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# Can Tho University's research collaboration: A view from its publications

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**ABSTRACT**

*Analyzing research collaboration within a university through its publication outputs is crucial for academia and research management. It helps understand knowledge exchange dynamics, inter-departmental and inter-institutional cooperation, and research impact, thereby promoting innovation and contributing to the scientific community. By examining co-authorship networks and publication metadata, we reveal the collaborative efforts at Can Tho University (CTU). This information supports interdisciplinary research, identifies influential researchers and departments, benchmarks against peers, and assesses research impact. Such insights enable the university to enhance research strategies, partnerships, and academic excellence.In this paper, we analyze CTU-affiliated publications to uncover inter-organizational, international, and industry collaborations, and identify predominant areas of collaboration. Our study examines 3,322 Dimensions publications from 2012 to 2023 to provide a comprehensive overview of CTU's collaborative landscape.*

## 1. INTRODUCTION

Universities often engage in cutting-edge research that requires expertise from multiple disciplines. Collaboration allows researchers from different departments or fields to come together and address complex problems. This interdisciplinary approach can lead to innovative solutions and discoveries (Glänzel & Debackere, 2022; Pham et al., 2023). Collaboration also encourages the sharing of knowledge and expertise among faculty members, researchers, and students (Cummings & Kiesler, 2005). This exchange of ideas and information can enhance the quality of education and research, leading to a richer academic experience. Moreover, collaboration often extends beyond the university's boundaries, fostering partnerships with other institutions both nationally and internationally. This global perspective can open up opportunities for joint research, student and faculty exchange programs, and a broader view of global issues (Pohl, 2021). Furthermore, collaborative projects facilitate networking and professional connections. These relationships can be invaluable for career development for faculty and students. They can lead to research opportunities, job placements, and partnerships with industry. Collaboration can be a catalyst for innovation (West & Bogers, 2014). By bringing together diverse perspectives and talents, universities can generate novel ideas and solutions that may not have been possible through isolated efforts (O'Dwyer et al., 2023). In summary, collaboration is essential for a university to foster innovation, advance research, and provide students with a well-rounded education. It also allows universities to tap into a broader pool of resources, expertise, and opportunities, ultimately contributing

to their mission of knowledge creation and dissemination.

Analyzing collaboration within organizations can be a complex task with several challenges (Bansal et al., 2019; Ross et al., 2010; Hara et al., 2003; John-Steiner et al., 1998;).First, gathering data on collaborative activities can be challenging, as collaboration may occur across various departments, research centers, and administrative units. Integrating data from diverse sources and systems can be complex and time-consuming. Ensuring the accuracy and completeness of the data is paramount. Incomplete or inaccurate data may compromise the integrity of analyses, potentially resulting in flawed interpretations and misrepresentations of collaboration patterns. Therefore, meticulous attention to data quality is essential to uphold the validity and reliability of our findings. Collaboration in academia can take many forms, including joint research projects, co-authored publications, shared grants, and joint events. Defining what constitutes collaboration and creating consistent metrics for measuring it can be challenging. Universities often have disparate data systems, each with its own set of data. This can result in data silos, making it difficult to get a comprehensive view of collaboration across the institution. Limited resources, including staff and funding for data collection and analysis, can be a constraint for universities seeking to conduct in-depth collaboration analyses. To address these challenges, universities may need to invest in data management and analysis tools, establish clear collaboration metrics, foster a culture of openness and cooperation, and ensure data privacy and ethical standards are maintained. Collaboration analysis can provide valuable insights, but it requires a thoughtful and strategic approach to overcome these challenges effectively.

CTU has a rich developmental history and has fostered collaborations with numerous organizations worldwide. Each year, researchers affiliated with CTU contribute to the publication of a substantial number of research articles. The collaboration among these researchers, as evidenced through their research papers, holds significant importance in the evaluation process. In this paper, we analyzed the collaboration of CTU through its publications. Analyzing publications is a common and informative way to assess academic collaboration, and it provides valuable insights into the relationships among researchers, departments, and institutions. To obtain this objective, one of the most straightforward methods is to analyze the co-authorship network within a university. We can find out the authors who have been publishing together, how frequently they collaborate, and the nature of the collaborations (e.g., interdisciplinary, intra-departmental, with external institutions). To achieve this objective, we analyzed 3,322 publications authored by individuals affiliated with CTU, spanning from 2012 to 2023, sourced from the Dimensions database. The analysis explored three dimensions of collaboration: international cooperation, inter-organizational collaboration, industry partnerships, and collaborations by area per year. This analysis will provide insights into the extent and nature of collaborative endeavors within CTU's research ecosystem.

## 2. METHOD AND DATA

In this study, we leveraged CTU-affiliated publications sourced from the Dimensions database. The Dimensions database offers a comprehensive and diverse collection of scholarly publications, making it an ideal resource for analyzing collaboration in university publications. With its vast coverage of academic literature from various disciplines and regions, Dimensions provide access to a wide range of publications, including journal articles, conference proceedings, preprints, and more. Additionally, Dimensions offers advanced search and filtering capabilities that allow researchers to easily identify and analyze collaborative efforts among authors, institutions, and research organizations. Its rich metadata and standardized publication records facilitate efficient data retrieval and analysis, enabling researchers to gain valuable insights into collaborative research networks, interdisciplinary collaborations, and emerging trends in academic publishing. Overall, the extensive coverage, advanced features, and user-friendly interface of the Dimensions database make it a valuable tool for studying collaboration in publications within the context of a university.

In Dimensions, collaboration in publications is typically analyzed based on metadata fields associated with each publication record. These metadata fields include information such as author affiliations, co-authorship relationships, author order, publication type, publication venue, publication type, and publication date. To enable analysis of collaboration, the Dimensions database often encodes author affiliations to indicate the institutions or organizations with which the authors are affiliated. This allows researchers to identify

publications involving authors from the same institution or from different institutions, facilitating the study of intra- and inter-institutional collaboration. Additionally, Dimensions encodes co-authorship relationships by listing the names of all authors associated with a publication. By parsing this information, researchers can determine the number of authors contributing to a publication and identify collaborative patterns among authors. Furthermore, Dimensions encodes author order, which provides insights into the level of contribution of each author to a publication. Analyzing author order can help researchers assess the degree of collaboration and identify lead authors, corresponding authors, and contributing authors within a publication. Overall, the encoding of data in Dimensions allows researchers to extract relevant information related to collaboration in publications, facilitating in-depth analysis and visualization of collaborative research networks, interdisciplinary collaborations, and research trends.

We focused on publications published from 2012 to 2023. Since 2012, CTU has had a significant number of international publications (Tran & Le, 2024). As a result, 3,322 publications were retrieved. Each publication metadata includes details of researchers such as names and affiliations, which allow us to determine the collaboration. It should be noted that a publication may have several authors affiliated with different organizations, and each publication may have several collaborations.

In our analysis, papers with two or more different affiliation names were considered external (*organizational) collaboration*. Otherwise, this was an internal collaboration. Papers with one or more of the authors' organizations located in a foreign country were classified as *international collaboration*, but otherwise domestic. Papers with at least one author affiliated with a company qualified as an *industrycollaboration*.

## 3. RESULTS

### 3.1. General statistics on publications from 2012 to 2023

Figure 1 presents general statistics on CTU's 3,322 publications from 2012 to 2023. As can be seen, CTU's research output tends to increase by year. It should be noted that the number of publications in 2023 is smaller than that in 2022 because the data collection was closed on October 24, 2023.

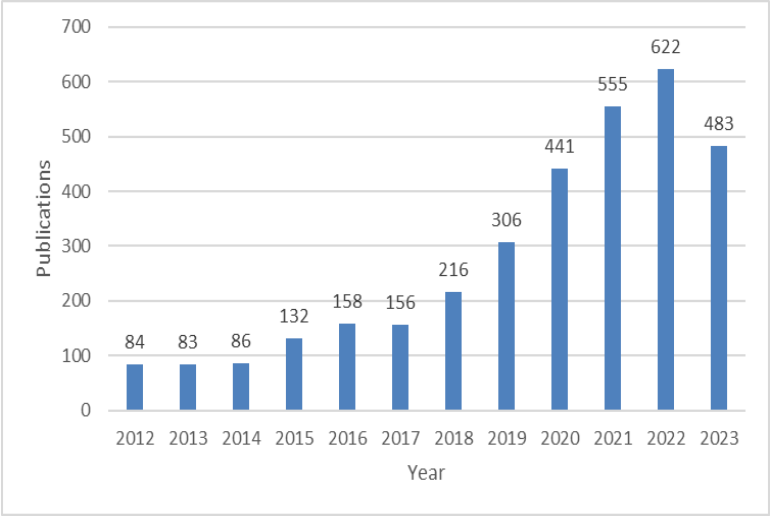


**Figure 1. CTU publications by year**

Figure 2 shows the counts of international, domestic, and internal publications. In general, the number of international publications surpassed the other two categories almost every year. An exception to this trend occurred in 2023 when the number of domestic publications exceeded that of international publications. Notably, the number of internal publications during this period was limited. The dominance of international publications provides concrete evidence of CTU's long-initiated efforts to seek and foster international collaborations in teaching and research. It also indicates the quality of CTU's research outputs because publications that involve collaborations with external organizations often find their way into journals indexed in well-known databases (Nguyen & Le, 2021).

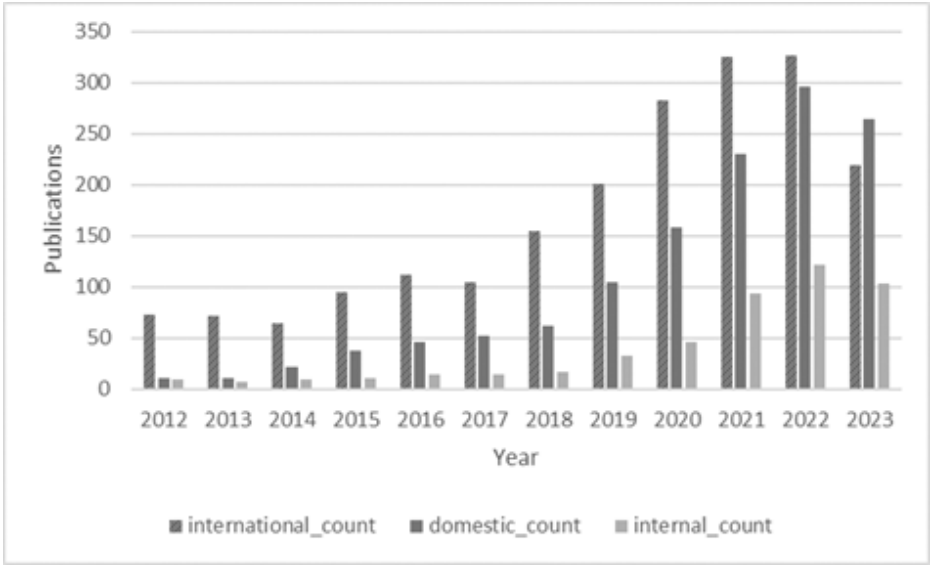


**Figure 2. CTU publications by scope of research collaborations**

### 3.2. Countries and organizations that foster research collaborations with CTU

Table 1 details the types of organizations that have collaborated with the CTU in producing research and the number of outputs. It is evident that various types of organizations were involved. The majority were educational institutions, accounting for 3,001 collaborations, while facility-based organizations accounted for 435 collaborations, and government organizations for 162. Other categories, such as healthcare and nonprofit, had relatively smaller numbers, with 155 and 87 collaborations, respectively. Companies had the fewest collaborations, totaling only 51.

**Table 1. Type of organizations collaborated with CTU**

| No | Types | Number of Collaborations |
|---|---|---|
| 1 | Education | 3,001 |
| 2 | Facility | 435 |
| 3 | Government | 162 |
| 4 | Healthcare | 155 |
| 5 | Nonprofit | 87 |
| 6 | Company | 51 |

A total of 3,905 organizations have collaborated with authors from CTU. Due to space constraints, Table 2 only displays the top 20 organizations with the highest number of publications in partnership with CTU. Remarkably, National Taiwan University of Science and Technology from Taiwan held the highest number of publications in collaboration with CTU. Wageningen University and Research (Netherlands) and Ghent University (Belgium) each had 9 collaborations. Several organizations in Viet Nam, such as the Vietnam Academy of Science and Technology and Nong Lam University Ho Chi Minh City, also contributed a relatively small number of publications in collaboration with CTU.

The 3,905 organizations that have research collaborations with CTU come from 79 countries. Table 3 presents the top 20 countries with the highest number of publications in collaboration with CTU. At the top of this list was Taiwan with 986 collaborations, followed by Japan with 929, and the United States with 533. Other European countries, including Belgium, the Netherlands, and France, also contributed to a significant number of collaborations. At the bottom of the list, we can see countries like Sweden with 59 collaborations and Italy with 62 collaborations, respectively.

**Table 2. Top20 institutions collaborating with CTU during the assessment timeframe**

| | Institutions | Countries | Number of Collaborations |
|---|---|---|---|
| 1. | National Taiwan University of Science and Technology | Taiwan | 25 |
| 2. | Wageningen University & Research | Netherlands | 9 |
| 3. | Ghent University | Belgium | 9 |
| 4. | Aarhus University | Denmark | 8 |
| 5. | Vietnam Academy of Science and Technology | Viet Nam | 7 |
| 6. | Universitas Katolik Widya Mandala Surabaya | Indonesia | 6 |
| 7. | Institut de Recherche pour le Développement | France | 5 |
| 8. | Delft University of Technology | Netherlands | 5 |
| 9. | KU Leuven | Belgium | 5 |
| 10 | UNSW Sydney | Australia | 4 |
| 11. | University of Stirling | United Kingdom | 4 |
| 12. | Tokyo University of Agriculture and Technology | Japan | 4 |
| 13. | Nong Lam University Ho Chi Minh City | Viet Nam | 4 |
| 14. | University of Namur | Belgium | 4 |
| 15. | German Aerospace Center | Germany | 4 |
| 16. | University of Bonn | Germany | 3 |
| 17. | Universiti Putra Malaysia | Malaysia | 3 |
| 18. | Tri-Service General Hospital | Taiwan | 3 |
| 19. | National Ilan University | Taiwan | 3 |
| 20. | IHE Delft Institute for Water Education | Netherlands | 3 |

**Table 3. Top 20 countries collaborating with CTU during the assessment time frame**

| | Countries | Number of Collaborations |
|---|---|---|
| 1. | Taiwan | 986 |
| 2. | Japan | 929 |
| 3. | United States | 533 |
| 4. | Australia | 523 |
| 5. | Belgium | 501 |
| 6. | Netherlands | 432 |
| 7. | France | 410 |
| 8. | South Korea | 382 |
| 9. | Thailand | 375 |
| 10 | Germany | 324 |
| 11. | Malaysia | 286 |
| 12. | China | 249 |
| 13. | United Kingdom | 244 |
| 14. | Indonesia | 140 |
| 15. | Denmark | 125 |
| 16. | India | 109 |
| 17. | Philippines | 86 |
| 18. | Canada | 66 |
| 19. | Italy | 62 |
| 20. | Sweden | 59 |

### 3.3. CTU's industry collaboration

As can be seen from Table 1, the number of papers authored by CTU's researchers in collaboration with companies was 51. While this number may not be particularly high, it remains an important indicator highlighting CTU's collaboration with the industry.

As shown in Figure 3, the number of publications resulting from CTU's collaboration with companies exhibited a steady increase over time. For instance, from 2020 to 2023, there were more than 12 publications. These publications featured various types, with the majority being articles, while other types such as preprints, chapters, and proceedings accounted for a relatively smaller portion of the total publications.

The companies that collaborated with CTU's authors in publications and the number of publications are presented in Figure 4. It can be seen that companies based in Viet Nam contributed to a larger share of the publications. It is also noteworthy to mention that several companies from developed countries, such as the United States, the United Kingdom, and Japan, have also collaborated with CTU's authors.

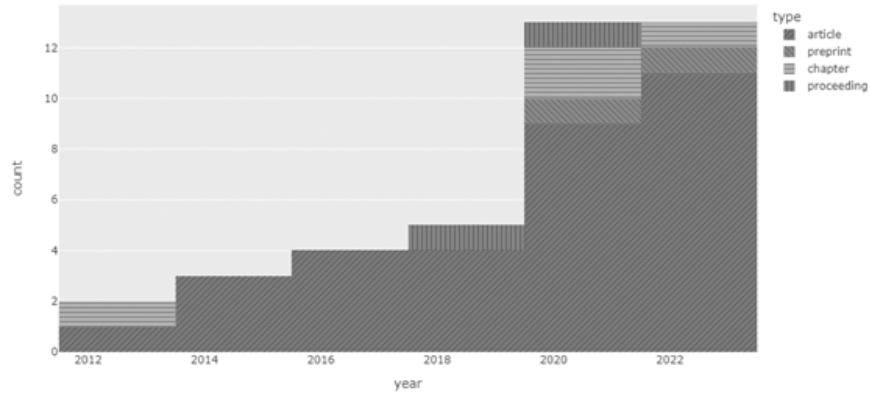


**Figure 3. Publications per year from industry collaborations**

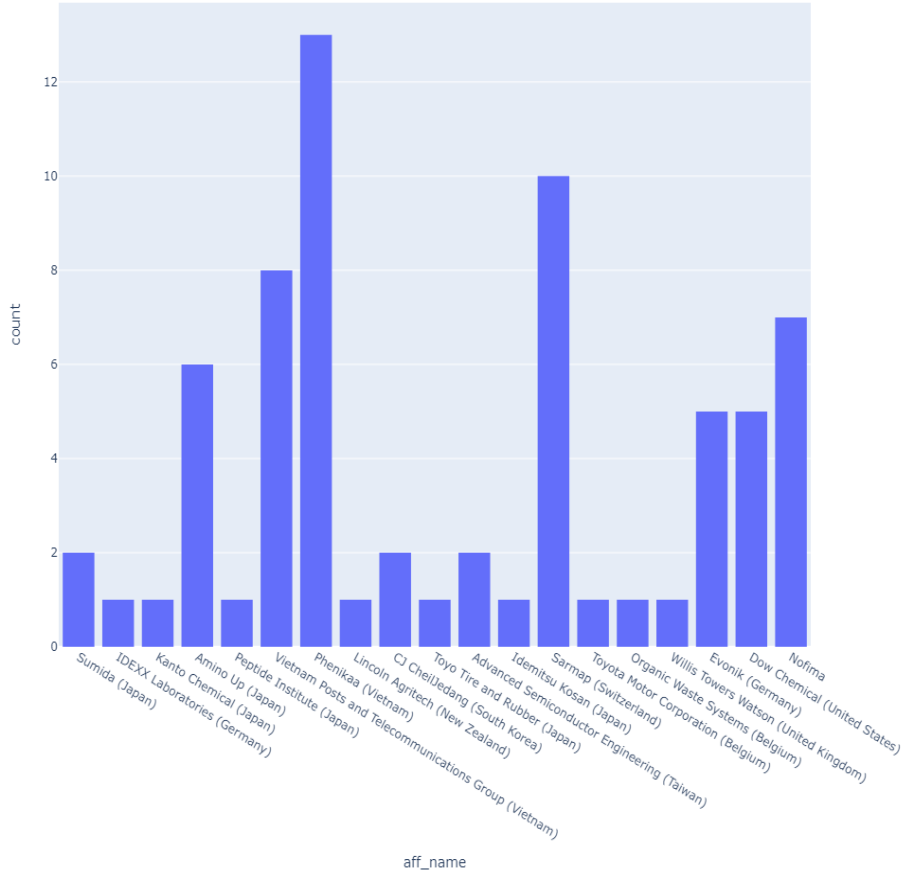


**Figure 4. Publications by Company from Industry Collaborations**

Figure 5 provides additional details regarding the percentage of publications that involve collaborations with companies by countries. Viet Nam boasted the highest proportion of publications at 30.4%, followed by Japan and Switzerland, with 17.4% and 14.5%, respectively. New Zealand and the United Kingdom accounted for a smaller share of publications, at 1.45%.

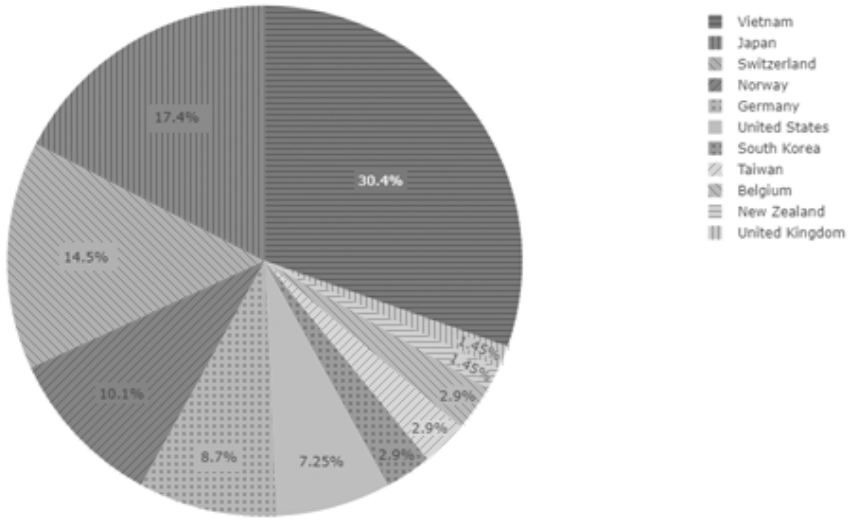


**Figure 5. Publications by country from industry collaborations**

### 3.4. Collaboration by area

Table 4 displays the number of CTU's publications categorized by area per year. To facilitate identifying areas with the highest and lowest publication counts, the table was sorted by the total number of publications. As can be seen, Agricultural, Veterinary, and Food Sciences exhibited the highest number of publications with a total of 711. This was followed by Engineering, Information and Computing Sciences, and Biological Sciences with 633, 585, and 477 publications, respectively. Conversely, the Built Environment and Design; Language, Communication and Culture; and Economics ranked lowest on the list, with publication counts of 98, 75, and 65, respectively. These figures likely reflect CTU's predominant research domains, as Agricultural, Veterinary, and Food Sciences; Engineering; and Information and Computing Sciences are among its primary areas of research.

**Table 4. Number of publications at CTU by area per year**

| Areas | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural, Veterinary and Food Sciences | 31 | 20 | 19 | 39 | 31 | 30 | 33 | 52 | 109 | 110 | 129 | 108 | 711 |
| Engineering | 8 | 19 | 19 | 22 | 25 | 26 | 48 | 59 | 98 | 98 | 119 | 92 | 633 |
| Information and Computing Sciences | 5 | 8 | 9 | 24 | 35 | 22 | 48 | 64 | 72 | 84 | 93 | 121 | 585 |
| Biological Sciences | 14 | 16 | 12 | 17 | 19 | 32 | 27 | 48 | 56 | 78 | 78 | 80 | 477 |
| Biomedical and Clinical Sciences | 7 | 5 | 2 | 13 | 10 | 16 | 11 | 18 | 33 | 44 | 68 | 87 | 314 |
| Chemical Sciences | 7 | 4 | 6 | 7 | 12 | 16 | 14 | 29 | 41 | 61 | 52 | 47 | 296 |
| Environmental Sciences | 8 | 11 | 11 | 12 | 12 | 10 | 14 | 16 | 20 | 42 | 57 | 43 | 256 |
| Mathematical Sciences | 5 | 9 | 6 | 11 | 14 | 17 | 20 | 17 | 27 | 20 | 19 | 15 | 180 |
| Earth Sciences | 7 | 5 | 8 | 4 | 6 | 3 | 12 | 15 | 13 | 21 | 31 | 22 | 147 |
| Physical Sciences | 7 | 1 | 7 | 3 | 8 | 13 | 13 | 11 | 16 | 16 | 20 | 21 | 136 |
| Commerce, Management, Tourism and Services | 2 | 4 | 2 | 1 | 2 | 6 | 7 | 14 | 10 | 28 | 18 | 32 | 126 |
| Health Sciences | 2 | 3 | 1 | 6 | 2 | 2 | 6 | 4 | 17 | 24 | 19 | 37 | 123 |
| Human Society | 8 | 1 | 2 | 4 | 2 | 0 | 5 | 18 | 9 | 19 | 27 | 27 | 122 |
| Education | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 11 | 13 | 29 | 31 | 29 | 122 |
| Built Environment and Design | 0 | 4 | 1 | 5 | 8 | 5 | 14 | 11 | 9 | 6 | 21 | 14 | 98 |
| Language, Communication and Culture | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 5 | 6 | 27 | 19 | 16 | 75 |
| Economics | 3 | 3 | 2 | 2 | 4 | 4 | 1 | 5 | 6 | 10 | 12 | 13 | 65 |

Table 5 displays the number of collaborations in publications at CTU. Generally, the number of collaborations aligned proportionally with the number of articles in respective fields. Specifically, the field of Agricultural, Veterinary, and Food Sciences recorded the highest number of collaborations, totaling 1,207. Engineering, Information and Computing Sciences, and Biological Sciences also exhibited notable collaboration counts, with 997, 618, and 852 collaborations, respectively. Interestingly, these collaboration figures surpass the corresponding publication counts in each field, suggesting active collaboration within these domains. Conversely, several areas, such as Economics, Language, Communication and Culture, and Education, exhibited collaboration counts lower than their publication counts, indicating relatively less collaboration in publications within these fields.

**Table 5. Number of collaborations in publications at CTU by area per year**

| Areas | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural, Veterinary and Food Sciences | 36 | 41 | 22 | 60 | 45 | 65 | 54 | 118 | 216 | 161 | 222 | 167 | 1,207 |
| Engineering | 14 | 35 | 34 | 22 | 30 | 28 | 64 | 87 | 166 | 154 | 213 | 150 | 997 |
| Information and Computing Sciences | 5 | 15 | 7 | 13 | 40 | 22 | 45 | 57 | 116 | 93 | 99 | 106 | 618 |
| Biological Sciences | 20 | 36 | 15 | 29 | 37 | 58 | 46 | 103 | 88 | 161 | 132 | 127 | 852 |
| Biomedical and Clinical Sciences | 8 | 9 | 3 | 24 | 20 | 32 | 21 | 53 | 101 | 113 | 135 | 171 | 690 |
| Chemical Sciences | 6 | 10 | 11 | 16 | 19 | 42 | 17 | 56 | 85 | 153 | 93 | 116 | 624 |
| Environmental Sciences | 11 | 21 | 11 | 24 | 29 | 21 | 44 | 31 | 36 | 80 | 89 | 80 | 477 |
| Mathematical Sciences | 5 | 7 | 5 | 9 | 14 | 21 | 22 | 23 | 29 | 20 | 18 | 23 | 196 |
| Earth Sciences | 8 | 9 | 13 | 3 | 10 | 4 | 28 | 31 | 37 | 59 | 44 | 35 | 281 |
| Physical Sciences | 8 | 2 | 6 | 7 | 13 | 27 | 22 | 27 | 47 | 51 | 38 | 58 | 306 |
| Commerce, Management, Tourism and Services | 1 | 1 | 4 | 3 | 0 | 5 | 9 | 12 | 6 | 24 | 20 | 30 | 115 |
| Health Sciences | 0 | 5 | 1 | 12 | 5 | 4 | 15 | 4 | 53 | 61 | 50 | 67 | 277 |
| Human Society | 17 | 1 | 2 | 4 | 2 | 0 | 10 | 24 | 19 | 28 | 35 | 41 | 183 |
| Education | 0 | 0 | 1 | 2 | 2 | 1 | 2 | 15 | 11 | 9 | 21 | 16 | 80 |
| Built Environment and Design | 0 | 12 | 2 | 2 | 9 | 7 | 18 | 17 | 15 | 8 | 24 | 17 | 131 |
| Language, Communication and Culture | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 6 | 10 | 9 | 33 |
| Economics | 3 | 1 | 2 | 1 | 3 | 5 | 2 | 5 | 2 | 10 | 12 | 8 | 54 |

## 4. CONCLUSIONS

In this paper, we conducted an analysis of CTU's collaborative efforts through its publications. Using co-author relationships, we explored the patterns of joint publication, the frequency of collaborations, and the characteristics of these collaborations. Our study specifically delved into a substantial volume of publications spanning from 2012 to 2023, aiming to uncover the spectrum of publication types, including international, domestic, internal collaborations, and collaborations by area per year. Furthermore, our research focused on identifying the organizations engaged in collaborative efforts with CTU through publications. Additionally, we investigated CTU's collaborations within organizations.

The findings revealed that CTU has a higher number of international publications compared to domestic and internal ones. It was observed that through its publications, CTU has engaged in collaborations with numerous organizations across various countries globally, with a notable emphasis on collaborations with different companies. The findings also indicated that certain academic fields at CTU, including Agricultural, Veterinary, and Food Sciences, Engineering, Information and Computing Sciences, and Biological Sciences, demonstrated robust collaboration, potentially due to interdisciplinary research demands. Conversely, fields like Economics, Language, Communication and Culture, and Education showed lower collaboration compared to their publication output, suggesting potential for enhanced collaborative

initiatives to foster interdisciplinary research and knowledge exchange.

Since the paper exclusively utilized publication metadata from the Dimensions database, it is subject to certain limitations. These include incomplete analysis datasets and inaccuracies in metadata fields, which could potentially impact the accuracy of collaboration counts. While Dimensions provides a vast collection of scholarly publications, it may not include all publications worldwide. This incomplete coverage can lead to gaps in the analysis, particularly if relevant publications are missing from the database. Additionally, the quality and completeness of metadata in Dimensions can vary, further affecting the accuracy of collaboration analysis. Missing or inaccurate metadata fields, such as author affiliations or collaboration details, can hinder the identification and characterization of collaborations.

While our current study prioritized presenting empirical findings, we acknowledge the importance of contextualizing our results within existing literature and addressing why collaboration tended to focus on specific areas. Future iterations of this research will delve deeper into the theoretical underpinnings of collaboration patterns in higher education contexts. We plan to incorporate a comprehensive review of related studies and provide a discussion section to contextualize our findings. By addressing these limitations, we aim to enhance the depth and breadth of our research, offering valuable insights into research collaboration dynamics.

## REFERENCES


Bansal, S., Mahendiratta, S., Kumar, S., Sarma, P., Prakash, A., & Medhi, B. (2019). Collaborative Research in the Modern Era: Need and Challenges. *Indian Journal of Pharmacology*, *51*(3), 137. https://doi.org/10.4103/ijp.IJP_394_19

Cummings, J. N., & Kiesler, S. (2005). Collaborative Research Across Disciplinary and Organizational Boundaries. *Social Studies of Science*, *35*(5), 703–722. https://doi.org/10.1177/0306312705055538

Glänzel, W., & Debackere, K. (2022). Various Aspects of Interdisciplinarity in Research and How to Quantify and Measure Those. *Scientometrics*, *127*(9), 5551-5569. https://doi.org/10.1007/s11192-021-04133-4

Hara, N., Solomon, P., Kim, S. L., & Sonnenwald, D. H. (2003). An Emerging View of Scientific Collaboration: Scientists' Perspectives on Collaboration and Factors That Impact Collaboration. *Journal of the American Society for Information Science and Technology*, *54*(10), 952-965. https://doi.org/10.1002/asi.10291

John-Steiner, V., Weber, R. J., & Minnis, M. (1998). The challenge of studying collaboration. *American Educational Research Journal*, *35*(4), 773-783. https://doi.org/10.3102/00028312035004773

Nguyen, H. S., & Le, B. L. (2021). International Publication of Hanoi National University for the period 2017-2020: Statistics and analysis of data from Scopus and Web of Science. *Information and Documentation Journal*, *3*, 20-29.

O'Dwyer, M., Filieri, R., & O'Malley, L. (2023). Establishing Successful University–Industry Collaborations: Barriers and Enablers Deconstructed. *The Journal of Technology Transfer*, *48*(3), 900-931. https://doi.org/10.1007/s10961-022-09932-2

Pham, H. S., Vancraeynest, B., Poelmans, H., Vancauwenbergh, S., & Ali-Eldin, A. (2023). Identifying Interdisciplinary Research in Research Projects. *Scientometrics*, *128*(10), 5521-5544. https://doi.org/10.1007/s11192-023-04810-6

Pohl, H. (2021). Internationalisation, Innovation, and Academic–corporate Co-publications. *Scientometrics*, *126*(2), 1329-1358. https://doi.org/10.1007/s11192-020-03799-6

Ross, L. F., Loup, A., Nelson, R. M., Botkin, J. R., Kost, R., Smith Jr, G. R., & Gehlert, S. (2010). The challenges of collaboration for academic and community partners in a research partnership: Points to consider. *Journal of Empirical Research on Human Research Ethics*, *5*(1), 19-31. https://doi.org/10.1525/jer.2010.5

West, J., & Bogers, M. (2014). Leveraging External Sources of Innovation: A Review of Research on Open Innovation. *Journal of Product Innovation Management*, *31*(4), 814–831. https://doi.org/10.1111/jpim.12125