The Innovation of Big Data Technology in the Ideological and Political Education of College Students in Resident Universities under the Background of Local Strategy

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Abstract: The era of big data comes with the in-depth development of Internet information technology, which not only brings new innovations, new changes, new ways of life, thinking, and communication but also creates new perspectives and opportunities for the ideological and political education research of college students in resident universities. Based on the local strategy of Mianyang City, this study analyzes the challenges of the ideological and political education of college students in Mianyang City, explores the problems existing in the ideological and political education of college students in Mianyang City, and puts forward the strategies of big data technology to promote the sustainable development of ideological and political education of college students in Mianyang City.

Keywords: Ideological and political education; Mianyang city; Big data technology

1. Introduction

In recent times, resident institutions of higher learning have emerged as vital contributors to the expansion of higher education accessibility in the nation, shouldering dual responsibilities: fostering local economic progress and societal evolution, while also grooming a substantial cadre of highly skilled, application-oriented professionals. This underscores the comprehensive impact of their educational endeavors on the nation's economic and social fabric. The advent of the big data era, an offshoot of the internet's information technology revolution, introduces not only transformative innovations, novel lifestyles, and modes of communication, but also ushers in fresh perspectives and avenues for the exploration of student ideological and political education within these residential campuses [1–2].

Lin Wen emphasizes that the in-depth transformation and innovation of ideological and political coursework, tailored to align with the requisites of new engineering development, delineate a contemporary mandate for these institutions [3]. The proposed reforms encompass reinforcing the instructional team

to accommodate multi-party cooperative education models; enriching curriculum content to mirror the restructuring of new engineering systems; adapting pedagogical approaches and tools to the evolving dynamics of engineering education; and broadening practical platforms for ideological and political courses within the collaborative instructional framework.[4–5] Yuan Yuanv advocates for an ideological and political education strategy at local universities that is goal-oriented toward talent cultivation. While adhering to the fundamental tenets of such education, Yuan underscores the necessity for a localized, context-specific approach that capitalizes on the distinctiveness of resident university settings. This involves exploring and establishing unique ideologies for ideological and political education that resonate with the resident college milieu, recognizing and leveraging the peculiarities that shape the distinct patterns of educational influence [6]. Hence, there is a contemporaneity to the ideological and political education in resident universities, necessitating a reassessment under the current local strategic landscape and leveraging big data technologies to facilitate innovation [7–8].

Grounded in this rationale, this study situates itself against the strategic backdrop of Mianyang City, delving into the challenges confronted in the ideological and political education of its resident college students. By unearthing the prevailing issues within this educational domain, the study proceeds to propose strategies leveraging big data technology that can propel the sustainable growth of ideological and political education for resident college students, thereby fostering an environment conducive to their holistic development amidst the complexities of the modern era.

2. Challenges of ideological and political education of college students in resident universities

2.1. Thinking challenge

Big data has brought about a huge change in the way people think. Based on people's traditional thinking set, it is believed that people's thoughts, emotions, and behaviors cannot be measured by data, so the innovation and development of ideological and political education in resident colleges and universities are facing huge thinking challenges [9]. On the one hand, college teachers and students lack awareness of big data. The vast majority of ideological and political educators in resident colleges and universities have a background in literature and history. Although they have a good theoretical foundation and political accomplishment, they are not good at using scientific rational thinking to think. Moreover, some ideological and political workers still stick to the traditional educational concepts of the past, and have prejudices against network information, believing that the complex Internet information is not good or bad. This will have adverse effects on college students and affect their growth and ability. Some teachers with deep experience are not willing to accept new things, and the consciousness of ideological and political education based on data is not strong.

On the other hand, the absolute dependence on data leads to "data-only." In the era of big data, the network is more developed, and all kinds of functional electronic equipment and convenient analysis and processing modes promote the development of ideological and political education of college students in resident universities but also face the problem of excessive instrumental rationality and lack of value rationality. As a quantitative tool, big data of college students in resident universities can objectively show their ideological and behavioral status and motivation. Although it greatly improves the efficiency of understanding students' inner world and provides an important basis for guiding students' growth and development, over-reliance on data will inevitably neglect perceptual experience and lead to educational errors. Over-reliance on big data will lead to the deviation of ideological and political education of college students in resident universities. The use of big data provides more scientific and rational concepts and educational methods for the ideological and political education of college students in resident colleges, greatly improving the objectivity and accuracy of

the ideological and political education of college students in resident colleges and universities, and can help ideological and political workers carry out a more rational analysis of the real situation of college students' ideological and behavior in practice. However, the use of big data will make educators over-rely on data and ignore the perceptual care for college students, falling into the data-only use mode.

2.2. Technical challenges

Big data transcends being merely a backdrop of the contemporary era, as it embodies a potent tool for dissecting and harnessing vast information arrays. Its application within the realm of resident university students' ideological and political education, albeit nascent, grapples with formidable hurdles, both ideational and technological. Initial obstacles pertain to conceptual receptiveness, succeeded by the intricacies of data aggregation and safekeeping, culminating in the daunting task of parsing and interpreting this amassed data [10]. Augmenting technological proficiency is thus imperative to bolster the robustness of the technological scaffold underpinning resident university ideological and political education. The essence of big data lies in its expansive and multifaceted origins of information, rendering the value of insights unpredictable and diluting premium intelligence amidst a sea of data. While the meteoric rise of internet technology has engendered a data surplus propelling socioeconomic advancements, it simultaneously poses challenges concerning the very gathering and retention of this data tsunami. Efficient harnessing hinges on meticulous curation and secure storage. Data proliferation signifies an ever-widening arc of human documentation, quantification, and scrutiny, pushing the frontiers of knowledge ever outward. Pertinently, for resident university students' ideological and political tutelage, the data harvest encompasses student demographics, faculty profiles, curricular minutiae of ideological education, and crucially, feedback loops encapsulating student responses and engagement metrics. Mastering these collated insights forms the cornerstone of enhancing educational efficacy and relevance.

2.3. Ethical challenges

While people enjoy the precise and convenient services brought by big data, they are also threatened by the privacy caused by data dictatorship, which has triggered a series of ethical problems involving big data. Personal privacy exposure and personal property safety of college students are threatened, if they cannot be managed by better rules and regulations, it will cause serious consequences. The "information explosion" in the era of big data has indeed brought a lot of convenience to social life. College students in resident universities have just come into contact with society and have poor self-control ability. They often do not know how to distinguish and choose in the face of massive and mixed information, which can easily lead to anxiety and irritability. They can freely obtain and produce data and information, and will inevitably be affected by fragmented culture, ideological views, and values. In the flood of complicated information, they are easy to have negative ideas, lose their life goals and ideals, weaken their sense of responsibility, and seriously decline their moral concept. The diversity and convenience of information dissemination exacerbate the negative impact of negative information, some decadent and backward values are sought after, and traditional mainstream values are impacted and challenged. As a result, some college students are at a loss in value choice and value orientation due to their weak will and lack of rational thinking ability and even have a sense of identity with their ideology.

3. Problems of ideological and political education of college students in resident universities

3.1. Ideological and political information technology construction is not perfect

Advancing the development of smart campuses poses a formidable challenge for institutions in this digital

epoch, marking a paradigm shift toward data-driven, microcosmic smart cities, each entailing complexities akin to their macro-urban counterparts. Compounding this, the phased elimination of the college entrance examination quota system in China has led to restrained financial outlays and cautious investment strategies, inadvertently slowing the pace of smart campus implementation. Survey findings reveal a conventional reliance on classroom instruction and counselor interactions for resident university students' ideological and political education (**Figure 1**), with scant utilization of dedicated IT platforms (Such as WeChat, Sina Weibo, and TikTok), a testament to incomplete ideological and tech integration. Some institutions, shackled by conservative mindsets, confine their smart campus ambitions to basic WiFi provisioning, eschewing further advancements. Limited WiFi coverage, intermittent connectivity issues, and subpar user experiences plague certain campuses despite attempts at universal, complimentary access, undermining the technology's potential to enhance student life. Moreover, the failure to integrate emergent technologies like big data, the Internet of Things, and cloud computing into students' daily routines hampers data structuring from sensor inputs, critical for effective ideological and political work. To bridge these gaps, advocating data-driven insights becomes pivotal, facilitating an understanding of students' lifestyles, communication habits, and service preferences. Such analyses should furnish comprehensive feedback to educators, informing their practices, while furnishing university management with empirical grounding for strategic decisions. As technological sophistication escalates, so too must the capacity to harness its potential in cultivating a truly "smart", data-informed ecosystem tailored to the nuanced needs of resident university students.
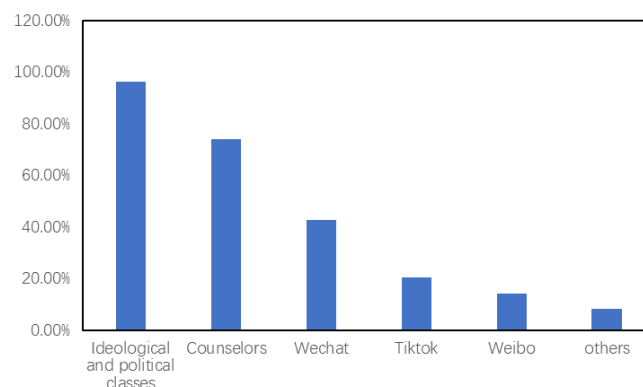

Figure 1. Ideological and political education approaches of college students in resident universities

3.2. Teaching staff policy is not fully grasped

The leader of ideological and political education is "the organizer and guide of the whole process of ideological and political education", and occupies a dominant position in the whole process of ideological and political education. At present, the resident universities attach great importance to the construction of ideological and political education teams, attach great importance to the provision of teachers, following the spirit of the CPC Central Committee and The State Council "Opinions on Further Strengthening and Improving Ideological and Political Education of College Students." Three teams of ideological and political education have been formed: the team of Party and government cadres and Communist Youth League cadres, the team of ideological and political theory and philosophy and social science teachers, and the team of counselors and class teachers. Compared with "211" and "985" universities, local universities have fewer advanced teachers or well-known experts, and the teachers' control of local policies is not in place, so it is difficult to build a teacher team consistent with local policies, and the effect of "famous teacher effect" is not obvious. According to the results of the questionnaire survey, there are some problems in the ideological and political education teaching staff

of college students in resident universities, such as the unification of ideological and political content and the inconsistency between the content and local policies, as shown in **Figure 2**.
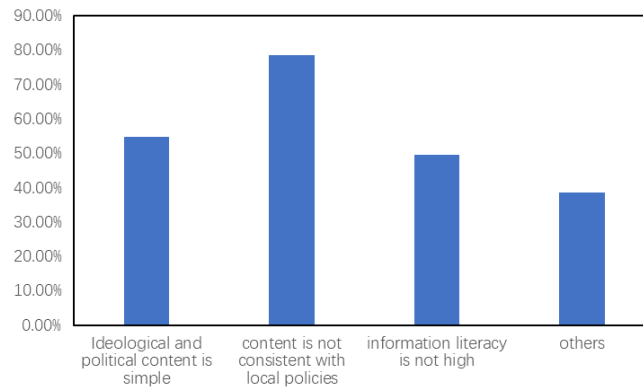

Figure 2. Problems of ideological and political education teachers in resident colleges and universities

3.3. The content of ideological and political education is not targeted

The ideological and political education of college students in resident universities has some problems, such as "emphasis on the whole, weak individual", "emphasis on preaching, weak practice", "emphasis on process, weak effect", and so on. The "precision" of the work needs to be improved, and the "reality" still needs to be enhanced. On the one hand, the form of theoretical education is single, mainly through thematic class meetings, theoretical preaching, and other forms for all students one-way indoctrination, ignoring the individual needs of students, more likely to cause students indifference and aversion. In recent years, the construction of the "ideological and political" integrated education system in colleges and universities has been continuously promoted and achieved remarkable results. However, there are still some problems in the ideological and political education of college students in resident universities, such as insufficient education atmosphere for all staff, incomplete coordination mechanism for the whole process of education, and incomplete all-round education pattern. The concepts of overall, coordination and integration need to be further deepened and implemented in the course of work. According to the survey results of ideological and political education contents of college students in resident universities, the contents of ideological and political education are mainly related to humanistic literacy education, patriotism education, national consciousness education, and so on, as shown in **Figure 3**, while the contents of local characteristics in resident colleges and universities are less. First of all, the internal education force of the ideological and political education team of the resident university students needs to be improved. The main body of ideological and political education in resident colleges and universities is numerous and distributed in different departments, which leads to poor information and insufficient joint force. Secondly, the team of ideological and political educators in resident colleges and universities and the team of ideological and political theory teachers are isolated and disconnected from each other and have not formed a joint force. Teachers of ideological and political theory courses rarely participate in the ideological and political education of college students in resident universities. It is an important part of the innovation and development of ideological and political education in the new era to deeply understand the realistic situation and difficulties of the synergistic interaction between ideological and political theory courses and ideological and political education, and to explore the practical path of the synergistic education between ideological and political theory courses and ideological and political education. Thirdly, the joint efforts of ideological and political educators, professional teachers, and management workers in resident colleges and universities have not yet been formed.
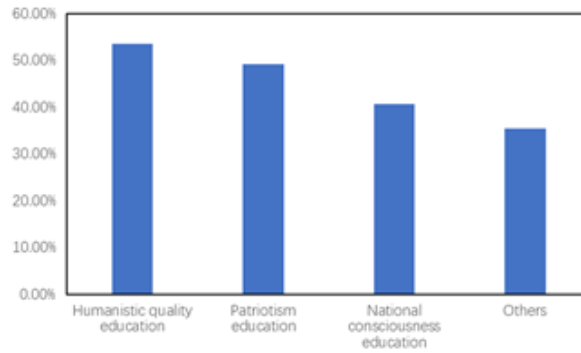
Figure 3. Ideological and political education contents of college students in resident universities

4. Big data technology innovation strategies for ideological and political education of college students in resident universities

4.1. Big data technology innovation strategies for ideological and political education of college students in resident universities

Improving the innovative application of big data in resident university students' ideological and political education necessitates a platform enabling data to reside, interconnect, and be utilized seamlessly. Co-creating an inclusive, shared information hub for student ideological and political education fosters a collaborative ecosystem powered by big data, invigorating this educational sphere. Institutions must align with the didactic principles of ideological and political education and the interactive dynamics of big data, orchestrating an optimized fusion of resources, personnel, and disciplines. This paves the way for the establishment of a distinctive university-centric big data platform tailored to ideological and political education. With the foundational big data platform in place, universities must reinforce technical infrastructure, boosting the platform's operational capability. Central to this is refining data capture techniques for resident students' ideological and political education, extending beyond structured data extraction to encompass a broader array of semi-structured and unstructured data scattered across diverse digital landscapes. Fostering interdisciplinary collaboration, universities can establish a comprehensive big data research center for resident college students' ideological and political education. Layered structurally, comprising data, platform, application, and service tiers, it consolidates insights from themed forums, student management, and online discourse, weaving these with academic performance, behavior, social, and administrative data. This converges into an all-encompassing educational data ecosystem, forging a pipeline, "data to function to analysis to visualization" for streamlined ideological and political education. The resultant university big data technology platform, equipped with functionalities spanning data acquisition to analytics and tool development, acts as a catalyst for cross-system data harmonization and synergy. It morphs into a repository brimming with educational resources, a dynamic arena for student-teacher engagement, and a potent instrument for informed decision-making and guidance in resident university ideological and political education, thereby elevating the entire educational experience.

4.2. Establish big data-led thinking

"Data-driven thinking," emergent from the synthesis of collegiate ideological-political education and data management within residential universities, represents a novel mindset. Anchored in the transformative era where big data reshapes student lifestyles and quantifies behaviors, this approach merges moral education with data literacy. Leveraging university platforms, it captures real-time insights into students' thoughts and actions,

transcending conventional ideological boundaries, expanding educational horizons, and immersing students in comprehensive digital politico-ethical experiences that epitomize contemporary relevance and online appeal. Central to this paradigm is fostering a data-centric mindset that champions holistic data analysis over isolated samples, encourages the integration of diverse datasets instead of relying on singular sources, and prioritizes correlation exploration before causation deduction. This involves nurturing a heightened data acumen and insightful interpretation skills, necessitating proactive data gathering, processing, and appraisal as an integral part of daily operations. Timely and thorough deciphering of data's underlying narratives, coupled with the strategic use of visual representations such as charts or metrics, unveils developmental opportunities for students, infusing their growth journey with the zeitgeist of digital transformation.

Furthermore, effectively harnessing the data footprint of resident university students in ideological-political education is pivotal. As digital natives actively engaged in online interactions, learning, and education, students demand an educational ecosystem attuned to their virtual existence. By meticulously guiding and leveraging this data, institutions can architect personalized, impactful educational paths, ensuring the alignment of both offline and online pedagogical landscapes with the unique needs and dynamics of this digitally native demographic.

4.3. Coordinate and integrate comprehensive data resources of college students' education

"Comprehensive data resources for college students' education" is proposed for the first time in this paper. It refers to the use of the ideological and political education platform of college students in resident universities to record an activity or the whole activity of college students' online and offline experiences with purposeful data in an all-round way, to achieve an all-round analysis of college students' education. Online can also be said to be the connection between the carrier of the Internet and the dynamic thoughts and behaviors of college students, resulting in an explosive increase in the amount of data. Online new media derived from the Internet include WeChat moments, Sina Weibo, Internet forums, information comments, Douyin, and so on. Imprint data of college students' thoughts and behaviors can be found on media platforms, and value guidance data with positive energy can be found. It can be said that everyone has a microphone and everyone plays with "we media", and the exaggerated expression of online thoughts and behaviors is easy to "attract fans." While increasing the attention of fans, fans also carry out reprinting to attract fans again, and the cyclic "we media information transmission mode" makes the data quickly focus and gradually enlarge. In comparison with the all-around data resources of offline college students' education, it generally refers to the data generated by one-way publicity and guidance of college students through radio, television, school newspaper, and publicity columns on campus. It has the characteristics of integrity, accuracy, and orientation, but its influence is not strong and the attention rate is not high. Moreover, due to the limited spare time of college students, most of them have enough time between classes or at night to query information online. Therefore, it is necessary to coordinate and integrate all kinds of data resources for college students' education into all kinds of data resources based on the integration of online, online, and offline media, so that online and offline data resources can support each other, grasp public opinion, and spread rapidly, and also convert unstructured data of online college students into structured data offline. This can provide a full range of big data analysis dimensions for the development of ideological and political education of college students in resident universities, to achieve the goal of data education, management education, and moral education.

5. Conclusions

The era of big data comes with the in-depth development of Internet information technology, which not only brings new innovations, new changes, new ways of life, thinking, and communication but also creates new

perspectives and opportunities for the ideological and political education research of college students in resident universities. Based on the local strategy of Mianyang City, this study analyzes the challenges of the ideological and political education of college students in Mianyang City, explores the problems existing in the ideological and political education of college students in Mianyang City, and puts forward the strategies of big data technology to promote the sustainable development of ideological and political education of college students in Mianyang City.

Disclosure statement

The authors declare no conflict of interest.

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