

**ADVANCED DIGITAL COMPETENCE PADA MAHASISWA TEKNIK:
STUDI SURVEY DARI INDONESIA**

SKRIPSI

Diajukan untuk Memenuhi Sebagai Syarat Memperoleh Gelar Sarjana Pendidikan
Teknik Elektro Konsentrasi Elektronika Industri



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FAKULTAS PENDIDIKAN TEKNOLOGI DAN KEJURUAN
UNIVERSITAS PENDIDIKAN INDONESIA**

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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar
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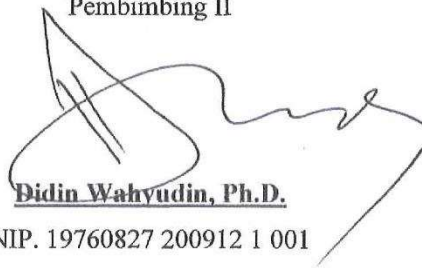
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ABSTRAK

Peningkatan teknologi digital telah mengubah lingkup pendidikan tinggi, khususnya di bidang teknik. Mahasiswa teknik dituntut untuk memiliki digital competence yang lebih tinggi guna menghadapi tantangan di era digital. Penelitian ini bertujuan mengevaluasi tingkat "*Advanced Digital Competence*" pada mahasiswa Departemen Pendidikan Teknik Elektro di Indonesia dengan menggunakan *framework DigComp 2.1*. Metode penelitian ini adalah pendekatan kuantitatif dengan metode deskriptif statistika sederhana. Data penelitian dikumpulkan melalui survei *online* menggunakan *Google Form* dan melibatkan 243 mahasiswa Departemen Pendidikan Teknik Elektro Universitas Pendidikan Indonesia. Hasil analisis data menunjukkan bahwa mayoritas mahasiswa (53.5%) telah mencapai tingkat "*Advanced Digital Competence*". Kemampuan mahasiswa dalam aspek *Information & Data Literacy* baik, namun perlu perhatian pada kemampuan menyimpan dan mengambil informasi; Aspek *Communication* memuaskan, namun perlu peningkatan dalam berpartisipasi dalam *online citizenship* dan *netiquette*; sementara dalam aspek *Problem Solving*, mayoritas mahasiswa telah memiliki kemampuan baik, tetapi ada potensi untuk meningkatkan kemampuan menyelesaikan masalah teknis dan mengidentifikasi kebutuhan serta respon teknologi. Dalam konteks dunia kerja yang semakin canggih secara teknologi, digital competence menjadi kunci kesuksesan. Temuan dari penelitian ini diharapkan dapat mempersiapkan mahasiswa untuk masa depan yang semakin dipengaruhi oleh teknologi dan menciptakan lingkungan pendidikan yang inklusif dan adil dalam era digital.

Kata Kunci: *Advanced Digital Competence, Engineering, DigComp 2.1*

ABSTRACT

The increase in digital technology has changed the landscape of higher education, particularly in engineering. Engineering students are required to have higher digital competence in order to face challenges in the digital era. This study aims to evaluate the level of "Advanced Digital Competence" in students of the Department of Electrical Engineering Education in Indonesia using the DigComp 2.1 framework. This research method is a quantitative approach with a simple statistical descriptive method. Research data was collected through an online survey using Google Forms and involving 243 students from the Department of Electrical Engineering Education at the Indonesian University of Education. The results of the data analysis show that the majority of students (53.5%) have reached the "Advanced Digital Competence" level. Students' ability in the Information & Data Literacy aspect is good, but attention needs to be paid to the ability to store and retrieve information; The Communication aspect is satisfactory, but needs improvement in participating in online citizenship and netiquette; while in the Problem Solving aspect, the majority of students already have good skills, but there is potential to improve their ability to solve technical problems and identify technological needs and responses. In the context of an increasingly technologically sophisticated world of work, digital competence is the key to success. The findings from this research are expected to prepare students for a future that is increasingly influenced by technology and create an inclusive and fair educational environment in the digital era.

Keywords: *Advanced Digital Competence, Engineering, DigComp 2.1*

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DAFTAR PUSTAKA

- Abbas, Q., Hussain, S., & Rasool, S. (2019). Digital Literacy Effect on the Academic Performance of Students at Higher Education Level in Pakistan. *Global Social Sciences Review*, *IV*(1), 108–116. [https://doi.org/10.31703/gssr.2019\(iv-i\).14](https://doi.org/10.31703/gssr.2019(iv-i).14)
- Asan, A. (2003). Computer Technology Awareness by Elementary School Teachers: A Case Study from Turkey. In *Journal of Information Technology Education* (Vol. 2).
- Ávila Sánchez, G. A., Venegas Mejía, V. L., Palacios Garay, J. P., Jara Nunayalle, J. del R., Jaramillo Zavala, J. B., & Fernández Zavaleta, R. F. (2022). Digital competence of the university student in times of COVID-19. *International Journal of Health Sciences*, 6467–6475. <https://doi.org/10.53730/ijhs.v6ns4.10226>
- Bravery, K., Maio, A. De, Baldwin, S., Gutowski, D., Keteci, I. C., & Hudson, T. (2020). *Global Talent Trend 2020*.
- Cabero-Almenara, J., Gutiérrez-Castillo, J. J., Guillén-Gámez, F. D., & Gaete-Bravo, A. F. (2023). Digital Competence of Higher Education Students as a Predictor of Academic Success. *Technology, Knowledge and Learning*, *28*(2), 683–702. <https://doi.org/10.1007/s10758-022-09624-8>
- Calvani, A., Cartelli, A., Fini, A., & Ranieri, M. (2008). Models and Instruments for Assessing Digital Competence at School Je-LKS Applications. In *Journal of e-Learning and Knowledge Society* (Vol. 4, Issue 3).
- Çam, E., & Kiyici, M. (2017). Perceptions of Prospective Teachers on Digital Literacy. In *Malaysian Online Journal of Educational Technology* (Vol. 5, Issue 4). www.mojet.net
- Carretero, S., Vuorikari, R., & Punie, Y. (2018). *DigComp 2.1 : the digital competence framework for citizens with eight proficiency levels and examples of use*. Publications Office. <https://doi.org/doi/10.2760/38842>
- Cazco, G. H. O., González, M. C., Abad, F. M., Altamirano, J. E. D., & Mazón, M. E. S. (2016). Determining Factors in Acceptance of ICT by the University Faculty in Their Teaching Practice. *Proceedings of the Fourth International Conference on Technological Ecosystems for Enhancing Multiculturality*, 139–146. <https://doi.org/10.1145/3012430.3012509>
- Chinonye Amaechi, G., & Omobola Opesade, A. (2021). Digital Competence and Lifelong Learning of University Undergraduates in Nigeria: How Interconnected Are They? *Journal of Information Science*, *5*(3), 18–42. www.arcis.ui.edu.ng/jisst
- Clifford, I., Kluzer, S., Troia, S., Jakobson, M., Zandbergs, U., Vuorikari, R., Punie, Y., Castaño, J., Centeno, C., O’keeffe, W., & Cabrera, M. (2020). DigCompSAT A Self-reflection Tool for the European Digital Competence Framework for Citizens. *Joint Research Centre European Commission*. <https://doi.org/10.2760/77437>
- Cohen, L., Manion, L., & Morrison, K. (2017). *Research Methods in Education* (8th ed.). Routledge. <https://doi.org/10.4324/9781315456539>
- Rendy Adiyana Budiman, 2023
ADVANCED DIGITAL COMPETENCE PADA MAHASISWA TEKNIK: STUDI SURVEY DARI INDONESIA
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- Cook, H., Apps, T., Beckman, K., & Bennett, S. (2023). Digital competence for emergency remote teaching in higher education: understanding the present and anticipating the future. *Educational Technology Research and Development*, 71(1), 7–32. <https://doi.org/10.1007/s11423-023-10194-4>
- Elhussein, G., Leopond, T. A., & Zahidi, S. (2020). *Schools of the Future Defining New Models of Education for the Fourth Industrial Revolution*. <https://www.weforum.org/reports/schools-of-the-future-defining-new-models-of-education-for-the-fourth-industrial-revolution/>
- Eloy, L.-M., Fabrizio, M. S., Esteban, V.-C., & José M, R.-H. (2020). University students' digital competence in three areas of the DigCom 2.1 model: A comparative study at three European universities. In *Australasian Journal of Educational Technology* (Vol. 2020, Issue 3).
- Esmosda, & Annisa, V. (2019, November 5). Digital Literacy Skills on the Generation of Digital Immigrants. *Proceeding International Confrence on Social Sciences*.
- Ferrari, A. (2012). *Digital Competence in Practice: An Analysis of Frameworks*. <https://doi.org/10.2791/82116>
- Ferrari, A., Punie, Y., & Brecko, B. (2013). *DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe*. (Issue LB-NA-26-035-EN-N). Publications Office of the European Union. <https://doi.org/10.2788/52966>
- Gutiérrez, I. (2011). *Competencias del profesorado universitario en relación al uso de tecnologías de la información y comunicación: análisis de la situación en España y propuesta de un modelo de formación* [Doctoral Thesis]. University Rovira I Virgili.
- Heidari, E., Mehrvarz, M., Marzooghi, R., & Stoyanov, S. (2021). The role of digital informal learning in the relationship between students' digital competence and academic engagement during the COVID 19 pandemic. *Journal of Computer Assisted Learning*, 37(4), 1154–1166. <https://doi.org/10.1111/jcal.12553>
- Kloss-Brandstätter, A., Pester, A., & Kurtz, G. (2021). Level of Digital Literacies Among Austrian College Students Assessed with an Online Survey. In M. E. Auer & T. Tsiatsos (Eds.), *Internet of Things, Infrastructures and Mobile Applications* (Vol. 1192, pp. 255–264). Springer International Publishing. <https://doi.org/10.1007/978-3-030-49932-7>
- Klowden, K., & Lim, Q. (2021). *Future Of Work Insights for 2021 and Beyond*.
- König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: teacher education and teacher competence effects among early career teachers in Germany. *European Journal of Teacher Education*, 43(4), 608–622. <https://doi.org/10.1080/02619768.2020.1809650>
- Krumsvik, R. J. (2011). Digital competence in Norwegian teacher education and schools. *Hogre Utbildning*, 1(1), 39–51.

- Leahy, D., & Wilson, D. (2014). Digital Skills for Employment. In *IFIP AICT* (Vol. 444). http://europa.eu/rapid/press-release_SPEECH-11-836_en.htm
- Liu, Z. (2023). The Digital Competence of Chinese University Students: A Survey Study. *Journal of Education and Educational Research*, 2(1).
- Lund, S., Madgavkar, A., Manyika, J., Smit, S., Ellingrud, K., Meaney, M., & Robinson, O. (2021). *The future of work after COVID-19*. www.mckinsey.com/mgi.
- Manco-Chavez, J. A., Uribe-Hernandez, Y. C., Buendia-Aparcana, R., Vertiz-Osores, J. J., Alcoser, S. D. I., & Rengifo-Lozano, R. A. (2020). Integration of icts and digital skills in times of the pandemic COVID-19. *International Journal of Higher Education*, 9(9), 11–20. <https://doi.org/10.5430/ijhe.v9n9p11>
- Pelin Yildiz, E., & Yıldız, E. P. (2020). Opinions of academicians on digital literacy: A phenomenology study. *Cypriot Journal of Educational Sciences*, 15(3), 469–478. <https://doi.org/10.18844/cjes.v%vi%i.4913>
- Rahimi, M., Rosman, M., Erlissa, N., Aziz, A., Ismail, N., Osman, G., & Wahid, K. A. (2022). Digital Skills Framework in Higher Education. *International Academic Symposium of Social Science*, 249–258. www.mdpi.com/journal/proceedings
- Saltos-Rivas, R., Novoa-Hernández, P., & Rodríguez, R. S. (2021). On the quality of quantitative instruments to measure digital competence in higher education: A systematic mapping study. *PLoS ONE*, 16(9 September). <https://doi.org/10.1371/journal.pone.0257344>
- Saltos-Rivas, R., Novoa-Hernández, P., & Serrano Rodríguez, R. (2022). How Reliable and Valid are the Evaluations of Digital Competence in Higher Education: A Systematic Mapping Study. *SAGE Open*, 12(1). <https://doi.org/10.1177/21582440211068492>
- Santos, S., Lucas, M., & Bem-Haja, P. (2022). BRIDGING THE DIGITAL COMPETENCE GAP: TELL US WHAT YOU NEED. *Proceedings of the International Conference ICT, Society and Human Beings 2022*, 104–111. <https://www.researchgate.net/publication/364311534>
- Schwab, K. (2017). *The Fourth Industrial Revolution*. Currency.
- Scuotto, V., & Morellato, M. (2013). Entrepreneurial Knowledge and Digital Competence: Keys for a Success of Student Entrepreneurship. *Journal of the Knowledge Economy*, 4(3), 293–303. <https://doi.org/10.1007/s13132-013-0155-6>
- Silva-Quiroz, J., & Morales-Morgado, E. M. (2022). Assessing digital competence and its relationship with the socioeconomic level of Chilean university students. *International Journal of Educational Technology in Higher Education*, 19(1). <https://doi.org/10.1186/s41239-022-00346-6>
- Syahrin, S., Almashiki, K., & Alzaanin, E. (2023). The Impact of COVID-19 on Digital Competence A Case Study of Preservice Teacher Education Students in the Sultanate of Oman. *International Journal of Advanced Computer Science and Applications*, 14(1), 511–519. <https://doi.org/10.14569/IJACSA.2023.0140156>
- Rendy Adiyana Budiman, 2023
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- The European Parliament and the Council. (2006). *Recommendation of The European parliament and of the Council*.
- Tømte, C., Enochsson, A. B., Buskqvist, U., & Kårstein, A. (2015). Educating online student teachers to master professional digital competence: The TPACK-framework goes online. *Computers and Education, 84*, 26–35. <https://doi.org/10.1016/j.compedu.2015.01.005>
- Ukwoma, S. C., Iwundu, N. E., & Iwundu, I. E. (2016). Digital literacy skills possessed by students of UNN, implications for effective learning and performance. *New Library World, 117*(11/12), 702–720. <https://doi.org/10.1108/NLW-08-2016-0061>
- Vodă, A. I., Cautisanu, C., Grădinaru, C., Tănăsescu, C., & de Moraes, G. H. S. M. (2022). Exploring Digital Literacy Skills in Social Sciences and Humanities Students. *Sustainability, 14*(5), 2483. <https://doi.org/10.3390/su14052483>