

Woman Participation Analysis in Public Universities in Indonesia by using k-means Method

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Abstract: In Indonesia, gender disparity is one problem that occurs in many areas. Although, government has big concern in emancipation and has enough effort to reduce this problem, gender disparity still occurs, no exception in higher education. In this research, we analyze the woman participation in public universities in Indonesia by using statistical computational method. k-means method has been used to clustering the gender based statistical data in public universities in Indonesia. The level of program that is clustered includes: diploma, bachelor, master, doctoral, profession and specialist. In this research, we show that there is negative correlation between program level and woman participation. Woman participation goes lower when the program level goes higher. Woman participation is high in education/teaching, healthcare and social science program. Meanwhile, woman participation is low in engineering, farming and fishery program.

Key words: Gender, woman participation, higher education, public university, Indonesia, fishery program

INTRODUCTION

Women play significant role in country development and civilization. Bradshaw *et al.* (2013) noted that society with high gender discrimination tend to have less rapid economic growth and low economic reduction rather society where the equality between male and female are better (Dollar and Gatti, 1999; Klasen, 1999). From limited role in domestic area especially in agricultural society (Giuliano, 2015), the role has transformed into many fields, so that, women also become agent of change and development (Bradshaw *et al.*, 2013; Hasan, 1981; Amusan and Ngoh, 2016). Besides managing their family, growing their children, women can also participate in public service (Azmi *et al.*, 2012; Nasser, 2018; Rahmah *et al.*, 2013) or society. Women also can have career in company or become business leader (Lantana, 2015; Bjursell and Backvall, 2011), so that, they can contribute in family income (Azmi *et al.*, 2012; Rahmah *et al.*, 2013). This condition occurs not only in developed countries but also in developing country such as Indonesia, India or Pakistan. Fortunately, government of Indonesia has provided its women public servant lots of flexibilities, so that, they still can take care of their families such as: flexible working hours, longer maternity leave and working from home (Azmi *et al.*, 2012).

Having this significant role, women should access adequate education (Sundaram *et al.*, 2014), both in levels

and quality. Margriet *et al.* noted that women have achieved improvement in education, since, 1960's and now a days, they have outperformed men in education (Hek *et al.*, 2016; Severies and Dam, 2012). In developed country, equality in accessing education occurs such as in European society (Hek *et al.*, 2016). Meanwhile, in many developing countries, women still struggle to access higher level of education, such as in Africa (Msoffe, 2016) and Arab world (Hamdan, 2006; Ostrosky, 2015). This condition occurs especially in countries that patriarchy perspective is still dominant. In this perspective, men are prioritized in accessing education rather than woman. This condition occurs, especially when in a family, the children are the combination between boys and girls and the family has limited budget in providing children's education. Generally, boys will be prioritized to access higher level education rather than girls.

Based on Anonymous (2015, 2017), woman participation in higher education in Indonesia is various. The variation occurs among provinces and between private and public institution. Unfortunately, deeper analysis about women participation or gender disparity in higher education in Indonesia is still limited. Muluk (2014) noted that in 2010, the number of enrolled female students surpassed that of male students in Islamic higher education in Indonesia. This condition occurs in both private and public institutions (Muluk, 2014). The same

trend also occurs in Aceh which it is known as religious province in Indonesia (Muluk, 2014). Other research held by Monash University about gender inequately in Indonesia (Anonymous, 2015) noted that now a days, woman participation in higher education is much better than in previous decades.

Based on this problem, the aim of this research is to analyze the woman participation in higher education in Indonesia, especially in public universities. The research is done by clustering the ratio between female student and male student in higher education in Indonesia. The research is not limited to the clustering research but is also analyzing the similarity among institutions with the same condition or in other word is in the same cluster. To provide deeper and broader knowledge, we also connect the condition with the sociologic aspect.

MATERIALS AND METHODS

In this research, we use official data that is provided by the Ministry of Research, Technology and Higher Education of Indonesia. This data is acquired from the Higher Education Statistical Year Book of Indonesia 2017. We use data about the number of enrolled students based on level of program and gender that are held by public universities. We process enrolled students from all levels, include: Diploma, bachelor, master, doctoral, professions and specialist. Totally, there are 63 universities that are clustered in this research. These universities can be divided into two groups: 52 general universities and 11 educational universities.

In this research, we use k-means method as the basis method for the clustering process. The reason is because this method is popular for quantitative clustering research, especially in processing the education data (Yang, 2017; Ahlawat *et al.*, 2016; Huang, 2016). Besides education, k-means method is used for data mining process (Aprilia *et al.*, 2018; Mustabshiroh *et al.*, 2019). Basic process of k-means clustering is shown in Fig. 1.

In k-means clustering method, clusters represent groups, so that, the number of clusters that is predefined will become the number of groups. Meanwhile, cluster's position represents the center of groups. In the beginning, cluster's position is defined randomly. Then, each node (in this research means university) will be dispatched to their nearest cluster. After all nodes are dispatched, the next step is calculating total node-cluster distance ($d_{tot,t}$). If the total distance reaches the minimum value then the process stops. Else, clusters will be repositioned. This condition occurs when $d_{tot,t}$ is less than $d_{tot,t-1}$.

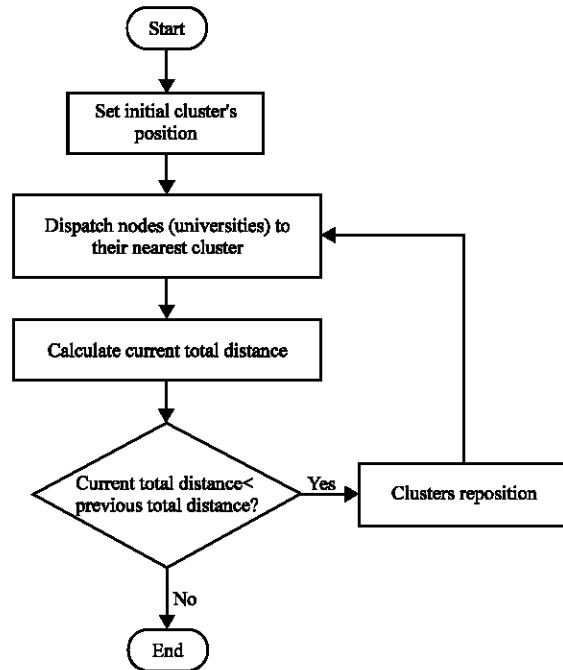


Fig. 1: k-means clustering process

RESULTS AND DISCUSSION

After the clustering process, in this study, we show the clustering result and the analysis of the result. The first process is the clustering of male-female ratio in diploma program. This process involves 51 universities. There are ten clusters that are used in this process. The result is shown in Table 1. The average ratio is presented in the average value.

Table 1 shows that the gender disparity among public universities in Indonesia is very wide. The 1st cluster average value is only 0.2% of the 10th cluster average value. In the first cluster with the only member is Malikussaleh University, the woman participation ratio in diploma program is very high. With the ratio is 0.01, it means that there is 1 male student in every 100 female students in Malikussaleh University. This condition is contrast with in the 10th cluster which the average value is 4.61. This value says that there is one female student in every more or less 4 male students in Cendrawasih University and Halu Oleo University. The highest equality occurs in the 6th and 7th cluster where the average value is close to 1.

By summing number of universities in both clusters, there are 14 universities in Indonesia that the gender equality in their diploma program is high. Besides that there are 21 universities where the woman participation is low and there are 24 universities where the woman

Table 1: Clustering result of male-female ratio in diploma program

No. of members	Average values	List of institutions
1	0.01	Malikussaleh University
2	0.24	Borneo Tarakan University, Gorontalo State University
5	0.48	Bengkulu University, Indonesia University, Lambung Mangkurat University, Padjadjaran University, West Sulawesi University
3	0.59	Airlangga University, Andalas University, Karawang Singaperbangsa University
10	0.74	Jenderal Sudirman University, Khairun University, Mulawarman University, Jakarta State University, Jakarta UPNV, Indonesia Education University, Sebelas Maret University, Sultan Ageng Tirtayasa University, North Sumatera University, Udayana University
6	0.93	Brawijaya University, Diponegoro University, Makassar State, Siliwangi University, Sriwijaya University, Tanjungpura University
8	1.06	Gadjah Mada University, Jambi University, Jember University, Mataram University, Yogyakarta State University, Riau University, Open University, Tidar University
10	1.40	Lampung University, Malang State University, Manado State University, Padang State University, Surabaya State University, Yogyakarta UPNV, Ganesha Education University, Sam Ratulangi University, Syiah Kuala University, Tadulako University
4	2.35	Medan State University, Semarang State University, Papua University, Trunojoyo University
2	4.61	Cendrawasih University, Halu Oleo University

Table 2: Clustering result of male-female ratio in bachelor program

No. of members	Average values	List of institutions
4	0.45	Airlangga University, Medan State University, Indonesia Education University, Open University
11	0.68	Indonesia University, Jember University, Jakarta State University, Makassar State, Malang State University, Semarang State University, Surabaya State University, Yogyakarta State University, Ganesha Education University, Sebelas Maret University, North Sumatera University
12	0.77	Andalas University, Hasanuddin University, Jenderal Sudirman University, Lambung Mangkurat University, Lampung University, Malikussaleh University, Gorontalo State University, Padjadjaran University, Riau University, Sultan Ageng Tirtayasa University, Syiah Kuala University, Trunojoyo University
10	0.84	Borneo Tarakan University, Diponegoro University, Gadjah Mada University, Jambi University, Mulawarman University, Manado State University, Padang State University, Jakarta UPNV, Sriwijaya University, Timor University
4	0.92	Brawijaya University, Maritim Raja Ali Haji University, Mataram University, Pattimura University
5	0.97	Bengkulu University, Halu Oleo University, Nusa Cendana State University, West Sulawesi University, Udayana University
7	1.06	Bangka Belitung University, Cendrawasih University, Khairun University, Sam Ratulangi University, Siliwangi University, Tanjungpura University, Tidar University
4	1.14	Papua University, Samudra University, Kolaka Sembilanbelas November University, Tadulako University
3	1.35	Musamus Merauke University, East Java UPNV, Karawang Singaperbangsa University
3	1.76	Palangka Raya University, Yogyakarta UPNV, Teuku Umar University

participation is high and out number the male student. Based on this result, it can be said that generally, woman participation in diploma program in Indonesia is high.

The second process is the clustering of male to female ratio in bachelor program. There are ten clusters that are used in this process. This process involves 63 universities. The result is shown in Table 2.

Table 2 shows that gender equality in bachelor program in public universities is better than in diploma program. The 1st cluster average value in Table 2 is higher than the 1st cluster average value in Table 1. Meanwhile, the 10th cluster average value in Table 2 is lower than the 10th cluster average value in Table 1. The 1st cluster average value is 25% of the 10th cluster average value. The average value disparity between the 10th cluster and the 1st cluster in Table 2 is only 1.31 compared to same disparity in Table 1. There are 37 universities that the ratio is low and there are 10 universities that the ratio is high. Meanwhile, there are 16 universities that the ratio tends to equal. This fact shows that although, gender disparity in bachelor program tends to be high, the woman participation tends to be lower than in diploma program.

The third process is the clustering of male to female ratio in master program. There are ten clusters that are used in this process. This process involves 54 universities. The result is shown in Table 3.

Table 3 shows that in public universities, woman participation in master program is lower than in bachelor program. The 1st cluster average value in Table 3 is little bit higher than the 1st cluster average value in Table 2. Meanwhile, the 10th cluster average value in Table 3 is much higher than the 10th cluster average value in Table 2. In Table 3, the 1st cluster average value is 19% of the 10th cluster average value. The disparity between 10th cluster average value and the 1st cluster average value is 2.35. These facts show that the gender disparity between the 1st cluster and the 10th cluster in master program is higher than in bachelor program but still lower than in diploma program. In master program, woman participation in 22 universities is high. Meanwhile, woman participation in 32 universities is low.

The fourth process is the clustering of male to female ratio in doctoral program. There are ten

Table 3: Clustering result of male-female ratio in master program

No. of members	Average values	List of institutions
4	0.57	Gorontalo State University, Malang State University, Medan State University, Indonesia Education University
7	0.73	Airlangga University, Andalas University, Manado State University, Padang State University, Yogyakarta State University, Padjadjaran University, Sriwijaya University
11	0.88	Gadjah Mada University, Hasanuddin University, Indonesia University, Lampung University, Jakarta State University, Makassar State, Semarang State University, Surabaya State University, Ganesha Education University, Sebelas Maret University, Udayana University
8	1.11	Bengkulu University, Brawijaya University, Diponegoro University, Jambi University, Nusa Cendana State University, Pattimura University, North Sumatera University, Tadulako University
7	1.30	Jember University, Jenderal Sudirman University, Mulawarman University, Riau University, Sam Ratulangi University, Sultan Ageng Tirtayasa University, Syiah Kuala University
2	1.43	Halu Oleo University, Palangka Raya University
2	1.49	Lambung Mangkurat University, Open University
5	1.80	Cendrawasih University, Mataram University, East Java UPNV, Tanjungpura University, Trunojoyo University
4	2.08	Khairun University, Papua University, Jakarta UPNV, Siliwangi University
4	2.92	Borneo Tarakan University, Malikussaleh University, Yogyakarta UPNV, Karawang Singaperbangsa University

Table 4: Clustering result of male-female ratio in doctoral program

No. of members	Average values	List of institutions
2	0.56	Lambung Mangkurat University, Indonesia Education University
3	0.99	Andalas University, Malang State University, Manado State University
5	1.21	Airlangga University, Gadjah Mada University, Indonesia University, Sriwijaya University, North Sumatera University
10	1.65	Diponegoro University, Hasanuddin University, Jenderal Sudirman University, Makassar State, Padang State University, Surabaya State University, Yogyakarta State University, Padjadjaran University, Sam Ratulangi University, Sebelas Maret University
6	1.87	Brawijaya University, Lampung University, Jakarta State University, Medan State University, Semarang State University, Udayana University
3	1.99	Bengkulu University, Jambi University, Gorontalo State University
5	2.36	Jember University, Mulawarman University, Riau University, Syiah Kuala University, Tadulako University
3	2.96	Nusa Cendana State University, Ganesha Education University, Tanjungpura University
2	4.30	Cendrawasih University, Halu Oleo University
1	12.67	Mataram University

Table 5: Clustering result of male-female ratio in profession program

No. of members	Average values	List of institutions
2	0.25	Bengkulu University, Gorontalo State University
3	0.32	Andalas University, Halu Oleo University, Jambi University
5	0.35	Jember University, Padjadjaran University, Palangka Raya University, Indonesia Education University, Riau University
2	0.38	Hasanuddin University, Indonesia University
4	0.43	Brawijaya University, Jenderal Sudirman University, Syiah Kuala University, Tadulako University
2	0.44	Airlangga University, Diponegoro University
6	0.48	Cendrawasih University, Gadjah Mada University, Malikussaleh University, Jakarta UPNV, Sriwijaya University, North Sumatera University
8	0.53	Lambung Mangkurat University, Lampung University, Mulawarman University, Padang State University, Semarang State University, Pattimura University, Sam Ratulangi University, Sebelas Maret University
4	0.61	Mataram University, Nusa Cendana State University, Tanjungpura University, Udayana University
1	2.02	Yogyakarta State University

clusters that are used in this process. This process involves 40 universities. The result is shown in Table 4.

Table 4 shows that woman participation in doctoral program is very low. It is lowest among all programs from diploma, bachelor, master, to doctoral. The 1st cluster average value in doctoral program is similar to the 1st cluster average value in master program. Meanwhile, the 10th cluster average value in doctoral program is extreme higher than in master program. In doctoral program, the 1st cluster average value is only 4% of the 10th cluster average value. The average value disparity between the 10th cluster and the 1st cluster is 12.11. There are only two universities where the woman participation is high.

There are three universities with the gender disparity is almost equal. Unfortunately, there are 35 universities where the woman participation in doctoral program is low or very low.

The fifth result is the clustering of male to female ratio in profession program. There are 10 clusters that are used in this process. This process involves 36 universities. The result is shown in Table 5.

Table 5 shows that woman participation in profession program is high enough. The average value of the 1st cluster to the 9th cluster is <1. The total populations of these clusters are 36 universities. Meanwhile, only one province that the male-female ratio in profession program is above 1 and this is in the 10th cluster (Yogyakarta

Table 6: Clustering result of male-female ratio in specialist program

No. of members	Average values	List of institutions
1	0.43	Udayana University
6	0.81	Airlangga University, Andalas University, Gadjah Mada University, Hasanuddin University, Indonesia University, North Sumatera University
3	0.90	Brawijaya University, Diponegoro University, Padjadjaran University
3	1.49	Sam Ratulangi University, Sebelas Maret University, Sriwijaya University
1	1.86	Syiah Kuala University

Table 7: Clustering result of male-female ratio in all programs

No. of members	Average values	List of institutions
1	0.28	Indonesia Education University
3	0.55	Airlangga University, Medan State University, Open University
15	0.73	Andalas University, Indonesia University, Jember University, Malikussaleh University, Gorontalo State University, Jakarta State University, Makassar State, Malang State University, Semarang State University, Surabaya State University, Yogyakarta State University, Padjadjaran University, Ganesha Education University, Sebelas Maret University, North Sumatera University
10	0.81	Borneo Tarakan University, Hasanuddin University, Jenderal Sudirman University, Lampung Mangkurat University, Lampung University, Manado State University, Riau University, Sriwijaya University, Sultan Ageng Tirtayasa University, Trunojoyo University
11	0.88	Diponegoro University, Gadjah Mada University, Jambi University, Maritim Raja Ali Haji University, Mulawarman University, Padang State University, Pattimura University, Jakarta UPNV, Syiah Kuala University, Timor University, Udayana University
5	0.97	Bengkulu University, Brawijaya University, Mataram University, Nusa Cendana State University, West Sulawesi University
5	1.06	Bangka Belitung University, Halu Oleo University, Khairun University, Sam Ratulangi University, Siliwangi University
6	1.13	Cendrawasih University, Samudra University, Kolaka Sembilanbelas November University, Tadulako University, Tanjungpura University, Tidar University
4	1.36	Musamus Merauke University, Papua University, East Java UPNV, Karawang Singaperbangsa University
3	1.76	Palangka Raya University, Yogyakarta UPNV, Teuku Umar University

State University). The average value disparity between the 10th cluster and the 1st cluster is 1.77. Meanwhile, the 1st cluster average value is 12% of the 10th cluster average value.

The sixth result is the clustering of female to male ratio in specialist program. There are five clusters that are used in this process. This process involves 14 universities. The result is shown in Table 6.

Table 6 shows that generally, woman participation in specialist program is high. There are 7 universities where the female students dominate male students in number. There are 3 universities that the number of female students is equal to the number of male students. Meanwhile, only 4 universities that run specialist program where the male students dominate the female students. The disparity between the 1st cluster and the 5th cluster is only 1.43. The 1st cluster average value is 23% of the 5th cluster.

The 7th result is the clustering of male to female ratio in all programs. There are five clusters that are used in this process. This process involves 63 universities. The result is shown in Table 7.

Table 7 shows that totally, woman participation in public universities is high, although, the value is various among clusters. There are 40 universities where the woman participation is high. Meanwhile, there are 10 universities where the woman participation is moderate. Unfortunately, there are 13 universities where the woman

participation is low. The average value disparity between the 10th cluster and the 1st cluster is only 1.48. The 1st cluster average value is 15% of the 10th cluster average value. This result is similar to it in bachelor and diploma programs because in Indonesia, sum of number of students in diploma and bachelor programs is very dominant.

In public universities in Indonesia, woman participation generally declines when the program level goes higher. At the beginning, in diploma program, woman participation tends to high. Unfortunately, woman participation in bachelor program is lower than in diploma program. This condition also occurs in master and doctoral program as the woman participation in doctoral program is the lowest. This condition is similar to findings in other researches. Chaudhuri (2011) wrote that generally, male is more dominant rather than female as doctoral holder and this condition occurs in most of fields of study (Physical Science, Mathematics, Computer Science, Life Science, Social Science and Engineering). The exception occurs in psychology study (Chaudhuri, 2011). Chaudhuri (2011) indicated several problems that are faced by female doctoral students: work-life balance, low self confidence, fewer numbers of female students, lacking of role models, gender discrimination and two-career problem. Meanwhile, higher woman participation in diploma or bachelor program is rationale because now a days, girls have important advantages in preparation to enter higher

education. Based on OECD. (2009a, b), at the age of 16, girls catch up in Mathematics, widen gap in English and outperform boys in reading.

The exception occurs in diploma program in Cendrawasih University and Halu Oleo University where the woman participation in these universities is very low. Based on Cendrawasih University profile, this university runs six diploma programs includes: office administration, nursery, electrical engineering, mechanical engineering, mineral engineering and civil engineering. But the nursery program does not have student. So, the engineering programs dominate the diploma program in Cendrawasih University. Meanwhile, Halu Oleo University has five active diploma programs: statistics, architecture engineering, electrical engineering, mechanical engineering and civil engineering. This fact indicates that when the number of engineering programs dominates, the woman participation gets low. This condition is similar to findings in other research that in engineering program, male student is more dominant rather than female student. Chaudhuri (2011) wrote that in engineering doctoral program, male students are 87.9% while the female students are only 12.1%. Different number is explained by Baird (2018) where in engineering field, women participation is 17% with the minimum occupation is in mechanical engineering (8%) and the maximum occupation is in environmental engineering (34%). Robinson and McIlwee (1991) wrote that culturally, engineering is strongly identified for male rather than female. Personal preference is also one aspect why male is more dominant rather than female in engineering field. Male puts high earning as his priority while female puts work-life balance as her priority (Zacaj, 2010).

Meanwhile, the extreme condition occurs in diploma program in Malikussaleh University as shown in Table 1. The woman participation in this university is extreme high. Based on the Malikussaleh University profile, this university runs only one diploma program, secretary program. This condition is rationale because secretary program is identical with female student and basically, in secretary program, female student becomes majority. This condition occurs because secretary is one of favorite job for female rather than male (Kurtz, 2013; Giles *et al.*, 1996).

In bachelor program, woman participation tends to be high in educational university that its basic purpose is to create or to educate teacher. In the 1st cluster, half of its members are education universities (Medan State University and Indonesia Education University). Meanwhile, in the 2nd cluster, seven of eleven members are education universities. Besides, these education universities, general universities in these first

and second clusters also have educational program, such as in Open University, Sebelas Maret University and Jember University. Besides, Engineering programs in universities in these first and second clusters are not dominant. This condition occurs because now a days, teacher is favorite job for woman rather than for man. Other report said that in 2014, 80% of bachelor degree in education belongs to women (Maurer, 2017). Advantages in becoming teacher that makes why more women like to become a teacher are: more time-off and more secure (Rich, 2014). This characteristics match with woman role as the primary caregivers in her family so that they have more times for caring her children, especially, her babies (Rich, 2014). Meanwhile, teacher salary is basically lower than other profession, so that, man is less interested to become a teacher (Rich, 2014). This fact makes teaching is less prestigious rather than other jobs. This stereotype becomes one of reasons why women are more dominant in primary school teacher (Paton, 2013).

The opposite condition occurs in bachelor program in Palangka Raya University, Yogyakarta UPNV and Teuku Umar University where woman participation is low enough. Based on Palangka Raya University profile, Although, this university runs many educational program, the number of engineering, technology and farming programs is also high. In Yogyakarta UPNV, engineering programs domination is also high. In Teuku Umar, agriculture programs (farming and fishery) domination is high compared to other programs.

In master program, woman participation in universities that runs educational program is very high. All of members in the 1st cluster in Table 3 are educational university. In the 2nd cluster, three of its seven members are educational universities. Meanwhile, profile of master program in general universities in the 2nd cluster is as follows. In Airlangga University, most of its master programs are in social science, health and psychology. In Andalas University, Padjadjaran University and Sriwijaya University, the number of social science and health related programs is higher than engineering programs. It is because there is not any gender stereotype in social science as it occurs in engineering (Robinson and McIlwee, 1991).

Meanwhile, condition in the universities which the woman participation in master program is low is as follows. In Yogyakarta UPNV, the engineering programs are very dominant. Meanwhile, there is not any engineering program in Malikussaleh University and Singaperbangsa University.

In doctoral program, woman participation is also high in educational universities. In Table 4, one of two universities in the 1st cluster is educational universities.

Meanwhile, two of three universities in the 2nd cluster are educational universities. Besides, these educational universities, woman participation in doctoral program in Lambung Mangkurat University and Andalas University is also high. Lambung Mangkurat University runs only one doctoral program: farming. Meanwhile, most of doctoral program in Andalas University are social science, natural science and farming.

Meanwhile, in Mataram University, the woman participation in its doctoral program is very low. This university runs only one doctoral program: law. Although, this doctoral program is not engineering program, the woman participation is still low.

In profession program, Yogyakarta State University is the only member in the 10th cluster. Although, this university is educational university, woman participation in the profession program is very low. Based on Yogyakarta State University profile, profession program in this university is suffering. In the other side, woman participation in Bengkulu University and Gorontalo State University is very high as these universities are in the 1st cluster. In Bengkulu University, the only prosperous profession program is doctor/medic. Meanwhile in Gorontalo State University, the only prosperous profession program is nursery. Fact in Bengkulu University and Gorontalo State University is relevant to other research that said that women dominate jobs in healthcare sector (Premarck, 2018; Dishman, 2015). The reason is that most of healthcare decisions are made by women, especially in US (Dishman, 2015). Besides, although, male patients do not care with the physician gender, women are more satisfied with female physicians rather than with male physicians (Derose *et al.*, 2001).

In the specialist program, there is not any correlation between geographical similarity and woman participation. Although, woman participation in Syah Kuala University is very low, woman participation in Andalas University and North Sumatera University is high. All of these provinces are in Sumatera Island. Meanwhile, besides Sebelas Maret University, woman participation in specialist programs in public universities in Java Island is generally high.

CONCLUSION

In this research, we have shown that generally, woman participation in public universities in Indonesia is high. Meanwhile, there are several findings about woman participation in public universities in Indonesia. Higher program level makes the woman participation goes lower. Woman participation is high in education/teaching,

healthcare and social science programs. Woman participation is low in engineering, farming and fishery program. Meanwhile, geographical aspect does not affect woman participation. Besides, stereotype about Java and non Java universities also does not affect woman participation.

Study in woman participation or gender disparity is very interesting and challenging. Besides in higher education area, analysis about these issues in country and society development is important. Besides about themselves, woman participation in developing future quality generation is important too.

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