How Does Rasch Model Reveal Dishonesty between Coastal Students and Grammar Test?

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ABSTRACT

Academic dishonesty can occur with the supports of the technology devices and it also can be prevented with the help of the technology with its applications like Rasch Model. It can give detail information of the analyzed data and can trace the academic dishonesty like cheating. The aims of this research are to (1) analyze the grammar test items whether they are difficult items or easy ones using Rasch Model, (2) know the percentage of those who are assumed to do cheating based upon their origins and sex, and (3) expose their patterns in working on the grammar test in the form of multiple choice through the Rasch Model analysis. The researcher hypothesized that the academic dishonesty i.e. cheating was undergone by students who are from rural and urban areas of Riau Archipelago Province. The results of this research were: (1) through the students' responses analyzed by Rasch Model, the grammar test was for medium ability, (2) The Rasch Model revealed that the percentage came to the number 5.71% or 4 of 70 students who were identified to cheat while working on the grammar test. They were two female students from rural area and the other two male students from urban area, and (3) The Rasch Model revealed that their responses did not represent their ability. The Rasch Model has helped the researcher to exposes the cheating deeds on exams. The practitioners just need methods, approaches, strategies, techniques, and media to prevent them in the future

Keywords: *Rasch Model, Wright Maps, Grammar Test.*

INTRODUCTION

The existence and the presence of the technology among people's lives invite pros and contras. Many people feel happy with them and many of them are thinking over about negative effects which technological devices give. The devices can help people to ease and facilitate their work effectively and efficiently. To some degree, their presence has been horrible since many students misused them. They have been using them to complete their assignments, scientific papers, academic projects, etc. Such deeds and habits drag them over to the academic dishonesty. They always press their notebooks

keyboards of control "C" and control "V". These two keyboards are so easy to use but they also can result in the devastating destruction academically. That is why many students are involved in in the practices of academic dishonesty starting from high to higher schools. Actually, students go to schools to have better education and to educate their behavior as well. Education is needed to give students better understanding of academic ethics to form their good attitudes and to steer clear of practices of academic dishonesty (Chertok, Barnes, & Gilleland, 2014).

A definition of academic dishonesty goes to unacceptable and unethical deeds which a student demonstrates in a test or examination to measure knowledge and ability (Wood, Thompson, Picus, & Tharpe, 2015). Other experts define academic dishonesty as illegal any unauthorized efforts on students' academic performances (Oran, Can, Senol, & Hadımlı, 2016). One of the activities of the academic dishonesty is cheating. Cheating is one type of academic dishonesty (Küçüktepe, 2011). The other types are like working together in an exam, browsing, sorting, copying, and pasting someone's work, hiring someone to accomplish scientific papers, and many more. It was claimed that the academic dishonesty has turned into a serious threat in higher education and in much more professions globally (Winrow, Reitmaier-Koehler, & Winrow, 2015; Nazir & Aslam, 2010). Plagiarism, (Teodorescu & Andre, 2009) and cheating on exams (Krueger, 2014) are the practices of the academic dishonesty.

Information can be accessed across continents from home easily. An American student is able to copy and paste full essays from an African author through browsing it on Google, or can pay an author to get his or her own essays by visiting Chinese website (Arhin & Jones, 2009). The students' practices of cheating deeds become prevalent. Many students do or do not realize that what they have done is not that right or is immoral. Changing these behaviors takes time for them and these acts should be avoided to be their new cultures (Bates, Davies, Murphy, & Bone, 2005).

Recent findings of the academic dishonesty show that based upon the statements on views on cheating, students regarding cheating, 43.9% have cheated on exams. This finding of Oran, Can, Senol, & Hadımlı (2016) was almost similar to the other researchers' findings in their literature. A research found that low and high-level innovative cheating techniques were used by the students when dealing with tests, papers, group work, or clinical practice (Faucher & S, 2009). Another finding claimed that female students are engaged in cheating more serious than that of male students (Wang, et al., 2015). Another study also confirmed that what made the students cheat was because

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of their culture, school atmosphere, bad teaching, financial problems, age, gender, etc (Kalhori, 2014). A result of a study gave an emphasis on the college students who involved in plagiarism activity of working on written tasks with different ways and the low penalties for the misconduct kept these practices existing (Lawa, Tingb, & Jeromeb, 2013). Another research found that sophisticated ICT and its development in the form of social media gave access to the students to be more creative to drag over cyber-cheating behaviors (Parks, Lowry, Wigand, Agarwal, & Williams, 2018). Another report showed that there was not significant difference dealing with cheating practices by gender, but it showed a positive correlation between self-reported cheating and the frequencies of this behavior in mates (David, 2015). In addition, another finding also came to the similar result showing no a significant relationship between any of the four cheating classifications or professional misconduct and the characteristics of grade point average, gender, or level of parent's education (Winrow, Reitmaier-Koehler, & Winrow, 2015). Another report suggested that consciousness of the penalties toward academic dishonesty, including plagiarism, would certainly prevent cheating students (Guraya & Guraya, 2018). The recent studies deal with how the students engaged with the cheating deeds and exposed which gender was involved in cheating deeds more serious, revealed the causes of the cheating, their motives of cheating, and the media used to cheat. In this way, they have not come to the specific areas of teaching like what course and how they do that. The importance of this research was that this study wanted to expose the specific course and to reveal how and who did it on the grammar test.

Different points of view on grammar teaching and researchers' findings, grammar plays its important part of language teaching (Sik, 2015). The measurement of teachers' grammar knowledge can be done through test-like instruments. Their beliefs are able to be obtained through questionnaires and interviews. Their cognitive aspects can be evaluated in complex ways through classroom practices and discussions with teachers (Sharabyan, 2011). Grammar should be taught to students to help them convey their meaning precisely deductively or inductively through its situational context (Larsen-Freeman, 2000).

Rarely being evaluated during the Wada procedure, grammar is very essential in human language system (Połczy'nskaa, et al., 2014). The implicit knowledge of grammar is able to construct a well-formed word, phrase, or sentence. After that, someone is able to create, comprehend, and judge the combinations through his or her grammaticality. Testing grammar is not only used to measure comprehension of its knowledge as a whole, but also to know

its parts (Połczyńskaa, et al., 2017). A test like multiple choice question (MCQ) is a favorite test form in educational assessment (Brady, 2005). It is widely used to measure the cognitive aspect of English grammar. A MCQ comprises a stem like filling a blank space with four options and with one correct answer (Fang, Tuan, Hui, & Wua, 2018).

The recent studies of the grammar showed that in terms of the academic achievement of adult students, the deductive teaching group on grammar is more successful and more efficient dealing with structures being taught in the grammar sessions (Sik, 2015). Another report said that language testing on grammar was effective in the recovery phase of Wada testing after surgery for epilepsy patients. The following report found that there was a possibility of CBI to develop the grammatical knowledge and competence of the learners. The pre-post-tests results of the two test types informed that (1) their grammar knowledge and use of language showed improvement, and (2) they came to a success to construct appropriate definitions which they did not make it before (Harun, Abdullah, & Wahab, 2017).

However, current studies having had much focus on nursing students to know the academic dishonesty in general. They have not exposed certain specific courses to investigate to know whether or not the academic dishonesty like cheating also takes place. One study dealt with that, but the focus was on plagiarism on students' academic writing. It did not expose who they were, how they did it, and how they were assumed to be involved in the cheating practices in the class after completing the exams. This research also takes part with the academic dishonesty like cheating, particularly on grammar test. The purposes of this research were to (1) analyze the grammar test items whether they are difficult items or easy ones using Rasch Model, (2) know the percentage of those who are assumed to do cheating based upon their origins and sex, and (3) expose their patterns in working on the grammar test in the form of multiple choice through the Rasch Model analysis. The researcher came to a hypothesis that the academic dishonesty i.e. cheating was undergone by students who are from rural and urban areas of Riau Archipelago Province.

RESEARCH METHODOLOGY

Quantitative approach for descriptive was used dealing with this research (Creswell, 2014; Fauziati, 2017). The setting of the research was in one of universities located in Tanjung Pinang, Riau Archipelago, Indonesia. The second-semester students comprising 70 students were involved in this research in the academic year of 2018/2019. It was carried out in April 2019. The instrument of this research was the grammar test. There were 40 items of the

grammar test which was provided by the researcher. The items were in the form of the multiple choice test type. The researcher distributed the grammar test material and the answer sheets. After ensuring that each student got them, he assigned them to fulfil their identity on the answer sheets. After that he set the stop watch up for 35 minutes for the test time. Then, he gave signal to start the test by tapping the stop watch. After the time was over, the students turned the answer sheets in. The researcher took them and brought them to analyze by using an application. The application to analyze the research instrument was Rasch model software i.e. Winsteps version 3.73 (Sumintono & Widhiarso, 2013), Aplikasi Model Rasch untuk Penelitian Ilmu-ilmu Sosial, (Chan, Ismail, & Sumintono, 2014; Mutalib, Ghafar, Baharom, & Hamzah, 2015; Ariffin, Omar, Isa, & Sharif, 2010; Cecilio-Fernandes, et al., 2013; Agust & Subroto, 2018; Matore, Maat, Affandi, & Khairani, 2018). The Rasch Model analyzed the dichotomous data i.e. the grammar test items.

The Cronbach alpha (KR-20) score of the grammar test was 0.82. The logit mean score on person was -.11. The person reliability of the grammar test was .82. It can be said that the grammar test was acceptable because it was more than the minimum acceptable score, i.e. 0.05 (Sumintono & Widhiarso, Aplikasi Model Rasch untuk Penelitian Ilmu-ilmu Sosial, 2013; Chan, Ismail, & Sumintono, 2014). The reliability of the grammar items score was .91. The score belonged to the very good category (Sumintono & Widhiarso, Aplikasi Model Rasch untuk Penelitian Ilmu-ilmu Sosial, 2013).

RESULT AND DISCUSSION

The summary statistics using Winsteps version 3.37 of the Rasch Model described the quality of the grammar test items in this research. The reliability score of the person of the grammar items was .82. The score belonged to good category. The reliability score of the item of the grammar test was .91. The score came to a very good category. From the both reliability scores of person and item, it can be concluded that students showed good consistency to deal with the grammar test items. The reliability of items was .96, which means that the quality of the items were excellent. The summary also reported the score of the Alpha Cronbach (KR-20) for the item i.e. .82. The score means that the students and the items showed very good interaction. Thus, through the Rasch Model analysis, the items of the grammar test were reliable to use in this research. It also confirmed the requirement of the Rasch Model analysis.

The quality of the grammar items was able to be measured by using some other elements of the Rasch Model. The score of the INFIT MNSQ of person was 1.00. The ideal score of the INFIT MNSQ was 1.00. Then, the score of the

OUTFIT MNSQ was 1.00. The ideal score of the OUTFIT MNSQ was 1.00. The scores of INFIT and OUTFIT ZSTDs were 0.0 and 0.0. The ideal score for both was 0.0. For the items, the score of the INFIT MNSQ was 1.01. The ideal score of the INFIT MNSQ was 1.00. The score of the OUTFIT MNSQ was 1.00. The ideal score of the OUTFIT MNSQ was 1.00. The scores for INFIT and OUTFIT ZSTDs were 0.0 and -.1. The ideal score for both was 0.0. All of the scores were about to reach the ideal scores. It means that the instrument of the grammar had good quality. The separation score for the grammar items based upon the summary statistics was 4.55. It showed that the score of the separation was high i.e. 4. It corresponded to the grammar items had six groups in the different levels i.e. (1) the most difficult, (2) more difficult, (3) difficult, (4) easy, (5) easier, and (6) the easiest. The Rasch model analysis said that the good items should be discriminatory. Interestingly, this instrument was discriminatory items. Figure 1 shows the items of the grammar test grouped into six levels based upon its difficulty levels.

The subject of this research was the college students. They are from one of the universities in Riau Isle Province. There were 70 students involved in this research, comprising 53 (75.71%) female students and 17 (24.29%) male students. Students from rural areas consisted of 39 (44.29%) and 31 (55.71%) students from urban areas spread away in Riau Isle Province. Table 1 gives a detail description of the students' demographic information.

Table 1. Demographic Information of Students

No	Demographic Information	Number	Percentage
1	Their Sex		
	Female	53	75.71%
	Male	17	24.29%
2	Their Origin		
	Rural	39	44.29%
	Urban	31	55.71%
	Total	70	100%

Grammar items: Figure 1 shows the grammar items about the nominal sentences which were well-spread to all levels of students' abilities. As previously stated, the grammar items were claimed as the discriminative items. From figure 1, the item with code P34 was the most difficult item. It was above the average of the item logit i.e. +2.08. The item was about nominal sentence dealing with year (2004). Most students failed to put a correct preposition before year. They agreed with on 2004 instead of in 2004. It means that they had to be brushed up on English prepositions. The items with code P35 (+1.69) and

P32 (+1.37) became the more difficult items. These items informed that the college students still did not understand the parts of speech of the nominal sentences, particularly on demonstrative pronoun and plural nouns.

**Figure 1.** Wright map of grammar items
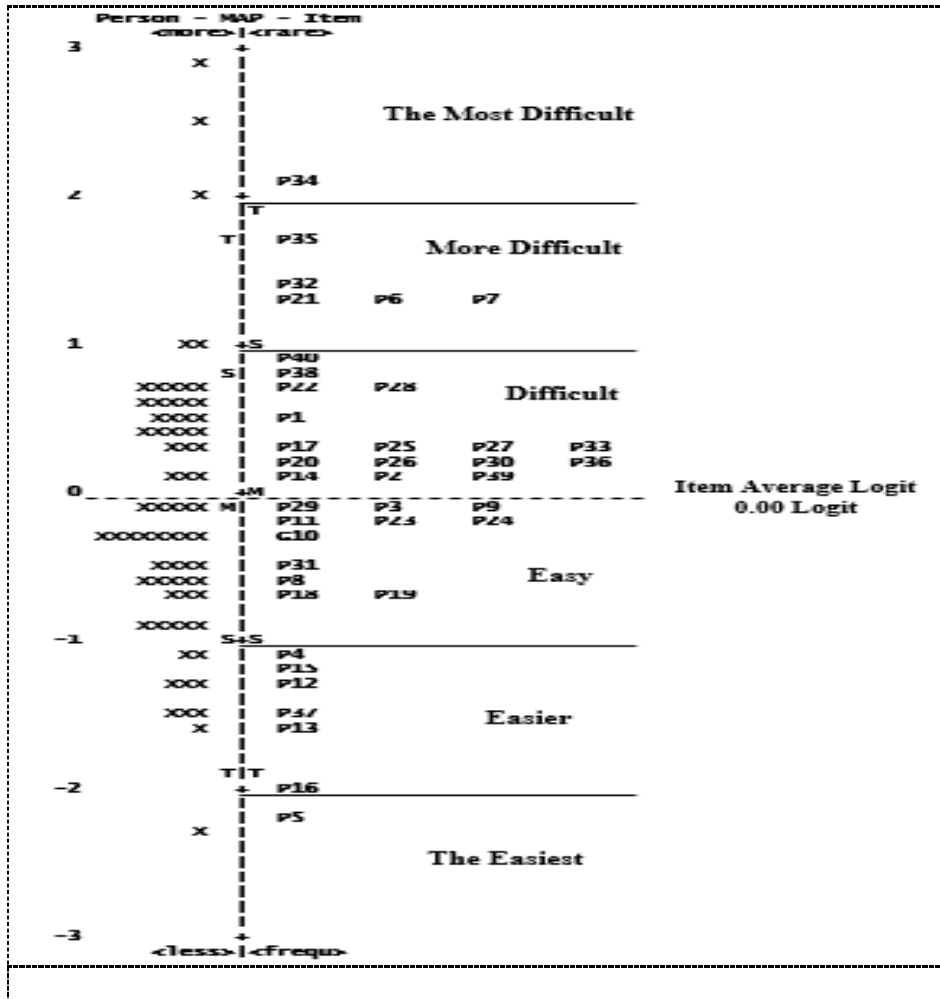
The two items with code P40 and P38 were also above the average of the item logit i.e. +.93 and +.85. They were categorized as the difficult items. Those who were below logit average found it difficult to work on them. They were still nominal sentences with focus on the adverb and the plural noun. The other items with code P29, P3, and P9 and the logit of which was the same i.e. -.13 below the average logit measured the same abilities. These three items were not discriminatory and they belonged to the easy items of the grammar test. They were the nominal sentences about noun phrase (subject), auxiliary in the simple present perfect tense, and adverb. The item with code P4 which logit was below the average logit i.e. -1.11 was considered as the easier item. There was one student who could not work on it correctly. It was about nominal sentence with focus on modal auxiliary. The easiest item on this grammar test was the item

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with code P5 which logit was below the average logit i.e. -2.15. Sixty-nine students were able to answer that correctly, but one student thought that the nominal sentence about the English pronoun as subject was not that easy, even though this item was categorized as the easiest item on the grammar test.

Figure 2 informs more detail about the test information function. For the lowest and the highest abilities, the test claimed less information which could be obtained. On the other side, the test could give much more information for the medium ability. It means that the grammar test which was given to the students about the nominal sentences was administered for those whose ability was at medium level. Thus, it was suitable for the normal diagnostic test.

Figure 2. Test information function of the grammar of test
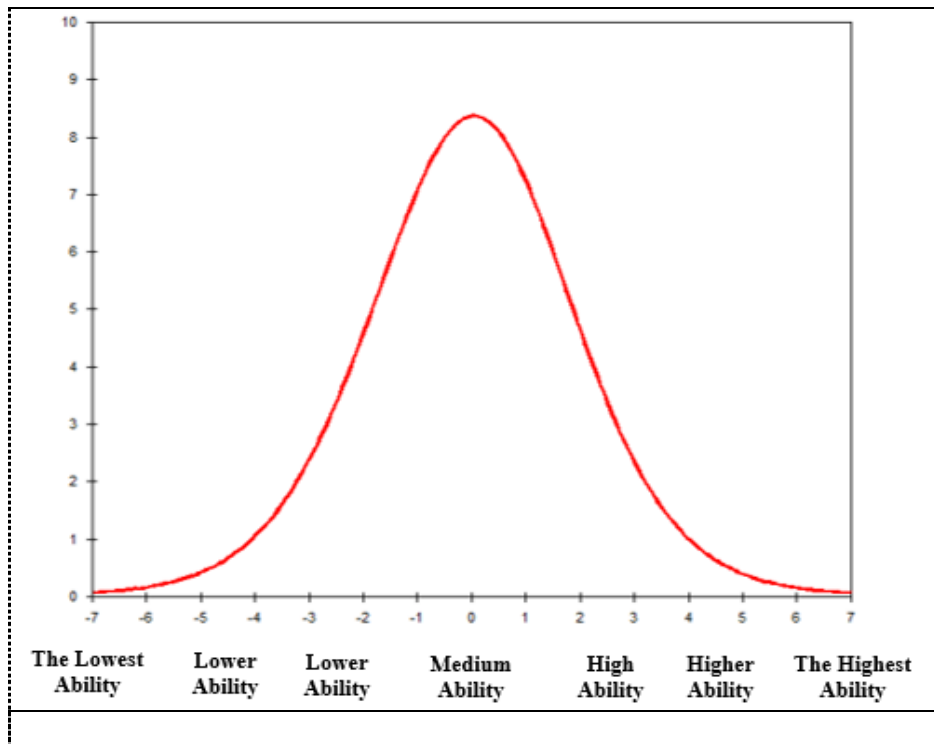
The Grammar test based upon the perspective of the students: Figure 3 informed the detail description relating to the students with the different abilities. The given codes for them were FU-MU and FR-MR, which mean that FU was a female student from urban area; MU was a male student from urban area and FR was a female student from rural area; MR was a male student from rural area. The given numbers like 1 through 70 were their entry numbers. The 3 of 70 students (4.29%) whose the ability was the highest went to the students with the codes 10FU, 58FU, and 53 FU. Their logits were +2.87 for 10FU, +2.53 for 58FU, and +2.02 for 53FU. The 2 of 70 students (2.86%) belonged to the

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higher ability with the same logits i.e. +1.01. Both of them were the male students. There were 25 of 70 students (35.71%) who came to the high ability. The 8 of 25 students are from rural areas, while the 17 of 25 students are from urban areas. It seems that the urban students dominated the high ability rather than the rural ones. The 30 of 70 students (42.86%) held the low ability. There were 23 of 30 students who emanate from rural area and 7 of 30 students who come from urban area. Surprisingly, the low ability went to the rural students dominantly. The 9 of 70 students (12.86%) were at the low ability. There was only 1 of 9 students who is from urban area and the rest were dominated by rural students. The 1 of 70 students (1.43%) whose the ability was the lowest came to the student with the code 09FU. The logit was below the average i.e. -2.27. She is from urban area.

From the 70 students, Rasch Model identified four students whose response patterns were not in line with their abilities or did not fit. The assumption was that they were able to answer the most difficult items correctly, but they failed to work on the easiest ones. Figure 4 gave detail of the students of how they responded to the given grammar test. Those students were 06FR with measured logit -1.63, 52FR with measured logit -1.30, 63FR with measured logit -1.14, and 16FR with measured logit -.47. The students from rural area were dominant with the response patterns. The score of the Outfit Mean Square (MSQ) of the 06FR student was +2.41, while the standard score of Outfit MSQ was 0.5 < MSQ < 1.5. The score of the Outfit Z-Standard (ZSTD) was +2.7, while the standard one was -2.0 < ZSTD < +2.0. The score of the Point Measure Correlation was -.27, while the standard score was 0.4 < Pt Measure Corr < 0.85. The score of the Outfit MSQ of the 52FR student was +2.14, while the standard score of Outfit MSQ was 0.5 < MSQ < 1.5. The score of the Outfit ZSTD was +2.8, while the standard one was -2.0 < ZSTD < +2.0. The score of the Point Measure Correlation was -.18, while the standard score was 0.4 < Pt Measure Corr < 0.85. The score of the Outfit MSQ of the 63FR student was +1.72, while the standard score of Outfit MSQ was 0.5 < MSQ < 1.5. The score of the Outfit ZSTD was +2.2, while the standard one was -2.0 < ZSTD < +2.0. The score of the Point Measure Correlation was +.13, while the standard score was 0.4 < Pt Measure Corr < 0.85.   The score of the Outfit MSQ of the 16FR student was +1.45, while the standard score of Outfit MSQ was 0.5 < MSQ < 1.5. The score of the Outfit ZSTD was +2.1, while the standard one was -2.0 < ZSTD < +2.0. The score of the Point Measure Correlation was +.13, while the standard score was 0.4 < Pt Measure Corr < 0.85.

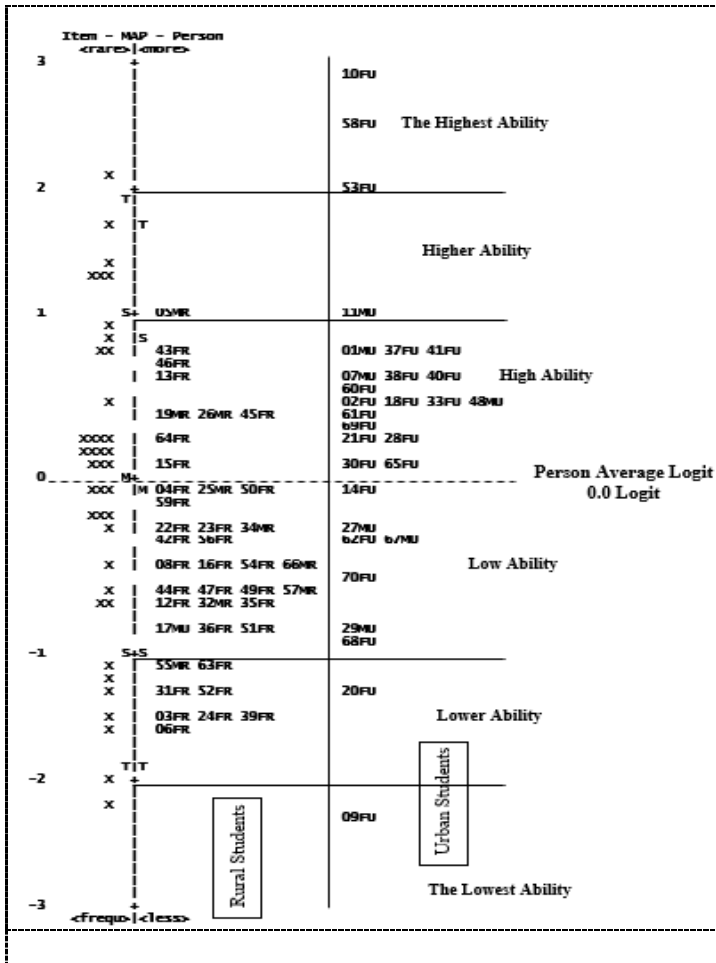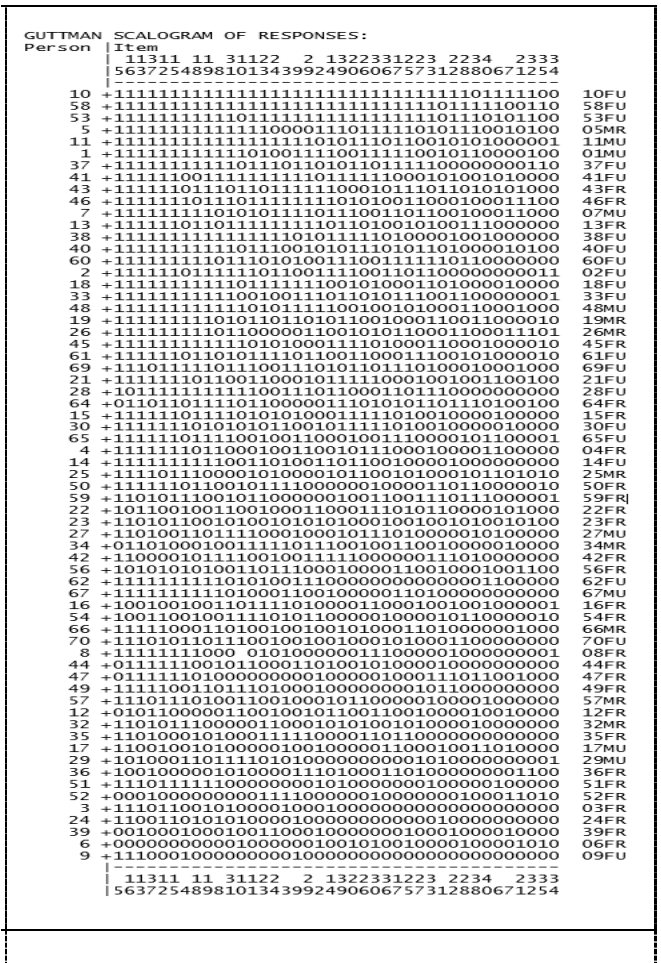Figure 3. Wright Map of Person on Grammar Test

Figure 4. Guttman Scalogram on Grammar Test

Through the scores of the Outfit MNSQ, Outfit ZSTD, and Pt Measure Corr for the 06FR student, it can be concluded that the way which she responded the grammar test did not correspond to the normal responses. The standard scores of the Outfits and Pt Measure Corr were not fulfilled. This case was the same as the case of 52FR student. She gave the different responses on the grammar test. The standard scores of the Outfits and Pt Measure Corr were above the standard scores. Unlike the next case, the 63FR student could fulfil one standard score of the Pt Measure Corr i.e. +.13. Unfortunately, the other standard scores of the Outfits were beyond the expectation. The following case of the 16FR student was much better than that of three students. The standard scores of the Outfit MNSQ and the Pt Measure Corr could be reached. Unluckily, the standard score of the Outfit ZSTD was about to be reached. That was why these four students gave unusual responses on the grammar test among the other sixty-six students.

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The purpose of this research was to analyze the grammar test items whether they were difficult items or easy ones using Rasch Model. Based upon the above findings through figure 2, the test information function of Rasch Model diagnosed that the test items were in the medium level. It means that the students would not have problems to work on it. They were supposed to be able to analyze each part of a given item. A report stated that testing grammar is not only used to measure comprehension of its knowledge as a whole, but also to know its parts (Połczyńskaa, et al., 2017). The other purpose was to know the higher percentage of those who are assumed to do cheating based upon their origins and sex. The Rasch Model revealed that the percentage came to the number 5.71% or 4 of 70 students who were identified to cheat while working on the grammar test. The number was not too big but their deeds were making it bigger or more serious. The students were 23FR, 34MR and 37FU, 01MU. They are from rural and urban areas. The numbers of the students who were indicated to do cheating were equal i.e. two female students from rural area and the other two male students from urban area. It means that the students had the same potential and probability to do cheating on the grammar test. The finding of this research showed different result from the finding of Oran, Can, Senol, & Hadımlı (2016). The percentage of the students doing cheating on exams was bigger i.e. 43.9%. This finding corresponded to the finding of David (2015). He reported no significant difference dealing with cheating practices by gender, but it showed a positive correlation between self-reported cheating and the frequencies of this behavior in mates.

This research also exposed their patterns in working on the grammar test in the form of multiple choices through the Rasch Model analysis. Based upon figure 4, the data showed their patterns to respond to the grammar test in the form of the multiple choices. The 06FR and 52FR students were very careless students. They are female and from rural area. They could not answer the easiest item of the grammar test i.e. the item 5. It was about a nominal sentence of the subject agreement to the copula. On the other hand, they were able to answer the 2nd difficult item i.e. the item 35. The item was a nominal sentence about the demonstrative pronoun. There were only 12 students who answered that correctly. It can be assumed that she dealt with a lucky guess when working on the item. This finding was in line with Sumintono & Widhiarso (2015). They said that the 18PD and 19LD students could not answer the easy item but they were successful to work on the difficult one. There was an indication of dealing with a lucky guess. The 63FR and 16 FR students almost had the same patterns of the responses. The 63 FR students was able to conquer the second and the third difficult items but she who is from rural area failed to

answer the easy item i.e. the item 5. What made it different from the responses of the 16FR student was that this female student from rural area was able to answer the most difficult item i.e. the item 34, where the students with the highest ability could not make it. However, she chose the incorrect answer for the second and the third easy items i.e. the items 16 and 13. A lucky guess as Sumintono & Widhiarso (2015) stated took place while she was working on the grammar test.

The researcher hypothesized that the academic dishonesty i.e. cheating was potentially and probably undergone by students who are from rural and urban areas of any gender of Riau Archipelago Province. The finding of this research showed that two female students from rural areas and two male students from urban areas were indicated to cheat while working on the grammar test. This result was not in allignment with another finding which claimed that female students are engaged in cheating more serious than that of male students (Wang, et al., 2015). This study also revealed that the academic dishnonesty among the college students occurred with 4 of 70 students (5.71%). They were identified to do cheating practices while facing the grammar test. This finding was confirmed by another result saying that the academic dishonesty has become a serious problem among college students (Winrow, Reitmaier-Koehler, & Winrow, 2015; Nazir & Aslam, 2010). Cheating on exams (Krueger, 2014) is the practice of the academic dishonesty. Their patterns of working on the grammar test were careless and lucky guess. The careless practice occurred where the students with high ability did not make it with the easiest items. The lucky guess practice appeared where the students with low ability were able to answer the most difficult items correctly. This finding corresponded to another result. The 18PD and 19LD students were not able to answer the easy item but they made it with the difficult one (Sumintono & Widhiarso, 2015). These practices could not be unstoppable, if strict regulation and consistent penalties are seriously implemented in order that the students will be aware of what should be and should not be and will not be against the law. A report given by Guraya & Guraya (2018) said that consciousness of the penalties toward academic dishonesty, including plagiarism, would certainly prevent cheating students.

CONCLUSION

The practices of the academic dishonesty which the college students do like cheating on exams are the classic problem. The college students around the world from developing countries to developed countries are dragged over in the unexpected and unacceptable practices through different ways. The

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sophisticated technological devices facilitate them to do it easily. To solve this problem, sophisticated applications to trace and expose this bad habit should be used. One of them is the Rasch Model. It analyzes the grammar test items of this research in detail. This application can help researchers and strengthen their assumption or hypothesis of their researches. The grammar test used in this research is a medium level of its difficulties. The test information function informs that the way the students respond to the given items of the grammar test reveals that their ability on grammar is at medium level. The percentage of the students assumed to do cheating is not that big but the notice is that the practice of cheating is there. Their patterns dealing with the grammar test in the form of the multiple choices are clumsy. Their responses do not represent their ability. They are able to answer the most difficult items in the test but they cannot make it with the easy ones. The lucky guess is also assumed to be involved in the test based upon the patterns which they form through their responses to the grammar test of this research. The academic dishonesty like cheating is revealed. It is not about how serious it is but how it should be prevented in the future. The existence of the technological devices is not to be blamed but the users' wisdom to use them positively matters.

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The activeness of the English students to engage in the learning processes of the grammar was so real, clear, and great that an article of this research was abe to write. Their ability to run the teaching steps of stepping th 5 Stairs "B" to learn grammar gave inspiring contribution to this research.

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