3.90% chose Kafka; 5.19% chose Data Visualization; 3.90% chose Linux; 3.90% chose C Language; 2.60% chose Machine Learning; and 10.39% chose other courses such as "NoSQL" and "Query Analysis and Computing".

3.1.5. What Content Do You Think Needs to be Supplemented Regarding Thesis Writing?

For this question (see Figure 2), among 73 surveyed Big Data students: 32.88% were most concerned about the graduation project process, indicating that some students had many doubts about the operation steps and sequence of the graduation project; 27.40% had confusion about other issues in thesis writing, such as reducing the repetition rate; 16.44% focused on thesis writing and format, reflecting the demand for content creation; 13.70% paid attention to materials and references, showing the need for accessing reference resources; and 9.59% were concerned about defense-related content, possibly due to the relatively late timing of the defense.

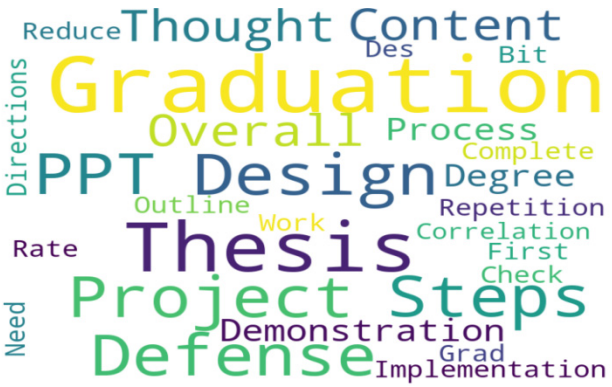


Figure 2. Correlation Word Cloud of Needed Supplementary Content in Graduation Thesis Writing for Big Data Major

4. Existing Problems and Improvement Measures

In response to the above problems, the research team actively engaged with students and teachers, identified problems through multiple forms such as questionnaire surveys and data analysis, and explored solutions. The team found that students were not satisfied with the implementation of practical teaching links in the college. Students generally believed that the courses were insufficient in improving their practical problem-solving abilities, reflecting the disconnection between theoretical teaching and practical needs[4]. Some teachers of Big Data majors in universities lack corporate practical experience, and their technical level and practical abilities need to be improved, making it difficult to meet the requirements of practical teaching [5]. In future graduation thesis writing and other practical teaching activities, the team will continue to conduct research through various forms to find more reasonable and effective reform measures to promote the overall teaching work of the university.

5. Conclusion

In summary, based on the questionnaire survey results of undergraduates majoring in Big Data from the 2024 and 2025 cohorts, combined with practical teaching data, the following conclusions are drawn: (1) The design and implementation of practical teaching links need to be improved; (2) Due to insufficient training in graduation thesis writing for college students, universities need to provide scientific and reasonable practical teaching arrangements, add data and analysis skills training in courses, improve students' data literacy, and help students better use data resources to complete their graduation theses; (3) In the future, this teaching reform work will continue, and relevant reform measures will be further implemented and improved in the process of practical teaching. It is hoped that this project can effectively promote the improvement of the quality of graduation thesis writing for Big Data majors in universities.

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References

[1] Gui, J. S., Zhang, Z. P., & Guo, K. H. (2018). Exploration and practice of new major construction in universities under the background of emerging engineering education — Taking the Data Science and Big Data Technology major as an example. Computer Education, (7), 27-31. https:// doi.org/10. 16512/ j.cnki.jsjjy.2018.07.007.

[2] Li, H. W. (2010). Discussion on the factors affecting the completion quality of undergraduate graduation design (thesis). China Science and Technology Information, (19), 240-241.

[3] Li, Y. Z., Wang, Y., Xu, L., et al. (2023). Exploration on the teaching reform of literature review courses for master's students majoring in Geological Engineering — Taking China University of Geosciences (Beijing) as an example. Journal of Higher Education, 9(30), 7-11. https://doi.org/ 10.19980/ j. CN23-1593/G4.2023.30.002.

[4] Peng, J., Li, C. H., & Shi, B. W. (2025). Analysis of influencing factors of professional satisfaction among students in private universities. Industrial and Science Tribune, 24(10), 86-89.

[5] Zhang, Y. (2022). Construction of Big Data professionals oriented to practical ability and social needs. Journal of North China Institute of Aerospace Engineering, 32(2), 33-3.