Research on the Impact of Big Data on the Thinking Modes of Contemporary College Students

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Abstract: This article delves into the impact of big data on the thinking patterns of contemporary college students, analyzing the changes, challenges, and coping strategies it brings. Big data presents significant characteristics of large data volume, diverse types, fast processing speed, and low value density, which has led to the emergence of holistic, relevant, fault-tolerant, and intelligent thinking. On the positive side, big data broadens the knowledge horizons of college students, stimulates innovative thinking, facilitates interdisciplinary integration, and enhances their abilities in data analysis, rational decision-making, problem-solving, and practical application, promoting academic exploration and entrepreneurial practice. The negative aspect lies in triggering information overload and fragmented thinking, resulting in data dependence, weakened critical thinking, increased risk of privacy breaches, and weak security awareness. In this regard, universities should optimize courses, strengthen thinking training, and enhance teachers' data literacy; College students need to enhance their awareness of information screening, critical thinking, and data security; Society and families should collaborate to create a healthy online environment, helping college students grow steadily in the wave of big data.

Keywords: Big Data; Mode of Thinking; College Student

1. Introduction

In today's era, big data is sweeping across the globe like a surging wave, profoundly reshaping every aspect of society. According to a report by International Data Corporation (IDC), the amount of data generated worldwide is growing exponentially each year, and is expected to soar to 175ZB by 2025, which intuitively demonstrates the rapid trend of data explosion in the era of big data.

As a cutting-edge group of the times, college students have active thinking and strong plasticity, and are immersed in the information rich mines created by big data. On the one hand, they rely on convenient data acquisition channels to quickly explore diverse knowledge and broaden their thinking horizons; On the other hand, the overwhelming amount of fragmented information and indistinguishable true and false data also pose many challenges to their thinking development. Exploring the impact of big data on the thinking patterns of college students in depth can help to accurately grasp the ideological dynamics of contemporary college students, provide strong support for the reform of higher education and teaching, and have profound significance for cultivating innovative talents that meet the needs of the times.

2. The Characteristics and Thinking Transformation of the Big Data Era

2.1 Characteristics of the Big Data Era

2.1.1 Large Volume of Data

The most intuitive feature of big data is its massive data scale. In today's digital wave, data is growing explosively, and traditional data storage units such as GB and TB are no longer able to carry it. PB, EB, and even ZB level data volumes are not uncommon. According to a report by International Data Corporation (IDC), the annual amount of data generated globally has skyrocketed from 33ZB in 2018 to an estimated 175ZB by 2025, achieving several fold growth in just a few years. Taking the Internet field as an example, Facebook users upload more than 350 million photos every day and generate more than 10 billion pieces of information such as text updates and comments; The search engine Google processes billions of search requests per day, involving multi-dimensional data crawling such as webpage indexing and user preferences. These massive amounts of information converge into a vast ocean of big data, far beyond the scope of traditional data processing, posing new challenges to storage, transmission, and analysis technologies.

2.1.2 Variety of Data Types

Big data encompasses various data types such as structured, semi-structured, and unstructured. Structured data is similar to traditional database tables, with regular rows and clear definitions, such as enterprise financial statements and e-commerce order information, making it easy to accurately query and statistically analyze; Semi structured data has a certain structural identifier but does not strictly follow a fixed table format. It is commonly found in XML and JSON files, such as network logs

that record user access time IP、 Operation path and other information, fields can be added or removed as needed; Unstructured data has no preset format, is free and flexible, and includes rich forms such as text, images, audio, and video. For example, there are massive experimental image materials in the scientific research field and short videos of daily life shared by social media users. Different types of data contain different information, and there is an urgent need for diversified processing technologies to explore value and meet complex analysis needs.

2.1.3 Fast processing speed (Velocity)

The era of big data emphasizes the real-time nature of data processing, requiring data collection, analysis, and feedback to be completed within a very short time window. In the e-commerce field, the peak transaction volume of the "Double 11" shopping carnival exceeds hundreds of thousands of transactions per second. Major e-commerce platforms need to use real-time stream processing technology to instantly process order information and payment data to ensure smooth transactions, respond to inventory updates and logistics allocation instructions in seconds, and avoid order backlog and delivery delays; In the financial industry, there is a massive influx of buy and sell orders every second in the stock trading market. High frequency trading algorithms analyze stock price trends and trading volume changes in real-time, make decisions to place orders in milliseconds, and capture subtle profit opportunities. Once the processing is delayed, it may miss the opportunity and trigger investment risks. Rapid processing ability has become the key for enterprises to seize the opportunity in fierce competition.

2.2 The Mindset Shift Brought About by Big Data

2.2.1 Overall thinking

The era of big data has given birth to holistic thinking, abandoning the limitations of traditional sampling thinking and gaining insights into the whole picture of things from a full sample perspective. In traditional research models, due to limitations in data collection, storage, and processing capabilities, sampling surveys have become mainstream. For example, in market research, partial samples are extracted from target consumer groups to infer overall demand preferences, while in academic research, representative subsets are selected from a large number of research objects to explore patterns. Although the samples have a certain representativeness, it is inevitable to miss key information, resulting in biased results.

In the big data environment, data acquisition and processing methods are innovated, and storage costs are reduced. For example, Internet enterprises can store full amount of user behavior data. Taking the

analysis of consumer purchasing behavior on e-commerce platforms as an example, it can cover the shopping records of all users for several years, from product browsing, adding purchases, purchase frequency to purchase time intervals, and other comprehensive analysis, accurately outlining the consumption profiles of different groups. Compared with sampling, it can more accurately grasp market trends, provide solid support for enterprise strategic decision-making and precision marketing, and drive various industries to move towards a new journey of precise insight and scientific decision-making.

2.2.2 Related Thinking

Related thinking focuses on the interrelationships between things and explores the potential value hidden behind data. Traditional thinking often focuses on exploring causal logic. In the era of big data, the complexity and massive amount of data make it difficult to accurately determine causality, while correlation mining is more practical and valuable.

In the field of e-commerce, platforms such as Amazon use algorithms to deeply analyze diverse data such as user purchase, browsing, and search history, mine association rules between products, and achieve personalized recommendations. When a user purchases book A, the system recommends related books B, stationery C, etc. based on their association, resulting in a significant increase in purchase conversion rate; Social networks, Twitter, and other platforms analyze user social graphs, interactive behaviors, and topic propagation paths to gain insights into group interest transfer and public opinion hot topic fermentation trends. For example, tracking specific topic tags to spread related accounts and regions can help brands achieve precise advertising and public opinion control. Relevant ideological and visual analysis becomes the key to unlocking the hidden value of big data and stimulating innovative applications.

2.2.3 Fault tolerant thinking

Fault tolerant thinking is a unique product of the big data era, which acknowledges the inaccuracy of data and accepts the existence of certain errors. Traditional data analysis pursues high accuracy, and even small flaws in sample data can distort the results. However, in the big data scenario, data sources are extensive and diverse, making it almost impossible to achieve complete accuracy.

For example, when collecting urban population data and integrating registered residence, social security, mobile operators and other multi-source data, it is inevitable that some information updates lag behind and input errors are unavoidable. However, under the aggregation of massive data, individual errors have little impact on the macro analysis of population size, structure and mobility trend; The operation of industrial IoT sensor monitoring equipment is affected by environmental interference,

resulting in fluctuations in collected data. Comprehensive analysis of massive monitoring point data can effectively offset local errors, accurately warn of equipment failures and performance degradation trends, and adopt fault-tolerant thinking in line with the characteristics of big data, ensuring the rapid extraction of core value from complex data.

3. The Positive Impact of Big Data on the Thinking Patterns of Contemporary College Students

3.1 Expand Knowledge Horizons and Stimulate Innovative Thinking

3.1.1 Enriching information acquisition channels
Before the advent of the big data era, the ways for college students to acquire knowledge were relatively single, mainly relying on classroom lectures, textbook reading, and library access to information. Classroom teaching time is limited, making it difficult for teachers to fully consider the knowledge absorption progress and personalized needs of each student; Textbook updates are relatively slow, making it difficult to reflect the latest developments in the discipline in a timely manner; Library information retrieval is time-consuming and laborious, and is constrained by the scope of library resources.

Entering the era of big data, online courses have flourished, and top universities around the world have launched courses through platforms such as Coursera and edX, covering many fields such as arts, science, engineering, and medicine. According to statistics, Coursera alone has collaborated with over 200 universities, offering over 4000 courses. College students can listen to lectures from renowned teachers without leaving their homes, pause or replay at any time, and independently control their learning pace. A massive collection of academic database resources, including China National Knowledge Infrastructure (CNKI) and Web of Science, includes a large number of academic journals and papers. Taking CNKI as an example, the annual literature update volume reaches millions of articles, providing solid data support for college students to conduct academic research. With the help of keyword search, advanced screening and other functions, the required literature can be accurately located and subject hotspots can be tracked. Social media has also become a new battlefield for knowledge dissemination. Platforms such as Weibo and Zhihu allow top experts and scholars in professional fields to share cutting-edge insights and research experiences. By following relevant accounts, college students can access professional information in fragmented time. For example, under the topic of "Biology" on Zhihu, numerous researchers

popularize knowledge such as gene editing and biological evolution, stimulating students' interest in exploration and broadening their knowledge boundaries.

3.1.2 Cultivate interdisciplinary thinking
Big data projects often involve the integration and analysis of data from multiple fields, which encourages college students to break down disciplinary barriers and cultivate interdisciplinary thinking. In environmental science research, exploring the causes and control of urban haze requires the integration of multidisciplinary knowledge such as meteorology, chemistry, geography, sociology, etc. Meteorological data reflects atmospheric circulation, temperature and humidity, chemical analysis detects pollutant composition and sources, geographic information clarifies pollution source distribution and terrain influence, sociological research analyzes human factors such as residents' energy usage habits and transportation modes, and college students participating in such projects need to integrate different disciplinary thinking models and research methods to construct comprehensive solutions.

The field of bioinformatics is particularly typical, integrating knowledge from biology, computer science, mathematics, and statistics. For the processing of massive gene sequencing data, it is necessary to use computer algorithms to optimize data storage and retrieval efficiency, construct gene regulatory networks with mathematical models, and use statistical methods to explore the association between genes and diseases. Biology students collaborate with computer and mathematics professionals to interpret biological data from multiple perspectives, leading to innovative achievements such as precision medicine and gene targeted drug development. This will enable college students to deeply understand the charm and power of interdisciplinary integration and enhance their ability to solve complex problems comprehensively.

3.1.3 Inspiring Innovative Inspiration
Big data provides rich data fuel for college students' innovation and entrepreneurship, helping them generate inspiration. In campus entrepreneurship projects, an intelligent catering service platform based on big data has emerged. The team collected and analyzed sales data of campus restaurant dishes, student dietary preference evaluations, dining time flow, and other information, and found that students' demand for healthy meals is increasing, and the peak dining hours are concentrated, and the ordering efficiency needs to be improved. Based on this, we have innovatively launched online advance booking, personalized nutrition matching recommendations, and intelligent food cabinet delivery services to accurately meet demand, improve restaurant operation efficiency, and enhance student satisfaction.

For example, in the field of e-commerce entrepreneurship, college students explore the consumption big data of e-commerce platforms, gain insights into niche personalized needs, focus on segmented markets such as handicrafts and retro trendy toys, and use social media precision marketing to break through the competitive red ocean with characteristic products and precise positioning. According to data from Michaels Research Institute, about 15% of college student entrepreneurship projects rely heavily on big data to explore market gaps, open up innovative business models, and demonstrate the innovation vitality and entrepreneurial potential of college students empowered by big data.

3.2 Enhance Data Analysis and Rational Decision-Making Abilities

3.2.1 Cultivation of Data Analysis Skills

In the era of big data, the curriculum system of universities keeps pace with the times, providing a platform for college students to systematically learn data analysis knowledge and skills. Taking statistics courses as an example, traditional statistics teaching focuses on theoretical deduction and simple case analysis. Nowadays, it integrates massive real data cases, such as consumer preference data collected by market research companies and population and economic data collected by government departments. Through practical analysis of these complex data, students will master methods such as data description, inference statistics, and correlation analysis, and understand how to extract inherent patterns from data representations.

Practical projects are also a 'training ground' for honing data analysis skills. In scientific research projects, college students participate in biodiversity research and need to handle diverse data from different ecological regions, covering species types, quantities, distributions, and more. Using programming tools such as Python and R, clean, transform, and analyze data, draw heat maps of species distribution, construct ecological models to predict species changes, visually present ecological trends, enhance data management and insight capabilities, provide accurate quantitative support for scientific research decisions, and help academic exploration move from theory to empirical research.

3.2.2 Rational decision-making based on data

Compared to traditional experiential decision-making, big data endows college students with a "discerning eye" for rational decision-making. In terms of career planning, in the past, students often relied on vague self-awareness and limited experience of others to choose their careers. Now, with the help of career assessment platforms and big data, they can comprehensively analyze personal personality, interests, and skill assessment results, combined with industry talent demand, salary trends, career development paths, and other data, to accurately anchor suitable career directions. If data analysis shows that a student has strong logical thinking, is sensitive to data, and there is a large talent gap and rapid salary growth in the IT industry, they will be guided to focus on planning their learning and growth path for the data analyst position.

The development of learning plans is also optimized due to big data. The online learning platform records data such as students' learning duration, course completion progress, and weak points in knowledge mastery, and generates personalized learning suggestions through intelligent analysis. If it is found that students have a high error rate and short learning time in a certain chapter of mathematics courses, targeted tutoring materials will be pushed and suggestions will be given to extend the learning time, helping students scientifically plan their learning pace, improve learning effectiveness, and accurately navigate their growth trajectory driven by data.

4. The Negative Impact of Big Data on the Thinking Patterns of Contemporary College Students

4.1 Information Overload and Fragmented Thinking

4.1.1 The Troubles of Information Explosion

In the era of big data, information is growing explosively, and college students are deeply immersed in the information flood, making it difficult to effectively filter out valuable information. In the field of academic research, China National Knowledge Infrastructure (CNKI) collects billions of literature, with millions of new papers added every year. When students search for a certain professional topic, a massive number of papers emerge instantly, with varying quality. From cutting-edge innovative achievements to low-level repetitive research, they are mixed in, making it time-consuming and laborious to identify. For example, searching for "the application of artificial intelligence in the medical field", thousands of results leave students confused and difficult to accurately locate high-value literature to assist research.

In terms of news and information, various news apps and social media push massive amounts of information in real-time, covering global current events, entertainment gossip, daily trivialities, and other information. According to statistics, Weibo adds over 200 million new pieces of information daily, and platforms such as Toutiao have complex algorithmic recommendations. When college students browse, a large amount of unverified and biased information floods their screens, overwhelming important information, consuming

energy and interfering with their objective understanding of the real world, affecting the construction of their knowledge system and the expansion of their thinking depth.

4.1.2 Formation of fragmented thinking

Frequent switching between massive amounts of fragmented information leads to impaired coherence and logic in college students' thinking. Social media updates, microblog, Tiktok and other platforms are fragmented, with short and jumping content. Ten second short videos and 100 word microblogs are limited, and students' thinking leaps quickly with information when browsing, making it difficult to explore the essence of knowledge in depth. Tiktok short science videos, biological knowledge, physical principles and other contents flash by, students have no time to think and digest, knowledge stays on the surface, and it is difficult to build a complete knowledge framework.

Multi task parallelism exacerbates the fragmentation of thinking, and it is common for college students to listen to online courses, browse social media, and search for information at the same time. A study by Stanford University shows that frequent task switching reduces brain processing efficiency by 40%, causing thinking to constantly jump between different contexts and knowledge modules, making it difficult to focus deeply. Logical deduction is prone to interruption, and over time, thinking tends to be fragmented, weakening the ability to integrate knowledge and analyze systems in the face of complex problems, and affecting academic and career development in dealing with complex tasks.

4.2 Data Dependence and Weakening of Critical Thinking

4.2.1 Over reliance on data

In the era of big data, some college students exhibit an excessive dependence on data during their learning and research processes, gradually losing their ability to think independently and question. Taking paper writing as an example, many students overly rely on data obtained from online searches when determining topic selection and constructing arguments, lacking independent analysis and deep thinking on the problem. When writing a paper on the impact of social media on the mental health of adolescents, some students directly pile up various survey data found online, such as a study showing that "XX% of adolescents suffer from anxiety disorders due to social media", without delving into the scientific selection of research samples and the rigor of research methods behind these data. They blindly believe in the conclusions of the data, making the paper a patchwork of data and lacking unique insights.

Similarly, in daily learning and life, when faced with viewpoint judgments, the influence of data is infinitely amplified. For information circulating on

the internet such as "drinking a certain functional beverage can improve XX% learning efficiency" and "using a certain learning app can improve XX points in a short period of time", many college students easily accept data without considering factors such as data sources and experimental conditions, ignoring their own rational judgment, falling into data traps, and seriously weakening their thinking autonomy.

4.2.2 Lack of Critical Thinking

When facing massive amounts of data, the lack of critical thinking among college students becomes increasingly prominent, mainly reflected in the lack of careful examination of key aspects such as data sources, data processing methods, and data conclusions. In terms of data sources, online information is complex, and a large number of self media and marketing accounts often publish unverified data for the purpose of attracting attention. However, some college students find it difficult to distinguish the authenticity. For example, some so-called "health preserving" official account claim that "according to the latest research, eating XX food every day can prevent cancer, supported by XX organization data", but this organization may not be authoritative, with obvious traces of data fabrication, but students do not think about quoting and spreading.

In terms of data processing methods, professional data analysis requires a rigorous process, with strict standards in sampling, statistics, and modeling. When social media hot topics are fermenting public opinion, such as the quality scandal of an electronic product, there is a rumor circulating online that "XX% of users have reported product problems". However, this data may be derived from non random sampling or one-sided questionnaires, which are not representative. College students follow this trend and accuse companies, without insight into data generation loopholes.

In the process of accepting data conclusions, students often lack the spirit of questioning. In academic research, the publication of new achievements should have undergone peer review and repeated verification. However, some college students eagerly share news such as "a research team discovered that rewriting genes can cure XX disease, with a success rate of XX%" without considering complex factors such as scientific research repeatability and long-term impact. They simplify the understanding of complex scientific research conclusions, and the lack of critical thinking makes it difficult for them to follow the trend of big data, distinguish right from wrong, and perceive the truth.

5.Strategies and Suggestions for Dealing with the Impact of Big Data

5.1 Guidance and Cultivation at the Level of Higher Education

5.1.1 Optimize course offerings

Universities should keep pace with the times, optimize their curriculum system, and add basic courses related to big data, such as "Introduction to Data Science" and "Fundamentals of Data Analysis", to systematically teach big data concepts, principles, and technical architecture, allowing students to build a solid theoretical foundation. Taking a key university as an example, the "Big Data Analysis Practice" course is introduced, requiring students to form teams to process real business data and use Python and R languages to mine data value. After the course, more than 80% of students master skills such as data cleaning and visualization. The quality of analysis reports has improved year by year, and some achievements have been adopted by enterprises, effectively improving students' data literacy and practical abilities, laying a solid foundation for thinking advancement.

5.1.2 Strengthen thinking training

Colleges and universities should take multiple measures to strengthen students' thinking training. On the one hand, they should hold special lectures on critical thinking to analyze social hot data disputes, such as distinguishing the authenticity of online public opinion data; On the other hand, organize systematic thinking practice activities, taking the campus energy consumption optimization project as an example, to guide students to integrate water and electricity, equipment, and personnel flow data to construct energy-saving plans, and optimize campus energy consumption management from local to overall. At the same time, academic discussions, case analysis competitions, and other activities are held to stimulate thinking collisions, encourage students to hone their thinking through diverse perspectives, and enhance their thinking agility, depth, and innovation.

5.1.3 Enhancing Teachers' Data Literacy

Universities need to provide comprehensive data literacy training for teachers, organize regular big data technology seminars, online course learning, and invite industry experts to analyze cutting-edge cases, such as education big data helping personalized teaching. Encourage teachers to integrate big data into teaching. Liberal arts teachers can use text mining to analyze the emotional tendencies of literary works to assist teaching. Science and engineering teachers can use simulation software to integrate experimental data, making abstract theories concrete. According to the survey, over 70% of teachers who participated in the training were able to proficiently use data tools to design teaching, significantly improving classroom interaction and student participation, empowering students' thinking growth with teacher data literacy.

5.2 Self Improvement and Management of College Students

5.2.1 Improve information filtering ability

College students need to master the skills of scientific information screening and use professional tools and platforms to improve the quality of information. By using academic search engines such as Google Scholar and Baidu Scholar to accurately locate authoritative academic materials, their algorithms rank them based on weight such as citation frequency and journal influence, helping students quickly access cutting-edge research; The literature management software EndNote and NoteExpress can screen literature based on keywords, authors, journals, etc., and build personalized knowledge bases. Students can research the application of artificial intelligence in medical imaging diagnosis, focusing on high-level papers and efficiently absorbing knowledge.

It is crucial to pay attention to the credibility of information sources, and prioritize referencing content published by official institutions and academic organizations. Taking the COVID-19 epidemic information as an example, the official website of the World Health Organization and the China Center for Disease Control and Prevention report data rigorously and timely, providing reliable guidance for the public; Academic journals Nature and Science have undergone strict peer review, and their published results have high credibility. Students can track scientific research trends and follow such authoritative sources to effectively avoid information traps and build a solid knowledge system.

5.2.2 Cultivating Critical Thinking

Faced with the torrent of big data, college students should be brave enough to question and conduct in-depth verification. Internet rumors are frequent, such as "XX food causes cancer" and "XX health preservation method can cure all diseases". When students encounter such information, they should trace the source of the information, check whether it is verified by authoritative institutions, and whether it conforms to scientific common sense. In the field of academic research, when studying papers, a comprehensive review of experimental design, sample selection, and data analysis methods is conducted to assess the reliability of conclusions. If some psychological research samples are limited to specific regions and age groups, and the generalizability of conclusions is questionable, students can identify these flaws and avoid blindly following them, forming independent thinking and judgment.

Cultivate the habit of thinking from multiple perspectives and break through fixed thinking patterns. Exploring the social hot topic of "difficulty in employment for college students", analyzing from multiple perspectives such as macroeconomic

situation, industrial structure adjustment, college major settings, and personal career planning, and comprehensively exploring the root causes and countermeasures of various factors; Participate in classroom discussions and group projects, listen to the collision of diverse viewpoints, absorb different perspectives, broaden thinking horizons, use critical thinking to master big data, and explore deep value.

5.2.3 Enhance data security awareness

College students should strengthen their awareness of privacy protection and treat personal data sharing with caution. Social media platforms set privacy permissions to restrict strangers from viewing photos, updates, and contact information; The job search website hides sensitive information such as ID number and bank card number to prevent the risk of information disclosure. Regularly clean up useless data, remove cache and account login information when uninstalling long-term idle apps, and reduce the risk of data residue; For important data such as learning materials, scientific research achievements, local multi version backups, cloud encrypted storage, such as using Nut Cloud, Tencent Weiyun, etc., to ensure data security and safeguard digital assets.

5.3 Collaborative Support between Society and Family

5.3.1 Creating a healthy online environment

All sectors of society should work together to create a healthy and orderly online environment, laying a solid foundation for the development of college students' thinking. On the one hand, the government and online platforms need to strengthen supervision and crack down severely on the spread of false information. In recent years, the cyberspace administration has launched a series of special actions to rectify online rumors, false information, and other irregularities. During the epidemic, quickly refute a large number of rumors related to the epidemic and curb the spread of panic. Social media platforms should also optimize algorithms, improve the weight of high-quality content recommendation, increase the promotion of positive energy content such as knowledge, science popularization, culture and art on platforms such as Tiktok and Station B, nourish college students' minds with knowledge short videos and documentaries, and help them develop positive thinking.

On the other hand, encourage media and self media to create high-quality knowledge content. CCTV has launched a series of programs called "Online Lecture Hall", inviting experts and scholars to interpret cutting-edge technology, cultural history, and other knowledge in an easy to understand and engaging manner; The popular science self media "paperclip" has analyzed the principles behind life and technology in the form of animation,

stimulating college students' curiosity with fun, providing diverse knowledge to broaden their thinking horizons, resisting the erosion of vulgar and fragmented information, and making the internet a treasure trove of knowledge for college students' growth.

5.3.2 Family guidance and supervision

As the first stop for college students' growth, family plays a crucial supporting role in coping with the impact of big data. Parents should keep up with the times, enhance their digital literacy, actively understand their children's internet usage habits, and communicate and guide them with an equal attitude. Organize family sharing sessions on weekends, where parents share examples of big data applications in their work and children share interesting campus stories and gains from online learning, promoting parent-child communication and guiding children to make good use of online resources.

At the same time, establish rules for home network usage, reasonably constrain internet time, and standardize browsing content. According to regulations, the whole family should stop using electronic devices after 9 pm every night to avoid staying up late and surfing the internet; Set up a whitelist for family networks, covering learning and news websites, restricting access to entertainment and harmful information websites, cultivating children's self-discipline in online habits, paying attention to their psychological state, providing emotional support and coping guidance when children encounter online fraud and information troubles, and using family warmth to escort college students to move forward steadily in the wave of big data.

6. Conclusion

This study systematically analyzed the multidimensional impact of big data on the thinking patterns of contemporary college students, revealing a complex picture of its intertwined advantages and disadvantages.

From a positive perspective, big data lays a solid foundation for college students to expand their knowledge and cultivate innovative thinking. Diversified information channels break the limitations of knowledge acquisition time and space, and online courses, academic databases, and social media collaborate to empower students to easily explore cutting-edge knowledge. For example, Coursera platform collaborates with prestigious universities to present a massive number of courses, inspiring exploration enthusiasm; Interdisciplinary data integration projects are frequently emerging, and interdisciplinary research in fields such as environmental science and bioinformatics encourages students to integrate multidisciplinary thinking, solve complex problems, and generate

innovative achievements in precision medicine; In the wave of entrepreneurship, big data accurately "points gold" to help students explore niche needs and create distinctive projects. About 15% of college students use big data to make a name for themselves and open up new business paths.

In terms of advanced thinking, big data has become a "smart bag" for college students to analyze data and make rational decisions. College curriculum reform and practical training are combined, with courses such as statistics incorporating real-world data operations, and research projects driving the use of tools such as Python and R to comprehensively enhance data processing capabilities; Career planning, learning arrangements, and other decision-making scenarios are turned around by big data. Students use career assessment and learning platform data to anchor adaptation directions, optimize growth paths, and achieve precise decision-making from experiential decision-making to data-driven.

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