Mapping Attribute of Occupational Health and Safety (OHS) Softskill with Predictive Modeling in Graphics Industry

Besse Irna Tawaddud and Muliani Ratnaningsih

[besse.irnat@polimedia.ac.id](mailto:besse.irnat@polimedia.ac.id) and muliani.r@fkmupri.ac.id

**Abstract**. Today's era recognizes that education and soft skill development can maximize productivity and build a positive culture in the graphics industry.This research aims to predict the need for soft skills for occupational health and safety (OHS) in the graphic industry in the future through the design of predictive modeling.The research method used is quantitative with a cross sectional study design with the research stages consisting of determination and sampling, data analysis, and model design based on data analysis. The research was conducted in 3 (three) cities, namely Jakarta, Makassar and Medan with the respondents that have been graduates from graphic engineering. The analytical method used rotation random forest with the comparative method of CHAD rotation forest using SPSS.This study asked 5 skill in OHS in the graphics industry such us, leadership, communication, initiative, empathy. and 5S From the modeling results, 18 softskill modeling in the field of OHS are obtained which should be owned by graphic engineering graduates. In addition, this study also shows that the OHS softskills expected from graphic engineering graduates should have 26.6% leadership, 28.1% communication, 18,8% initiative, and 14.1% empathy, and 12.5 % 5S out of 100% of the total skills for graphic engineering graduates.

1. Background

There are many job opportunities for Diploma III graduates in the business sector of the industrial world in the creative field. The creative economy sector has its own uniqueness. The educational structure of the creative economy workforce is different from the workforce in general [1]. The things that make or make people successful in business/industry are 80.00% determined by the mindset they have and 20.00% is determined by technical skills [2]. In the current education system, soft skills allocated on average are only 10.00% of the curriculum [3]. Although up to 91% of LinkedIn's 'Professional Talent' survey respondents in 2019 said that demand for soft skills has the potential to change future hiring [4 ]. There must be soft skill development in students [5].

This is in accordance with research by Wagiran (2008) which shows that the market sector requires the use of learning that combines aspects of soft skills and forms of assessment so that graduates become proficient in soft skills, and relevant professional competencies. skills that require long-term organizational planning. towards success [7] In addition, the competence of graduates expected by the creative industry is entrepreneurial ability (3.23%), humorous (3.25%), creative (3.59%), achievement index (> 3.0) (3.68%), wise (3.75%) ), polite (3.82%), friendly (3.85%), self-confident (3.95%), leadership (3.97%) , detail oriented (4%), organizational skills (4.05%), computer skills (4.21%) analytical power (4.36%), adaptability (4.41%), motivation/initiative (4.42%), ethical (4.46%), interpersonal skills (4.5%), teamwork skills (4.54%), honesty (4.59%), and communication skills (4.69%) with the proportion that soft skills are more desirable in the creative industry than hard skills [8].

Soft skills related to OHS are equally important to be mastered by professional graduates because the requirements for DUDI related to OHS are also very high. This is in accordance with work safety which in the end will be closely related to worker productivity. Therefore, it is important to design a predictive model that aims to predict the demand for occupational health and safety soft skills for vocational training graduates in the business world from the creative industries and above.

1. Methods

This research is a quantitative research with a cross sectional research design approach. This research is processed using a predictive model with 253 graduates from Diploma III Graphic Engineering study program at the Creative Media Polytechnic Makassar, Jakarta and Medan. The sample size uses the sample formula, namely:



## Based on this formula, the sample is calculated, where N (population) is 253 with the standard effect size used is 0.3 with a 95% confidence interval, and 80% power (β). Using this formula, the total sample required to be interviewed is 64 people.

## The analytical method used is rotation random forest with the comparative method of CHAD rotation forest using SPSS. This study asked graphic engineering graduates about 5 (five) OHS soft skills needed in the creative industry DUDI, namely leadership, communication, initiative, empathy, and 5S management.

1. Result

The mathematical pattern of predictive modeling of Occupational Health and Safety (OHS) Soft Skills is as follows:

∑\_5▒〖(64¦5)=0.281 x P(64¦5)!+0.266 x P(64¦4)!+0.188 x P(64¦3)!+0.141 x P(64¦2)!+0.125 x P(64¦1)!〗

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| Chart, waterfall chart  Description automatically generated | | |
| **Figure 1.** Based on model 1, there are 3 main skills needed, namely initiative skills, 5R management, and communication. Furthermore, it is expected that graphic engineering graduates who are already working have 22.1% initiative skills, 15.4% 5R management skills, and 10.1% communication skills. | | |
| Chart, box and whisker chart  Description automatically generated |  | Chart  Description automatically generated | |
| **Figure 2.** Based on model 2, there are 3 main skills needed, namely 5S management skills, communication, and leadership. Furthermore, it is expected that graphic engineering graduates who are already working have 29.1% 5S management skills, 13.6% communication skills, and 10.1% leadership and empathy skills. |  | **Figure 3.** Based on model 3, there are 3 main skills needed, namely communication skills, 5R management, and leadership. Furthermore, it is expected that graphic engineering graduates who are already working have 21.6% communication skills, 16.4% 5S management skills, and 11.2% leadership skills. | |

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| **Figure 4.** Based on model 4, there are 3 main skills needed, namely 5R management skills, communication, and initiative. Furthermore, it is expected that graphic engineering graduates who are already working have 18.4% 5S management skills, 14.2% communication skills, and 10.2% initiative skills. | | |
| Chart, bar chart  Description automatically generated |  | Chart, box and whisker chart  Description automatically generated | |
| **Figure 5.** Based on model 5, there are 3 main skills needed, namely leadership, communication, and 5R management skills. Furthermore, it is expected that graphic engineering graduates who are already working have 16.1% leadership skills,12.7% skill komunikasi, dan 11.7% skill manajemen 5S. |  | **Figure 6.** Based on model 6, there are 3 main skills needed, namely leadership skills, 5S management, and communication. Furthermore, it is expected that graphic engineering graduates who are already working have 28.1% 5R management skills, 28.1% leadership skills, and 21.9% communication skills. | |

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| **Figure 7.** Based on model 7, there are 3 main skills needed, namely 5R management skills, empathy, initiative/leadership. Furthermore, it is expected that graphic engineering graduates who are already working have 24.1% 5S management skills, 14.7% empathy skills, and 12.1% leadership/initiative skills. | | |
| Chart, waterfall chart  Description automatically generated |  | Chart, box and whisker chart  Description automatically generated | |
| **Figure 8.** Based on Model 8, there are 3 main skills needed, namely 5S management skills, empathy, initiative/leadership. Furthermore, it is expected that graphic engineering graduates who are already working have 21.1% 5S management skills, 17.1% empathy skills, and 12.1% initiative skills. |  | **Figure 9.** Based on model 9, there are 3 main skills needed, namely 5R management skills, initiative, and leadership. Furthermore, it is expected that graphic engineering graduates who are already working have 21.1% 5R management skills, 12.2% initiative skills, and 11.8% leadership skills. | |

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| **Figure 10.** Based on model 10, there are 3 main skills needed, namely 5S management skills, initiative, and leadership. Furthermore, it is expected that graphic engineering graduates who are already working have 21.1% 5S management skills, 12.2% initiative skills, and 11.8% leadership skills. | | |
| Chart, box and whisker chart  Description automatically generated |  | Chart  Description automatically generated | |
| **Figure 11.** Based on Model 11, there are 3 main skills needed, namely communication skills, leadership, and initiative. Furthermore, it is expected that graphic engineering graduates who are already working have 21.1% communication skills, 20.5% leadership skills, and 9.1% initiative skills.. |  | **Figure 12.** Based on model 12, there are 3 main skills needed, namely leadership skills, communication, and 5S management. Furthermore, it is expected that graphic engineering graduates who are already working have 22.1% leadership skills, 19.4% communication skills, and 11.7% 5S management skills. | |

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| **Figure 13.** Based on model 13, there are 3 main skills needed, namely initiative, leadership, and communication skills. Furthermore, it is expected that graphic engineering graduates who are already working have 22.1% initiative skills, 16.3% leadership skills, and 9.1% communication skills. | | |
| Chart, box and whisker chart  Description automatically generated |  | Chart  Description automatically generated | |
| **Figure 14.** Based on model 14, there are 3 main skills needed, namely communication skills, initiative, and 5R management. Furthermore, it is expected that graphic engineering graduates who are already working have 35.1% communication skills, 21.1% initiative skills, and 11.6% communication skills. |  | **Figure 15.** Based on model 15, there are 3 main skills needed, namely communication skills, leadership, and empathy. Furthermore, it is expected that graphic engineering graduates who are already working have 22.8% communication skills, 21.4% leadership skills, and 4.2% empathy skills. | |

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| **Figure 16.** Based on model 16, there are 3 main skills required for 5S communication, leadership, and management skills. Furthermore, it is expected that graphic engineering graduates who are already working have 22.1% communication skills, 11.4% leadership skills, and 10.1% 5R management skills. | | |
| Chart, box and whisker chart  Description automatically generated |  | Chart  Description automatically generated | |
| **Figure 17.** Based on model 17, , there are 3 main skills needed, namely leadership skills, 5S management, and communication. Furthermore, it is expected that graphic engineering graduates who are already working have 26.1% leadership skills, 12.3% 5S management skills, and 11.7% communication skills. |  | **Figure 18.** Based on model 18, there are 3 main skills needed, namely initiative, communication, and leadership skills. Furthermore, it is expected that graphic engineering graduates who are already working have 32.1% initiative skills, 12.2% communication skills, and 8.2% leadership skills. | |

Chart, bar chart, box and whisker chart

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Final Modeling 19

Predictive Modeling of Occupational Health and Safety (OHS) Soft Skills

Figure 19. Based on the rotation random forest tree in the final model 19, the K3 soft skills required by graphic engineering graduates at creative DUDI are 28.1% communication, 26.6% leadership, 18.8% initiative, 14.1% empathy, and 12.5% ​​5S management. When compared based on job status, there are 3 main skills needed based on the final 19 modeling, namely leadership, communication, and 5S management skills. Furthermore, it is expected that graphic engineering graduates who are already working have 22.8% leadership skills, 17.4% communication skills, and 9.7% 5R management skills.

1. Conclusions

The conclusion of this research is obtained 18 modeling soft skills in the field of Occupational Health and Safety (OHS) which should be owned by graphic engineering graduates. In addition, this study also shows that the OHS soft skills expected from graphic engineering graduates should have 26.6% leadership soft skills, 28.1% communication soft skills, 18.8% initiative soft skills, and 14.1% empathy soft skills, and 12.5% ​​5R management soft skills out of 100% of total skills. for graphic engineering graduates

References

1. Redyanto, Mohammad.Analisis Rekrutmen Tenaga Kerja Industri Kreatif (Studi Perusahaan. Slides Malang. Jurnal Ilmiah Universitas Brawijaya Malang.2020
2. Samani M, Harianto.Pendidikan Karakter. Bandung: Remaja Rosdakarya; 2011
3. I W Arnata.2014. Evaluasi Soft Skills dalam Pembelajaran Mahasiswa Baru di Fakultas Teknologi Pertanian Universitas Udayana. Jurnal Pendidikan dan Pembelajaran, Volume 21, Nomor 1, April 2014.
4. Bottino, Barry. A Hard Look at Soft Skills.2020 [cited 2021 Nov 21] Available from https://www.safetyandhealthmagazine.com/articles/20081-a-hard-look-at-soft-skills
5. Sudjimat, Dwi. Pengembangan Model Pendidikan Softskill melalui Pembelajaran pada program Studi Pendidikan Teknik Mesin FT UM. Teknologi dan Kejuruan, Vol. 33, NO. 2, hlm. 133−142;2010
6. Wagiran, W. The Importance of Developing Soft Skills in Preparing Vocational High School Graduates. 2018 [cited 2021 Oct 27]. Available from http://www.voctech.bn
7. Kapp, M. K., & Hamilton, B. White paper: designing instruction to teach principles (soft skill). 2006 [cited 2021 Oct 15]. Available from http://www.karlkapp.com/materials/teaching principles.pdf
8. Amin, M. Kebutuhan Soft Skills Bagi Tenaga Kerja Lulusan Pendidikan Vokasi. Prosiding Seminar Hilirisasi Penelitian Untuk Kesejahteraan Masyarakat. In: http://semnaslit.unimed.ac.id/proceeding. Lembaga Penelitian Universitas Negeri Medan:semnaslit; 2017.