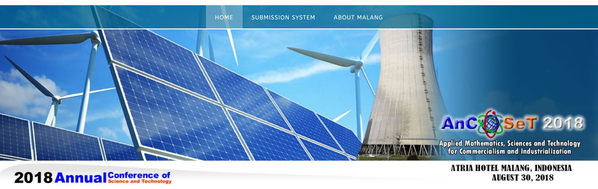

2018 Annual Conference of Science and Technology

ATRIA HOTEL MALANG, INDONESIA
AUGUST 30, 2018

The Proceeding of Annual Conference of Science and Technology 2018 is already available in IOP Journal of Physics: Conference Series Digital Library

Dear colleagues,

We are happy to inform you that the Proceeding of Annual Conference of Science and Technology 2018 is already available in IOP Journal of Physics: Conference Series Digital Library, and you can access it by clicking this Link:

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This proceeding is now in the middle of indexing process to SCOPUS by the publisher (IOP). We really hope that this process will be fast.

Thank you and have a great day.

Regards,

Invited Speakers

Selected papers will be published in Internationally indexed publishers i.e, Scopus and Thomson Reuters. All articles published will get Digital Object Identifier (DOI).

Background

One way to accomplish its internationalization programs, Universitas Kanjuruhan Malang hosts international conferences with prominent speakers. Its first conference, Universitas Kanjuruhan International Conference on Education and Social Sciences (UK-ICESS), was held on November 9-10, 2016. This conference was attended by lecturers, researchers, and practitioners within the fields of education and social sciences across Indonesia and overseas. Universitas Kanjuruhan Malang also hosted Annual Conference on Social Sciences and Humanities (ANCOSH) on April 24, 2018 with its thought-provoking theme "Revitalization of Local Wisdom in Global and Competitive Era". The upcoming conference is Annual Conference on Science and Technology (ANCOSET) that will be held on August 30, 2018 with the theme "Applied Mathematics, Science, and Technology for Commercialization and Industrialization". This conference offers a forum for intellectual propositions and academic discussions on how science and technology could result in social prosperity through commercialization and industrialization. Therefore, this conference welcomes researchers, scientists, engineers, practitioners, lecturers, and students to share and to discuss their insightful and innovative ideas on applied mathematics, science and technology.

Conference Scope

1. Mathematics
2. Physics
3. Computer Science
4. Material Science
5. Chemistry
6. Biology
7. Pharmacology
8. Sport Science and Technology
9. Management Science
10. Mechanical Engineering
11. Chemical Engineering
12. Civil Engineering
13. Electrical Engineering
14. Electronics Engineering
15. Material Engineering
16. Environmental Engineering
17. Industry Engineering
18. Information Engineering
19. Computer and Communication Engineering
20. Architecture

Venue and Activities

Atria Hotel & Conference Malang
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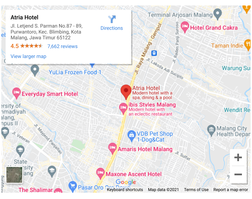

Important Dates

- Abstract Submission Deadline: ~~**30 June 2018**~~, Extended to **16 July 2018**
- Notification of Abstract Acceptance: ~~**13 July 2018**~~, Extended to **23 July 2018**
- Payment Deadline: **15 August 2018**
- Full paper submission Deadline: **29 August 2018**
- Coaching Clinic: **29 August 2018**
- Conference Date: **30 August 2018**

Publication

Publication: **Indexed by:**

Full papers submitted to the conference will be peer reviewed. Authors are requested to submit abstract to the Organizing Committee by **July 16, 2018**. The abstract is maximum 200 words and should consist of the following: aim of study, method used, result, and implication. The papers should be written in English and must be between 4 to 8 pages.

Abstract and Paper Submission

(**IMPORTANT**) To submit an abstract, authors must register first (click here). Then they can submit their abstracts by logging in to this site (menu "Submission System" then "Login"). The manuscript (full paper) can be submitted only after authors submit their abstracts. The whole submission process is done fully online (**NOT by email**) to guarantee smooth administration. Letter of Acceptance (LoA) and Letter of Invitation (LoI) can be downloaded directly from your account once your abstract is accepted to be presented at the conference.

Registration Fee and Payment

- Indonesian Presenter: **IDR. 2,250,000/presenter**
- Indonesian Participant: **IDR. 1,000,000**
- International Presenter and participant: **USD. 300/presenter**

Please do bank transfer for the registration fee to:

- Bank Name: **Bank Negara Indonesia, Branch Malang, Indonesia**
- Swift/ BIC: **BNINIDJAMLG**
- Account Number: **0100403813**
- Account Holder: **Ati Retno Sari**

(**IMPORTANT**) After making the payment, author **MUST** upload the transfer proof via this website (**NOT Email**). Author can upload by logging in to our submission system. Payment receipt can be downloaded directly from your account once your payment is confirmed by the committee.

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Preface

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Preface

One of factors that influences the growth of industry is the rapid and advanced enhancement of research on science and technology. There is a wealth of opportunities for science in industry, government, and in areas of applied science. This conference offers a forum for intellectual propositions and academic discussions on how science and technology could result in social prosperity through commercialization and industrialization.

Annual Conference of Science and Technology (Ancoset) was held by Universitas Kanjuruhan Malang. The conference aimed at showcasing the latest technological research and providing a forum in which to discuss insightful and innovative ideas on mathematics and science practice as well as facilitating debate, networking and professional development opportunities. The conference was conducted in Malang, Indonesia on August, 30th, 2018, and attended by more than 150 participants from mathematics, science and technology enthusiasts.

Five experts from Australia, Thailand, Malaysia and Indonesia contributed to give their knowledge and experiences on relevant themes. Audience came from several countries such as Indonesia, Malaysia and Australia. More than 130 papers were presented in the conference. With respect to more than 100 papers selected. The Ancoset committee herewith would congratulate the authors whose papers were published in this conference series. The committee hopes that all the findings and knowledge shared in this venture give beneficial impacts on the quality of mathematics and science.

The Editors
Dr. Ade Gafar Abdullah
Dr. Asep Bayu Dani Nandiyanto
Dr. Enike Dwi Kusumawati, S.Pt., M.P.
Riza Weganofa, M.Pd

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Technology transfer program for SMEs in Indonesia

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Technology transfer program for SMEs in Indonesia

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Abstract. Technology transfer is a way to improve technology capability, especially for Small to Medium Enterprises (SMEs) in Emerging Economies such as in Indonesia. SMEs are often thought to have insufficient resources for advancing their in-house technology development. Therefore, SMEs need technology transfer programs to increase their technology capability. Government, Business, Universities have been involved in technology transfer program in this country. Using data from about 200 Javanese metal-based SMEs, this paper discovers the technology transfer program from Government, Business, Universities in advancing the SMEs technology capability in Indonesia. The results show that substantial numbers of small to medium enterprises are actively involved in technology transfer programs.

1. Introduction

Nowadays, Small to medium enterprises (SMEs) in Indonesia are faced with a significantly complex rapid technological evolution, globalization and advanced competitors [1]. SMEs that are involved in this environment must develop their performance in order to survive in the global marketplace [2]. In this situation, SMEs are pushed to be able to reach a rapid response capability to provide goods or services for customer needs. In this environment, creating and maintaining competitive advantage through technology transfer has occurred widely [1-6]. The aim of this study is to discover the application of technology transfer program in Indonesia. The success of any program that seeks to achieve a transfer of technology has a crucial dependency on external resources such as the transferor and the program itself.

2. Requirement for technology transfer

Technical sustainability facilitates technology adaptation and technology innovation within the SME [7-11]. If successful, this process can then be repeated as needed within the SME. In this way, the technical learning process is being completed in a sustainable manner. Moreover, the learning process itself will provide a guide to sustainable technology transfer with which it is possible to create self-sustaining technology development. This is the opposite of the neoclassic economic assertion that considers technology as an exogenous factor for developing countries, where an imported technology remains unexplained to the human user [12].

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New technology that improves the long-term capability of a company is likely to encourage on-going knowledge and technology transfer. However, it is also important that firms observe increased competitiveness or profitability if the owners of SMEs are to support future uptake of knowledge and technology transfer. Since there may be several sources of motivation, it is necessary for these to be included in the construction of a model for sustainable technology transfer.

3. Methodology and Data

Fieldwork were conducted for this research to gain initial information about target areas of Central Java and East Java. The fieldwork completed a survey to collect detailed data from more than 200 respondents. Face-to-face interviews with SMEs are conducted.

3.1. Knowledge and technology transfer programs

An example of knowledge and technology transfer for SMEs in Ceper Indonesia, the district of hundreds of Metals based SMEs, was a project associated with the Divided Blast Cupola (DBC) [1]. The availability of technology, and demands from the SME customers challenged SMEs to improve their capability to produce a wider variety of products with increased precision and quality control. Government-initiated knowledge and technology transfer in Indonesia is normally completed through government ministries and their associated agencies, inter-ministry departments and local government. Government ministries include the Ministry of Research and Technology, Ministry of Cooperation and Small to Medium Enterprises, Ministry of Industry, and Ministry of Trade. Government-initiated knowledge and technology transfer programs have provided training programs and expertise transfer, as well as physical equipment (machinery and tools) to SMEs. Government has provided training centers for use by SMEs. Large enterprises (Les) were found to be involved in knowledge and technology transfer to Ceper and Pasuruan SMEs through human resource development in particular. LEs have provided highly focused training programs to SME employees. These training programs have, for example, sought to encourage improved capabilities in product standardization, enabling SMEs to then supply products with the required quality to these larger businesses through improved competency.

4. Result and discussion

4.1. Demographic characteristics of participating organisations

About 200 metal-based SMEs participated in this research by supplying detailed organisational information. Metal-based SMEs in East Java and Central Java were selected as fieldwork research areas because the metal-based SMEs located in those areas were considered to be representative of characteristic of the metal-based SMEs in Java, and about two thirds of the total population of Java Island is located in those areas.

4.1.1. Product classification of respondent organisations. In the survey questionnaires, contributing organisations were requested to nominate their product categories. Figure 1 shows that the largest percentage of the responding organisations manufacture automotive spare parts (e.g. motorbike hand brake handles, intake manifolds), followed by product ‘others’ (e.g. fittings for water pipe, stove burners), furniture metal products (e.g. door handles, chairs), and machinery and equipment (e.g. fly wheels for generators, counterbalance forklifts).

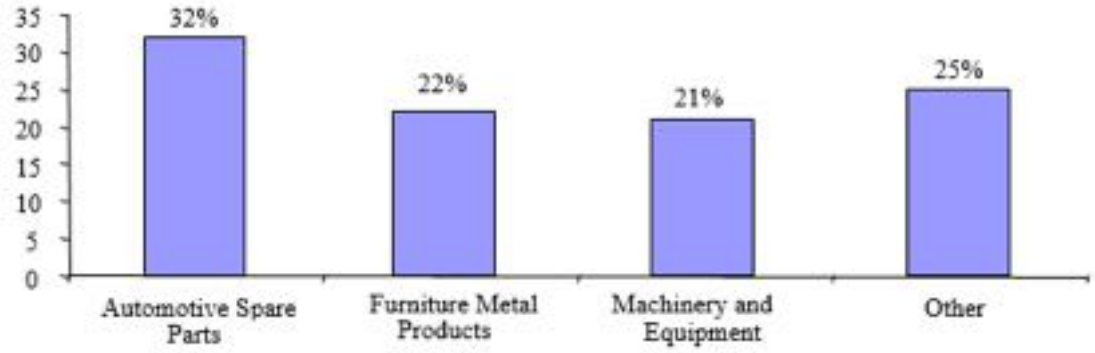

Figure 1. Product classifications by manufacturing sector.

Products types are reasonably consistent across the nominated classifications. Indonesia has a huge market for motorbikes, cars, even trucks, and as such, spare parts production is a significant branch of the metal-based manufacturing sector. Millions of motorbikes and cars are registered in Indonesia Every year, the number of vehicles increases. This offers significant opportunities for metal-based manufacturing to meet this market demand. However, based on the similar percentages of the various product sectors (figure 1), it is possible that the opportunity to supply metal-based products extends beyond the automotive sector, for example, machinery for agriculture, and metal components for furniture manufacture.

4.1.2. Level of registration to standards. The level of registration of respondent organisations to formal standards presented an indication of respondent organisations' commitment to and awareness of quality standard certification. The responding organisations were requested to indicate whether they have committed to a formal standard, and if so, which standard. Figure 2 shows that the overwhelming majority (82%) of the respondents have no registration to formal standard certification. A minority of the participant organisations have committed to be registered with formal certification: 8% for national standards and 6% for international standards. 4% of participant organisations did not offer a response to this question.

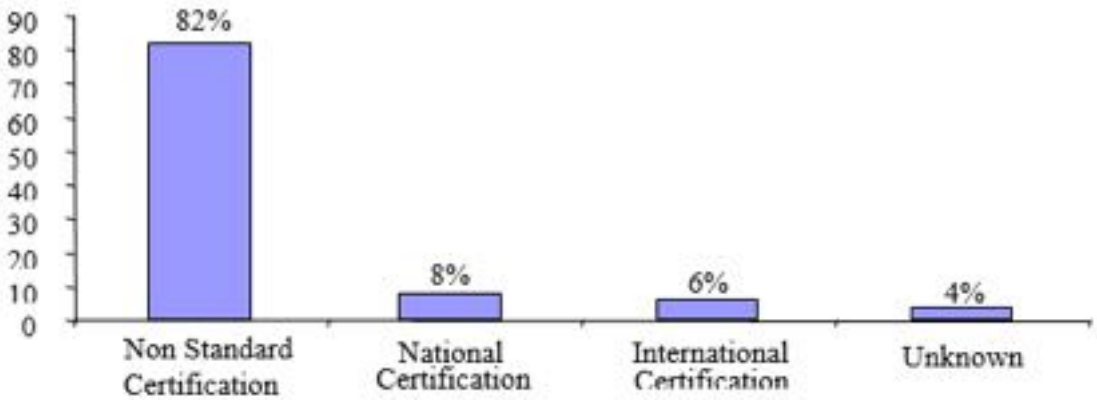

Figure 2. Registration to standards.

The extremely high number of 'Non-Standard Certification' organizations could be due to the organizations mostly supplying to the local (domestic) market. However, low commitment to formal standard certification is detrimental as it results in Indonesian SMEs being less competitive in the international market, especially for international markets that require international standard certification.

4.1.3. Level of education. Specific personnel within participating organisations were requested to state their highest level of education (Figure 3). The largest grouping is associated with a highest educational level of senior high school (46%), followed by junior high school (25%). Only 29% respondents had more than a senior high school qualification.

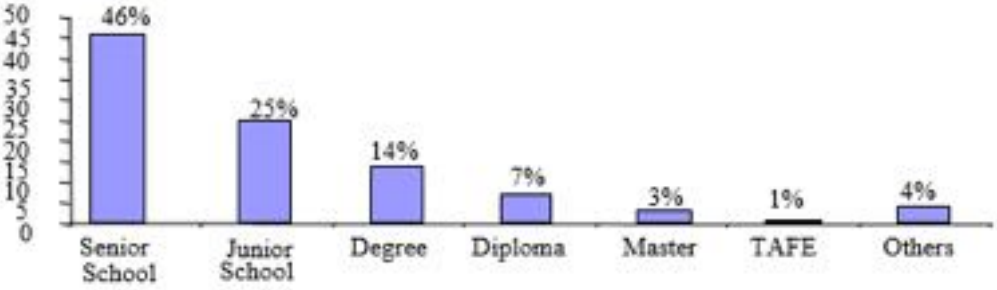

Figure 3. Highest educational level achieved by interviewee in participating organization.

4.1.4. Educational background. Specific personnel within participating organisations were asked to state their educational background with reference to subjects or disciplines studied. Figure 4 shows that most respondents reported an engineering education background (34%), with roughly half this number studying either economics (15%) or education (12%). A significant number of respondents stated 'Other' (20%).

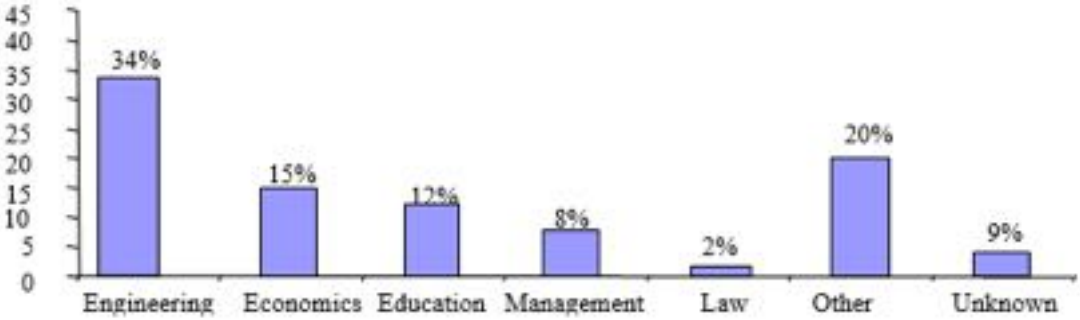

Figure 4. Educational background of interviewee.

The participating respondents with engineering education backgrounds are the dominant group in this metal-based manufacturing sector survey. Interaction and communication between managers of an organisation and employees can be more effective if the manager has a technical understanding of the business. As knowledge is one of the most significant supporting factors in the successful management on a business, the availability of appropriate knowledge can lead to more benefits for the organization [13].

4.2. Perceptual responses scores

This section analyses the participating organisation responses. Since the ordinal data used the five-point Likert measuring scale, the median is used as the primary measure of central tendencies and percentiles (25, 50 and 75) are calculated as measures of dispersion, as is recommended for this data type [14-17]. However, much of the applied psychology/organisational studies in the available literature treat Likert scales as producing interval type data [17]. Therefore, mean and standard deviation measures were also measured for all the items in this research.

4.2.1. Technology provider's role: government, business, and universities. Successful approaches to technology transfer strongly emphasize the crucial role of transferors in enabling an organisation technology transfer program [18, 19]. Aspects of the transferor's role were measured along eight dimensions (items 1-8 in Table 1). Respondents were asked to express their level of agreement with the items (survey statements that seek a response from 1 = strongly disagree, to 5 = strongly agree from the participant), in terms of the adequacy of the transferor's actions to meet the technology transfer requirements of their organisation. The results contained in Table 1 show that for 4 dimensions (items 3, 4, 5, 6) the middle response corresponds with "agree" (median = 4), and 4 others (items 1, 2, 7, 8) the middle ranking were "neutral" (median = 3). Items 1,2,7,8 in Table 1 show a "neutral" overall response from participants, where a participant offered a mixed opinion about the items associated with responsibility, appropriate project terms, industry visits and sufficient feedback offered by government transferors.

Table 1. The government.

Item	Median	Percentiles			Mean	Std. Dev
		25	50	75		
Responsibility and control of government for technology transfer (TT) is appropriate for company's need	3	2	3	4	3.19	1.03
Project terms of technology transfer program is suitable for company's need	3	3	3	4	3.45	0.90
There has been effective communication built by government associated with technology transfer program	4	3	4	4	3.54	0.90
Conference or meeting program by government is suitable for company's need	4	3	4	4	3.57	0.90
Sufficient personnel exchange programs have been provided by government associated with technology transfer program	4	3	4	5	3.51	1.09
Sufficient workshop programs have been provided by government	4	3	4	4	3.58	0.92
There have been sufficient industry visits associated with the technology transfer program provided by government	3	3	3	4	3.28	1.08
Government encourages feedback process associated with their technology transfer program	3	2	3	4	3.10	1.11

Scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree

The respondents expressed an overall "agree" opinion about the value of items associated with effective communication, the meeting program, the personnel exchange program and the workshop program (items 3, 4, 5, 6). It is clear that the "agree" option is dominant in respondent expression particularly in their opinion about personal exchange program (Item 5).

While the number of respondents who 'agree' on the value of items associated with sufficient responsibility (item 1) and the sufficient feedback encouraged by government (item 8) are approximately equal with the respondents who 'do not agree'. Overall, the respondents 'agree' that the transferor manner and style support sufficient knowledge and technology transfer for their organisations (item 3, 4, 5, 6).

Table 2. The business.

Item	Median	Percentiles			Mean	Std. Dev
		25	50	75		
Responsibility and control of business for technology transfer (TT) is appropriate for company's need	3	3	3	4	3.37	0.86
Project terms of technology transfer program is suitable for company's need	4	3	4	4	3.51	0.78
There has been effective communication built by business associated with technology transfer program	4	3	4	4	3.62	0.88
Conference or meeting program by business is suitable for company's need	3	3	3	4	3.50	0.87
Sufficient personnel exchange program has been provided by business associated with technology transfer program	3	3	3	4	3.27	0.94
Sufficient workshop program has been provided by business	4	3	4	4	3.63	0.91
There have been sufficient industry visits associated with the technology transfer program provided by business	3	3	3	4	3.35	0.96
Business encourages feedback process associated with their technology transfer program	3	3	3	4	3.42	0.99

Scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree

The results contained in Table 2 show that respondents tend to 'agree' (median = 4) with the survey statements associated with items 2, 3, and 6 and are 'neutral' to the statements associated with items 1, 4, 5, 7 and 8. The responses for item 2, 3 and 6 have a negative skew, where the 50 and 75 percentiles were equal for the 'agree' response. This shows the tendency of respondents' opinion about the sufficient of the project term, the effective communication, and the workshop program provided by business transferors indicate 'agree'.

Overall, since the median response to the statement in items 1, 4, 5, 7 and 8 is 'neutral' and the median response for to the statement in items 2, 3 and 6 is 'agree", it is asserted that the respondents tend to 'agree' that the business transferors provide sufficient technology transfer programs.

Table 3. The university.

Item	Median	Percentiles			Mean	Std. Dev
		25	50	75		
Responsibility and control of universities for technology transfer (TT) is appropriate for company's need	3	3	3	4	3.29	0.88
Project terms of technology transfer program is suitable for company's need	3	3	3	4	3.42	0.80
There has been effective communication built by universities associated with technology transfer program	4	3	4	4	3.55	0.89
Conference or meeting program by universities is suitable for company's need	3	3	3	4	3.50	0.89
Sufficient personnel exchange programs have been provided by universities associated with technology transfer program	3	3	3	4	3.37	0.85
Sufficient workshop programs have been provided by universities	3	3	3	4	3.50	0.82
There have been sufficient industry visits associated with the technology transfer program provided by universities	3	3	3	4	3.45	0.84
The University encourages feedback process associated with their technology transfer program	3	3	3	4	3.32	0.96

Scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree

The results contained in Table 3 show that for most of the survey statements (i.e. items 1, 2, 4, 5, 6, 7, 8), respondents offered median 'neutral' responses. The one exception is for item 3, where the respondents offered a median 'agree' to the statement that universities offer sufficient communication in technology transfer programs. The respondents generally have a 'neutral' opinion about most of the items associated with the knowledge and technology transfer programs provided by the university transferors.

Table 4. The joint program.

Item	Median	Percentiles			Mean	Std. Dev
		25	50	75		
Responsibility or control of technology provider's joint program for technology transfer is appropriate for company's need	3	2	3	4	3.21	1.10
Project term of technology provider's joint program for technology transfer is suitable for company's need	3	3	3	4	3.43	0.82
There has been effective communication built by technology provider's joint program for technology transfer	4	3	4	4	3.60	0.90
Conference or meeting program by technology provider's joint program for technology transfer is suitable for company's need	4	3	4	4	3.61	0.92
Sufficient personnel exchange programs have been provided by technology provider's joint program for technology transfer	3	3	3	4	3.23	1.02
Sufficient workshop programs have been provided by technology provider's joint program for technology transfer	4	3	4	4	3.50	1.04
There have been sufficient industry visits associated with the technology transfer program provided by technology provider's joint program for technology transfer	3	3	3	4	3.31	1.04
Technology provider's joint program for technology transfer encourages sufficient feedback process	3	3	3	4	3.32	1.12

Scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree

The results contained in Table 4 show that for most of the survey statements (i.e. items 1, 2, 5, 7, 8), respondents again offered median 'neutral' responses. Respondents offered a median 'agree' for three items, 3, 4 and 6. The results also show that opinion of the respondents (items 3, 4, 6) have negative skew. Overall, since the median for all the items was 3 (neutral) and 4 (agree), it is asserted that the respondents tended to 'agree' that the transferor (joint program) offers knowledge and technology transfer benefits.

5. Comparison of responses from respondents and conclusion

Comparing survey responses with respect to the transferors (government, business, university, joint program), the respondents offered quite similar overall responses to many of the items (Tables 1, 2, 3 and 4). Respondents expressed 'agree' that the transferors have built effective communication (item 3). Respondents expressed mixed opinions on items 1, 7, 8 (i.e. the responsibility, the industry visits, and the sufficient feedback) of the transferors to meet the technology transfer requirement of the respondents' organisation. Respondents expressed 'agreement' on the appropriate project terms (Table 2, item 2) provided by the business transferors and on the sufficient personal exchange (Table 1, item 5) provided by government but the respondents stated 'neutral' opinion on the appropriate project terms (Tables 1, 3, 4, item 2) provided by the government, the university, and the joint program, and the sufficient personal exchange (Tables 2, 3, 4, item 5) provided by the business, the university, and the joint program. Respondents tended to 'agree' with the suitable meeting programs (Table 1, 4, item 4) provided by the government and the joint program, whereas they expressed 'neutral' on the suitable meeting programs (Tables 2, 3, item 4) offered by the business and the university. Respondents were 'neutral' about workshop programs provided by the university (Table 3, item 6), while they expressed 'agree' about the benefit of the workshop programs provided by the government, the business, and the joint program (Tables 1, 2, 4, item 6).

The research has summarized an extensive analysis of perceptual responses of about 200 organisations to survey statements concerning knowledge and technology transfer practices. The analysis reported on:

- an investigation on the population demographic of the surveyed organisations and respondents, and
- perceived responses of the respondents relating to the technology transfer practices in their organisations.

The sample of organisations that took part in this survey is plausibly representative of metal-based manufacturing organizations in Java. Characteristics such as product classification of respondent organizations and level of education are shown to be reasonably similar to the total population of manufacturing organisations. This provides confidence that the findings from the population sample could be reasonably used to predict the overall situation of the overall population of manufacturing organisations within this sector in Java. The level of commitment, interest and engagement of SMEs regarding technology transfer programs was reviewed. The results show that substantial numbers of small to medium enterprises are actively involved in technology transfer programs.

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