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TEACHER MENTORING AND PERCEIVED RESEARCH COMPETENCE: A STUDY OF HSS UNDERGRADUATES

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ABSTRACT

Driven by China's national initiatives to develop the 'New Liberal Arts' and enhance undergraduates' innovation, fostering research competence among students in the humanities and social sciences (HSS) has become a critical priority. This study aims to explore the impact of teacher mentoring on the perceived research competence of undergraduates in the HSS and its internal mechanism. To examine the research context, this study employed a mixed-methods approach, combining a questionnaire survey (n = 98) and semi-structured interviews (n = 8), conducted with students from four "Double First-Class" universities in China. Quantitative data show that both academic guidance and emotional care from teachers are significantly positively correlated with the students' research competence. Regression analysis further indicates that the role of emotional care is even more prominent. Qualitative interviews reveal that students' investment, targeted teacher guidance, and emotional encouragement collectively serve as key pillars in enhancing research competence. Finally, the paper proposes practical recommendations to improve undergraduate research training and teacher-student interactions at the levels of students, teachers, and university administration.

1 INTRODUCTION

Amid the tides of globalization and the knowledge economy, enhancing the quality of higher education and cultivating top-notch, innovative talent has become a central strategy for nations worldwide. Against this backdrop, China has undertaken significant strategic reforms in its higher education system over the past decade. From the launch of the "Six Excellence and One

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Top-notch Talent" (*Liu Zhuo Yue Yi Ba Jian*) Plan 2.0, to the comprehensive promotion of the "New Liberal Arts" (*Xin Wen Ke*) initiative, and emphasis on "comprehensively improving our ability to nurture talent at home" in the report to the 20th National Congress of the Communist Party of China, a series of top-down policy designs signal a clear shift: undergraduate research training, particularly in the humanities and social sciences (HSS), has been elevated to an unprecedented level of importance. These policies aim to promote interdisciplinary integration and cultivate liberal arts talent equipped with both innovative thinking and practical research skills in the new era, thereby strengthening China's cultural soft power and academic discourse authority.

Despite strong policy advocacy and an increasing demand in practice, academic attention to this issue remains largely delayed and uneven. Existing research on undergraduate research competence primarily focuses on students in science, technology, engineering, and mathematics (STEM). By contrast, systematic investigations into status, developmental trajectories, and challenges faced by HSS undergraduates are relatively scarce. This imbalance has left our understanding of ways to guide HSS students effectively in research activities and to enhance their research competence relatively underdeveloped. Although existing literature occasionally acknowledges the role of teacher mentoring, few studies have thoroughly examined the complex, intrinsic relationship between specific mentoring behaviors and students' perceptions of their research competence. This perceived competence not only shapes students' academic confidence and self-efficacy but also directly influences their willingness and potential to pursue future research.

This study, therefore, seeks to explore the following core question: within the current educational policy context, how does teacher mentoring influence the perceived research competence of undergraduate students in the HSS, and what are the underlying mechanisms? In tackling this question, the study serves a dual purpose. Theoretically, it contributes to the body of literature on undergraduate research and higher education mentoring, particularly by shifting the research focus to the often-overlooked HSS fields. It offers new empirical insights into the relationship between mentoring and student competence development. Practically, the findings have the potential to inform actionable policy recommendations and mentoring strategies for university administrators and educators. In doing so, the study aims to strengthen undergraduate research training systems, effectively address the national initiative to cultivate high-level innovative talent, and contribute to the strategic objectives of the "New Liberal Arts" initiative.

In this study, teacher mentoring is defined as the personalized guidance and support provided by experienced faculty members to students in academic, research, and emotional domains. Mentoring is structured into emotional care and instructional guidance, which mirror the actual practices of student-led inquiry in China.

Perceived research competence refers to an individual's subjective evaluation of his/her abilities in the research process, abilities that may not have been fully recognized before participation in research. To complete an undergraduate research project, students need competence in four key areas: research ability, auxiliary skills, social competence and relationships, and professional socialization. These four dimensions serve as the basis for our self-assessment framework of undergraduate research competence. Research competence refers to the essential skills involved in designing and conducting scholarly research, including selecting a topic, synthesizing existing literature, applying analytical methods, and identifying research gaps. This is the most fundamental component. Auxiliary skills involve practical capabilities such as academic presentation, communication, and data analysis. Social competence and relationships encompass teamwork, interpersonal communication, and building research networks. Professional socialization refers to the attitudes and dispositions essential for research, including resilience in the face of failure, rigor, skepticism toward authority, and objectivity.

2 LITERATURE REVIEW

The concept of undergraduate research can be traced back to the founding principles of the

University of Berlin, established by Humboldt in 19th-century Germany. Later, American universities and scholars localized this somewhat abstract concept, integrating it broadly into undergraduate education. In 1969, the Massachusetts Institute of Technology (MIT) launched one of the earliest undergraduate research programs. By the late 1990s, research-intensive universities in the United States began extending the "research–teaching–learning nexus" from graduate education into undergraduate curricula, making it an essential component of cultivating innovative talent. Since then, many institutions abroad have developed a wide variety of research programs and courses tailored for undergraduates. The aim is to encourage students to join faculty-led research teams, serve as research assistants, or conduct independent research projects.

Firstly, many studies have investigated the developmental outcomes students gain through undergraduate research training. In terms of research ability, it was found that students perceived undergraduate research experiences to greatly enhance their skills in hypothesis testing, data collection, writing, and data presentation (Craney et al., 2011). Regarding cognitive development, research indicates marked improvements in analytical and logical reasoning, inductive thinking, and independent learning (Ishiyama, 2002).

Independent, student-led projects have also been shown to promote critical thinking and a proactive learning attitude, enabling students to engage with one another in novel ways and to think, act, and adapt as informed citizens in a complex global world (Killinger et al., 2016). Moreover, in addition to hard skills and abilities, scholars have emphasized the social benefits of undergraduate research, such as improved interpersonal communication (Landrum & Nelsen, 2002), stronger willpower, and increased self-confidence. In terms of academic performance, research experiences at the undergraduate level have been linked to greater clarity in career goals and a higher likelihood of pursuing and succeeding in graduate education (Lopatto, 2007). Another survey confirmed that even after controlling pre-college variables and institutional attributes, undergraduate research participation remained strongly associated with graduate degree aspirations (Kilgo & Pascarella, 2015). These findings have laid a foundation for hypothesizing the potential impacts of undergraduate research in China, particularly on students' competencies and postgraduate ambitions.

Secondly, concerning research methods and approaches, scholars have employed a variety of methodologies, most commonly interviews, self-report surveys, and quasi-experimental designs. These methods are often used in combination to ensure methodological rigor and to enable in-depth examination of research subjects and themes. For example, professors at the University of Maine conducted one-on-one interviews with students involved in an interdisciplinary ethics undergraduate research program and briefly summarized these dialogues to conclude. Moore et al. (2018) used self-report surveys and focus group interviews to comprehensively examine the varying motivations, expected outcomes, and perceived benefits of both faculty and students participating in directed studies courses (an honors thesis-based undergraduate research experience). STEM-oriented instructional designs and scaffolded pedagogical frameworks have demonstrably utilized interview-based evaluations to assess student outcomes and the impact of educational interventions. These studies either compared treatment and control groups or evaluated changes in students' self-perceived competence before and after participation. They covered different types of undergraduate research experiences, including first-year seminars, capstone experiences, extracurricular projects, and research-integrated courses. The methods used ranged from qualitative interviews to self-reported surveys and quantitative data analysis. Some scholars also conducted comparative analyses to examine how research participation affects academic performance and retention among students from various backgrounds, by year level, parental education, or high school preparation (Bowman & Holmes, 2018).

Extensive empirical evidence has shown that mentoring is the most influential factor in the success of undergraduate research (Lopatto, 2006).

Specifically, emotional and social dimensions of teachers have been shown to have the greatest impact on undergraduate students' academic

research, professional socialization, and satisfaction with the research experience (Haeger & Fresquez, 2016). Faculty members play a crucial role in undergraduate research activities. Their mentoring behaviors directly affect whether students can complete research tasks and whether their academic abilities and scholarly qualities can be meaningfully developed. As such, teacher mentoring is widely regarded as the cornerstone of undergraduate research.

Currently, scholarly investigations in China remain sparse, with the majority concentrating primarily on STEM undergraduate populations. Between 2014 and 2018, Guo conducted a series of in-depth studies on undergraduate research in STEM disciplines. Guo's earlier work (2018) aimed to cultivate students' innovative capacities through the "College Student Innovation and Entrepreneurship Training Program" (*Da Xue Sheng Chuang Xin Chuang Ye Xun Lian Ji Hua*). The findings revealed that students involved in research activities differed significantly from their non-participating peers. Undergraduate research was found to be more conducive to improving STEM students' acquisition of disciplinary knowledge and skills, thus promoting their professional development.

Beyond Guo Hui's contributions, existing research in China is fragmented. Some studies have examined the outcomes of undergraduate research without exploring underlying mechanisms. For instance, Fan et al. (2017), examining students in science and social science majors, found that those with undergraduate research experience were more inclined to pursue academic master's programs. Their study demonstrates that undergraduate research is instrumental in developing students' innovative capacities. Similarly, Gou et al. (2022), through a mixed-method study involving 140,000 samples, reported that research participation enhances undergraduates' non-cognitive skill development. This includes measurable improvements in neurocognitive and interpersonal abilities, as well as subtle influences on self-regulation.

In summary, localized research in China is severely lacking. While Western scholars have developed a robust conceptual foundation that can inform our understanding of specific mentoring behaviors in undergraduate research, these insights have yet to be fully contextualized within the Chinese higher education environment.

Therefore, this study aims to advance the understanding of teacher mentoring and HSS students perceived research competence, promote greater integration of research and teaching in China, and contribute to the cultivation of innovative talent by enhancing the research capacity of HSS undergraduates.

3 METHODOLOGY

This study consists of both quantitative and qualitative phases. Initiated through a questionnaire survey, the study explores undergraduate research competence and teacher mentoring practices among HSS students. Based on the survey results, an interview protocol is then developed to help reinterpret the survey findings. Finally, the study draws on the results to offer practical recommendations.

3.1 Quantitative phase

- *Questionnaire Design:* To design the questionnaire, we reviewed relevant literature to identify existing frameworks and define the dimensions of perceived research competence and teacher mentoring. Based on this review, we selected a scale with strong external validity that was suitable for this study. Considering sociocultural differences and the specific focus and target group of this research, we made appropriate adjustments to the wording of the items to better align the questionnaire with the actual circumstances of our participants: undergraduates majoring in the HSS fields.
- *Questionnaire Distribution and Data Processing:* The survey was conducted online. It included four main sections: introductory instructions, demographic information, perceived research competence, and teacher mentoring. Emphasis was placed on the authenticity of responses and the anonymity of participants. Data was collected through the *wjx.cn* platform and analyzed using SPSS 25.0 for data management, storage, and statistical analysis.
- *Research Instruments:* The questionnaire was adapted from Guo and Han's (2018)

"Behavioral Indicators for Effective Teacher Mentoring in Undergraduate Research" and the "Indicators for Measuring Undergraduate Research Learning Outcomes." The "Teacher Mentoring Scale" comprised two dimensions: academic guidance and emotional care. The "Undergraduate Perceived Research Competence Scale" included three dimensions: research ability, auxiliary skills, social competence and relationships, and professional socialization. Each item was rated on a five-point Likert scale, where 1 to 5 represent "strongly disagree" to "strongly agree." Higher average scores indicate better perceived research competence or stronger faculty mentoring. A pilot test with 40 respondents yielded a Cronbach's alpha of 0.884 for the "Teacher Mentoring Scale", indicating good reliability. Exploratory factor analysis yielded a Kaiser-Meyer-Olkin (KMO) value of 0.818, affirming the scale's appropriateness for factor analysis. Based on the results, poorly performing items were removed, resulting in a scale with strong structural validity.

3.2 Qualitative phase

- *Interview Preparation and Data Collection:* Based on the analysis of survey results and the review of relevant literature, a semi-structured interview protocol was developed. Participants were recruited via convenience sampling from undergraduate students in HSS disciplines at a Chinese University. Participation was voluntary, and individual interview appointments were arranged. One-on-one interviews were conducted to ensure depth of dialogue. Audio recordings and field notes were collected for each interview.
- *Data Processing and Thematic Coding:* Immediately following each interview, recordings were transcribed verbatim, anonymized, and assigned identification codes. Transcripts were repeatedly reviewed for accuracy. All data were imported into NVivo 11 software for thematic coding and categorization. Concepts and themes relevant to the research questions were extracted through this process.
- *Instruments and Interview Protocol Description:* This study employed a semi-structured interview guide and NVivo 11 for qualitative analysis. The semi-structured format provided the flexibility to follow up on interviewees' responses and adjust questions as needed, enabling deeper data exploration and addressing the limitations of the quantitative phase.

3.3 Limitations

Eight participants (n = 8) from a single university made up the small sample size for the qualitative phase. Although the semi-structured interviews yielded rich qualitative insights into students' experiences, the results may lack external validity when applied to the broader HSS undergraduate population in China. To validate and extend our findings, future research would benefit from utilizing a substantially larger and more diverse sample drawn from multiple academic institutions.

4 RESULTS

4.1 Quantitative phase

This questionnaire covers students majoring in HSS from four "Double First-Class" universities. The questionnaire was distributed via mobile applications such as QQ and WeChat. To ensure authentic responses and protect participants' privacy, the survey was conducted anonymously. Of the 104 questionnaires distributed, 98 were returned and deemed valid, yielding a response rate of 94%. Among the respondents, 52 were male and 46 were female. Of the valid responses, 37 students majored in Education, 14 in History, 12 in Management, 10 in Philosophy, 9 in Literature, 8 in Arts, and 4 each in Economics and Law.

Descriptive statistical analysis was conducted using SPSS 25.0 to examine the mean scores of each dimension. The assessment revealed that the lowest-performing dimensions were teacher academic guidance and students' perceived research competence. Further analysis of specific items showed that within academic guidance, Item 21, "My teacher discusses the nature of science with me and guides me to develop a research identity", had the lowest mean score, followed by Item 20, "My teacher instructs me in research techniques and methods." In contrast, Item 19, "My teacher demonstrates qualities of diligence

and persistence in research", showed relatively high performance. In terms of students perceived research competence, Item 7 ("I can identify weaknesses in research design") yielded a mean score of 3.47, suggesting limited ability in this area. The mean scores for the remaining items were relatively strong (Table 1).

Table 1. *Descriptive statistics*

	Valid N.	Min.	Max.	Mean	SD
Teacher academic guidance	98	3.00	15.00	10.4286	3.35218
Academic skills	98	4.00	20.00	14.0204	4.10175
Research ability	98	5.00	20.00	14.3061	4.09528
Social competence & relationships	98	4.00	20.00	14.3265	4.09369
Teacher emotional care	98	4.00	20.00	14.4694	4.47261
Professional socialization	98	6.00	30.00	22.3776	6.38218
Valid cases (columns)	98				

Using SPSS 25.0, a correlation analysis was conducted on the two variables: students perceived research competence and teacher mentoring. The results (Table 2) showed a significant positive correlation between them, with a Pearson correlation coefficient of 0.873 ($p = 0.000 < 0.05$). This indicates a strong positive relationship between the two variables, although the directionality of influence remains unclear. The coefficient of determination (R^2) was 0.7621, meaning that 76.21% of the variance in perceived research competence can be explained by teacher mentoring, or vice versa. The direction of influence requires further verification through regression analysis.

Table 2*. Correlation analysis*

		Research competence	Teacher mentoring
Research competence	**Pearson correlation**	1	0.873**
	Sig. (2-tailed)		0.000
	Sum of squares & cross-products	30096.908	11331.306
	Covariance	310.277	116.818
	n	98	98
Teacher mentoring	**Pearson correlation**	0.873**	1
	Sig. (2-tailed)	0.000	
	Sum of squares & cross-products	11331.306	5594.980
	Covariance	116.818	57.680
	n	98	98

** Significant at the 0.01 level (2-tailed)

Teacher mentoring was divided into two dimensions: academic guidance and emotional care. Based on existing theoretical assumptions, teacher mentoring was hypothesized to affect students' perceived research competence. Thus, teacher mentoring was treated as the independent variable and perceived research competence as the dependent variable. As there are not many independent variables in this study and the regression model is simple, the forced entry method is more suitable. All independent variables were simultaneously included in the regression equation. The path coefficients representing the influence of each independent variable on the dependent variable were identified based on standardized regression coefficients. Specifically, the predictor variables "teacher academic guidance" and "teacher emotional care" were entered into the regression model and analyzed using SPSS 25.0. The resulting model summary is presented in Table 3. According to Table 3, the R^2 value was 0.774. Since only one regression model was used, the change in R^2 equaled the R^2 statistic itself, indicating that these two predictor variables jointly explained 77.4% of the variance in the criterion variable of teacher guidance.

Table 3. Model summary[b]

Model	R	R^2	Adjusted R^2	Std. Error of Estimate
1	0.880[a]	0.774	0.769	8.46880

Where:

a. Predictor variables: (constants), teacher academic guidance, and teacher emotional care.
- b. Dependent variable: total score of perceived research competence.

Further analysis, based on the ANOVA summary (Table 4), revealed an F-statistic of 162.321 and a p-value of 0.000, indicating statistical significance at the 0.05 level. This suggests that the overall regression model was statistically significant, indicating that at least one regression coefficient is not equal to zero, that is, at least one predictor variable has a significant effect.

Table 4. ANOVA[a] summary

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	23283.455	2	11641.728	162.321	0.000[b]
	Residual	6813.453	95	71.721		
	Total	30096.908	97			

a. Dependent variable: total score of perceived research competence.
b. Predictor variables: (constants), teacher academic guidance, and teacher emotional care.

Table 5 presents the regression coefficients and their significance tests. The standardized regression equation is as follows:

$$PRC = 0.729 \times TEC + 0.167 \times TAG$$

Where:

PRC – Perceived research competence
TEC – Teacher emotional care
TAG – Teacher academic guidance

This standardized equation shows that among the two predictor variables, teacher emotional care had the greater influence on the dependent variable. Both predictor variables had positive standardized coefficients, indicating that they each exerted a positive effect on the dependent variable. The sign of the standardized regression coefficients (β) corresponded with that of the earlier Pearson product-moment correlation coefficients, reaffirming that both predictor variables exerted a positive influence. The t-values for the significance tests of the two predictor variables were 7.045 ($p < 0.001$) for emotional care and 1.612 ($p = 0.110$) for academic guidance, indicating that only emotional care was statistically significant at the 0.05 level. The regression coefficient for academic guidance was not statistically significant, suggesting a limited contribution to the variance in students' perceived research competence.

***Table 5**. Regression coefficients and their significance tests*

Model		Unstandardized coefficients		Standardized coefficient	t	Sig.	95.0% CI for B	
		Estimated value of B	Std. Error	Beta coefficient distribution			UL	LL
1	(Constants)	14.350	2.948		4.867	0.000	8.497	20.203
	Emotional care	2.871	0.407	0.729	7.045	0.000	2.063	3.679
	Academic guidance	0.877	0.544	0.167	1.612	0.110	-0.203	1.957

However, since a significant correlation was found between teacher academic guidance and perceived research competence during the correlation analysis, multicollinearity could be a concern. As shown in Table 6, the tolerance values for both predictor variables were approximately 0.200, and the variance inflation factors (VIFs) were below 5, which is well under the commonly accepted threshold of 10.

Table 6. Collinearity results

	Tolerance	VIF
Emotional care	0.223	4.493
Academic guidance	0.223	4.493

These results suggest that multicollinearity between the independent variables in the regression model is not severe.

4.2 Qualitative phase

Based on the principle of voluntary participation, a group of undergraduate students was selected for interviews conducted both online and in person. After interviewing eight participants, no new themes emerged, indicating that data saturation had been reached. Therefore, we stopped collecting additional interview data. The interviewees were numbered sequentially from S1 to S8 according to the order in which the interviews were conducted.

Through thematic coding of the interview data from the eight participants, we identified several reasons behind changes in students' perceived research competence:

- *Personal Investment:* Most interviewees mentioned that at this stage, they mainly relied on self-directed learning through instructional videos and relevant books to enhance their research competence. For example, S2 stated, "I learned by doing. While participating in research competitions, I gathered materials around specific problems, and gradually started learning SPSS..." Similarly, S5 noted, "We had to conduct regression analysis, so we searched for tutorials on video-sharing platforms like Bilibili and found some cloud drive resources. We figured it out ourselves—the online courses were quite clear..." S6 said, "The teacher did not respond to us, so we just found some resources and did it ourselves. In the end, we even won second prize, which wasn't too bad..."
- *Feedback and Guidance from Teachers:* At the same time, students who had achieved outstanding research results all mentioned receiving either suggestions on research orientations or detailed feedback from their teachers. For instance, S1 shared, "When I was writing my paper, the teacher gave me some directional guidance on the critical review section. For example, he pointed out which data needed interpretation. He also advised me on how to collect data to support my arguments, and how to use the data more effectively..." Regarding feedback, S6 said, "What impressed me most was the teacher's feedback. During my time in university, few teachers ever provided a detailed analysis of my academic papers. I was very touched. Even though the comments weren't extensive, the experience was unforgettable. He even remembered every student's name, which left a deep impression on me."
- *Encouragement from Teachers:* One interviewee highlighted the importance of encouragement from a teacher, which gave them the passion and courage to continue pursuing academic work. S7 said, "My supervisor, Professor Tang, is truly amazing. She does not have a background in sociology, but she taught herself to help me organize my scattered materials. When I was on the verge of giving up, she wrote me a three-page outline the next day. She also helped me build my theoretical foundation. Meeting her during my undergraduate studies was unbelievably lucky."

During the interviews, most students described their ideal type of teacher or the form of mentoring they hoped to receive. Further coding of the interview data revealed four main themes:

- *Training in Academic Writing*: All interviewees acknowledged limited experience with empirical research, and some also expressed uncertainty regarding their academic writing skills. They were unsure how to write scholarly papers in a standardized, logical, and academically appropriate way. For instance, S6 remarked, "Right now, I feel what I lack most is systematic training in academic writing. I hope to receive more of this during my graduate studies. As for empirical research, I think I can manage it through self-learning."
- *Hands-on Training in Quantitative Research*: Several students pointed out that they lacked systematic training in quantitative methods and hoped to participate in the full process of

quantitative research, starting with questionnaire design. S1 said, “But now, I lack a lot of experience in quantitative research, such as in designing questionnaires. I have never been involved in the whole process. I hope to participate from the beginning and go through the entire process of conducting quantitative research.”

- *Guidance on Research Direction*: A few students hoped that teachers would offer more direction on shaping their research focus. For example, S4 noted, “Actually, I can solve many things through self-learning, but I spent too much time searching for literature and learning about different research methods and fields. My teacher could not give me much guidance on research direction…”
- *Opportunities for Field Research:* Fieldwork emerged as a significant theme in the interviews. S2, a member of an agrarian society within the Department of Education, stated: “I think the biggest help my teacher gave me was the chance to conduct fieldwork. Through the agrarian society, I engaged with traditional Chinese culture and became aware of the needs of agrarian communities." I also came to understand the value of Education as a discipline.” S7 recalled, “At that time, our teacher helped us contact schools and provided all kinds of support. She even took us to conduct experiments and observe classes, allowing us to bring the R-STEAM concept to life. Whenever we were under pressure, she would gently encourage us. She said she just wanted us to experience educational experiments and see how things worked in schools. She always guided us patiently.”

5 DISCUSSION

5.1 Returning to Practice: How Fieldwork Can Resolve the Crisis in Undergraduate Research

At present, undergraduate research faces several significant challenges. Although academic learning has grown increasingly detached from practical contexts, students now tend to approach research instrumentally, viewing it primarily as a way to build credentials. Students study abstract and "grey" theories within the university context, yet may have limited opportunities to apply them in authentic settings. Driven by the expectations of postgraduate admissions and job markets, research competitions increasingly function as instruments for credential accumulation. This phenomenon risks diminishing students' curiosity and desire for knowledge, thereby obscuring the intrinsic purpose of academic research. Fieldwork offers a valuable approach, reorienting students toward the authentic spirit of research.

First, fieldwork breaks down the barrier between theory and reality. Most undergraduates lack access to social networks or practical environments, which limits their ability to engage meaningfully with frontline issues in education or society. Knowledge acquired in the classroom becomes decontextualized due to the lack of applicable contexts and is often quickly forgotten after examinations. Fieldwork, by contrast, provides a “living classroom,” placing students directly within real-world problem contexts. Whether through in-depth conversations with frontline educators or firsthand observation of complex social phenomena, fieldwork revitalizes textbook knowledge. It encourages students to activate and internalize their learning through real problem-solving, making their limited study time more productive and meaningful.

Second, fieldwork helps students rediscover the original value and purpose of research. When research is equated with GPA, awards, or graduate school qualifications, its essential goals — exploring the unknown and serving society — are obscured. Many students superficially participate in multiple research projects, merely to enhance their résumés, without ever reflecting on the social value of their work. Fieldwork provides a counterbalance. When students enter rural communities or urban neighborhoods and witness real hardship and unmet needs, they begin to shift their focus from primarily individualistic goals and ask themselves, “Whom does my research benefit?” Just as educator James Yen dedicated himself to rural education and used knowledge to transform local communities, fieldwork instills in students a sense of social responsibility, redirecting their focus from personal gain to broader societal concerns. This can be a powerful driver in academic research.

Thus, fieldwork is not merely an "engaging" extracurricular activity. It is a significant pathway to addressing the current challenges in undergraduate research. It bridges the gap between knowledge and practice, creating a space that nurtures academic passion and reaffirms the core purpose of scientific research. It is essential for cultivating researchers who are problem-conscious and socially engaged.

5.2 The Three Pillars of Undergraduate Research: Investment, Mentoring, and Encouragement

The findings suggest that the development of research competence among HSS undergraduates is primarily supported by three interconnected pillars: personal investment, teacher mentoring, and teacher encouragement. These three elements interact dynamically, shaping students' developmental trajectories from passive participation to active exploration.

Personal investment forms the foundation of research, yet its impact can be both empowering and problematic. Nearly all interviewees emphasized that "self-study" and "trial-and-error" are the norm in their research journeys. While self-constructed knowledge is necessary, these behaviors often lack coherence and are driven by immediate problems in the absence of effective guidance. As a result, students may resolve short-term issues but remain confused about the broader disciplinary landscape or future academic directions. Their knowledge becomes fragmented and unsystematic, making sustained academic development difficult.

Teacher mentoring adds direction and depth to the research process. Traditional teacher mentoring, such as recommending literature or explaining methods, can help students complete individual papers. However, its effects often remain superficial and utilitarian, lacking the capacity to foster sustained intellectual engagement. Our interviews reveal that more impactful mentoring involves providing opportunities for fieldwork. When students step outside the university context and immerse themselves in real-world educational settings, abstract theory is tested against and integrated with real-world complexities. This "being present" experience enables students to appreciate the contemporary relevance of their disciplines and identify problems and solutions within authentic contexts. These experiences can significantly enhance research interest far more effectively than classroom-based study alone.

Teacher encouragement acts as a key facilitator that can transform extrinsic motivation into intrinsic passion. Many students initially engage in research to earn extra credit or secure graduate school placements. When they encounter setbacks, teachers' encouragement and emotional support help them overcome frustration, foster a sense of belonging within research teams, and experience a sense of accomplishment after overcoming challenges. These positive experiences fulfill students' psychological needs and gradually shift their motivations from extrinsic pressures to intrinsic interest in academic work. Furthermore, a teacher's enthusiasm for their research can be highly influential, motivating students to find what they are genuinely passionate about and thereby fostering their long-term academic development.

In summary, effective undergraduate research training requires an organic integration of students' investment, directional teacher mentoring, especially through exposure to practical contexts, and continuous emotional encouragement. All three pillars are indispensable.

6 PRACTICAL IMPLICATIONS

This section offers brief recommendations from the perspectives of students, teachers, and universities, aiming to improve the current status of teacher mentoring. We advocate promoting student initiative in learning, encourage teachers to attend to students' developmental needs through emotional care, and reform faculty evaluation systems to advance undergraduate research in the HSS fields.

The most influential aspect of teacher mentoring in undergraduate research is emotional care combined with timely and constructive feedback. Students engaged in academic exploration need guidance and support. A single thoughtful and responsible piece of feedback can provide profound psychological encouragement and, more importantly, shape a student's future academic or career path. For students who experience setbacks in research competitions or face major

disappointments, teacher encouragement and directional guidance are critical sources of motivation that help them persevere. Therefore, teachers should strengthen their communication with students and offer timely and meaningful feedback. Both measures are vital for talent cultivation and for sparking long-term academic interest.

Personal investment is the foundation of research competence. Students should take the initiative in learning and maintain active communication with their teachers to clarify their research direction. For HSS majors, textbook learning alone is insufficient. Students must engage in fieldwork, immerse themselves in real-world contexts, and identify problems within society where theoretical knowledge can be applied. This approach not only brings academic content to life but also fosters professional socialization and reveals the true value and purpose of research to students.

Universities should provide stronger institutional support for undergraduate research. In addition to encouraging student autonomy, institutions should establish incentive mechanisms such as forming undergraduate research teams and supporting faculty-led field investigations to cultivate a positive research environment. It is necessary to shift away from evaluation-centered approaches and prioritize the construction of practice-oriented platforms that make research an intrinsic motivation for students. Now, universities must strengthen both the quality and relevance of coursework. They should redesign curricula to reflect real-world needs, enabling students to apply their knowledge in practice. This will help elevate the overall quality of undergraduate education.

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