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Data Science Awareness level of Students in Northeastern College

Fidelito Roxas Bautista

Graduate School, Northeastern College, Santiago City, Philippines

ABSTRACT: Data science has emerged as a pivotal field in education and industry, equipping individuals with the tools to analyze and interpret complex datasets to inform decision-making and innovation. This study investigates the preparedness of students at Northeastern College to adopt data science concepts, methodologies, and technologies. Using a structured survey distributed via Google Forms, data was collected from students across various academic programs, focusing on their awareness, training, interest, and willingness to integrate data science into their studies and future careers. The responses, stored in a CSV file for analysis, provided both quantitative and qualitative insights. The results revealed that 72.6% of respondents were familiar with data science, and 55.6% acknowledged its rising importance in their fields. However, only 15.4% had formal training, and 47.3% had no prior practical experience with data science tools. Despite these gaps, the majority of students rated the importance of data science as high, with 97% expressing a willingness to embrace it in their professional practices. Preferred training methods included workshops, seminars, and online courses, highlighting the need for diverse and accessible learning opportunities.

I.INTRODUCTION

Big data analytics and data science professionals are in high demand worldwide. In the Due to the strong demand, there is a 151,717 professional shortage nationwide in the United States (US). Having expertise in data science [1]. In the past, the profession had an abundance of data scientists and big data analysts. was not seen as a field with a high demand for jobs. 2015 saw a US employer who desired There was no trouble finding someone with the necessary skills to recruit a data scientist. When hiring, employers had a wide range of candidates to choose from. Employers frequently look for business analysts and data scientists. analysts with strong business sense and communication abilities. Consequently, if the applicants have outstanding ability to communicate, they are getting closer to becoming proficient data scientists. But in 2021 In every major American city, there was a severe lack of data science expertise. Big data analytics and data science professionals are in high demand across sectors in the world [2]. To handle the growth, several IT companies have chosen to hire foreign workers. particularly in artificial intelligence (AI) and big data analytics, as they were outfitted with the necessary abilities. The businesses would benefit because there would be no need for additional training, and this Workers might make an immediate contribution to the business [3]. This career's primary draw is the generous compensation package. Many students from Malaysia are now enrolled in local universities. and researching the relevant courses. But will all the students be prepared to work in this sector after they graduate? graduate? Are they aware of the abilities needed to flourish as a data scientist? A recent piece from the website towardsdatascience.com highlights that becoming proficient in data analytics is a prerequisite for becoming a data researcher. In addition, this position calls for critical thinking and innovation, as well as expertise in data analysis, programming abilities, particularly in Python and R, statistics, and databases, education, machine and deep learning, and visualization [4][5]. To produce competent, aware, and trained graduates who can contribute to the nation's skilled workforce, it is crucial to determine the students' readiness for innovations like data science. Since HEIs are thought of as training facilitators for other businesses, this will help them make sure that their graduates have the skill sets required to operate in the tech era [6]. In this Paper, it will assess the awareness and preparedness level of student in embracing data science.

Since graduate students usually actively interact with research data under the supervision of their academic advisers, studies have shown the importance of helping them build their RDM skills [7–9]. For their own studies, graduate students are typically expected to manage all data on their own [10]. Since graduate students will be the next generation of researchers, it is imperative to comprehend their needs for expanding their RDM knowledge and practices [11]. When implementing a new technology, several needs must be critically examined, encompassing both technical and

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human-related concerns. To examine university students' behavioral intention to use AI technology, the study used the Unified Theory of Acceptance and Use of Technology (UTAUT) paradigm. Technical elements like the availability of the required infrastructure, the applicability of software systems, efficient policies and standards, and human aspects like aptitude and disposition all influence how well technologies are accepted and used in organizations, especially academic libraries. Existing research has shown that integrating AI into library operations is a great way to encourage efficient library use. According to Sife et al. (2019) [12], socioeconomic and technological challenges cause developing nations like the Philippines to have a moderate degree of ICT implementation.Data scientists collaborate with others. As previously said, a data scientist in this field must Work together with individuals that possess diverse backgrounds and abilities. Thus, effective communication It takes talents. The modernization of business intelligence and analytics techniques in big Data necessitates the development of new multidisciplinary competencies ranging from business to IT. communication abilities and domain expertise [12]. Although big data is presently the most popular subject of interest in business analytics and business intelligence, survey findings indicate that one of the major Communication is one of the crucial skills that businesses look for when making recruiting selections and Data Science is named the sexiest job of the 21st century.

II.METHODOLOGY OF PROPOSED SURVEY

Data science plays a transformative role in modern education and research, offering the tools to systematically analyze and interpret large datasets to derive meaningful insights. This research investigates the preparedness level of students at Northeastern College to adopt data science concepts, methodologies, and technologies. The importance of this study lies in its ability to provide educators and policymakers with data-driven insights that could shape future curricular and technological interventions to better equip students for the data-centric demands of various industries. Recognizing that the foundation of any data science study is reliable and representative data collection, we employed Google Forms to design a comprehensive survey targeting a diverse sample of students across different programs and academic levels.

The survey instrument was carefully designed to capture both quantitative and qualitative data, covering a range of topics to gauge students' awareness, interest, and preparedness to integrate data science into their studies and future careers. The survey questions included the following:

- Course/Program: To identify the academic background of the respondents.
- Have you ever heard about data science before? To assess students' familiarity with the term and concept of data science.
- Are you aware that Data Science and analytics are rising? To determine students' awareness of the growing significance of data science.
- Did you attend any Data Science and Analytics Training Before? To measure prior exposure to formal or informal training in the field.
- Have you ever used data science or analytics in your work or studies? To understand the practical experience of respondents with data science tools or methods.
- How important do you think data science and analytics are for your industry? To gauge perceptions of the relevance of data science in their respective fields.
- Do you believe data science and analytics can improve decision-making in your field? To explore beliefs regarding the impact of data science on decision-making processes.
- Are you interested in learning more about data science and analytics? To assess the level of interest among students in further exploring the field.
- What type of training or resources would you find most helpful? (Select all that apply): To identify preferred learning methods or resources, such as workshops, online courses, tutorials, or textbooks.
- Are you willing to embrace Data Science and Analytics in your field of expertise? To evaluate readiness and willingness to integrate data science into their future professional practices.

Responses to these questions were automatically recorded through the Google Forms platform and stored in a CSV file. This structured format allowed for efficient organization, analysis, and interpretation of the collected data. The use of a

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CSV file ensures compatibility with various data processing using Excel, enabling in-depth analysis and the generation of insightful results.

The inclusion of both closed-ended and open-ended questions ensured that the dataset was not only quantitative but also provided qualitative insights. For instance, open-ended responses to questions about the importance of data science in their industry and the preferred type of training or resources offered rich qualitative data, reflecting the diverse needs and perspectives of students. This approach provided a more comprehensive understanding of their preparedness and interest in adopting data science. By leveraging a structured survey and a robust data collection methodology, this study aims to provide actionable insights that Northeastern College can use to refine its educational strategies, develop targeted training programs, and prepare students for a data-driven world. This methodologically sound approach reflects the study's commitment to producing reliable, impactful research aligned with the evolving educational and technological landscape.

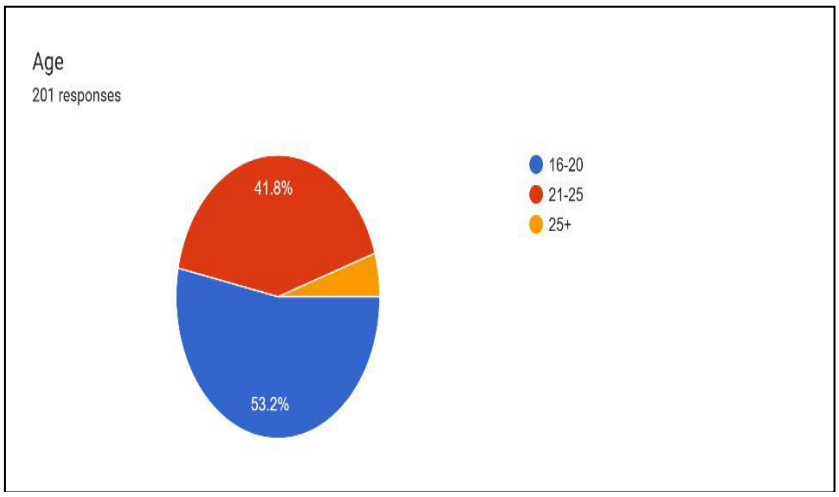

Figure 1. Age bracket

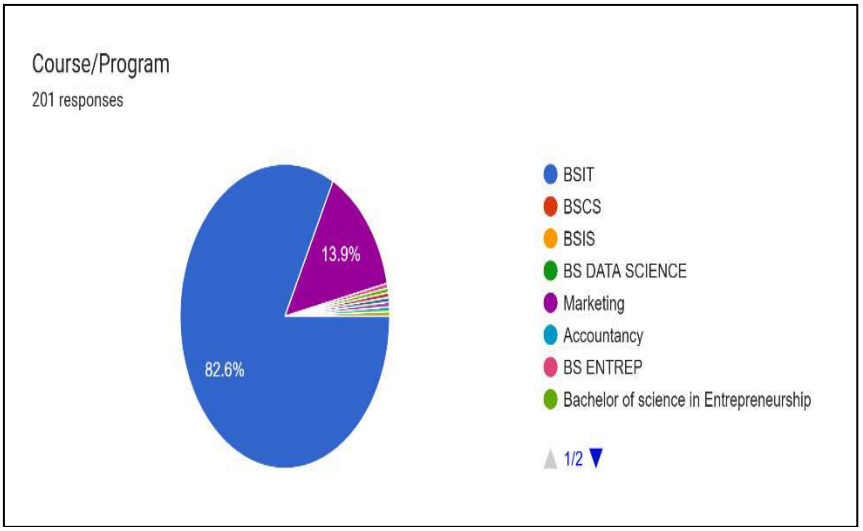

Figure 2. Program bracket

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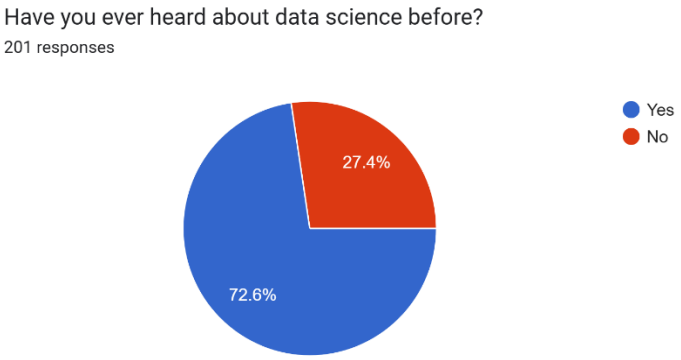

Figure 3. Questionnaire regarding their familiarity with data science

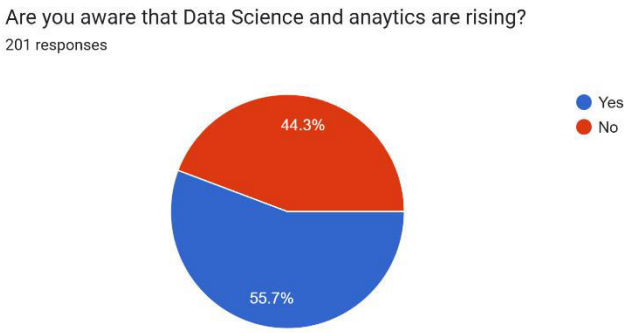

Figure 4. Questionnaire regarding their familiarity with data science

Most respondents (72.6%) indicated that they have heard about data science, which is a positive indication of the field's growing recognition among students. However, 27.4% of the students were not familiar with the term, suggesting a need for increased awareness campaigns or introductory courses to ensure broader engagement. Furthermore, 55.6% of respondents acknowledged the rising significance of data science and analytics in various industries, while 44.4% were either unaware or unsure. This gap in awareness highlights an opportunity for institutions to emphasize the relevance of data science through targeted seminars, webinars, or integration into the curriculum. Despite the encouraging level of awareness, the survey revealed a significant gap in formal training. Only 15.4% of the respondents had attended data science or analytics training, while 84.6% had no prior exposure. This lack of training correlates with the limited practical experience reported, as 47.3% of students had never used data science tools or techniques in their studies or work. These findings underscore the importance of providing accessible training programs and practical opportunities, such as workshops, hands-on projects, or internships, to bridge the gap between theoretical knowledge and practical application.

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Table 1. Survey Analysis using statistical methods.

	How important do you think data science and analytics are for your industry?	Do you believe data science and analytics can improve decision-making in your field?	Are you interested in learning more about data science and analytics?
count	200	201	201
Mean	4.28	4.298507463	4.208955224
std	0.908696123	0.959399688	1.017899505
min	1	1	1
25%	4	4	4
50%	5	5	5
75%	5	5	5
max	5	5	5

When asked to rate the importance of data science and analytics for their respective industries on a scale of 1 to 5, the majority of students rated it as highly important (5). Specifically, 106 respondents (52.7%) selected the highest rating, followed by 54 respondents (26.8%) who rated it as 4. This indicates a strong acknowledgment of the role data science plays in driving innovation and improving efficiency across various fields. However, a small portion of respondents rated its importance as 3 (neutral) or below, which suggests that further efforts are needed to demonstrate the value of data science in less obvious or traditional domains. The interest in learning more about data science and analytics was overwhelmingly positive, with 104 respondents (52.3%) expressing the highest level of interest. Another 54 respondents (27%) rated their interest as 4, indicating significant enthusiasm for further education in this area. When asked about their preferred training resources, many students identified workshops, seminars, and face-to-face training as the most effective. Others showed interest in online courses and other flexible learning formats, reflecting diverse learning preferences that institutions can cater to by offering a mix of in-person and online opportunities. A striking 97% of respondents expressed a willingness to embrace data science and analytics within their fields of expertise. This overwhelming majority underscores the students' recognition of the potential benefits of integrating data science into their professional toolkit. However, the remaining 3% who were hesitant indicate the need for tailored interventions to address specific barriers, such as perceived complexity or relevance to their industry.

III.CONCLUSION AND FUTURE WORK

This study has provided valuable insights into the preparedness and attitudes of students at Northeastern College toward adopting data science and analytics. The findings reveal a promising level of awareness and interest, with 72.6% of respondents familiar with data science and a strong majority recognizing its importance in their respective industries. However, significant gaps in formal training and practical experience highlight the need for targeted educational initiatives to bridge these divides. Most students expressed high interest in learning more about data science, with workshops, seminars, and face-to-face training identified as the most preferred learning methods. The results emphasize the critical role of institutions in fostering a data-driven culture through accessible and diverse learning opportunities. By incorporating data science into curricula, offering experiential learning projects, and leveraging industry collaborations, educational institutions can better prepare students for a data-centric future. Furthermore, the overwhelming willingness (97%) of students to embrace data science underscores their recognition of its potential to enhance decision-making and drive innovation across fields. Addressing the barriers faced by the small minority who remain hesitant through tailored interventions will ensure that all students are equipped to thrive in an increasingly data-driven world. In conclusion, this research highlights the transformative potential of integrating data science into education and the importance of aligning educational strategies with the evolving demands of the modern workforce. The actionable insights gained from this study serve as a foundation for Northeastern College to refine its educational policies and empower its students to become leaders in the era of data science and analytics.

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