

Development of Professional Ethics Assessment Instruments for Electrical Installation Operators

S A Akmal¹

Electrical Engineering Education Department
Universitas Negeri Yogyakarta
Yogyakarta, Indonesia
tiwanakmal@gmail.com

Haryanto²

Electrical Engineering Education Department
Universitas Negeri Yogyakarta
Yogyakarta, Indonesia
haryanto@uny.ac.id

Abstract—This study aims: (1) to develop a professional ethics assessment instrument model of the appropriate electrical installation operator to measure the electrical installation operators ethics for Senior Vocational School graduates(SMK), (2) to examine the quality of professional ethics assessment instruments for SMK graduates of electrical installation operators, and (3) to examine the feasibility of the professional installation ethics assessment instrument for SMK Graduates of electrical installation operators. It is a Research & Development that used 4-D development model integrated with the non-test development model. The subjects of product trial were 3 supervisors, 7 electrical installation operators of CV Utilindo Perkasa, 9 electrical installation operators of CV Global Techindo, and 7 electrical installation operators of CV Muda Karya Sejahtera. The research data was obtained through observation sheets, non-cognitive test questionnaire sheets, validation questionnaire sheets, and expert responses sheets. Data analysis technique used the V'Aiken's formula and the ICC (Interclass Correlation Coefficient). The results of this study could be known: (1) observation sheet and non-cognitive test questionnaire sheet,(2) The observation sheet produced was valid and reliable. The non-cognitive test questionnaire sheets produced was valid but not reliable, (3) the function of the professional ethics assessment instrument produced was in a good category. Ethics of electrical installation operators that were considered included in the good category.

Keywords: *assessment, electrical installation operators*

I. INTRODUCTION

Electricity workers when conducting electrical installations are still of low quality in Indonesia. In addition to the low level of education of workers in Indonesia as the main cause, this also affects the instruments of work quality in Indonesia which have not been appropriately assessed in terms of the quality of labor in Indonesia that cannot be carried out optimally. Standard and appropriate assessment instruments must meet the requirements in substance that they can concentrate the competencies assessed [27]. Meanwhile, the current era of global competition requires every country in the world to be able to prepare a competent workforce that can compete in the world of work, so an assessment tool is needed which is used as an effort to encourage the quality of labor in Indonesia in general and in the electricity sector in particular.

Electricity workers while working on a high-rise building electrical installation project in Yogyakarta are still unable to compete when compared to electricity workers in other

provinces in Indonesia. The competitiveness of the electricity workforce in Yogyakarta is still unable to compete when compared to the electricity workers from the provinces of DKI Jakarta, East Java, Central Java, West Java, Banten and Bali [27]. The data shows that the quality of the competitiveness of the electricity workforce in Yogyakarta needs to be improved. Based on this, efforts to improve the quality of the electricity workforce in Yogyakarta can be pursued through the use of assessment instruments that can measure labor quality appropriately.

So far there have not been many ethical related assessment instruments. Many assessments have led to cognitive aspects only, so there have not been many instruments regarding ethical assessment. This shows that the instrument of valuation about ethics is not considered too important, whereas ethics leads to one's ability to take action. In other words, ethics as a form of one's practical activity in making decisions that are vital in how he chooses to live and act [5]. Based on this explanation, it is known that ethics plays an important role in making decisions when working or acting.

The World of Industry and Business World (DUDI) currently desperately needs and prioritizes a worker who has good ethics. DUDI not only requires workers who have hard skills, but more importantly and who are preferred are those who are disciplined with time, responsible, have morals in words and deeds, work safely, care for others and work, and are committed to work and in keeping promises [24]. Based on this, the development of assessment instruments related to ethics needs to be done because DUDI is currently prioritizing and in desperate need of workers who have good ethics.

One effort can be made to overcome this problem through an assessment. the assessment carried out was related to the discipline and commitment of the electrical installation operators because this was an effort to improve the professionalism of the operators of the electrical installation in working in the field.

The electricity installation operator while working in the field is still indifferent to safety. This is an indicator of the safety and health awareness of the operators of electrical installation is still low. This problem is of course very risky and endangers personal safety and the environment. The purpose of occupational safety and health as an effort to ensure the safety and health of workers from the risk of

accidents, reduce or eliminate the risk of damage to the work environment [7].

Data from the Managing Agency for Social Security (PBJS) in 2015 recorded 105,182 cases of work accident, and as many as 2,375 severe cases which resulted in the death of a total number of cases of work accident [18]. The data shows that the number of work accidents in Indonesia is still high so this event needs to be a major concern because it works not only about completing work but also how to work safely.

Satori (2002: 79) states that life skills are abilities that a person needs throughout life, ownership of complex thinking skills, effective communication skills, ability to build cooperation, having readiness and ability to work so that he is able to compete where he will live and stay [21]. Related to the scope that must be mastered by someone in life skills, Anwar (2006: 29-30) suggests that there are several coverage of life skills, namely: (1) personal skills that include self-awareness skills and rational skills, namely self-realization as being God Almighty, members of society and citizens, and be aware and grateful for their strengths and weaknesses, as well as making it capital in improving themselves as individuals who benefit themselves and the environment, and skills in processing information and making decisions and solving problems creatively, (2) social skills (social skills), namely individual skills in interacting, communicating, and working with the community or the environment to conduct reciprocal activities and find solutions to problems that occur in the community and the environment, (3) academic skills (academic skills) that is the ability to be scientific thinking, and (4) vocational skills or vocational skills which are generally applied in Vocational High School (SMK) [1].

Samani (2004: 86) states that a person's life skills consist of several details, namely: (1) communication (communication), (2) critical thinking (critical thinking), (3) creativity (creativity), (4) collaboration (collaboration), (5) information technology skills (information technology skills), (6) counting (numeracy), (7) decision making and problem solving (decision making and problem solving), (8) self management, (9) learning skills (study skills), (10) perseverance, (11) interpersonal relationship skills (interpersonal relationship skills), (12) responsibility, (13) national identity (national identity), (14) commitment (Commitment), (15) self awareness, (16) empathy (empathy) [20].

Haji, Mohammadkhani & Hahtami (2011: 408) states that a person's life skills consist of several skills, namely: (1) effective communication skills, (2) good interpersonal relationship skills, (3) decision-making abilities, (4) problem solving skills, (5) creative thinking skills, (6) problem solving skills, (7) critical thinking skills, (8) ability to realize yourself, (9) ability to have good empathy with others, (10) ability to regulate emotions, and (11) and the ability to deal with stress [9].

Further said by the Ministry of National Education BBE Team (2002) the five pillars are categorized again into two parts, namely general life skills, namely self-knowledge skills, rational thinking, and social skills. Whereas academic skills and vocational skills are categorized into specific life skills. Similar thing also said by Rachman (2009: 21) that life skills in general can be divided into two main types, namely: (1) generic life skills (generic life skills), which includes personal skills (personal skills) including self-awareness or self

awareness and thinking skills, while social skills include communication skills (communication skills) and collaboration skills (collaboration skills), (2) specific life skills (specific life skills), namely skills to deal with work or certain conditions, which include academic skills or intellectual skills related to the field of work that require more thought, and vocational skills related to the field of work that require more motor skills.

More specifically said by Rachman (2009: 21) that life skills aim namely: (1) empowering assets of inner qualities, attitudes, and physical actions of a person through introduction (logos), appreciation (ethos), and practice (patos) of the value of daily life - days so that they can be used to maintain their survival and development, (2) provide extensive insight into career development, starting from self-introduction, career exploration, career orientation, and career preparation, (3) providing basic provisions and exercises carried out correctly regarding the values of everyday life that can enable a person to function in facing future life full of competition and collaboration, (4) optimizing the use of human resources by encouraging increased independence, (5) facilitating someone in solving life problems faced daily.

Robinson, Dixon, Preece, & Moodley (2007: 25) state that ethics is something that is related to wrong and right in human behavior and what rules or principles govern it. Meanwhile, Sunar & Tabancali (2012: 2458) said that ethics is a philosophical discipline containing values and rules that underlie a person's individual or social relationships in terms of good or bad things. The same thing was also conveyed by Naagarazan (2006: 5) that ethics is a word that refers to the moral, values, and beliefs of individuals, families or communities.

Meanwhile, Arsana (2016: 30) says that ethics is the study of good and bad deeds, right and wrong based on human nature that is instilled in his will so that humans will try to find the most appropriate principles in behaving and acting so that they are happy like respecting people old, hang out and talk politely, say and do honest. In line with this, Armaeni (2015: 42) says that ethics is essentially a life view and guidance on how someone behaves and ethics comes from human consciousness which is a clue about which actions are good and which are bad.

Keraf (2010: 20-21) says that there are two types of ethics that must be understood to determine the good and bad of human behavior, namely: (1) descriptive ethics, namely ethics that tries to explore critically and rationally human attitudes and behavior and what is pursued by humans in this life as something of value. Descriptive ethics provides facts as a basis for making decisions about attitudes or attitudes to be taken, (2) normative ethics namely ethics that seek to establish various attitudes and ideal behavior patterns that humans should have in life as something of value. Normative ethics assesses and gives norms as the basis and framework for action to be decided.

Professional ethics is closely related to professional attitudes and attitudes and professionalism. As Armeni (2015: 43) says that professional ethics is a way of life in the form of justice to provide professional services to the community with full order and expertise as a service in the context of carrying out duties in the form of obligations to the community. Farahani & Farahani (2014: 2085) said that professional ethics is clearly defined as a set of moral codes and rules of practice

of professional rules. Professional ethics is closely related to professional and professional attitudes and attitudes. Professional identity shows a professional code of ethics that must be maintained by a professional. As said by Van de Poel & Royakkers (2011: 69) that a professional code of ethics requires a professional to be responsible to the moral norms and values of the profession he pursues. Furthermore Van de Poel & Royakkers (2011: 70) says that most modern professional codes of ethics are divided into three domains: (1) doing a profession with integrity, honesty that is not manipulating facts and still respecting agreements that have been made, and carried out with competent way, (2) obliged to clients or service users, namely avoiding conflicts of interest, and (3) being responsible for the public or society. Ethics plays an important role in showing the quality of a professional so that it must be owned by every professional. As stated by Robinson, Dixon, Preece, & Moodley (2007: 73) that professional operators need at least six self quality factors, namely: (1) integrity, namely openness and honesty to oneself and others, (2) independence which is free from interests secondary with other parties, (3) impartiality that is free from unbalanced interests bias, (4) responsibility, namely recognition and acceptance of personal commitments, (5) wisdom that is concerned with communication and trust.

In addition, Bovens (1998: 27) says that a professional operator should have professional responsibility, namely responsibility based on one's role as a professional operator insofar as he remains within the limits of what is morally permissible, and pays attention to active responsibility, namely responsibility before something happens that refers to the task, caring for the situation, or certain parties. Furthermore, it is said that active responsibility consists of: (1) adequate perceptions of norm violations, (2) considering the consequences of each violation, (3) autonomy namely having the ability to make moral decisions independently, (4) displaying behavior based on code that is verifiable, and consistent.

On the other hand, Harris (1998: 7) says that operators in the field must be able to adjust to several things, namely: (1) refusing to engage in direct or intentional danger, (2) not participating in adverse technology implementation, (3) participating only in constructive technology, and (4) not participating in human rights violations. Meanwhile, Ngang & Chan (2015: 9) said that soft skills are quality and relevant skills lead to effective job performance. The same thing was said by Ngang, Hasim & Yunus (2015: 285) that soft skills show an indicator of the quality of one's work performance. Furthermore said Ngang & Chan (2015: 9) at least someone has some soft skills at work, namely: (1) communicative skills, (2) critical thinking and problem solving skills, (3) work skills in teams, (4) lifelong learning and information management, and (5) entrepreneurial skills.

Suryanto, Kamdi & Sutrisno (2013: 112-113) said that the ethics of operators or workers who are needed by the industrial world are: (1) communication skills, (2) honesty and good behavior, (3) having a sense of responsibility, (4) time discipline, (5) working safely, (6) having commitment in keeping promises, (7) ability to manage communication, (8) being polite and good in communication and actions, (9) being able to manage themselves with both at work, (10) respect for the older, (11) caring for others, (11) caring for work, and (12) easy to receive input.

Meanwhile, different views expressed Ariratana, Sirisookslip & Ngang (2015: 332) that the main skills needed by humans in the 21st century are: (1) the ability to create innovation, (2) problem solving skills, (2) communication and cooperation, (3) creative thinking, (4) critical thinking, (5) leadership skills, and (6) responsibility.

Based on the data and reality described above, research is needed on the development of instruments for evaluating the professional ethics of electricity plant operators in the form of efforts to improve the quality and professionalism of Indonesian workers.

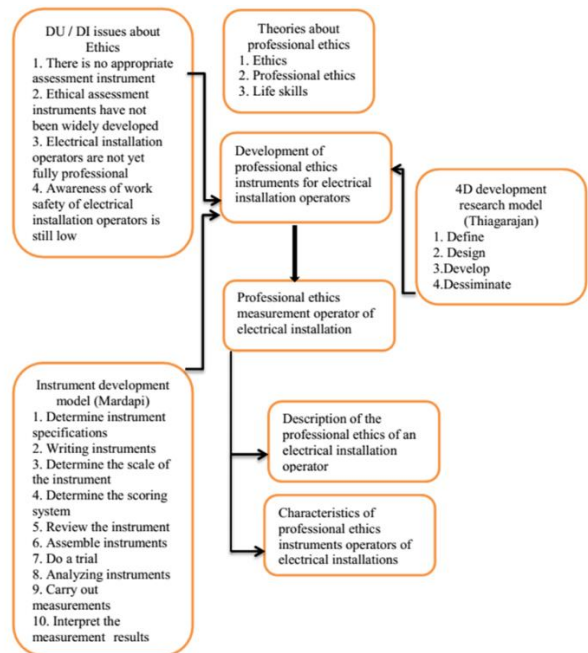


Figure 1. Research Framework

II. METHODOLOGY

A. Research Design

This type of this research is a research and development. The development model used in this study adopted the 4D model proposed by Thiagarajan (1974: 10-11) which was integrated with the non-test development model. The development of the 4D model has four steps: (1) define, (2) design, (3) develop, (4) design. Model development of Mardapi's non cognitive test instrument (2012: 110-130). consists of: (1) determining instrument specifications, (2) writing instruments, (3) determining instrument scales, (4) determining scoring systems, (5) reviewing instruments, (6) assembling instruments, (7) conducting trials, (8) analyzing instruments, (9) carrying out measurements, (10) interpreting measurement results.

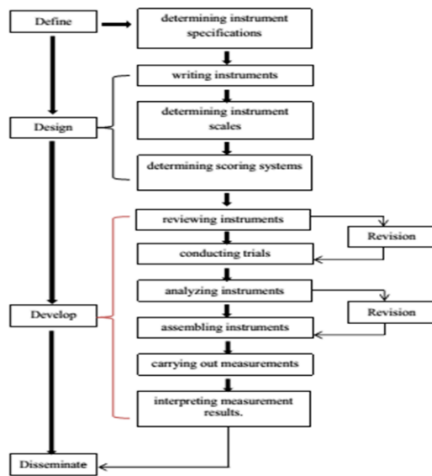


Figure 2. Development Model

B. Techniques and Data Collection Instruments

Data collection techniques in this research used observation, observation sheets, non cognitive test questionnaire sheets, validation questionnaire sheets, and expert response questionnaire sheets. Observations were used to find out what was done by the operator of the electrical installation at work, the observation sheet and non cognitive test questionnaire sheets were used to assess the electrical installation operator's attitude or ethics while working, while the validation questionnaire sheets and response questionnaire sheets were used to determine product validity, and the functionality of the product developed. The collection instruments in this study were observation, observation sheets, non cognitive test questionnaire sheets, validation questionnaire sheets, and expert response questionnaire sheets.

C. Data Analysis Technique

This research has been tested for validity and reliability. The data obtained were analyzed using the Aiken's formula and using the ICC (Interclass Correlation Coefficient) technique by looking at the Cronbach's Alpha index. The procedure for this analysis involves collecting first trial data, second trial, and operational field trials. The quantitative data obtained are then qualified to describe the quantitative data obtained so that the meaning of the data obtained is known.

III. RESULTS AND DISCUSSION

The model of the assessment instrument for professional ethics of electrical installation operators produced in this research was in the form of an observation sheet, and a non cognitive test questionnaire sheet. The construction of a professional ethics assessment instrument produced by an electrical installation operator has a statement sentence that is free from uncertain sentences, uses straightforward sentences, and has clear instructions for filling in each item of the statement. Construction of substance or material for professional ethics assessment instruments operators of electrical installations produced have statements that are in accordance with the indicators. The construction of the language of the instrument for assessment of the professional ethics of the electrical installation operator produced has a

language that is in accordance with EYD, the statement sentence in it does not contain or cause multiple interpretations, and the sentence used is clear and easy to understand.

The professional ethics assessment of the electrical installation operator using the observation sheet was measured through three aspects, namely: (1) the first aspect was the aspect of responsibility covering sub-aspects of caring for the work with indicators maintaining work reputation; (2) The second aspect is interpersonal covering sub-aspects of collaborating with indicators able to organize themselves well in working with coworkers; (3) The third aspect is integrity, including sub-aspects of communication with indicators having the ability to manage good communication.

Meanwhile, the professional ethics assessment of the electrical installation operator using a non cognitive test questionnaire sheet was measured through three aspects, namely: (1) the first aspect is the aspect of responsibility covering the work concern with the first indicator is carrying out work in accordance with the SOP, and the second indicator is maintaining reputation or work; (2) The second aspect is interpersonal includes the first sub-aspect is to communicate with indicators have the ability to manage good communication, the second sub-aspect is to work with indicators to be able to organize themselves in working between colleagues, and the third sub-aspect is empathy with indicators of mutual assistance between colleagues; (3) The third aspect is integrity covering the first sub-aspect is honesty with indicators expressing the actual facts, and the second sub-aspect is openness with indicators that are easy to accept inputs or suggestions.

The observation sheet produced was valid and reliable with a V'Aiken value of 0.83-0.92, and the Cronbach's Alpha value was 0.74. While the non-cognitive test questionnaire produced was valid but not reliable with V'Aiken's score of 0.75-0.92, and Cronbach's Alpha value was 0.69. Jhonson & Chrostensen (2012: 78) states that an instrument is said to be reliable if the value of Cronbach's Alpha is equal to or greater than 0.70.

Table 1. Results of V 'Aiken Values Observation sheets of the Dimensional Accuracy of Aspects

Items	Value of V'Aiken	Information
1	0.83	High Validity
2	0.83	High Validity
3	0.83	High Validity
4	0.83	High Validity
5	0.83	High Validity
6	0.92	High Validity
7	0.83	High Validity
8	0.92	High Validity
9	0.83	High Validity
10	0.83	High Validity
11	0.92	High Validity

Tabel 2. V'Aiken Value Results Observation Sheet Accuracy of Points to Dimensions

Items	Value of V'Aiken	Information
1	0.83	High Validity
2	0.83	High Validity
3	0.83	High Validity
4	0.83	High Validity
5	0.83	High Validity
6	0.92	High Validity
7	0.83	High Validity
8	0.92	High Validity
9	0.83	High Validity
10	0.83	High Validity
11	0.92	High Validity

Tabel 3. Results of Reliability Analysis Sheet Observation of Field Operations

Cronbach's Alpha	Items
0,74	11

Tabel 4. V'Aiken Value Results Non-Cognitive Test Questionnaire Sheet Dimensional Accuracy to Aspects

Items	Value of V'Aiken	Information
1	0.83	High Validity
2	0.83	High Validity
3	0.75	Moderate Validity
4	0.75	Moderate Validity
5	0.83	High Validity
6	0.83	High Validity
7	0.83	High Validity
8	0.83	High Validity
9	0.92	High Validity
10	0.83	High Validity

Tabel 5. Values of V'Aiken Non-Cognitive Test Questionnaire Sheet Accuracy of items to Dimensions

Items	Value of V'Aiken	Information
1	0.83	High Validity
2	0.83	High Validity
3	0.75	Moderate Validity
4	0.75	Moderate Validity
5	0.83	High Validity

6	0.83	High Validity
7	0.83	High Validity
8	0.83	High Validity
9	0.92	High Validity
10	0.83	High Validity

Tabel 6. Reliability Analysis Results of the Field Operational Test Non-Cognitive Test Questionnaire Sheet

Cronbach's Alpha	Items
0,69	10

IV. CONCLUSION AND SUGGESTION

A. Conclusion

The conclusions of this research were

1) The model of professional ethics assessment instruments produced in the form of observation sheets and
2) non-cognitive questionnaire test sheets. The construction aspect that is produced has a statement that is free from uncertain sentences, uses straightforward sentences, and has clear instructions for filling in each item. Substance construction aspects or the material produced has a statement in accordance with the indicator. The aspect of language construction produced has a language that is in accordance with EYD, the sentence in it does not contain or cause multiple interpretations, and the sentence used is clear and easy to understand.

3) The quality of the resulting observation sheet is stated to have good quality with a V'Aiken value of 0.75-0.92, and a Cronbach's Alpha value of 0.74. The non-cognitive questionnaire test sheets produced have not been declared to have good quality. The results of the V'Aiken score of the non-cognitive test questionnaire showed that the acquisition of the V'Aiken score was 0.75 to 0.92, while for the Cronbach's Alpha value from the non-cognitive questionnaire test sheet showed a value of 0.69.

B. Suggestion

The suggestion of the researcher for the utilization of the product of the professional ethics assessment instrument for the operator of the electrical installation in the form of an observation sheet and a non cognitive test questionnaire sheet is as follows:

1) The final product of a professional ethics assessment instrument for an electrical installation operator can be used to assess the ethics of electrical installation operators when working or completing a project as a means to evaluate and improve the quality of the workforce owned by a contracting company.

2) The final product evaluation instrument for professional ethics of electrical installation operators can be maximally used to assess the ethics of electrical installation operators when used in work or project conditions under the main contractor who strictly applies the Occupational Health and Safety regulations.

REFERENCES

- [1] Anwar. (2006). Pendidikan Kecakapan Hidup. Bandung: Alfabeta Bandung.
- [2] Ariratatana, W., Sirisookslip, S., Ngang, T.K. (2015). Development of Leadership Soft Skills Among Educational Administrators. *Social Behavioral Sciences Journal*. 186. 331-336. Retrived from <https://reader.elsevier.com/reader/sd/pii/S1877042815022764?token>
- [3] Armaeni, N.K. (2015). Kajian Etika Profesi Keinsinyuran Sipil. *Jurnal PADUKARSA*. 4(2). 2303-2693.
- [4] Arsana, I. P.J. (2016). Etika Profesi Insinyur. Yogyakarta: Deepublish.
- [5] Bovens, M. (1998). The Quest for Responsibility Accountability and Citizenship in Complex Organization. Cambridge: Cambridge University Press.
- [6] Bowen, W.R. (2009). Engineering Ethics Otlne of an Aspirational Approach. London: Springer-Verlag London Limited.
- [7] Cecep, T., & Mitha, E. (2013). Kesehatan Lingkungan dan K3. Yogyakarta: Nuha Medika.
- [8] Farahani, M.F., Farahani, F.F. (2014). The study Professional Ethics Components Among Faculty Members in The Engineering. *Social and Behavioral Sciences Journal*. 116. 2085-2089. Retrived from <https://reader.elsevier.com/reader/sd/pii/S1877042814005412?token>
- [9] Haji, T.M, Mohammadkhani, S., & Hahtami, M. (2011). The Effectvness of Life Skills Training on Happeeines, Quality of Life and Emotion Regulation. *Social and Behavioral Sciences Journal*. 30. 407-411. Retrived from <https://www.sciencedirect.com/science/article/pii/S1877042811019057>.
- [10] Harris, C.E., Pritchard, M. S., & Rabins, M. J. (2009). Engginering Ethic Concept and Cases. (4th ed.). USA: Wadsworth.
- [11] Harris, C.E.(1998). Enginerring Responsinilities in Lesser-Developed Nations: The Welfare Requirment. *Science and Engineering Ethic*, 4, 321-331.
- [12] Jhonson, B., & Christensen, L. (2012). Educational Research Quantitative, Qualitative, and Mixed Approaches. Thousand Oaks: Sage Publisher.
- [13] Keraf, A.S. (2010). Etika Lingkungan Hidup. Jakarta: Kompas.
- [14] Mardapi, D. (2012). Pengukuran Penilaian & Evaluasi Pendidikan. Yogyakarta: Nuha Litera.
- [15] Ngang, T.K., Chan, T.T. (2015). The Important of Ethics, Moral dan Professional Skills of Novice Teachers. *Social and Behavioral Sciences Journal*. 205. 8-12. Retrived from <https://reader.elsevier.com/reader/sd/pii/S1877042813034770?token>
- [16] Ngang, T.K., Hashim, N.H., & Yunus, H.M. (2015). Novice Teacher Perceptions of the Soft Skills Needed in Today's Workplace. *Social and Behavioral Sciences Journal*. 177. 284-288. Retrived from <https://reader.elsevier.com/reader/sd/pii/S1877042815016924?token>
- [17] Rachman, H.A. (2009). Dimensi Kecakapan Hidup (Life Skill) Dalam Pembelajaran Pendidikan Jasmani. *Jurnal Pendidikan Jasmani Indonesia*, 62.
- [18] Ramadhiani, H. (2016). Kecelakaan Kerja di Indonesia Tercatat 105.182 Kasus. Retrived from <https://properti.kompas.com/read/2016/11/09/154736121/kecelakaan.kerja.di.indonesia.tercatat.105.182.kasus>
- [19] Robinson, S., Dixon, R., Preece, C., & Moodley, K. (2007). Engineering, Business and Professional Ethics. British: Heinemann Publications.
- [20] Samani, M. (2004). Kecakapan Hidup Melalui Pendidikan Berbasis Luas. Surabaya: Swa Bina Qualita Indonesia.
- [21] Satori, D. (2002). Implementasi Life Skill dalam Konteks Pendidikan di Sekolah. Artikel Jurnal Pendidikan dan Kebudayaan. Jakarta: Balitbang Depdiknas.
- [22] Sunar, O.B., Tabancali, E. (2012). Ethic Behaviours of Schools Administrations. *Social and Behavioral Sciences Journal*. 46. 2457-2461. Retrieved from <https://reader.elsevier.com/reader/sd/pii/S187704281201631X?token>
- [23] Suryanto, D., Kamdi, W., & Sutrisno. (2013). Relevansi Soft Skill yang Dibutuhkan Dunia Usaha/Industri dengan yang Dibelajarkan di Sekolah Menengah Kejuruan. *Jurnal Teknologi dan Kejuruan*, 36(2), 107-118. Retrieved from <http://journal.um.ac.id/index.php/teknologi-kejuruan/article/view/3811>
- [24] Theopelussat, T. (2016) . Kemampuan Soft Skill Bagi Siswa SMK Perlu Ditingkatkan. Retrived from <http://www.muhammdiyah.or.id/news-6087-detail-kemampuan-soft-skill-bagi-siswa-smk-perlu-ditingkatkan.html>
- [25] Thiagarajan, et al. (1974). Instructional Development for Training Teacher of Exeptional Children. Minesota: Indiana University.
- [26] Tim Broad Based Education. (2002). Konsep Pendidikan Berorientasi Kecakapan Hidup. Jakarta: Depdiknas.
- [27] Tricahyanto, I. (2017). DIY Masih Kalah Saing. Retrived from <http://www.apindodiy.co.id/diy-masih-kalah-saing.html>.