

# Perspective on the Role of Pentahelix Collaboration Towards the Development of Energy Innovation in Higher Education

Febrianty<sup>1\*</sup>, Faisal Rahman Dongoran<sup>2</sup>, Esther Kembauw<sup>3</sup>, Jaenal Mutakim<sup>4</sup>, Adi Irvansyah<sup>4</sup>, Maryam Sangadji<sup>3</sup>

<sup>1</sup>Palcomtech Polytechnic, Palembang, Indonesia

<sup>2</sup>Universitas Muhammadiyah Sumatera Utara, Indonesia

<sup>3</sup>Universitas Pattimura, Indonesia

<sup>4</sup>Universitas Negeri Jakarta, Indonesia

Corresponding Author: febrianty@palcomtech.ac.id

## Article Info

Volume 83

Page Number: 6405 - 6421

Publication Issue:

March - April 2020

**Abstract:** Collaboration Penta Helix is known to accelerate the development of entrepreneurship innovation in universities by prioritizing participation in developing creatively based relationship or entrepreneurship in creative industries or called as creativepreneurship. This study applied the partnership model of Mohr and Spekman (1994) in describing the collaborative model of Penta Helix among stakeholders in the development of entrepreneurial innovation in universities, which involves: attributes, communication behavior, and conflict resolution techniques. This study aimed to determine perspective perpetrators and the role of perpetrators helix penta to the development of entrepreneurial innovation in university. The study design is a causal or causal research. The analysis of this research used Structural Equation Modeling (SEM) Analysis, which is operated through Lisrel Program. Population in this research was lecturer of entrepreneurship subject. Based on the sampling technique by purposive sampling that the lecturer had to take entrepreneurship subject at least twice / semester so that got the number of samples as many as 120 people. Based on the result of this research, it can be concluded that there were significant positive attributes, communication behavior, and conflict resolution techniques to the development of entrepreneurship innovation in universities, either partially or simultaneously.

## Article History

Article Received: 24 July 2019

Revised: 12 September 2019

Accepted: 15 February 2020

Publication: 04 April 2020

**Keywords:** Penta-Helix, Entrepreneurship Innovation, Attribute, Communication Perpreator, Conflic Resolution Technique.

## I. INTRODUCTION

Based on data from (BPS, 2010), unemployment rate in Indonesia reached 10.43 million people. In addition, based on data from BPS as of February 2017, open unemployment still reaches 7.01 million people. This is further added, those who have graduated from university are finding it increasingly difficult to get a job because there is not much expansion in business activities. Unemployment problems including those with high education can negatively affect social and

community stability. This condition is supported by the fact that most of university graduates prefer be job seeker rather than creating jobs. This is also due to the system of learning applied in various universities currently focused more on preparing students who graduate and get jobs quickly, without considering how to prepare graduates who are able to create jobs. According to Global Entrepreneurship Monitor, one-third of economic growth is generated through entrepreneurial activity. Therefore, every year, in the United States,

the population creates 600 to 800 thousand new entrepreneurs.

Indonesia is a big nation that is developing and surely is trying to be a developed country. This is supported by the large population and also the abundant of natural resources, and the geographical location which is also very strategic. With a population of approximately 265 million inhabitants, and Indonesia lies between the two great oceans of the Pacific and the Indians, and is flanked by two broad plains of Asian and Australian continents. As the country with the largest archipelago in the world (17,504 islands) the natural wealth lies both on land and at sea/ocean. According to McClelland (Kasali, Nasution, & Purnomo, 2010) one of the factors that causes a country to go forward is when the number of entrepreneurs in the country is at least 2% of the total population. Indonesia is at 1.67% in 2013-2014, and by 2017 based on BPS data has risen to 3.1% (Depkop, 2017). That means that, Indonesia is a country that has great potential will be developed countries such as: Europe, America and Japan. But with 3.1% the total entrepreneurship of the total population of Indonesia is still inferior to neighboring countries such as Malaysia which is at 5%, Singapore 7%. The growth of entrepreneurship can not be separated from the participation of the community, universities with the government in creating and continuously working together to develop new businesses in accordance with market interest. (Jamal & Stronza, 2009) stated that partnerships require the collaboration not the short term cooperation.

The concept of building entrepreneurship is not an easy issue because it can not be separated from the mental, cultural, norms, traditions, and life principles as well as the value of the socio-society view that being a worker, especially a civil servant is better than being an entrepreneur. This philosophy is not only applied to certain ethnicities, but also to a living philosophy. Therefore, in order to change the mindset from seeking work to the form of creating employment or entrepreneurship, it must be done systematically, integrated in strategic blueprint, and sustainable. In order to realize this, academics at universities have developed the concept of Penta Helix to adopt a business that is currently developed by entrepreneurs. Universities began to sharpen the concept of Penta Helix in

order to be implemented optimally by the stakeholders associated with the optimization of development and development of entrepreneurship in Indonesia. Penta Helix focuses on developing entrepreneurship by Academics, Business, Community, Government, Media or often abbreviated as ABCGM.

The academics are a source of knowledge for every entrepreneur through the concept and the latest theories relevant to the business to be developed and certainly up to date in accordance with the times. It is as said by (Kuswara, 2012) that the world of education in responding to the current trend that more and more universities are competing to become entrepreneurial University in addition to learning and research University. On the other hand, entrepreneurs need these concepts and theories in order to achieve sustainable competitive advantage. Business actors who are companies also need to be exploited by entrepreneurs in the context of being a market, supplier, and even source to get CSR or PKBL programs in the form of training and even funding to grow their business. While the community is a group of people who have the same interests and in this case, entrepreneurs seek the same community and are related to the business they develop. Today, many communities are beginning to grow and can get funding, marketing information, and even the raw materials that is needed by every entrepreneur.

The government must also be optimized by every entrepreneur in the development of his business as it relates to the policies and regulations he makes. Other parties that are not less important is the media that must also be optimized by every entrepreneur for the interests in branding-self, products/services, and business of every entrepreneur, where there is a mutual relationship so it is mutually beneficial

Increasing the ratio of entrepreneurship can also begin with the role of universities in terms of improving the implementation of education, especially in entrepreneurship courses, because the university will be the spearhead of the release of entrepreneurial seeds born on the basis of academic sciences that will also help them in theory to improve the science that can be applied simultaneously with practice in the world of entrepreneurship. Higher Education should also seek to develop the science of entrepreneurship and

should be adapted to the development of the world, especially in the field of entrepreneurship. How can entrepreneurship programs in universities collaborate maximally with the existing business incubator, through the direct involvement of universities towards students. In this case, universities design an entrepreneurship curriculum in accordance with the needs and market demand, so it can help the students or entrepreneurial candidates to excel and also generate income.

(Bjork, 2016) argued that innovation is an important strategy in addressing sustainability issues and fostering economic growth. Innovation is a product of consumer needs and creative ideas (Amabile, 1996). (Saublens, 2011) rediscovered existing ideas and performed remodel of other innovative ideas identified by entrepreneurs and entrepreneurial organizations. Likewise, innovation requires the creation and exploitation of opportunities that will result in better products and services and improvements in systems and management, skills development, and new competencies. (Schumpeter, 1947) emphasized the adoption and dissemination of these products to the market. The existing literature on research, innovation, and entrepreneurship seems to overlap in some way because each is related to the other (Etzkowitz, 2007). Therefore, innovation is a combination of one's enterprising nature and organizational entrepreneurial endeavor (NCEE, 2013). In a larger area, for example, entrepreneurship-generated entrepreneurial innovation is indispensable to all industry value chains that consisting of: production, processing, manufacturing, distribution / trading, and consumer.

Therefore, the Penta Helix model becomes the current choice for the development of university entrepreneurship innovation. Penta Helix collaboration can accelerate the development of entrepreneurship innovation in universities by prioritizing to participate in developing *creativity based entrepreneurship* or entrepreneurship in creative industries or also called creativepreneurship.

Education in the form of knowledge and ideas is a building block in innovation and economy knowledge that encourages social change and improves quality of life (OECD, 1997). Universities (or Higher Education Institutions / HEIs) and research institutions play a key role in shaping a

knowledge-based society. (Effendi, 2003) stated that the society now entrust to the universities as institutions of higher education that still have the moral strength to be a role model of society in the transformation toward the global community. They have the ability to shape society through the provision of skilled labor needed for the knowledge economy to flourish. They prepare the students for critical thinking and innovative skill, enterprising, and entrepreneurship. These institutions produce key players in knowledge generation and conservation as well as knowledge transfer for those who need such knowledge and skills.

Collage contributes to economic growth and development through innovation programs and commercial applications of the knowledge, products and services, technologies, and processes they create. They are responsible not only for developing talent and producing knowledge (Feller, 1990) but also transforming their achievements into economic benefits ((Department for Business, 2009); (Etzkowitz, 2007)). In addition, universities are also responsible for developing innovations that "support new ideas, new, experimentation, and creative processes, thus turning into established practices and technologies" (Lumpkin & Dess, 1996). This core value is defined in the university's strategic plan in the form of curriculum that is implemented in teaching and learning activities as well as research. Therefore, every university is required to enter entrepreneurship courses. In 2018, many universities have incorporated innovation as part of the vision and mission as well as the value of the organization. In addition, entrepreneurship education in universities has been facilitated by Dikti since 1997 with entrepreneurship development programs in universities that offer various activities: Entrepreneurship Lecture (KWU), Entrepreneurship Internship (MKU), Business Lecture (KKU) Business Consultancy and Work Placement (KBPK), Indonesian Student Business Competition (KBMI), and New Entrepreneur Incubator (INWUB) and many other programs. In its development Dikti offers other programs that are packaged as Student Creativity Program (PKM) which facilitates students to be creative in various fields including research, community service, technology application, scientific articles, written ideas, initiative and entrepreneurship. Furthermore, since 2009 Dikti

provides scheme for students who are interested as job creator through Student Entrepreneur Program (PMW). All policies are implemented in an effort to improve the quality of graduates of higher education by implementing the skills, expertise, responsible attitude, build teamwork and develop independence and develop the business through creative activities in the field of science that ditekuni. This is in line with Government Regulation No. 17 of 2010 which states that the purpose of higher education, among others, is to form a critical, creative, innovative, independent, self-confident and entrepreneurial spirit.

The issue of collaboration and the extent to which the role of helix in the development of entrepreneurial innovation in universities is the lack of coordination and lack of commitment among stakeholders involved in the collaboration. An example is the coordination between the government and the industrial community in designing training programs, which in some training content programs are not relevant to needs. Communication between parties is not effective enough for the partnership process among stakeholders. Conflicts arising from incompatibility of entrepreneurial innovation between partners' needs and those developed by universities. Innovations that are not market-oriented, lack of business confidence in Indonesia to take the advantage of entrepreneurial innovation results, and lack of open science concept implementation.

The research on the model and implementation of Penta Helix is done by (Amrial, Askar, & Emil, 2017) on "Penta helix Model: Sustainable Development Solutions through the industrial sector". The result of the research is an idea for the government to implement this policy so that sustainable development through the development of industrial sector can be achieved as well as balanced development infrastructure, especially education and industry.

Research on the application of penta helix model is also done by (Halibas, Sibayan, & Maata, 2017) regarding Penta Helix Model Innovation in Oman: Perspective of Higher Education. This study examines how universities can foster regional socio-economic growth and development through research innovation and entrepreneurship. This study discusses how universities can produce, nurture, encourage, and sustain innovation and

entrepreneurial activity by using strategic blueprints of innovation such as the Penta Helix model by promoting university innovations. The model also suggests the establishment of network channels to enable key players in innovation networks to share innovation information and collaborate with each other that ultimately contribute to the development of a culture of innovation in university.

Therefore, this study aimed to determine the perspective of perspective perpetrators of the role of collaboration penta helix perpetrator to the development of entrepreneurial innovation in universities. This study looks from the perspective of faculty entrepreneurship lecturer in the university with the assumption of the role of helix penta actors can be stated clearly in teaching and learning activities and lecturers support the subjects of entrepreneurship development programs in universities.

## II. THEORETICAL FOUNDATION

### Model Developments Before The Appearance Of The Penta Helix Model

When the Triple Helix concept was introduced 15 years ago (Etzkowitz & Leydesdorff 2000), it is important to make the policy and understanding of innovation systems and the different roles that actors can adopt. At that time, the helical metaphor was regarded as a "winding and braiding" relationship rather than linear. Further, immediately, the institutional arrangements established on Triple Helix's behalf become more segregated and conventional: the findings should be produced in so-called "knowledge infrastructure" (universities), developed through "support structures" (incubators, etc.) and eventually commercialized in "production structure" (personal business). The result will then be economic growth and welfare improvement.

Although this model is the foundation for developing conventional innovation systems with a focus on production and commercialization over time, it becomes increasingly clear that this concept is not ideal for social innovation processes. Researchers can find extreme ideas as well for social innovation and it does happen that social innovation can be commercialized, but this model can hardly be described as a typical or valid model. This concept cannot be ascertained that social innovation should be carried out in the form of new

or autonomous ventures - and it is also possible about changing routines in public administration.

One of the critical responses to the concept of triple helix is the emergence of helix quadra or Quattro model. (Ahonen & Hämäläinen, 2012), which argued that Triple Helix needs to be supplemented by third sector organizations, users, citizens or other people based on the open logic of innovation. (Billing, 2009) In the report "Øresund - Social Innovation Zone?" and (Danilda, Lindberg, & Torstensson, 2009) empirically based on the WINNET network; in contrast, the structured Quattro helix model is specifically based on the argument that third sector organizations also have a legitimate role to play in innovation systems.

Both approaches are relevant, but also impose restrictions that can be problematic. In other words, it can be said that innovation has become a central concept today, at least due to the economic crisis, which makes it possible to argue that the innovation system can be described as a form of governmental structure. The "open positions" of Ahonen and Hämäläinen can be seen as reproducing and legitimizing the basis of a system which proves to be unsustainable ecologically, socially and economically. Billing's and Danilda's model, Lindberg & Torstensson, (2009) are considered logical, as they appear to be based on the model structure of the welfare state in the Nordic countries, where legitimacy is closely linked to organizational and organizational forms. This means that it is possible to understand the latter model of the helical quattro as well as a reflection of the Swedish state's welfare model and its roots in social movements, such as the labor movement. At the same time, an important part of the discourse on social innovation is the critique of economic, ecological and social structures (such as the organization of welfare services) and the need to rethink (and create) different and innovative models. The central value is also a civil perspective in which rights and responsibilities are in focus (Björk, Hansson, Lundborg, & Olofsson, 2014)

### III. LITERATURE REVIEW

#### Entrepreneurship

According to (Yaghoobi, Aramesh, & Akbari, 2010) that entrepreneurship is a person who dares to open independent production activities.

(Jong & Eenekers, 2008) mentioned that entrepreneurs are people who take risks in running their own business by exploiting opportunities to create new business opportunities or with innovative approaches so that managed businesses to grow big and independent in the face of competitive challenges. (Baldacchino, 2008) also stated in the same way that entrepreneurship should have creative and innovative abilities, tips and resources to seek opportunities for success. (Frese & Gielnik, 2014); (Shin, 2015) stated that in entrepreneurship must have the skills, identify, take the opportunity, dare to risk, have the financial ability and effectiveness of lead so that can increase creativity and innovation.

The terms of a creative person according to Roe in (Frances, 2004) are: a. openness to experience b. Observing / seeing things in an unusual way, c. desire to tolerate for ambiguity, d. Independence in judgment, thought and action, e. Require autonomy, f. independence, g. Not subject to group standards and control, h. Willing to take calculated risks.

Someone to be an entrepreneur or entrepreneur does not just happen but has to go through the process. As said by (Husna, 2017) entrepreneurial process is a combination of cognitive and entrepreneurial steps at each stage of entrepreneurial development. The purpose of entrepreneurial cognition is the structure of knowledge that people use in judgment, decision-making involving opportunity evaluation, reporting and business development (Hisrich, Fox, & Grand, 2007). In general, cognition deals with perceptions, intentions, confidence structures, structures cognitive and entrepreneurial learning context (Krueger, 2005).

Based on the above explanation can be concluded that entrepreneur must dare to face risk. As stated by (Hadiyati, 2010) that keyword of entrepreneurship is risk-taking, running own business, exploiting opportunities, creating new business, innovative approach, independent (independent of government aid).

According to (Fayolle, 2007);(Fayolle & Senicourt, 2005), entrepreneurship and entrepreneurship education can be seen at different levels:

1. Entrepreneurship is a cultural problem (institutional point) or a matter of state of mind

(individual point). That means that entrepreneurship education is helpful to create an entrepreneurial culture within the country, society, companies, associations, and so on. Or to change the mindset of the individual. Culture and state of mind can be approached primarily in terms of values, beliefs, and attitudes.

2. Entrepreneurship is also a behavioral issue. Organizations and individuals can develop entrepreneurial behaviors as described by Stevenson: opportunity orientation, commitment to opportunity orientation, resource commitment, and so on.

3. Entrepreneurship is a particular problem or situation (creation of a new company, business enterprise, acquiring existing business and so on) including change, uncertainty, complexity and requires entrepreneurial behavior such as previously open and entrepreneurial competencies with respect to this particular feature of the situation.

### **Entrepreneurship Innovation**

(Larsen & Lewis, 2007) stated that one of the most important characters of the entrepreneur is the ability to innovate. So without any innovation, the company will not be able to survive in a long time. This is due to the needs, desires, and customer demands change. Customers will not always consume the same product. Customers will look for other products from other companies that can satisfy their needs. For that reason, it needs continuous innovation if the company will go further and still stand by its business. Innovation is something about goods, services or ideas that are felt new by someone. Although the idea has long existed but this can be said an innovation for people who just saw or felt it. The Company can innovate in the areas of: a. Product innovation (goods, services, ideas and places). b. Management innovation (work process, production process, marketing finance, and others). In conducting innovations, it needs to pay attention to the following principles: a. Analyzing opportunities, b. What to do to satisfy the odds, c. Simple and directional, d. Starting from a small, and e. Leadership.

(Hills, 2008) defined innovation as an idea, practice or object which considered new by an individual or other user units. (Suryana, 2003) stated that innovation: "as the ability to apply

creativity in order to solve problems and opportunities to enhance and enrich life". (Keeh, Nguyen, & Ping, 2007) explained innovation is important because there are the following reasons:

1. Technology changes very rapidly as new products, processes and services emerge from competitors, and this encourages entrepreneurial efforts to compete and succeed. All you have to do is adjust to new technological innovations. 2. The effect of environmental changes on the product life cycle is shorter, which means that old products or services must be replaced with new ones in quick time, and this can happen because there are creative thinking that leads to innovation. 3. Consumers today are smarter and demand fulfillment. Expectations on fulfilling needs expect more in terms of quality, renewal, and price. Therefore, innovative skills are needed to satisfy the needs of consumers while keeping customers as customers. 4. With the rapidly changing market and technology, a good idea can be more easily replicated, and this requires new, improved product, new and improved processes, and faster service delivery. 5. Innovation can lead to faster growth, improve market segments, and create better corporate positions. So Innovation happens when an individual or other user considers new things from an idea, practice or object (Hills, 2008).

The achievement of innovation can also be developed through action groups, such as research results by (Febrianty & Divianto, 2017) with the title of "The Influence Of Entrepreneurial Action Group On The SMEs Performance Through Internalization Of Quadruple Helix Innovation Role". There is a significant influence of Entrepreneurial Action Group and Internalization of Quadruple Helix Innovation Role on Creative Economy-Based SMEs performance.

### **Penta Helix Model**

Penta Helix is a socio-economic development model that drives a knowledge economy to pursue innovation and entrepreneurship through collaboration and profitable partnerships between academia, government, industry, NGOs and civil society, and social entrepreneurs (REPEC, 2012). The Penta Helix model is rooted in Triple Helix (Etzkowitz & Leydesdorff, 2000) where trilateral networks between academia, industry, and government combine to take advantage of

innovative research projects cultured in educational institutions and transform projects into viable, as well as commercial and service products, NGOs, civil society, and social entrepreneurs are added to Penta Helix. Penta Helix (Lindmark, Stureson, & Nilsson-Roos, 2009) is an extension of the triple helix strategy by involving various elements of society or nonprofit institutions in order to realize innovation. The picture below is a penta helix model.

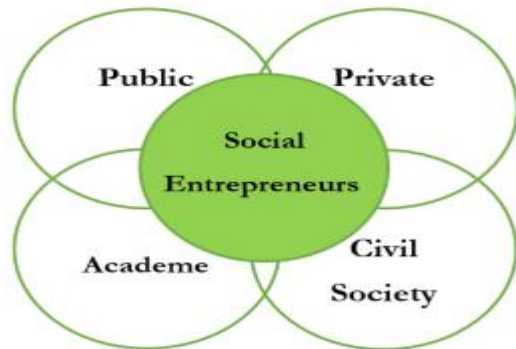


Figure 1. Penta Helix (Calzada, 2016)

Figure 1. shows the parties involved in Penta Helix, they have an important role in supporting the common goal of innovation (Rampersad, Quester, & Troshani, 2010) and they contribute to the regional socio-economic progress. (Von Stamm, 2004) stated that the best innovation will be achieved when there is strong collaboration and partnership between key players. This model is particularly useful for multi-stakeholder issues areas where stakeholders represent different interests in a place or problem. With synergistic collaboration, it is expected to realize innovation supported by diverse resources that interact synergistically.

Academics are a source of knowledge that has concepts and theories in business development to gain a sustainable competitive advantage. Communities are people who share a common interest and are relevant to a growing business. The Government is one of the stakeholders who have policies/regulations and responsibilities in developing the business. Business is an entity that has activities in processing goods or services becomes valuable. Meanwhile, the media are stakeholders who have more information to grow the business and play a strong role in promoting the business. (Jamal & Stronza, 2009) stated that partnerships require collaboration instead of cooperation in the short term.

(Carayannis & Campbell, 2012) argued that there is a need for a "sustainable development perspective that unites innovation, entrepreneurship, and democracy." Based on this it is possible to conceptualize a social innovation approach that can be explained by the Penta Helix concept. Penta Helix concept is not new in innovation discourse.

The partnership model of (Mohr & Spekman, 1994) is used to illustrate Penta Helix collaborative model among stakeholders.

1. Attribute: Suggests that some construction-related projects assist in guiding the flow of information between partners, managing the depth, and breadth of interactions and capturing dynamic exchange and recognizing dynamic interdependence among partners and their willingness to work for the sake of continuity of relationships. These attribute includes commitment, coordination, interdependence, trust, strength.
2. Communication Behavior: indicates that partnerships must have effective communication, including communication quality, information sharing, and participation in goals and planning.
3. Conflict Resolution Techniques: Conflict often occurs in relationships between organizations due to the inherent interdependence between partners. An understanding of how such conflicts are solved is important given that a number of conflicts are expected. The impact of conflict resolution on relationships can be productive or even destructive. Thus, the way in which couples resolve conflicts has implications for success in partnership.

## DEVELOPMENT OF THE RESEARCH MODEL

### The relationship of Attribute with Entrepreneurship Innovation Development in Universities

Research conducted by (Aditya & Daryanto, 2014) on the Influence of Modernity Entrepreneurship Attitudes on the Success of Tempe and Tahu MSMEs In Bogor Regency. The results showed that modernity attributes of entrepreneurial attitudes on Tempe producers are innovative, hard work, on time, and individual responsibility, while for Tahu producers are innovation, hard work, on time, achievement motivation, confidence and individual responsibility. The research conducted by (Febrianty, 2017) on the Interest of SMEs Actors of

Choice for the Application of Coopetition Strategy (Case Study: SMEs in Palembang City). Coopetition as part of business game related to creation and value enforcement (Siregar, 2016). The result of the research showed that there were significant positive influence of attitude, trust belief and perceived risks simultaneously to the interest of choice for the implementation of coopetition strategy in SMEs in Palembang City. Thus it can be stated that the attributes of partners had a positive relationship with the development of entrepreneurial innovation in universities, so the first hypothesis is stated as follows:

H1: Attribute positively influences Entrepreneurship Innovation Development in Universities.

### **The relationship of Communication Behavior with Entrepreneurship Innovation Development in Universities**

Behavior is an action that implements the knowledge and attitudes that have formed in the human self. It also deals with the norms that apply to the community (Irmasari, 2013). According to Rogers and Shoemaker in (Witjaksono, 1990), communication behavior is always related to the effort to obtain information as a material consideration in decision making. The research results conducted by (Rakib, 2010) on The Influence of Communication Among Entrepreneurs, Entrepreneurship Learning, and Entrepreneurship Attitude to Small Business Performance (A Study on Small Businesses of Wood Furniture in Parepare City). The results showed that both partially and simultaneously communication between customer entrepreneurs, entrepreneurial learning, and entrepreneurial attitude significantly influence the performance of small businesses. The increased performance of small business owners was influenced by factors such as the ability to communicate effectively with customers by showing behaviors such as openness, empathy, supportive behavior, positive behavior, and similarity. Therefore the second hypothesis of this study is stated as follows:

H2 : Communication Behavior positively influences Entrepreneurship Innovation Development in Universities.

### **The relationship of Conflict Resolution Technique with Entrepreneurship Innovation Development in Universities**

Conflict is defined as an inappropriate activity in which one's actions interfere with the actions desired by others. (Wallenstein, 2002) stated the resolution of the conflict as a condition after the conflict where the conflicting parties execute an agreement to solve the problems they are fighting and stop all violent acts against each other. This inappropriate activity takes place both in a cooperative and competitive situation and depends on whether the parties perceive their goals as cooperative or competitive will affect the expectations, interactions and results obtained (Coetzer & Trimble, 2010). Not all conflicts are destructive (Tjosvold, 2006, Wirawan, 2010). This opinion depends on the type of conflict and the resulting debate. Some authors argue that if the conflicts that occur can be managed properly it gives a positive influence on human resources. Such conflicts will increase productive behavior in the form of understanding from various sides over the consequences of the decisions taken. Conflict will always be present in teamwork as well as in the collaboration of Penta Helix. Previous research has shown that different conflict management orientations affect success at the individual and team level. A study conducted by (Alper, S., Tjosvold, D., and Law, 2000) found that conflict management would cooperatively control conflict (conflict efficacy) so that conflicts could be managed to produce higher team performance. Research on the Effect of Orientation on Entrepreneurship and Organizational Conflict to Company Performance conducted by (Riza & Fahrul, 2017). The result of the analysis shows that company performance was positively influenced by entrepreneurship orientation and conflict efficacy. Thus, conflict management techniques or skills influence the formation of entrepreneurial innovation in universities so that the third hypothesis is stated as follows:

H3 : Conflict Resolution Technique positively influences Entrepreneurship Innovation Development in Universities

#### IV. METHODOLOGY

##### Research Design

The research design is a causal study. According to (Sugiyono, 2016) causal relationship is cause and effect relationship.

##### Type and Sources of Data

The type of research used was a quantitative research that is presented in the form of numbers or using statistical formula to measure variables in research (Sugiyono, 2016). Sources of data used in this study were in the form of primary data, namely in the form of questionnaires and partly performed with interviews directly.

##### Population and Sample

Population in this research were lecturers who teach entrepreneurship course. The reason for the population in this study was limited to lecturers who take entrepreneurship courses (at least two times teaching the course) was given the importance of the input that will be given for the development of entrepreneurial innovation in learning in universities.

Based on sampling technique by purposive sampling that entrepreneurship lecturers of entrepreneurship subject in South Sumatera University area of 120 lecturers. This is because in order to facilitate directly gain perspective the extent to which support the role given from the actors of penta helix in the development of entrepreneurial innovation in universities and the obstacles encountered.

**Table 1. Operational Definition of Research Variables**

| Variable                            | Definition  | Indicator  | Scale   |
|-------------------------------------|---|--|---------|
| Attribute (AB)                      | Suggests that some construction-related projects assist in guiding the flow of information between partners, managing the depth, and breadth of interactions and capturing dynamic exchange and recognizing dynamic interdependence among partners and their willingness to work for the sake of continuity of relationships (Mohr & Spekman, 1994) | - commitment, coordination, interdependence<br>- trust, strength   | Ordinal |
| Communication Behavior (CB)         | indicates that partnerships must have effective communication, including communication quality, information sharing, and participation in goals and planning (Mohr & Spekman, 1994)   | - effective communication<br>- including communication quality, information sharing, participation in goals and planning   | Ordinal |
| Conflict Resolution Technique (CRT) | An understanding of how such conflicts are solved is important given that a number of conflicts are expected (Mohr & Spekman, 1994)   | - Conflict itself<br>- Characteristics of the people involved in it<br>- Expertise of individuals involved in conflict resolution<br>- The importance of conflicting issues<br>- Availability of time and effort | Ordinal |
| Entrepreneurship Innovation (EI)    | as the ability to apply creativity in order to solve problems and opportunities to enhance and enrich life (Suryana, 2003)  | - Analyzing opportunities<br>- What to do to satisfy the odds,<br>- Simple and directional,<br>- Starting from a small,<br>- Leadership  | Ordinal |

##### Structural Equation Modelling (SEM) Analysis

The analysis of this research used Structural Equation Modeling (SEM) Analysis, which was operated through Lisrel Program. SEM with PLS only allows the relationship model between variables that are recursive (unidirectional) only. Another reason is the error of each observation is not ignored but still analyzed so that SEM is more accurate in analyzing the questionnaire data involving perception. All latent variables are related to one another based on the theory of substance. The structural equation built on the guidelines:

$$\text{Endogenous Variable} = \text{Exogenous Variable} + \text{Endogenous Variable} + \text{Error}$$

One of the objectives of Path Analysis is to determine whether the model is fit or not. According to Hulland et al in (Ferdinand, A., 2005), several conformity indexes and their "cut-off value" are used to test whether a model is accepted or rejected, ie:

**Table 2. Goodness of Fit Index**

| Goodness of Fit Index    | Cut-of Value         |
|--------------------------|----------------------|
| $\chi^2$ -Chi-square     | Expected to be small |
| Significancy Probability | $\geq 0.05$          |
| RMSEA                    | $\leq 0.08$          |
| GFI                      | 0 – 1                |
| AGFI                     | $\geq 0.90$          |
| CMIN/DF                  | $\geq 3.00$          |
| TLI                      | $\geq 0.95$          |
| CFI                      | 0 – 1                |

##### Research Hypotheses

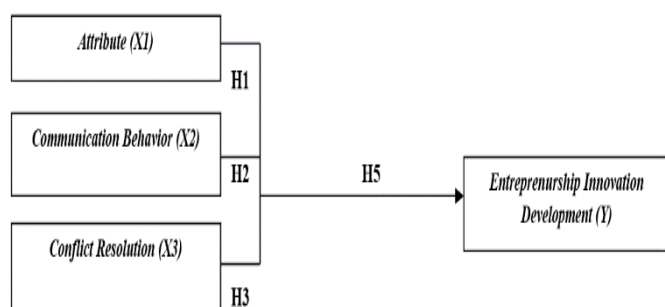
The hypotheses built in this study are as follows:

H<sub>1</sub> : Attribute positively influences Entrepreneurship Innovation Development in Universities.

H<sub>2</sub> : Communication Behavior positively influences Entrepreneurship Innovation Development in Universities.

H<sub>3</sub> : Conflict Resolution Technique positively influences Entrepreneurship Innovation Development in Universities

The research framework based on the built hypothesis is presented in Figure 2. below:



**Figure 2.** Research Framework

## V. RESEARCH FINDINGS AND DISCUSSION

### Description of Respondents

The description of respondent's characteristics of lecturers on entrepreneurship subject based on gender, age, education level, length of business and business group is presented in Table 3.:

**Table 3.** Characteristics of Respondents

| Information         | Characteristic                  | Total | Percentage |
|---------------------|---------------------------------|-------|------------|
| Sex                 | Female                          | 76    | 63%        |
|                     | Male                            | 44    | 37%        |
| Age                 | < 30 years old                  | 21    | 18%        |
|                     | 30-40 years old                 | 61    | 51%        |
|                     | >40 years old                   | 38    | 32%        |
| City/Regency Origin | Palembang City                  | 48    | 40%        |
|                     | Lahat Regency                   | 8     | 7%         |
|                     | Musi Banyuasin Regency          | 8     | 7%         |
|                     | Musi Rawas Regency              | 5     | 4%         |
|                     | Muara Enim Regency              | 6     | 5%         |
|                     | Ogan Ilir Regency               | 7     | 6%         |
|                     | Ogan Komering Ulu Timur Regency | 8     | 7%         |
|                     | Ogan Komering Ilir Regency      | 7     | 6%         |
|                     | Ogan Komering Ulu Regency       | 5     | 4%         |
|                     | Prabumulih City                 | 5     | 4%         |
|                     | Lubuk Linggau City              | 7     | 6%         |
|                     | Pagar Alam City                 | 6     | 5%         |

Based on Table 3. The sample respondents in this study were male dominant, aged 30-40 years old, with the largest number of lecturers of entrepreneurship subject lecturer at the university in Palembang City which was 40%. Table 7. below presents the recapitulation of respondents' answers to the question items in the Penta Helix variable.

**Table 4.** The form of Collaborative Role of Penta Helix Performers on Entrepreneurship Innovation Development at Universities in Palembang

| No | Information                                       | Collaboration Role   |
|----|---|--|
| 1  | Lecturers between Universities                    | <ul style="list-style-type: none"> <li>- Become a liaison to partners and prospective partners between universities</li> <li>- Being a coach and partner</li> <li>- Being a provider of products/services based on science and technology</li> <li>- Be a facilitator who provides training, coaching and mentoring programs for partner universities</li> <li>- Being an inter firm linkage between partner universities</li> <li>- As a guarantor of ease of access with other parties</li> <li>- Being a party that can expand the reach of universities</li> </ul>   |
| 2  | College with Government                           | <ul style="list-style-type: none"> <li>- The government supports universities in particular through training programs and infrastructure development, establishment of research laboratories, technology and science centers, training centers and incubation centers, consulting centers, skills and technology transfer centers, spinoffs, start-ups, etc.</li> <li>- The government invites university academics to become members of national advisory and consultant committees</li> </ul>  |
| 3  | Colleges and Private Sector                       | <ul style="list-style-type: none"> <li>- Universities and private sector as provider of entrepreneurship facility program or entrepreneurship empowerment</li> <li>- The private sector, represented by industry/industry groups, provides employment opportunities for universities graduates</li> <li>- The private sector is willing to be a place for apprenticeship and business counseling</li> <li>- The industry also invests and provides the capital and human resources needed to produce and distribute innovative projects of universities to the market through research funding and commercialization</li> <li>- Universities build strong partnerships with industry by providing financial resources that help transform research projects into business ventures</li> <li>- Small industries and businesses can assign colleges and university research institutions to develop products and services.</li> <li>- Universities see value in the Corporate Social Responsibility (CSR) of the private sector/industry that gives the college the opportunity to create business from the research result of the universities</li> <li>- Knowledge of universities is very useful for the private sector because it can equip companies in areas where they have no experience and knowledge and vice versa.</li> <li>- The private sector supports innovation and entrepreneurial initiatives of universities not only through financial assistance but also through financial and advisory initiatives.</li> </ul> |
| 4  | Universities and NGOs and Community Organizations | <ul style="list-style-type: none"> <li>- Non-governmental organizations (NGOs) and civil society organizations are usually the recipients of government donations, contributions and subsidies. Their participation in policy-making and in planning and comprehensive development programs is essential. Therefore, universities continue to open opportunities for dialogue and partnerships with them by involving them in social innovation programs and universities product development</li> </ul>   |
| 5  | Colleges and Social Entrepreneurs                 | <ul style="list-style-type: none"> <li>- Stakeholders in universities develop social entrepreneurs primarily on their graduates with good socioeconomic status, who can use their innovative thoughts, shared values and interests, and donate contributions to continue their social mission.</li> </ul>  |

Based on Table 4, it implies that there is still a great deal of potential collaboration on the role of Penta Helix at universities in Palembang City that have not yet been optimized. Universities should not only promote the development of entrepreneurship innovation at the university as part of the institutional practice of the university but it will increase awareness of the collaborative role of stakeholders/partners and intensify the role optimally and identify other potential partnerships.

Therefore, the university needs to identify the need to increase the level of appreciation and involvement in the development of entrepreneurial innovation among its stakeholders/partners. The effectiveness of collaborative monitoring of universities in Palembang City with the stakeholders/partners has not happened well since most were still limited to articulate entrepreneurial innovation in vision and mission statement, university strategic plan or part of measurement of research performance and community service/lecturer professional development program.

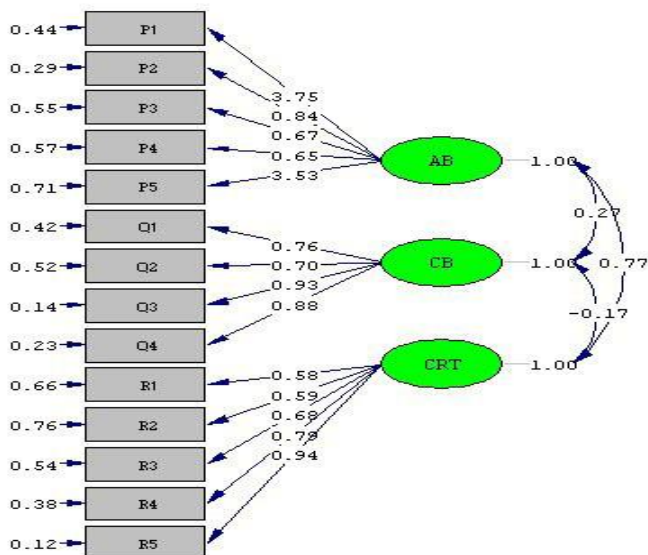
The University also only identifies that collaboration with its stakeholders/partners as a

platform for the establishment of intellectual property rights and patents, commercialization of research, and external partnerships. There are only a few universities in Palembang City that apply innovation culture from study program level even institutionally rooted. The final outcome that the university wishes to achieve for the collaborative role of penta helix actors to the development of entrepreneurship innovation at the university in Palembang City was still limited to the many forms and the number of entrepreneurial innovations that have not been performed on the effect of the development of entrepreneurship innovation (knowledge transfer, technology transfer, and commercialization of innovative products/services) to how collaborative the partners themselves are, the involvement of MSMEs actors/owners, students, alumni, and society even more broadly helps the growth of regional and national economies.

## Confirmatory Factor Analysis or CFA

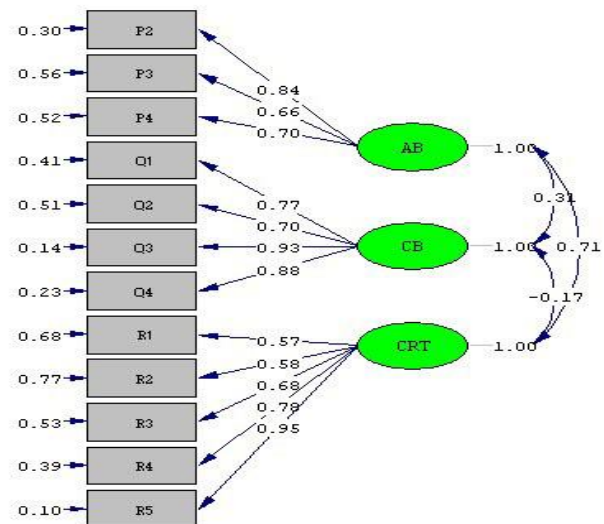
### a). CFA Exogenous Construct

CFA Exogenous Construct can be seen in Figure 3. as below:



**Figure 3.** Model\_1 Exogenous Construct

Based on Figure 4. it can be seen that in Model\_1 CFA Exogenous Construct there was loading factor value  $< 0.5$ , namely P1 and P5 indicators on variable AB, meaning those indicators were not yet valid and must be rejected so that obtained Model\_2 CFA Exogenous Construct as follows:



**Figure 4.** Model\_2 CFA Exogenous Construct

Based on Figure 4. indicated that on the Model\_2 CFA Exogenous constructs there was no loading factor value  $< 0.5$ , all indicators were valid.

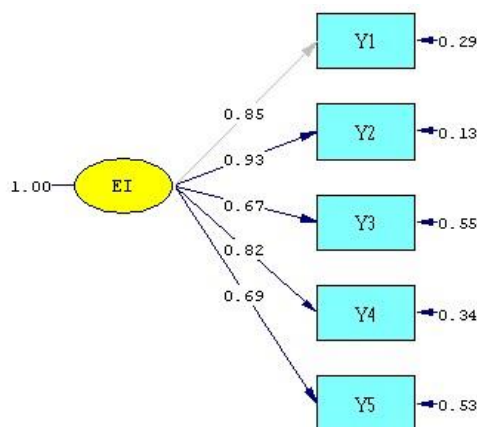
**Table 5.** Reliability of Exogenous Construct\_2

| Variable | Dimensio<br>n | $\lambda$ | Error = $1 - \lambda^2$ | $CR = (\sum \lambda)^2 / ((\sum \lambda)^2 + \sum \text{Error})$ |
|----------|---------------|-----------|-------------------------|--|
| AB       | P2            | 0.84      | 0.30                    | 0.778  |
|          | P3            | 0.66      | 0.56                    |  |
|          | P4            | 0.70      | 0.52                    |  |
| CB       | Q1            | 0.77      | 0.41                    | 0.893  |
|          | Q2            | 0.70      | 0.51                    |  |
|          | Q3            | 0.93      | 0.14                    |  |
|          | Q4            | 0.88      | 0.23                    |  |
| CRT      | R1            | 0.57      | 0.68                    | 0.837  |
|          | R2            | 0.58      | 0.77                    |  |
|          | R3            | 0.68      | 0.53                    |  |
|          | R4            | 0.78      | 0.39                    |  |
|          | R5            | 0.95      | 0.10                    |  |

Based on Table 5. it shows that the Construct Reliability value of all exogenous constructs AB, CB, and CRT was above 0.7. Thus the research variables in Full Model had good reliability and validity.

### b). Confirmatory Factor Analysis of Endogenous Construct

CFA Endogenous Construct can be seen in Figure 5. as below:



**Figure 5.** Model\_1 CFA Endogenous Construct

Based on Figure 5. indicated that in the Model 1 CFA Endogenous Constructs there was no loading factor value  $< 0.5$ , so all indicators in the endogenous variables have already shown as valid.

**Table 6.** Reliability of Endogenous Construct

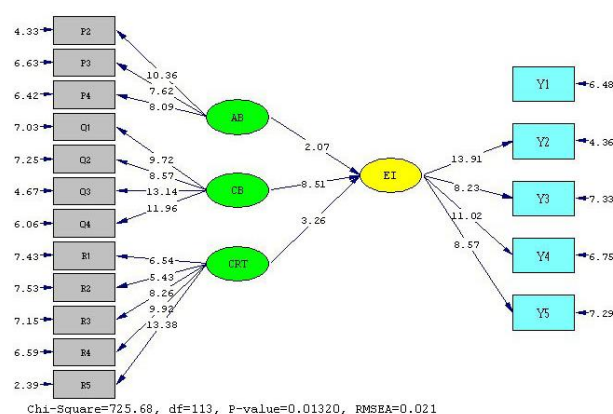
| Dimension | Indicator | $\lambda$ | Error = $1 - \lambda^2$ | $CR = (\sum \lambda)^2 / ((\sum \lambda)^2 + \sum \text{Error})$ |
|-----------|-----------|-----------|-------------------------|--|
| EI        | Y1        | 0.85      | 0.29                    | <b>0.895</b>   |
|           | Y2        | 0.93      | 0.13                    |  |
|           | Y3        | 0.67      | 0.55                    |  |
|           | Y4        | 0.82      | 0.34                    |  |
|           | Y5        | 0.69      | 0.53                    |  |

Based on Table 6. Construct Reliability (CR) it showed that of the endogenous construct was above 0.7. Thus it can be concluded that all dimensions and variables of EI had good reliability so that it can be analyzed.

**Table 7.** Goodness of Fit Index

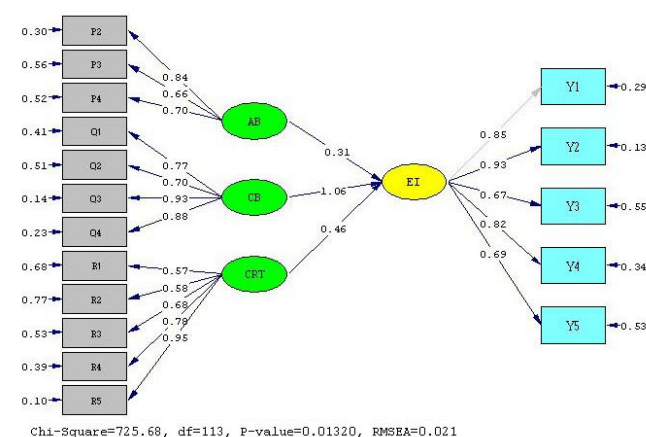
| Goodness of Fit Index    | Value  | Description  |
|--------------------------|--------|--------------|
| $\chi^2$ -Chi-square     | 725.68 | Marginal Fit |
| Significance Probability | 0.013  |              |
| RMSEA                    | 0.021  | Good Fit     |
| GFI                      | 0.88   | Good Fit     |
| AGFI                     | 0.93   | Good Fit     |
| NNFI                     | 0.83   | Marginal Fit |
| CFI                      | 0.89   | Good Fit     |

The estimation results for the SEM full model analysis based on t-value are shown in Figure 6. below:



**Figure 6.** Full Model based on t-value

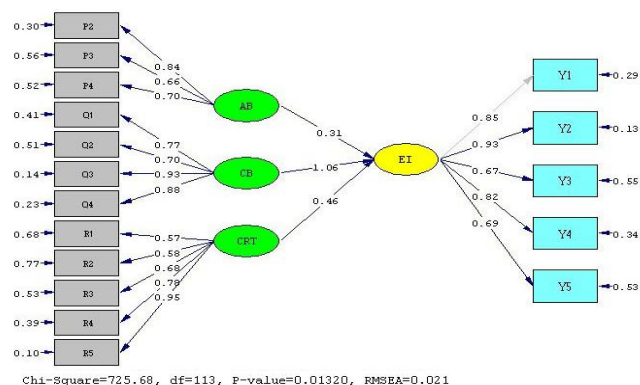
Based on Figure 6. it can be seen that almost all parameters in the Full Model were all significant (t-count value was greater than 1.96), at the 0.05% level. The result of Structural Equation Modeling (SEM) based on loading standards is shown in Figure 7. below:



**Figure 7.** Loading Standard

**Equation:**  $EI = 0.31*AB + 1.06*CB + 0.46*CRT$ , Errorvar.= 0.13 ,  $R^2 = 0.87$

Based on the structural model, it can be explained that EI was influenced by AB, CB, and CRT. This means that the better the AB, CB, and CRT then the EI will increase. The magnitude of the effect of AB on EI was 0.31, CB on EI was 1.06, whereas CRT on EI was 0.46. This shows that CB had a greater influence on EI than AB and CRT.



**Figure 8.** Full Model Estimate based on Estimation

Loading value stated the relationship between research variables with the indicator then the best indicator on a variable is that which has the largest loading value, the higher relationship of these indicators with research variables.

### Match Analysis of Structural Models

The conclusion of hypothesis test is presented in Table 10.

**Table 8.** Conclusion of Hypothesis Test

| No. | Path     | t-value | Estimation | Description   |
|-----|----------|---------|------------|---|
| 1   | AB → EI  | 2.07    | 0.31       | H <sub>1</sub> :Positively and Significantly Influence  |
| 2   | CB → EI  | 8.51    | 1.06       | H <sub>2</sub> : Positively and Significantly Influence |
| 3   | CRT → EI | 3.26    | 0.46       | H <sub>3</sub> : Positively and Significantly Influence |

This study aimed to test the Perspective on the Collaboration Role of Penta Helix Actors on Entrepreneurship Innovation Development in Universities. Based on the results of the analysis, the following discussion:

#### 1. The influence of Attribute on Entrepreneurship Innovation Development in Universities

The results of this study support the first hypothesis that the attribute variable (X1) had a significant and positive influence on the development of entrepreneurial innovation in universities. This is indicated by the value of regression coefficient of Attribute (AB) of 0.31 which stated that each attribute that increase of 1 unit will increase the development of entrepreneurship innovation in college of 0.31 units, with t-count > t-table (2.07 > 1.98), thus indicating that attributes had a significant positive effect on the development of entrepreneurial innovation in universities. The indicators of attribute namely: commitment, coordination, interdependence, trust, and strength of the university and its partners to be the main capital in doing collaboration that supports the development of entrepreneurial innovation in the university. The results of this study supported the

results of previous research which is research by (Aditya & Daryanto, 2014), the results showed that attributes of entrepreneurship modernity attitudes influence the success of SMEs.

#### 2. The influence of Communication Behavior on Entrepreneurship Innovation Development in Universities

The results support the second hypothesis that the communication behavior variable (X2) had a significant positive effect on the development of entrepreneurship innovation in universities. This is indicated by the value of the communication behavior regression coefficient (CB) of 1.06 which stated that each increase in communication behavior of 1 unit will increase the development of entrepreneurship innovation in universities of 1.06 units, with tcount > t table (1.06 > 1.98), thus indicating that Communication Behavior had a significant positive effect on the development of entrepreneurial innovation in universities. Communication Behavior Indicators, namely: effective communication, including communication quality, information sharing, participation in goals and planning. This variable had a dominant influence on the development of entrepreneurship innovation in universities compared with other variables. Communication behavior is indispensable in improving collaboration between universities and their stakeholders/partners, which can be implemented through best practices of each party to deliver optimal performance. Effective, ethical, and open communication will make each party more trustworthy and work together to produce innovation. The results of this study support the research by (Rakib, 2010), where the results showed that both partial and simultaneous communication between entrepreneurs had a significant effect on the performance of small businesses.

#### 3. The influence of Conflict Resolution Technique on Entrepreneurship Innovation Development in Universities

The results support the third hypothesis that conflict resolution technique variables (X1) had a significant positive influence on the development of entrepreneurial innovation in universities. This is indicated by the value of regression coefficient of conflict resolution technique (CRT) of 0.46 states that the increase of conflict resolution techniques of 1 unit will increase the development of

entrepreneurship innovation in universities of 0.46 units with  $t_{count} > t_{table}$  (3, 26 > 1.98), thus indicating that conflict resolution techniques had a significant positive effect on the development of entrepreneurial innovation in universities. Technical indicators of conflict resolution, namely: the conflict itself, the characteristics of the people involved, individual expertise involved in conflict resolution, the importance of conflicting issues, the availability of time and effort. The better the social skills of universities and partners, the higher the chance of achieving the goal of developing entrepreneurship innovation in universities. The complexity of innovation level that will be achieved and the environmental changes faced by universities and their stakeholders/partners, it will demand the ability of mature conflict resolution techniques resulting in the outcome of conflict that can provide solutions and bring conflicts to the realm that produce positive impacts namely the achievement of goals the development of entrepreneurial innovation. The results of this study support research by (Riza & Fahrul, 2017) with the results of the analysis showed that the company's performance was positively influenced by conflict efficacy.

## VI. CONCLUSION

Based on the results of this study it can be taken the conclusion as follows: there was a significant positive influence of attribute, communication behavior, and conflict resolution techniques to the development of entrepreneurship innovation in universities, either partially or simultaneously. Further research on the development of entrepreneurial innovation in universities should take into account the opinion of Penta Helix and consider the blue print of entrepreneurship development of higher education. The development of advanced study, especially on measuring the level of entrepreneurship innovation of higher education, to be able to use in addition to the primary data is also equipped with secondary data. Further research is also expected to extend the scope of measurement research and the development of entrepreneurship innovation levels at universities in Indonesia through further research and establishing studies on specific entrepreneurship development projects specifically

conducted by the Penta Helix perpetrators and the extent of the impact of the collaboration.

## REFERENCES

- [1]. Aditya, A. D. R., & Daryanto, H. K. S. (2014). Pengaruh Modernitas Sikap Kewirausahaan Terhadap Keberhasilan Umkm Tempe Dan Tahu Di Kabupaten Bogor. Retrieved from <https://media.neliti.com/media/publications/61372-ID-pengaruh-modernitas-sikap-kewirausahaan.pdf>
- [2]. Ahonen, L., & Hämäläinen, T. (2012). CLIQ: A practical approach to the quadruple helix and more open innovation. CLIQ: A practical approach to the quadruple helix and more open innovation. IN: MACGREGOR, S., & CARLETON, T. (Eds). Sustaining innovation. Collaboration models in a complex world. Springer.
- [3]. Alper, S., Tjosvold, D., and Law, K. S. (2000). Conflict Management Efficacy and Performance in Organizational Teams. *Personel Psychology*, (53), 625–643.
- [4]. Amabile, T. (1996). *Creativity in context (1st ed.)*. Boulder, Colorado: Oxford: Westview Press.
- [5]. Amrial, Askar, M., & Emil, M. (2017). Penta helix model: A sustainable development solution through the industrial sector. *Social and Human Sciences*.
- [6]. Baldacchino. (2008). Entrepreneurial Creativity and Innovation. In *The First International Conference on Strategic Innovation and Future Creation*. Malta: University of Malta.
- [7]. Billing, P. (2009). Öresund social innovation zone? Föreningsliv, frivilligkraft och innovativ regional utveckling.
- [8]. Bjork, F. (2016). *Social innovation, sustainable development and governance*. Sweden. Retrieved from <https://www.slideshare.net/luftrbj/si-sd-governance>
- [9]. Björk, F., Hansson, J., Lundborg, D., & Olofsson, L.-E. (2014). *An Ecosystem for Social Innovation in Sweden A strategic research and innovation agenda*.
- [10]. BPS. (2010). *Statistik Indonesia Tahun 2010*. Jakarta.
- [11]. Calzada, I. (2016). Plugging smart cities with urban transformations: Towards multi-stakeholder city-regional complex urbanity. *Journal of Urban Studies and Social Sciences*, 6(2), 37. Retrieved from 6418

- <http://www2.ual.es/urbs/index.php/urbs/article/view/calzada>
- [12]. Carayannis, E. G., & Campbell, D. F. J. (2012). *Mode 3 Knowledge Production in Quadruple Helix Innovation Systems. Mode 3 Knowledge Production in Quadruple Helix Innovation Systems*. [https://doi.org/10.1007/978-1-4614-2062-0\\_1](https://doi.org/10.1007/978-1-4614-2062-0_1)
- [13]. Coetzer, G. H., & Trimble, R. (2010). An Empirical Examination of the Relationship Between Adult Attention Deficit, Cooperative Conflict Management and Efficacy for Working in Teams. *American Journal of Business*, 25(1), 25–34.
- [14]. Danilda, I., Lindberg, M., & Torstensson, B. M. (2009). DANILDA, I., LINDBERG, M., TORSTENSSON, B.-M., 2009. Women resource centres—a Quattro Helix innovation system on the European agenda. In *Triple Helix VII, 17–19 June 2009*. Glasgow, UK.
- [15]. Department for Business, I. & S. (2009). *The future of universities in a knowledge economy*. Edinburgh, UK: Higher Ambitions. Retrieved from <http://www.ed.ac.uk/files/atoms/files/bis-higherambitions-summary-nov2009.pdf>
- [16]. Depkop, 2017. (2017). Ratio Wirausaha Indonesia Naik Jadi 3,1 Persen. Retrieved August 20, 2004, from <http://www.depkop.go.id/content/read/ratio-wirausaha-indonesia-naik-jadi-31-persen/>
- [17]. Effendi. (2003). *Pengelolaan Perguruan Tinggi Menghadapi Tantangan Global*. Retrieved January 2, 2018, from [www.sofian.staff.ugm.ac.id](http://www.sofian.staff.ugm.ac.id)
- [18]. Etzkowitz, H. (2007). University-industry-government: The triple helix model of innovation. Paper presented at the 51st EOQ Congress. Prague, Czech Republic. Retrieved from [http://www.eoq.org/fileadmin/user\\_upload/Documents/Congress\\_proceedings/Prague\\_2007/Proceedings/007\\_EOQ\\_FP\\_-\\_Etzkowitz\\_Henry\\_-\\_A1.pdf](http://www.eoq.org/fileadmin/user_upload/Documents/Congress_proceedings/Prague_2007/Proceedings/007_EOQ_FP_-_Etzkowitz_Henry_-_A1.pdf)
- [19]. Etzkowitz, H. (n.d.). University-industry-government: The triple helix model of innovation. Paper presented at the 51st EOQ Congress. Prague, Czech Republic. Retrieved from [http://www.eoq.org/fileadmin/user\\_upload/Documents/Congress\\_proceedings/Prague\\_2007/Proceedings/007\\_EOQ\\_FP\\_-\\_Etzkowitz\\_Henry\\_-\\_A1.pdf](http://www.eoq.org/fileadmin/user_upload/Documents/Congress_proceedings/Prague_2007/Proceedings/007_EOQ_FP_-_Etzkowitz_Henry_-_A1.pdf)
- [20]. Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from national systems and “Mode 2” to a triple helix of university–industry–government relations. *Research Policy*, 29(2), 109–123.
- [21]. Etzkowitz, H., Ranga, M., Dzisah, J., & Zhou, C. (2007). University-Industry-Government Interaction: The Triple Helix Model Of Innovation. *Asia Pacific Tech Monitor*, 24(1), 14–23.
- [22]. Fayolle, A. (2007). *Handbook of Research in Entrepreneurship education-A Contextual Perspective* (volume 2). Cheltenham (UK): Edward Elgar.
- [23]. Fayolle, A., & Senicourt, P. (2005). Peut-on former des entrepreneurs? *L'Expansion Management Review*, 16(1), 34–41.
- [24]. Febrianty. (2017). Minat Pelaku UKM Atas Pilihan Untuk Penerapan Strategi Koopetisi (Studi Kasus : UKM di Kota Palembang). In *Seminar Nasional Teknologi Informasi, Bisnis, dan Desain* (pp. 34–42). Palembang: STMIK – Politeknik PalComTech. Retrieved from [http://www.news.palcomtech.com/wp-content/uploads/downloads/2017/08/05\\_FEBRIANTY.pdf](http://www.news.palcomtech.com/wp-content/uploads/downloads/2017/08/05_FEBRIANTY.pdf)
- [25]. Febrianty, & Divianto. (2017). THE INFLUENCE OF ENTREPRENEURIAL ACTION GROUP ON THE SMES PERFORMANCE THROUGH INTERNALIZATION OF QUADRUPLE HELIX INNOVATION ROLE. *Biotika*, 2(15), 30–41. Retrieved from [https://journal-biotika.com/current-issues/2017-02/article\\_07.pdf](https://journal-biotika.com/current-issues/2017-02/article_07.pdf)
- [26]. Feller, I. (1990). Universities as engines of R&D-based economic growth: They think they can. *Research Policy*, 19(4), 335–348.
- [27]. Ferdinand, A., T. (2005). *Structural Equation Modelling*. Semarang, Indonesia: Badan Penerbit Universitas Diponegoro.
- [28]. Frese, M., & Gielnik, M. M. (2014). *The Psychology of entrepreneurship. Annual Review of Organizational Psychology and Organizational Behavior*. Retrieved from doi:10.1146/annurev-orgpsych-031413091326
- [29]. Frinces, H. (2004). *Kewirausahaan dan Inovasi Bisnis* (Cetakan Pe). Yogyakarta: Penerbit Darusalam.
- [30]. Hadiyati. (2010). *Pemasaran untuk UMKM (teori dan Aplikasi)* (Edisi Pert). Malang: Banyumedia.
- [31]. Halibas, A. S., Sibayan, R. O., & Maata, R. L. R. (2017). The penta helix model of innovation in Oman: An hei perspective. *Interdisciplinary Journal of Information, Knowledge, and Management*, 12, 159–172. <https://doi.org/10.28945/3735>

- [32]. Hills, G. (2008). Marketing and Entrepreneurship, Research Ideas and Opportunities. *Journal of Small and Medium Entrepreneurships*, 27–39.
- [33]. Hisrich, Fox, L., & Grand. (2007). Entrepreneurship research and practice: a call to action for psychology. *American Psychologist*, 62(6), 575–589. <https://doi.org/doi:10.1037/0003-066X.62.6.57>
- [34]. Husna. (2017). *The 6th University Research Colloquium 2017 Universitas Muhammadiyah Magelang*. Magelang.
- [35]. Irmasari, R. (2013). *Respons Perangkat Desa Terhadap Penganekaragaman Pangan Tepung Umbi-Umbian di Kabupaten Bantul*. Fakultas Pertanian UGM.
- [36]. Jamal, T., & Stronza, A. (2009). Collaboration theory and tourism practice in protected areas: stakeholders, structuring and sustainability. *Journal of Sustainable Tourism* 2, Hal. 169–189., 17(2), 169–189.
- [37]. Jong, & Eenekers. (2008). *Conceptualizing Entrepreneurial Employee Behavior. SMEs and Entrepreneurship Programme Finance by the Netherlands Ministry of Economic Affairs*.
- [38]. Kasali, R., Nasution, A. H., & Purnomo, B. R. (2010). *Modul Kewirausahaan untuk Program Strata I*. Jakarta: Penerbit Hikmah.
- [39]. Keeh, H. T., Nguyen, M., & Ping. (2007). The Effects of Entrepreneurial Orientation and Marketing Information on the Performance of SMEs. *Journal of Business Venturing*, 592–611.
- [40]. Krueger. (2005). *The Cognitive Psychology of entrepreneurship in the Z.J.Acs & D.B. (Audretsch)*. Boston: Kluwer Academic Publishers.
- [41]. Kuswara, H. (2012). Strategi Perguruan Tinggi Mewujudkan Entrepreneurial Campus. Retrieved from <http://www.dikti.go.id/> Strategi Perguruan Tinggi-mewujudkan-entrepreneurialcampus
- [42]. Larsen, P., & Lewis, A. (2007). How Award Winning SMEs Manage The Barriers to Innovation. *Journal Creativity and Innovation Management*, 141–151.
- [43]. Lindmark, A., Stureson, E., & Nilsson-Roos, M. (2009). *Difficulties of collaboration for innovation -A study in the Öresund region*. Lund University, Lund, Sweden. Retrieved from <http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=1437850&fileId=2435467>
- [44]. Lumpkin, G., & Dess, G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21(1), 135–172.
- [45]. Mohr, J., & Spekman, R. (1994). Characteristic of partnership success: partnership attributes, communication behavior and conflict resolution techniques. *Strategic Management Journal*, 135.
- [46]. NCEE. (2013). *From Concept To Action*. UK. Retrieved from <http://eulp.co.uk/wp-content/uploads/2013/11/From-Concept-To-Action.pdf>.
- [47]. OECD. (1997). *National innovation systems*. Paris. Retrieved from <http://www.oecd.org/science/inno/2101733.pdf>.
- [48]. Peraturan Pemerintah Nomor 17 tahun 2010 tentang Tentang Pengelolaan Dan Penyelenggaraan Pendidikan.
- [49]. Rakib, M. (2010). Pengaruh Model Komunikasi Wirausaha, Pembelajaran Wirausaha, Dan Sikap Kewirausahaan Terhadap Kinerja Usaha Kecil. *Jurnal Ilmu Pendidikan*, 17(2), 121–129.
- [50]. Rampersad, G., Quester, P., & Troshani, I. (2010). Managing innovation networks: Exploratory evidence from ICT, biotechnology and nanotechnology networks. *Industrial Marketing Management*, 39(5), 793–805.
- [51]. REPEC. (2012). *Application of Penta Helix Model in economic development*. UK.
- [52]. Riza, & Fahrul. (2017). Organisasi Terhadap Kinerja Perusahaan, 337–346.
- [53]. Saublens, C. (2011). *Supporting the entrepreneurial discovery process at regional level*. Brussels. Retrieved from <http://slideplayer.com/slide/743253/>
- [54]. Schumpeter, J. (1947). The creative response in economic history. *The Journal of Economic History*, 7(2), 149–159.
- [55]. Shin, S. J. (2015). *Leadership and creativity: The mechanism perspective in the C.E. Shalley, M.A. Hint & J. Zhou (Eds)*. (The oxford). New York: Oxford University Press.
- [56]. Sugiyono. (2016). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- [57]. Suryana. (2003). *Kewirausahaan, Pedoman Praktis, Kiat dan Proses Menuju Sukses* (Edisi Revi). Jakarta: Salemba Empat.
- [58]. Siregar, S. L. (2016). Koopetisi Industri Perbankan di Indonesia. In *Prosiding Seminar Nasional Manajemen Teknologi IV*. Surabaya: Program Studi MMT-ITS.
- [59]. Tjosvold, D. (2006). Defining conflict and making choices about its management: lighting the dark side of organizational life. *International Journal of Conflict Management*, 17(2), 87–95.
- [60]. Von Stamm, B. (2004). Collaboration with other firms and customers: Innovation's secret weapon. *Strategy & Leadership*, 32(3), 16–20.
- [61]. Wallensteen, P. (2002). *Understanding Conflict*

*Resolutin : War Peace and the Global system.*  
London: London:Sage.

- [62]. Wirawan. (2010). *Konflik dan Manajemen Konflik: Teori, Aplikasi, dan Penelitian*. Jakarta: Salemba Humanika.
- [63]. Witjaksono, R. (1990). *Hubungan Perilaku Komunikasi dan Tingkat Pemahaman Informasi Anggota Kelompok Tani Tentang Paket Teknologi Supra Insus di WKBPP Sanden, Kabupaten Bantul, D.I. Yogyakarta*. IPB, Bogor.
- [64]. Yaghoobi, S., Aramesh, & Akbari. (2010). An Evaluation of Independent Entrepreneurship Obstacles in industrial SMEs. *European Journal of Social Science*, 33–45