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Analysis Of The Effect Of Knowledge On Entrepreneurship Readiness Using Random Forest Classification Machine Learning

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Abstract. Entrepreneurship is a phenomenon that has an important influence on the progress and welfare of the world, so that entrepreneurship is used as the base of economic development. Psychologically, entrepreneurs are people who have a strong internal drive as an effort to achieve certain goals so that they have a tendency to experiment in showing a character that is free from the control of others. Entrepreneurship can be seen from various points of view. The angle and context in question are views from several fields, namely according to economists, management, business people, psychologists and investors. The main requirement that an entrepreneur must have is entrepreneurial knowledge. entrepreneurial readiness is determined by the knowledge possessed and experience in conducting a business (Kurniawati, 2019). In the midst of the rapid development of artificial intelligence (AI) technology today. Not many people know that artificial intelligence consists of several branches, one of which is machine learning. This machine learning (ML) technology is one of the branches of AI that is very interesting. The sample population in this study was obtained from the air transportation school consisting of 7 populations. Data analysis is done by using . The research location is an air transportation school with Machine Learning Random Forest Classification with a population of cadets, lecturers and the general public

Keywords. Knowledge; Readiness; Entrepreneurship; Machine Learning; Random Forest Classification

Introduction

Entrepreneurship is an activity in creating something that has added value through the development of technology and science in order to win the competition, and entrepreneurship is a process of creating wealth through highlighting added value by utilizing the knowledge, skills and available resources. The background underlying this research is to find out that the knowledge factor affects the readiness of cadets in entrepreneurship. Readiness (readiness) is an adjustment to conditions that at one time will affect or tend to respond (Slameto, 2013). Entrepreneurial readiness is a person's ability to do business in accordance with the provisions without experiencing difficulties and obstacles with maximum results and according to the specified target. Entrepreneurial readiness is determined by internal factors which are influences that come from within a person, and external factors which are influences that come from outside (Kwok, 2014). In entrepreneurship, it is required to continue to innovate to create new things, which of course use the latest technology. In the midst of the rapid development of

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artificial intelligence (AI) technology today. Not many people know that artificial intelligence consists of several branches, one of which is machine learning. This machine learning (ML) technology is one of the branches of AI that is very interesting, why? Because machine learning is a machine that can learn like humans. In this study using machine learning artificial intelligence. Artificial intelligence in its application is broadly divided into seven branches, namely machine learning, natural language processing, expert systems, vision, speech, planning and robotics. The branch of artificial intelligence is intended to narrow the scope when developing or learning AI, because basically artificial intelligence has a very broad scope..

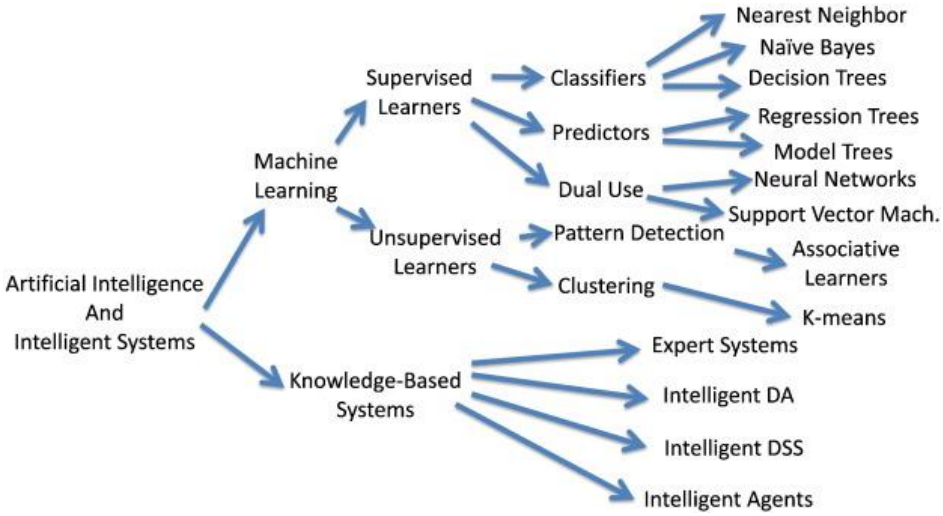

Figure 1. Machine learning concept

In Figure 1. It can be seen that artificial intelligence can create machine learning so that it can be developed into very diverse abilities.

Machine learning is used to process data with a larger population so that maximum results can be obtained and as expected. In machine learning applications, algorithms or sequences of statistical processes are trained to find specific patterns and features in large amounts of data. It aims to make a decision or prediction based on these data. The better the algorithm, the better the system's decision and prediction accuracy will be. Clustering analysis is an unsupervised learning method that separates the data points into several specific bunches or groups, such that the data points in the same groups have similar properties and data points in different groups have different properties in some sense.

Density-Based Clustering refers to unsupervised learning methods that identify distinctive groups/clusters in the data, based on the idea that a cluster in data space is a contiguous region of high point density, separated from other such clusters by contiguous regions of low point density.

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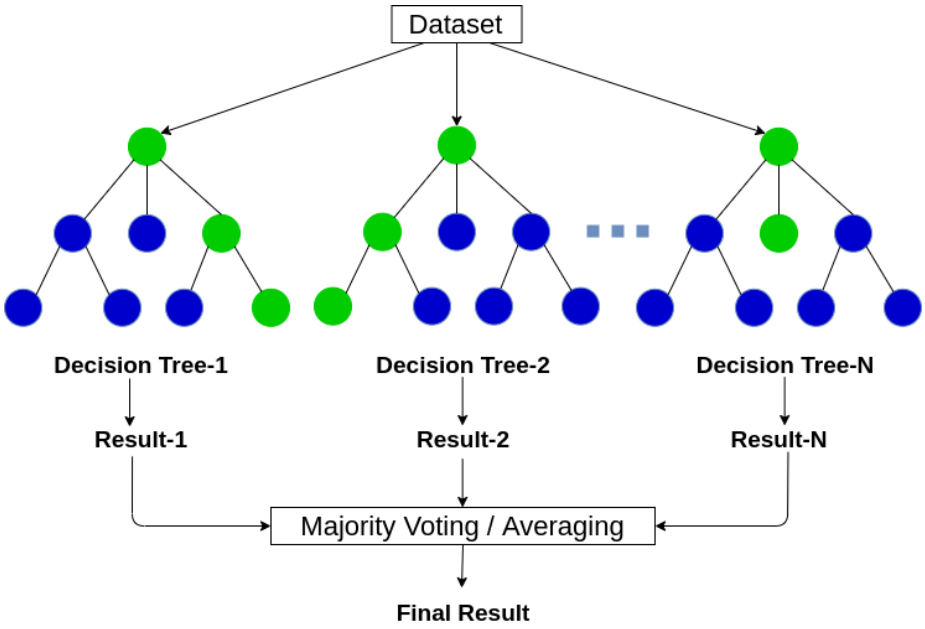

Figure 2. Prediction of Data Results

Based on Figure 2. It is stated and it has been clearly seen that all the data collected will result in a decision until the decision is condensed until the results are known. The results will be searched for the average value so that the results of the study can be determined. In this study, the Random forest (RF) approach is an algorithm used to classify large amounts of data. Random forest classification is done by merging trees (trees) by conducting training on the sample data owned.

Overview Theory

The main requirement that an entrepreneur must have is entrepreneurial knowledge. entrepreneurial readiness is determined by the knowledge possessed and experience in conducting a business (Kurniawati, 2019). Someone who wants to achieve success in entrepreneurship is very important to have the personality of "becoming active" which means having certain dispositions and traits, the disposition in question includes abilities, knowledge and skills in terms of entrepreneurial potential (Kozubikova et al., 2017). This is shown in the research of Prilovia and Iskandar (2018) which reveals another variable that influences entrepreneurial interest, namely entrepreneurial knowledge

Data collection

In the process of finding answers to the problem formulation and research objectives, it is necessary to collect relevant data. These data were collected in various ways, including literature studies, filling out questionnaires with several instruments from both knowledge and readiness variables.

Data analysis

In this research, the analysis of the influence of knowledge on the entrepreneurial readiness of cadets uses descriptive data analysis with quantitative methods. Data analysis is carried out starting with organizing the data because the nature of quantitative data is generally very much and varied. Organizing the data so that the data obtained is neat, structured, systematic, and complete. In the process of organizing the right data, researchers can obtain

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good quality data, document the analysis carried out, store the data and analyze it for the completion of the research carried out. Data analysis that is carried out is to use . The research location is an air transportation school with Machine Learning Random Forest Classification with a population of cadets, lecturers and the general public

Research Methodology

Population and Sample

The population in this study were all cadet at the Politeknik Penerbangan Surabaya. In this study, the population is around 952, but the data sample used by the author for a while is a sample obtained by a random sample method from the entire population.

Instrument Questionnaire

The sample population in this study was obtained from the air transportation school consisting of 7 populations

Table 1. Statistical Description

Descriptive Statistics

	Sex	
	Female	**Male**
Valid	198	387
Missing	0	0
Mean	7.727	7.850
Std. Deviation	2.534	2.560
Minimum	3.000	1.000
Maximum	10.000	10.000

with a sample value of 585 respondents, Among them are 198 women and 387 men, resulting in the following calculation

Table 2. Calculation

Descriptive Statistics

	KNW1	**KNW2**	**KNW3**	**KNW4**	**KNW5**	**KNW6**	**KNW7**
Valid	585	585	585	585	585	585	585
Missing	0	0	0	0	0	0	0
Mean	6.872	7.039	6.566	7.072	7.060	6.962	7.610
Std. Deviation	2.498	2.497	2.582	2.540	2.527	2.506	2.597
Minimum	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Maximum	10.000	10.000	10.000	10.000	10.000	10.000	10.000

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With Knowledge Variable Missing value of 0, Valid 585 with knowledge instruments as many as 7 Question instruments were asked of respondents on entrepreneurial readiness. Standard deviation of KNW1:2,498; KNW2:2,497; KNW3:2.582; KNW4:2,540; KNW5:2,527; KNW6:2.506; KNW7:2.597

Table 3. Knowledge Variable Assessment Instruments

The assessment instrument of the Knowledge variable	
KNW1	I have enough knowledge to do a business
KNW2	Frequent viewing of entrepreneurship exhibitions sparked my ideas to open a business
KNW3	I am active in entrepreneurial activities carried out on my campus
KNW4	By attending an entrepreneurship seminar, it helps me increase my knowledge regarding the strategy of opening a business
KNW5	I have new ideas to take advantage of things around me so that they add value
KNW6	I can read new business opportunities around me
KNW7	Good service will attract consumers

Table 4. Calculation of Readiness Variables

Descriptive Statistics

	RED1	RED2	RED3	RED4	RED5
Valid	585	585	585	585	585
Missing	0	0	0	0	0
Mean	7.703	7.361	7.650	7.658	7.711
Std. Deviation	2.482	2.429	2.440	2.437	2.508
Minimum	1.000	1.000	1.000	1.000	1.000
Maximum	10.000	10.000	10.000	10.000	10.000

With the Readiness Variable Missing value 0, Valid 585 with a readiness instrument as many as 5 Question instruments were asked of respondents on entrepreneurial readiness. The standard deviation is RED1:2.482; RED2:2.429; RED4:2,440; RED4:2.437; RED5:2.508

Table 5. Knowledge Variable Assessment Instruments

The assessment instrument of the Knowledge variable	
RED1	I will create my own work with the abilities I have
RED2	I will save for entrepreneurship capital after graduating cadets
RED3	I dream of becoming a successful entrepreneur
RED4	I want to take part in motivational exercises as a provision for entrepreneurship
RED5	I'm interested in entrepreneurship because I don't have to go here and there looking for work

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In this study, 5 instruments were used related to the assessment of the knowledge variable. The author can group various respondents based on 5 answers

Data Retrieval

Some of the steps taken in data collection were preparation Questionnaire instrument, entrepreneurial interest cadet, determine the sample, prepare the specified learning media, before learning to carry out the entrepreneurial interest questionnaire cadet, carry out a questionnaire on the entrepreneurial interest of cadet. The research data is in the form of a collection of questionnaires interest in entrepreneurship cadet. The analysis step carried out was the normality test by using the Chi-Square Test to determine the normal population of each variable. Briefly, all the steps carried out in this study are shown in Figure 3.

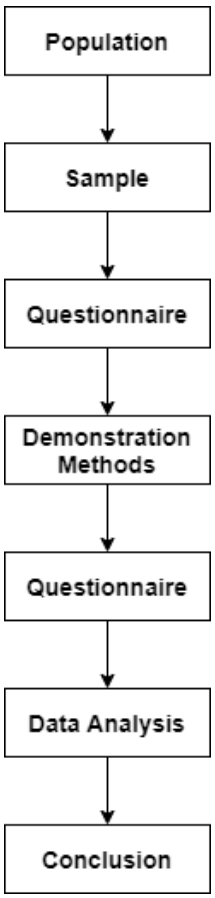

Figure 3. Research implementation design chart.

Result and Discussion

The random forest method is included in the development method of the CART method, with the application of bootstrap aggregating (bagging) and random feature selection methods (Breiman 2001). In a random forest, many trees grow so that a forest is formed, then an analysis is carried out on the collection of trees. In the data cluster consisting of n observations and p explanatory variables, random forest was carried out in the following way (Breiman 2001; Breiman & Cutler 2003):

1. Perform random sampling of size n with recovery on clusters of data. This stage is the bootstrap stage.

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2. Using the bootstrap example, the tree is constructed until it reaches its maximum size (without pruning). At each node, the disaggregation is done by selecting m explanatory variables at random, where m << p. The best disaggregator is selected from the m explanatory variables. This stage is the random feature selection stage
3. Repeat steps 1 and 2 k times,

This results in a forest consisting of k trees. The response of an observation is predicted by aggregating the predicted results of k trees. In the problem of classification is done based on the majority vote (most votes). The random forest classification error is estimated through the OOB error obtained by (Breiman 2001; Breiman & Cutler 2003; Liaw & Wiener 2002):

1) Predict each OOB data in the appropriate tree. OOB (out of bag) data is data that is not included in the bootstrap example.
2) On average, each of the original data cluster observations will be OOB data for about 36% of the trees. Therefore, in step 1, each of the original data cluster observations is predicted to be about one-third times the number of trees. If a is an observation from the original data cluster, then the random forest's prediction result for a is the combined result of the prediction each time a becomes OOB data.
3) OOB error is calculated from the proportion of misclassification of random forest prediction results from all observations of the original data cluster

Table 6. Calculation of Random Forest Classification

Random Forest Classification

Trees	Predictors per split	n(Train)	n(Validation)	n(Test)	Validation Accuracy	Test Accuracy	OOB Accuracy
56	3	374	94	117	0.670	.658	.841

Note. The model is optimized with respect to the *out-of-bag accuracy* .

By validating the data between the variables of knowledge and entrepreneurship readiness, the cadets obtained a random forest classification of 56 trees with a predictor of 3, with n(Train) 374, n(Validation) 94 and n(Test) 117 the Validation accuracy data sheet value was 0.670. so the Test Accuracy is 0.658 the OOB Accuracy value is 0.841

Table 7. Performance Measurement Matrix

Confusion Matrix

		Predicted	
		Female	**Male**
Observed	Female	0.07	0.26
	Male	0.08	0.59

This performance measurement requires performance measurement to find out machine learning classification problems where the output is female prediction with observed female 0.07 male 0.26 while male prediction with observed female 0.08 male 0.59

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Table 8. Measurement

Class Proportions				
	Data Set	**Training Set**	**Validation Set**	**Test Set**
Female	0.338	0.345	0.319	0.333
Male	0.662	0.655	0.681	0.667

In this measurement, it can be seen that the test data for women are 0.338 and for men 0.662, resulting in a training set of 0.345 for women and 0.655 for men, until it is known that the test set produces 0.333 for women and 0.667 for men.

Table 9. Measurement Results

Evaluation Metrics						
		Precision	**Recall**	**F1 Score**	**Support**	**AUC**
	Female	0.471	0.205	0.286	39	0.560
	Male	0.690	0.885	0.775	78	0.562
/ Total	Average	0.617	0.658	0.612	117	0.561

Note. Area Under Curve (AUC) is calculated for every class against all other classes.

In table 8, it can be seen that the measurement results between women and men produce an average precision of 0.617, Recall 0.658, F1 Score 0.612, support value 117 and AUC 0.561.

Table 10. Important Research Variables

Variable Importance		
	Mean decrease in accuracy	**Total increase in node purity**
RED5	-0.049	0.086
RED3	-0.044	0.070
RED2	-0.053	0.058
KNW5	-0.017	0.058
RED4	-0.023	0.050
KNW2	-0.033	0.049
RED1	-0.023	0.044
KNW7	-0.023	0.043
KNW4	-0.010	0.028
KNW6	-0.002	0.016
KNW1	0.006	0.015
KNW3	0.014	-0.008

The following table presents the importance of the variables of knowledge and entrepreneurial readiness of cadets. Seen in the table, the value of the total increase in

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node purity is mostly positive, where the results of these variables also determine how the final results are sought by the author.

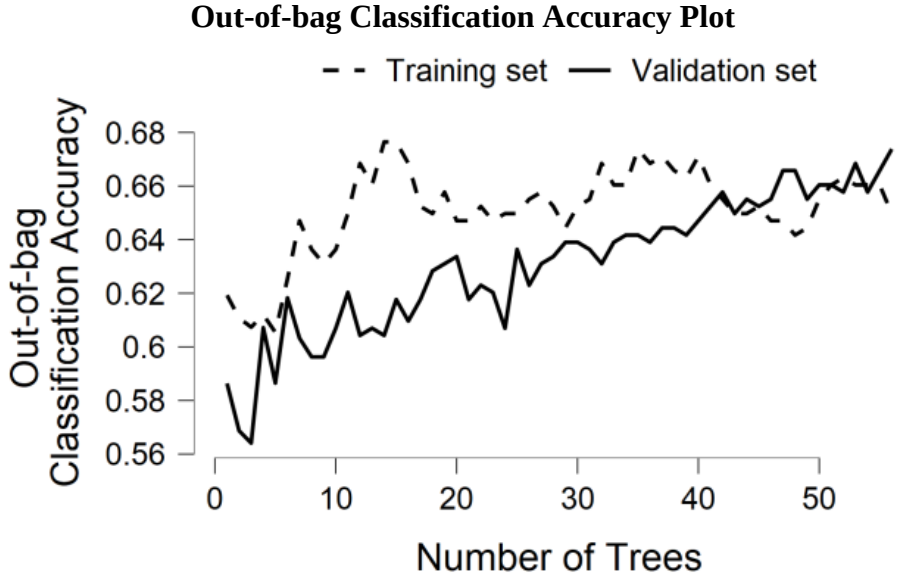

Figure 4. Plot Accuracy

The following is an image of an out-of-bag (OOB) plot depicting the error for the random classification of forests to Crohn's disease and the control group. OOB data are used to estimate the accuracy of classification predictions. Where in the classification will produce high validation

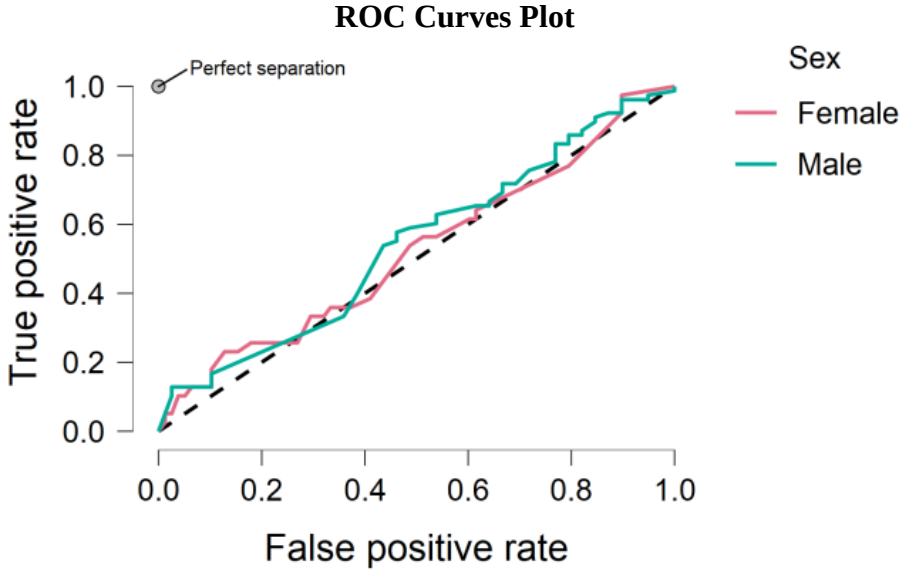

Figure 5. ROC curves plot for changes in k.

Breiman (2001) states that the level of misclassification of random forests will converge to a certain value when the size of the random forest gets larger. The simulation results (Figure 3) are in accordance with this, which is shown by when k gets bigger, the magnitude of the

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decrease in the average level of misclassification becomes less visible. It is also mentioned in the picture that the random forest classification analyzes between women and men

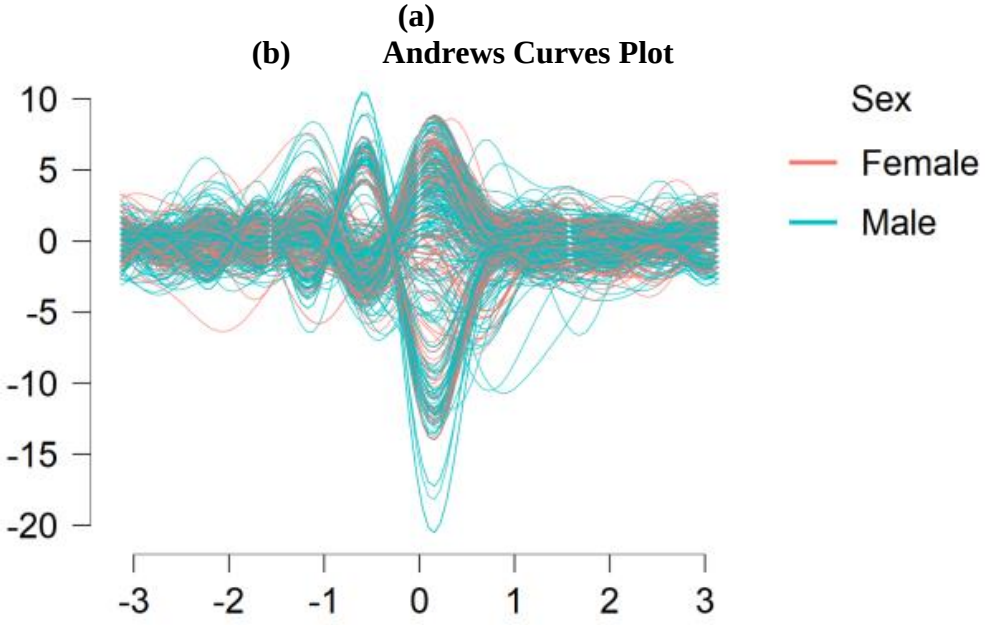

Figure 6. Plot Andrews

Here is a plot of the Andrews curve to visualize the structure of the independent variables. Which will visualize the structure of the female and male variables.

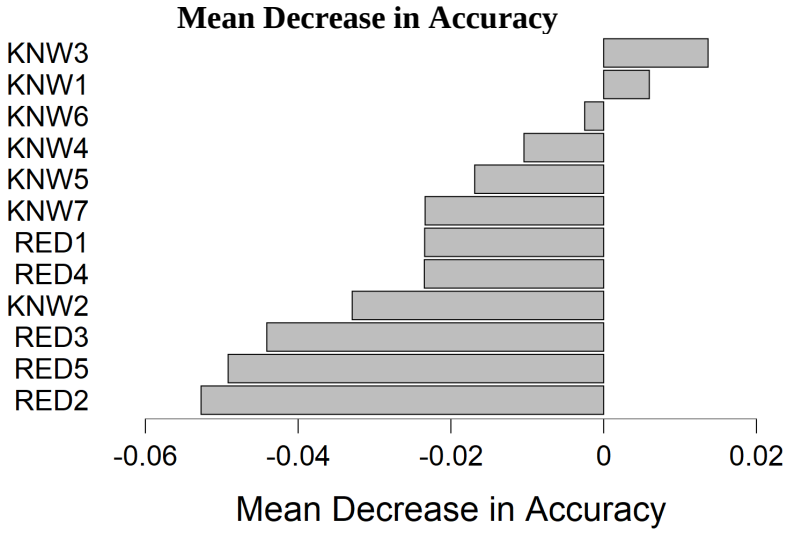

Figure 7. Plot Andrews Mean Decrease in Accuracy

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The following is a picture of the decrease in accuracy of each variable of knowledge and readiness, it can also be seen that RED2 is inversely proportional to KNW3. Where in the accuracy it is clear that 10 variables are negative and 2 are positive

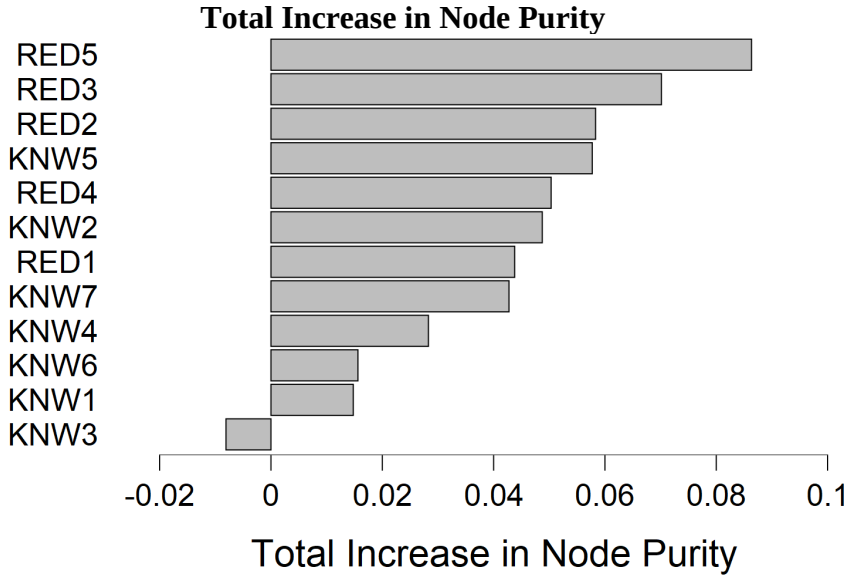

Figure 8. Total Increase in Node Purity

The following is a picture of the increased accuracy of each knowledge and readiness variable. There are 11 variables with positive values and 1 variable with negative values. In the table it is stated that RED5 is inversely proportional to KNW3, so it can be concluded that students are willing to be active in implementing learning and entrepreneurship practicum held by the campus.

Conclusion

In the study entitled "analysis of the influence of knowledge on cadets' entrepreneurial readiness, the random forest method was used where this method can provide high and stable prediction accuracy, with a misclassification rate ranging between 33% and 35.5% with an average value of 34.5%. By validating the data between the variables of knowledge and entrepreneurship readiness, the cadets obtained a random forest classification of 56 trees with a predictor of 3, with n(Train) 374, n(Validation) 94 and n(Test) 117 the Validation accuracy data sheet value was 0.670. so the Test Accuracy is 0.658 the OOB Accuracy value is 0.841

Suggestion

Based on research data, then suggested for future researchers to develop research on the approach contextual through different methods or comparing several methods.

Conflicts of interest statement

The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional

relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

References

[1] Aji, Sunan Purwa., Mulyadi, Hari., & Widjajanta, Bambang. (2018). Keterampilan Wirausaha Untuk Keberhasilan Usaha. *Journal of Business Management Education,* 3(3), pp.111-122.

[2] Al Hakim, M. F., Sariyatun., & Sudiyanto. (2018). Constructing Student's Critical Thinking Skill Through Discovery Learning Model and Contextual Teaching and Learning Model as Solution of Problems in Learning History. *International Journal of Multicultural and Multireligious Understanding,* 5(4), pp.175-183.

[3] Alfianto, Eko Agus. (2012). Kewirausahaan: Sebuah Kajian Pengabdian Kepada Masyarakat. *Jurnal Heritage,* 1(2), pp.33-42.

[4] Anwar, Saiful. (2018). Model Pembelajaran Contextual Teaching and Learning (CTL) dalam Pembelajaran Inklusi. *Jurnal Ilmiah Sustainable*, 1(1), pp.57-74.

[5] AnkitaTripathiTapasGoswamiShrawanKumarTrivediRaviDattaSharma, (2021) A multi class random forest (MCRF) model for classification of small plant peptides A. Tripathi, T. Goswami, S.K. Trivedi et al. International Journal of Information Management Data Insights 1 (2021) 100029

[6] Aprilianty, Eka. (2012). Pengaruh Kepribadian Wirausaha, Pengetahuan Kewirausahaan, dan Lingkungan Terhadap Minat Berwirausaha Siswa SMK. *Jurnal Pendidikan Vokasi,* 2(3), pp.311-324.

[7] Ardiyanti, Dyah Ayu., & Mora, Zulkarnaen. (2019). Pengaruh Minat Usaha dan Motivasi Usaha terhadap Keberhasilan Usaha Wirausaha Muda di Kota Langsa. *Jurnal Samudra Ekonomi dan Bisnis*, 10(2), pp.168-178.

[8] Ariyono S, Luthfiyah N, et al (2019), Development of e-learning as a learning medium for vocational education, Proceedings of the 1st SANTIKA National Seminar, pp. 52-56.

[9] Ariyono Setiawan, L Nurlaela, IGPA Buditjahjanto, B Suprianto, Y Suprapto (2020), Curriculum Development is Conducted to Improve Competencies of Air Transportation Managemental Study Program for Cadets of Aviation Polytechnique Surabaya. International Joint Conference on Science and Engineering (IJCSE 2020), 70-74

[10] Ariyono Setiawan, Yuyun, SIGSM Diyasa (2020), The Effects of Self-Efficacy on the Competency of Cadets in Aviation Polytechnic of Surabaya. International Joint Conference on Science and Engineering (IJCSE 2020), 130-135

[11] Ariyono S, Luthfiyah N, et al (2021) Grow Up Entrepreneurial Interest For Cadets In Aviation Polytechnic Surabaya Using Ctl With Demonstration Methods. Technium Soc. science. J. 19, 156

[12] Ariyono Setiawan, Luthfiyah Nurlaela, Meini Sondang (2020), Application of Value Clarification Technique (Vct) Models In Improving Learning Outcomes In Dangerous Goods Regulation. Journal Of Vocational Education Studies 3

[13] Atmaja, Ahmad Tri., & Margunani. (2016). Pengaruh Pendidikan Kewirausahaan dan Aktivitas Wirausaha Terhadap Minat Berwirausaha Mahasiswa Universitas Negeri Semarang. *Economic Education Analysis Journal,*5(3), pp.774-787

[14] Berns, R. & Erickson, P. (2001). Contextual teaching and learning: Preparing students for the new economy. *Educational Resources Information Center*, pp.1-9.

[15] Boldureanu, G., Ionescu, A. M., Bercu, A. M., Bedrule-Grigoruta, M. V., & Boldureanu, D. (2020). Entrepreneurship Education through Successful Entrepreneurial Models in Higher Education Institutions. *Sustainability,* 12, pp. 1-33.

[16] Bygrave, W. D. 2003. The Portable MBA Entrepreneurship. Jakarta: Binarupa Aksara.
[17] Christianingrum., & Rosalina, Erita. (2017). Pengaruh Pembelajaran Kewirausahaan Terhadap Minat Berwirausaha. *Integrated Journal of Business and Economics,* 1(1), pp.45-55.
[18] Corbetta, Guido., Huse, Morton., & Ravasi, Davide. (2004). Crossroads of Entrepreneurship. Springer Science + Business Media, Inc (Vol. 1). New York: Kluwer Academic.
[19] Djaali. (2008). Teori Motivasi dan Aplikasinya. Jakarta: Bumi Aksara.
[20] Drucker, P. F. (1994). Innovation and Entrepreneurhip. New York: Harpercollins Publisher.
[21] Elaine, B. J. (2011). CTL Contextual Teaching & Learning Menjadikan Kegiatan Belajar Mengajar Mengaysikkan dan Bermakna. Jakarta. Kaifa.
[22] Fahmi, I. (2013). Kewirausahaan. Bandung: Alfabeta.
[23] Fuadi, Iski Fadli. (2009). "Hubungan Minat Berwirausaha Dengan Praktik Kerja Industri Siswa Kelas XII Teknik Otomatif SMK Negeri Adiwerna Kabupaten Tegal". *Jurnal PTM*, 9, pp. 92-98.
[24] Hasibuan, A. H., Lubis, I., & Rujiman. (2019). The Role of the Management of the Indonesian Young Business (HIPMI) Group in Increasing Business Interest of Young Generation in Padangsidimpuan City. *International Journal of Research & Review,* 6(11), pp. 327-354.
[25] Hendro. (2011). Dasar-Dasar Kewirausahaan. Jakarta: Erlangga.
[26] Herdiani, Nadya Monica., & Hidayat, Rahmat. (2017). Faktor-Faktor Motivasi yang Mempengaruhi Mahasiswa Terhadap Minat Berwirausaha (Studi pada Mahasiswa Kelas Regular Pagi Politeknik Negeri Batam). *Journal of Applied Business Administration,* 1(1), pp.139-146.
[27] Hermana, D., Supardan, D., & Undang, G. (2010). Contextual Teaching and Learning (sebuah panduan awal dalam pengembangan PBM). Yogyakarta: PT. Diandra Primamitra Media.
[28] Hisrich, R. (2001). Entrepreneurship kewirausahaan. Jakarta: Salemba Empat.
[29] Hurlock, Elizabeth. 2008. Psikolgi Perkembangan. Jakarta: Erlangga.
[30] Indarto., & Santoso, Djoko. (2020). Karakteristik Wirausaha, Karakteristik Usaha dan Lingkungan Usaha Penentu Kesuksesan Usaha Mikro Kecil dan Menengah. *Jurnal Riset Ekonomi dan Bisnis,* 13(1), pp.54-69.
[31] Indrityatni, Lies. (2013). Pengaruh Mata Kuliah Kewirausahaan Dalam Menumbuhkan Mahasiswa Untuk Berwirausaha (Studi Kasus Pada Mahasiswa STIE Pelita Nusantara Semarang). *Fokus Ekonomi*, 8(1), pp. 52- 59.
[32] Johnson, B. E. (2002). Contextual teaching and learning: why it is and why it is here to stay. California: Sage Publications Ltd.
[33] Katz J. A. (2003), The chronology and intellectual trajectory of American entrepreneurship education. *Journal of Business Venturing*, 18(2), pp.283-300.
[34] Katz, J., & Gartner, W. (1988) Properties of Emerging Organizations. *Journal of Academy of Management Review*, 13(3), pp.429-441.
[35] Kunandar. 2008. Guru Profesional Implementasi Kurikulum Tingkat Satuan Pendidikan (KTSP) dan Sukses dalam sertifikasi Guru. Jakarta: Pt Raja Grafindo Persada.
[36] Kuntowicaksono. (2012). Pengaruh Pengetahuan Wirausaha dan Kemampuan Memecahkan Masalah Wirausaha Terhadap Minat Berwirausaha Siswa Sekolah Menengah Kejuruan. *Jurnal of Economic Education,* 1(1), pp.45-52.

[37] Kuratko, D.F. dan Hodgetts R.M. (1998). Entrepreneurship; Contemporary Approach. Fort Worth: The Dryden Press.
[38] Kurnianti, Edy Dwi. 2015. Kewirausahaan Industri. Yogyakarta: Depublish.
[39] Krueger, N. (1993). The Impact of Prior Entrepreneurial Exposure on Perceptions of New Venture Feasibility and Desirability. *Entrepreneurial Theory Practice*, 18(1), pp.5–21.
[40] Lambing, Peggy A., & Kuehl, Charles R. (2007). Entrepreneurship. 4th Ed. New Jersey: Pearson Practice Hall.
[41] Lee, S.H. & Wong, P.K. (2004). An Exploratory Study of Technopreneurial Intentions: A Career Anchor Perspective. *Journal of Business Venturing*, 19(1), pp.7-28.
[42] Lindner, J. (2019). Entrepreneurial Spirit for the Whole School–Ways to Become an e.e.si-Entrepreneurship School. *Discourse and Communication for Sustainable Education*, *10*(2), pp.5-12.
[43] Muchtar, M. I. (2017). Contextual Teaching and Learning Method in Studying Arabic. *Hunafa: Jurnal Studia Islamika*, 14(1), pp.175-188.
[44] Nasaruddin, N., Salija, K., & Jafar, M. B. (2020). The Implementation of Contextual Teaching and Learning (CTL) in Learning English for Maritime in an Indonesian Maritime Polytechnic. Makassar: Universitas Negeri Makassar, Thesis.
[45] Nanako Kanno, Shingo Kato, Moriya Ohkuma, Motomu Matsui, Wataru Iwasaki,Shinsuke Shigeto Machine learning-assisted single-cell Raman fingerprinting for in situ andnondestructive classification of prokaryotes (2020) PII:S2589-0042(21)00943-3DOI:https://doi.org/10.1016/j.isci.2021.102975
[46] Nurhadi. 2003. Pembelajaran Kontekstual (Contextual Teaching and Learning) dan Penerapannya dalam KBK. Malang: UNM.
[47] Novitasyari, Wiwin., Setiawati, Tati., & Rahmawati, Yulia. (2017). Minat Berwirausaha Mahasiswa Program Studi Pendidikan Tata Boga Universitas Pendidikan Indonesia. *Media Pendidikan, Gizi dan Kuliner,* 6(2), pp.81-93.
[48] Patricia., & Silangen, Christian. (2016). The Effect of Entrepreneurship Education on Entrepreneurial Intention in Indonesia. *DeReMa Jurnal Manajemen*, 11(1), pp. 67-86.
[49] Pintrich, Paul R & Dale H. Schunk. 1996. Motivation in Education, Theory, Research, and Application. Ohio: Prentice-Hall.
[50] Putri, Ni Luh Wahyuni Widya. (2017). Pengaruh Pendidikan Kewirausahaan Terhadap Minat Mahasiswa Untuk Berwirausaha Pada Mahasiswa Pendidikan Ekonomi Universitas Pendidikan Ganesha. *Jurnal Pendidikan Ekonomi Undiksha*, 9(1), pp.137-148.
[51] Rahmadi, Afif Nur., & Heryanto, Budi. (2016). Analisis Faktor-Faktor yang Mempengaruhi Minat Berwirausaha Pada Mahasiswa Program Studi Manajemen Fakultas Ekonomi Universitas Kadiri. *Jurnal Ekonomi Universitas Kediri*, 1(2), pp.153-169.
[52] Santoso, D. (2013). Modul Pembelajaran Kewirausahaan. Jakarta: Direktorat Jenderal Pembelajaran dan Kemahasiswaan, Kementrian Pendidikan dan Kebudayaan.
[53] Saragih, Rintan. (2017). Membangun Usaha Kreatif, Inovatif, dan Bermanfaat Melalui Penerapan Kewirausahaan Sosial. *Jurnal Kewirausahaan,* 3(2), pp.26-34.
[54] Sari, Intan Kurnia., & Yunianta, Tri Nova Hasti. (2017). Upaya Meningkatkan Hasil Belajar Matematika Siswa Melalui Model Contextual Teaching and Learning dengan Media Cuisenaire Rods. *Scholaria: Jurnal Pendidikan dan Kebudayaan*, 7(2), pp.143-152.
[55] Sears, J. S. (2002). Contextual teaching and learning: a primer of effective instruction. USA: Phi Delta Kappa Educational Foundation.

[56] Semih Kuter, Completing the machine learning saga in fractional snow cover estimation from MODIS Terra reflectance data: Random forests versus support vector regression (2018) Remote Sensing of Environment
[57] Simanjuntak, M., Setiawan, Deny., & Matondang, Zulkifli. (2018). The Development of Authentic Assessment and Learning Models of Contextual Teaching and Learning (CTL) to Improve Learning Outcomes in Junior High School 3 Paranginan, Indonesia. *International Journal of Education, Learning, and Development,* 6(12), pp.79-91.
[58] Slameto, S. (2010). Belajar dan faktor yang mempengaruhinya. *Jakarta: Rineka Cipta*.
[59] Subandono, Aris. 2007. Minat Berwirausaha. Jakarta: Rajawali Pers.
[60] Suharyono. (2017). Sikap dan Perilaku Wirausahawan. *Jurnal Ilmu dan Budaya,* 40(56), pp.6551-6586.
[61] Sunarya, P. A., & Saefullah, A. (2011). Kewirausahaan. Penerbit Andi.
[62] Suparno, P. (2006). Teori Perkembangan Kognitif Jean Piaget. Yogyakarta: Kanisius.
[63] Suryana. (2003). Kewirausahaan Pedoman Praktis: Kiat dan Proses Menuju Sukses. Jakarta: Salemba Empat.
[64] Suryana, (2009). Kewirausahaan Pedoman Praktis Kiat dan Proses Mencari Menuju Sukses. Jakarta: Salemba Empat.
[65] Suryawati, Evi., & Osman, Kamisah. (2018). Contextual Learning: Innovative Approach Towards the Development of Student's Scientific Attitude and Natural Science Performance. *Eurasia Journal of Mathematics, Science and Technology Education,* 14(1), pp.61-76.
[66] Suyeon YooSungjin KimSeungjae KimBrent Byunghoon Kang, (2020) AI-HydRa: Advanced hybrid approach using random forestand deep learning for malware classification. Information Sciences 546 (2021) 420–435421
[67] Timmons, Jeffry A. & Spinelli, S., Jr. (2008). New Venture Creation. Kewirausahaan untuk Abad 21. Yogyakarta: Andi. (Buku asli New Venture Creation: Entrepreneurship for the 21st Century 6th ed.)
[68] Trianto. (2007). Model-Model Pembelajaran Inovatif Berorientasi Konstruktivistik. Jakarta. Prestasi Pustaka.
[69] Wahyono, Budi. (2013). Pengaruh Pendidikan Kewirausahaan terhadap Niat Berwirausaha Siswa SMK N 1 Medan Tahun 2013. Solo: Tesis Universitas Sebelas Maret Surakarta.
[70] Wahyuni, E. S. (2013). The Application of Contextual Teaching Learning Using React In Speaking Practices for Business English Class. Magister Scientiae.
[71] Widayati, Enny., Yunaz, Hazwan., Rambe, Tagor., Siregar, B. Wishman., Fauzi, Achmad & Romli. (2019). Pengembangan Kewirausahaan dengan Menciptakan Wirausaha Baru dan Mandiri. *Jurnal Ilmiah Manajemen Bisnis dan Inovasi Universitas Sam Ratulangi,* 6(2), pp.98-105
[72] Widnyana, I Wayan., Widyawati, Sapta Rini., & Warmana, G. O. (2018). Pengaruh Pemberian Mata Kuliah Kewirausahaan dan Pelatihan Wirausaha Terhadap Minat Wirausaha Ekonomi Kreatif Pada Mahasiswa UNMAS Denpasar. *Jurnal Bakti Masyarakat Indonesia*, 1(1), pp.171-177.
[73] Winarti. (2015). Contextual Teaching and Learning (CTL) Untuk Meningkatkan Kemampuan Berpikir Kreatif Siswa. *JPFK,* 1(1), pp.1-8.
[74] Wuisang, J. R. R. (2019). Contextual Approaches in Kaiwa Learning (Speaking) Japanese Language. *Journal of Educational Method and Technology,* 2(1), pp.1-14.
[75] Xuebin Yuea, Hengyi Lia, Kenshi Sahob, Kazuki Uemurab, Aravinda C Vc, Lin Menga, Machine Learning based Apathy Classification on Doppler RadarImage for the

Elderly Person (2020) International Conference on Identification, Information and Knowledge in the internet of Things

[76] Yanto. (1996). Peluang Kerja dan Minat Berwirausaha di Kalangan Siswa Sekolah Teknologi Menengah Negeri Pembangunan Pekalongan (Laporan Penelitian). Semarang: IKIP Semarang.

[77] Yulianingsih, I. P. (2013). Hubungan Pengetahuan Kewirausahaan dan Persepsi Peluang Kerja di bidang Akuntansi dengan Minat Berwirausaha. *Jupe-Jurnal Pendidikan Ekonomi*, *2*(1).

[78] Y Suprapto, A Setiawan, et al (2020) The Role of Information Technology Knowledge and Online Learning on Learning Environmental Changes in Vocational Education. Third International Conference on Vocational Education and Electrical

[79] Y Suprapto, A Setiawan, et al (2020) Design And Implementation Of Self-Test Learning Application To Increase Competence. International Joint Conference On Arts And Humanities (Ijcah 2020), 381-384

[80] Zimmerer, Thomas W., & Scarborough, Norman M. (2008). Kewirausahaan dan Manajemen Usaha Kecil. Jakarta: Salemba Empat.