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The Effect of Guided Inquiry Model and Learning Motivation on the Understanding of Physics Concepts

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Abstract

The aim of this study was to find out the difference understanding of physics concepts of the students taught by employing guided inquiry model of learning by direct instruction holistically, high learning motivation, and for low learning motivation. Besides that to analyze the effect of interaction between models of learning with learning motivation to the understanding of student physics concepts at SMAN 18 in Makassar. In order to achieve the aim, research has been done by using treatment by level design, factorial 2 x 2. This study involved four classes. Two classes were taught by using guided inquiry model and the other two used direct instruction. The number of population was 160 students of XI IPA class. The number of samples was 68 students selected by cluster random sampling technique. The data were analyzed by means of two-way ANOVA. The result of the study indicates that holistically there was a difference of physics concept understanding between students taught with guided inquiry model and direct instruction. Furthermore, there was an effect of interaction between learning model with learning motivation to the understanding of physics concepts. There was a difference of understanding the physics concepts of students taught by guided inquiry learning model and direct instruction both for the students having high learning motivation and low learning motivation.

Keywords: direct instruction, guided inquiry, learning motivation, treatment by level design, two-way ANOVA, understanding of physics concept

I. INTRODUCTION

Science, technology and arts develop continuously until today including in it learning technology. Various methods, models, or approaches in learning are continually adapted with the student's characteristics as learners (Arafah, B., & Kaharuddin 2019). In order the students

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can understand learning material well, the teacher should be able to understand the students as well. So far most education system in Indonesia is still teacher centered. In this type of learning, the students lack of time to pose their ideas, tell their experiences and ability to solve problems (Kaharuddin, Hikmawati, Arafah, B. 2019). This will have an effect on low understanding of physics concepts of the students including SMAN 18 in Makassar.

Therefore the teacher should try to develop learning which is oriented to student (student centered). Besides that learning also should pay attention to student's learning motivation. This is important because the chosen learning model should be congruent with student's learning motivation. In this research, guided inquiry model and direct instruction were applied by putting into account the student's learning motivation.
Ješková et. al (2016) emphasize the implementation of inquiry based science education (IBSE). In their research, the consistent implementation model of the three studies in three courses: mathematics, physics, and informatics. The results indicate a statistically significant improvement on the test results of gender independent, but class specialization plays a significant role. The results show that the designed model from the implementation of IBSE was effective coactively for the development of skill inquiry.

In line with Ješková et al research, the study by Sulistijo, Sukarmin, and Sunarno (2017) indicates that there was a difference of learning outcomes between students taught with model of Inquiry Student Team Achievement Division (STAD) and guided inquiry model. The other results also show a difference between the outcomes of students having high learning motivation and low learning motivation.

Likewise is the guided inquiry study by Ningsih and Said (2017) who discovered a difference between students' learning outcomes taught by guided inquiry learning model and group discussion plus student's working sheet. Further Cohen (2008) found out that students in direct instruction group earned higher scores but not significant statistically with inquiry group. This finding also shows mixed learning style will function to spread information effectively and motivate student to learn.

II. LITERATURE REVIEW

Understanding the concept of physics tends to find out more than facts of method isolated from the concepts of physics. Therefore the understanding of concepts is more complex than factual knowledge (Pickard, 2013, Arafah, B., & Kaharuddin. 2019, Arafah, A. N. B., & Setiyawati, D. 2020). The understanding of physics concepts is the student's ability to perceive meaning of a concept both in the forms of verbal and writing that can produce behavioral changes. The said behavioral change is the change of student's ability in translating, interpreting and extrapolating the physics lesson.
The understanding of concept can help the students to define concepts (Arafah, B. & Hasyim, M. 2019, Arafah, B., Jamulia. J., & Kaharuddin. 2020). It includes physics. The student's involvement in learning activity will have a positive effect on the achievement of concept

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understanding being learned (Arends, 2012, Andi, K., & Arafah, B. 2017). The learning model of physics concepts is guided inquiry. Guided learning inquiry can develop the student's scientific way of thinking (Arafah, K., Arafah, A. N. B., & Arafah, B. 2020).

In solving physics problem, the student can get knowledge in the form of investigation. In relation to that Kuhlthau, Maniotes and Caspari (2007) state that guided inquiry is the way teacher in guiding the students to build up knowledge and profound understanding about learning materials. Through guided inquiry learning process, it must be planned carefully and to be controlled carefully. The characteristic of guided inquiry learning model is assumed to be able to develop the will and motivation of the student in learning principles and physics concepts. This learning model presents five stages: problem display stage, make hypothesis, collect data, analyze data and draw conclusions (Trianto, 2013).

In guided inquiry model the student does not only sit, listen and write to find the answer to the problem provided by the teacher. The task of the teacher is to make the students to do something. The teacher comes to class bringing problems to be solved by the students. Then they are guided to find the best way to solve the problem. This guided inquiry learning can help the students construct the physics concepts learned. The teaching material that has been constructed by the students can stay longer and is kept in their memory. The student's role is more dominant and more active in guided inquiry learning; whereas, the role of teacher only gives directive and guidance to student appropriately.

On the contrary, learning that makes teacher plays more roles in teaching direct instruction. Adams and Engelmann (1996) explain two kinds of techniques and order in direct instruction (DI) that is technique and order of DI fixing standard and order of material. Commercial ID is planned to be used by untrained people. Supporting theory of direct learning is behaviorism and social learning theory.

Based on both theories, direct instruction emphasizes learning as a change of behavior. If behaviorism emphasizes learning as a mechanic stimulus-response process, the social learning theory accentuates on an organic change of behavior through imitation. According to Trianto (2013), direct instruction is the form of lecture, demonstration, training, and group work. Direct instruction is used to deliver lesson material which is directly transformed by the teacher to the students.

Further, Slavin (2017) defines direct instruction as an approach to teaching in which lessons are goal-oriented and structured by the teacher. When the teacher wants to execute this direct instruction model, there are five steps that must be paid attention to: express goal and make student represent and demonstrate knowledge or skill, guide training, check understanding and feedback and give opportunity to advanced training and application.

In order to be able to have the understanding of a holistic concept, learning motivation is needed which is congruent with the learning model used by the teacher. Uno (2010) defines learning motivation as an impulse in individual to try to make a change of behavior in better learning. Further, Sardiman (2012) states that learning motivation has its root in the word motive which means motivating force in oneself to do certain activities to achieve a goal. Therefore learning

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motivation means the ability to do learning activity. By this the research hypothesis can be formulated as follows:

- Holistically there is a difference of understanding the physics concepts between students taught with guided inquiry and students taught with direct instruction.
- For high motivation students, there is a difference of understanding the physics concepts between students taught with guided inquiry model and the students taught with direct instruction model.
- For low motivation students, there is a difference of understanding the physics concepts between students taught by guided inquiry model and the students taught by direct instruction model.
- There is an effect of interaction between learning model and learning motivation on the students understanding of physics concepts.

III. RESEARCH METHOD

This study was an experiment conducted at SMAN 18 in Makassar by employing treatment by level design (Khan, 2008) as follows:

Level of Motivation (B)	Learning Model (A)	
	GI (A_1)	DI (A_2)
High (B_1)	$Y[A_1,B_1]$	$Y[A_2,B_1]$
Low (B_2)	$Y[A_1,B_2]$	$Y[A_2,B_2]$
$\sum$	$Y[A_1,B_1]+Y[A_1,B_2]$	$Y[A_2,B_1]+Y[A_2,B_2]$

Figure 1. Treatment by level design, 2 x 2 factorial

Information:
GI = Guided inquiry, DI = Direct instruction Y is the understanding of physics concepts.

The number of population was 160 students from five classes XI science in which the number of students in each class was 32 students at SMAN 18 in Makassar. The samples were selected by cluster random sampling technique so that four classes were selected with the number of students 128 people as target population. Two classes were taught by using guided inquiry learning model and the other two classes were taught by using direct instruction model. For the sake of analysis, students understanding score of physics concepts at the experimental class, 27% were taken from each high learning motivation group and low learning motivation group (Sani et al., 2019). As a consequence, 68 people were taken as samples of analysis.

The instruments used in this study were test and questionnaire. The test was used to collect data on the students understanding of physics concepts and questionnaire for students learning

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motivation. The content validity of both instruments has been calculated by using Gregory (2015) technique. The coefficient of internal consistency obtained from the learning motivation instrument was 0.89 and 0.93 from the test of understanding of physics concepts.

The validity of each item criteria for questionnaire of learning motivation was computed by using Karl Pearson product moment correlation (Sugiyono, 2011). Meanwhile the test of understanding the physics concepts was computed by using biserial point correlation (Brown, 1988). The reliability of learning motivation questionnaire was computed by alpha cronbach (Djaali and Mulyono, 2004). After the computation, the reliability coefficient obtained was 0.97. Further, the understanding of instrument reliability of physics concepts was computed by the formula KR 20 (Surapranata, 2004) with the reliability coefficient obtained was 0.92. Both instruments are said to be reliable and can be used to collect data.

Further, the data on understanding the physics concepts was analyzed by using descriptive statistics and inferential. Inferential statistics used was two-way ANOVA (Supardi, 2013) at the level of confidence 95%. Before the path analysis was used, the normality test was done first by Chi-square test (Sudjana, 2005) and homogeneity test of the two data was done by using F test (Sudjana, 2005). Finally hypothesis testing was done by the criteria Ho was accepted if F count < F table and Ho was rejected if F count ≥ F table. The number of samples analyzed by each cell was similar for each group, therefore. Turkey test was employed (Supardi, 2013).

IV. RESULT AND DISCUSSION

Descriptive data of this research were processed by using IBM SPSS 20.0 for windows The data consist of data on student's learning motivation and data on the understanding of physics concepts. Both data are presented in the following table.

Table 1. Scores of students' learning motivation and understanding of physics concepts

Statistics	Learning motivation		Understanding of physics concepts	
	GI	DI	GI	DI
Means	78.7	81.1	16.1	14.5
Standard Deviation	13.9	8.9	2.9	2.8
Maximum score	98.0	103	21.0	20.0
Minimum score	39.0	55.0	10.0	9.0

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Variance	19 6	78. 9	8.5	8.1

Source: research data that have been processed
GI = Guided Inquiry, DI = Direct Instruction

Table 1 above shows that scores variation of learning motivation of class using guided inquiry model was wider compared to class taught by direct instruction model. Unlike the understanding of physics concepts taught by guided inquiry model and direct instruction, the variation of scores was relatively similar. The wider scores variation shows that between maximum scores and minimum scores the distance was great.

The distribution frequency of test scores of understanding of physics concepts by students taught by guided inquiry learning model is presented below:

Table 2. Frequency distribution of students' understanding of physics concepts taught by guided inquiry model.

Class Interval	Frequency	
	Absolute	Relative %
20 – 24	6	17.7
15 – 19	18	52.9
10 – 14	10	29.4
5 – 9	0	0
Total	34	100

Source: research data that have been processed

Table 2 above shows category scores of understanding the physics concepts mostly above the scores range 10 – 14. This means that the student's understanding of physics concepts taught by guided inquiry learning model belongs to high category meaning that the students tend to be able to understand the physics concepts if they were provided with guidance in finding the physics concepts in learning. The role of the students here is still dominant, the teacher only helps to direct them to find physics concepts. Further, frequency distribution of understanding test scores of physics concepts taught by direct instruction learning model is presented in table 3.

Table 3. Frequency distribution of physics concepts understanding taught by direct instruction model

Class Interval	Frequency	
	Absolute	Relative %
20 – 24	2	5.9

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15 – 19	10	29.4
10 – 14	19	55.9
5 – 9	3	8.8
Total	34	100

Source: research data that have been processed

Based on the table 3 above, the understanding physics concepts scores of students taught by direct instruction model has relatively greater frequency that is 55.9% which belongs to moderate category. This means that in general students taught by using direct instruction model tend to be passive in understanding the physics concepts. As a consequence the scores of physics concepts understanding was relatively under the group taught by using guided inquiry.

Further, normality test was done to data on understanding of physics concepts. The result for experimental class was X2count = 5.91; whereas, X2 table for data on understanding physics concepts of control group the X2 count = 1.16. As for the criteria of data testing is said to be distributed normally when X2 count < X2 table. Since 5.91 < 7.81 and 1.16 < 7.81, this indicates that data on physics concepts understanding of students taught by both guided inquiry model and direct instruction model come form the same population which is distributed normally. Likewise after the homogeneity testing was done, the obtained information was both data come from homogenous variants.

After both precondition tests were fulfilled, the hypothesis testing was followed. The hypothesis testing of the research was done by using two-way ANOVA test. This test was done to answer statistical hypothesis using factorial design 2 x 2. In order to be easier in doing the hypothesis testing, the two-way ANOVA working table was made with the same cell as follows:

Table 4. Statistics to test two-way ANOVA

Learning motivation (B)	Learning model (A)	
	GI (A_1)	DI (A_2)
High (B_1)	n = 17 $\sum (X) = 275$ $\sum (X)^2 = 75.63$ $\bar{X} = 17.19$ $\sum (X^2) = 292.23$ S = 2.66 $S^2 = 7.09$	n = 17 $\sum (X) = 219$ $\sum (X)^2 = 47.96$ $\bar{X} = 13.69$ $\sum (X^2) = 187.42$ S = 2.24 $S^2 = 5.03$
Low (B_2)	n = 17 $\sum (X) = 239$ $\sum (X)^2 = 57.12$ $\bar{X} = 14.93$	n = 17 $\sum (X) = 244$ $\sum (X)^2 = 59.54$

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$\sum (X^2)$ = 222.91	$\bar{X}$ =15.25
S = 2.79	$\sum (X^2)$ = 232.56
S^2 = 7.79	S = 3.23
	S^2 = 10.4

Source: research data that have been processed

Table 4 above illustrates the results of statistical analysis for guided inquiry learning model and direct instruction model and high and low learning motivation. It is clear that students who have high learning motivation, the scores of understanding concepts taught by guided inquiry model were higher than direct instruction. Unlike the students whose learning motivation were low their physics concepts of understanding was higher taught by instruction direct model than guided inquiry. The summary of two-way ANOVA test is shown in Table 5 below.

Table 5. Summary of the results of statistical hypothesis testing of the research

Source of Variance	F_{count}	F_{table}	Decision test
Intercolumn	5.35	4.00	H_0 is rejected
Intergroup	4.41	2.76	H_0 is rejected
Inter-line	7.65	4.00	H_0 is rejected
Interaction	4.26	4.00	H_0 is rejected

Source: research data that have been processed

Table 5 above can be explained as follows. The test decision indicates that null hypothesis (Ho) was rejected or alternative hypothesis was accepted. This means holistically there was difference of concepts understanding between students taught by using guided inquiry model and direct instruction. Further, t test was done to see the average difference of understanding of concepts between students taught by guided inquiry learning model and direct instruction. The result of t test analysis was t count = 3.72 and t table = 1.67 at the level of significance 0.05. Since the value of t count > t table or 3.72 > 1.67, the test decision can be said that there was a difference of the average of physics concepts understanding between students taught by using guided inquiry model and direct instruction.

The test was then continued by Turkey test to see the superiority of the two learning models. After doing the computation, the result of Q count = 6.67 and Q table = 4.00 so, it can be concluded that holistically the guided inquiry learning was superior to direct instruction model. This is assumed to be caused by the student's active involvement in solving the problem together with their friends group. The students were given an opportunity to have discussion with friends in the group and find themselves the knowledge of material taught. This research result was supported by research conducted by Sarwi, Sutardi and Prayitno (2016). The

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conclusion of their research is the implementation of guided inquiry model was effective to improve the SMA student's mastery. In line with this research, Aditomo and Klieme (2020) found the similarity of structural equation showing that inquiry has a positive correlation with the concepts understanding when he included teacher's guidance and negative when it is not. Likewise Paharani et al. (2016) conclude that learning material through guided inquiry model was effective to improve student's skill in problem solving based on several representatives at senior high school. Finally the research by Bilgin (2009) shows that students taught by guided inquiry has a good understanding of concepts.

The result of second hypothesis shows that F count = 4.41 was greater than F table = 2.76. Based on this test, Ho was refuted or H1 was accepted. The conclusion that can be drawn is there is a difference of physics concepts understanding based on the application of learning model to group of students with high learning motivation. The hypothesis testing was continued by Turkey test with the value for Q count = 5.73 and Q table = 4.00. The test decision shows Q count is greater than the Q table. The Turkey test result supports the second hypothesis testing in which students with high learning motivation in which the application of guided inquiry learning was superior or was better than direct instruction model. Likewise with the result of the third hypothesis testing the F count = 7.65 was greater than the F table = 4.00. This means that the result of Ho test was refuted or H1 was accepted. It can be concluded that there is a difference of understanding the physics concepts based on the application of learning model to group of students with low learning motivation. Then the hypothesis testing was continued with Turkey test and value for the Q count = 6.03 and the Q table = 4.41. The test result shows Q count was greater than Q table. This Turkey test result supports the third hypothesis that students with low learning motivation, the application of guided inquiry model was superior than the direct instruction model.

Finally, the testing of hypothesis four indicates F count > F table or 4.26 > 4.00. This hypothesis testing result indicates that the Ho test was accepted. This shows that there is an interaction effect between learning model and learning motivation to students understanding of physics concepts. The following is the graphic of interaction between learning model and learning motivation to the understanding of physics concepts of students at SMAN 18 in Makassar. The graphic was drawn by using SPSS 20.0 and the result can be seen in figure 2.

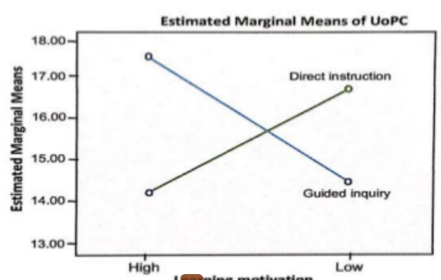

Figure 2. Interaction between learning model and learning motivation to the students understanding of physics concepts

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The line crossing in figure 2 above can be explained based on data presented in table 4. The average scores of the student's physics concepts understanding taught by using guided inquiry model for high earning motivation was 17.19 for low learning motivation was 14.93. The average scores of students understanding of physics concepts taught by using direct instruction model for high learning motivation was 13.69 and for low learning motivation was 15.25.
Figure 2 displays that if high physics concepts understanding is to be achieved, guided inquiry learning tends to be congruent for students who have high learning motivation. This result is consistent with the research result done by Sarwi, Sutardi and Prayitno (2016) that the implementation of guided inquiry model was effective to improve the students' mastery of concepts in the topic discussion about size and measurement.
The finding above was strengthened by Aditomo and Klieme (2020) that inquiry is related positively with the understanding of student's concept when teacher's guidance was included. Even the teacher who dressed nicely can improve student's attitude to learning (Kashem, 2019, Floriani, R., Arafah, B., & Arafah, A. N. B. 2020). The research results show that the role of teacher is very important in inquiry to improve the students understanding of physics concepts. Further, Williams et al. (2020) state that students who learn based on inquiry was better to be contextualized and more open to decision making.
Figure 2 above further shows that for students who have low learning motivation tend to be taught appropriately using direct learning to be able to have high physics concepts understanding. This research result shows that at SMAN 18 in Makassar, the students who have low learning motivation, their physics concepts understanding is more appropriate to improve if they were taught by direct instruction model. This can be understood that students who have low learning motivation tend to have direct learning model to present concrete examples. Due to the frequent provision of direct concrete examples, they can trigger their critical thinking ability. Ling and Loh (2020) point out that critical thinking is a good predictor to the recognition of students learning pattern. Meanwhile the recognition of good patterns will easily improve students' concepts of understanding in learning.

V. CONCLUSIONS

Based on the explanation above, the conclusions can be drawn as follows:

1. Holistically, there is a difference of understanding of physics concepts between students taught using guided inquiry learning model and direct instruction model.
2. For students who have high learning motivation, there is a difference of understanding of physics concepts between students taught by using guided inquiry learning model direct instruction model.
3. For students who have low learning motivation, there is a difference of understanding of physics concepts between students taught by guided inquiry learning model and direct instruction model.
4. There is interaction between learning model and learning motivation to the students understanding of physics concepts.

The findings above show that guided inquiry learning can be reference for the teacher who wants to improve the students' physics concepts understanding. It is to be noted that this model

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is more appropriate to be used to improve the students physics concepts understanding who have high learning motivation. On the contrary, for students who have low learning motivation, the suitable model to improve their physics concepts understanding is direct instruction.

REFERENCES

1. Adams, G.L. and Engelmann, S. 1996. *Research on direct instruction: 25 years beyond DISTAR*. Upper Saddle River, NJ: Prentice Hall, Inc.
2. Aditomo, A. and Klieme, E. 2020. Forms of inquiry based science introduction and their relations with learning outcomes: evidence from high and low performing education systems, *International Journal of Science Education*, https://doi.org/10.1080/09500693, 2020.1716093.
3. Andi, K., & Arafah, B. (2017). Using needs analysis to develop English teaching materials in initial speaking skills for Indonesian college students of English. *The Turkish Online Journal of Design, Art and Communication (TOJDAC), Special Edition*, 419-436.
4. Arafah, A. N. B., & Setiyawati, D. (2020). Volunteerism in Sub-District Social Welfare Worker in Dosaraso Halfway House. *International Journal of Psychosocial Rehabilitation*, *24*(Special Issue 1), 357–362. doi: 10.37200/ijpr/v24sp1/pr201165
5. Arafah, B., Jamulia. J., & Kaharuddin. (2020). The Speaking People of South Halmahera Languages: A study on Cultural Relationship. *Journal of Talent Development and Excellence*, *12*(3s), 1331-1340.
6. Arafah, B., & Kaharuddin. (2019). The Representation of Complaints in English and Indonesian Discourses. *Opción*, 35 (24), 501-517
7. Arafah, B. & Hasyim, M. (2019). Linguistic functions of emoji in social media communication. *Opcion*, 35, (24): 558-574.
8. Arafah, B., & Kaharuddin (2019). The Idol: A Model for Incorporating Literature in Elt. *KnE Social Sciences*, 43-59.
9. Arafah, K., Arafah, A. N. B., & Arafah, B. (2020). Self-Concept and Self-Efficacy's Role in Achievement Motivation and Physics Learning Outcomes. *Opción*, 36, (27), 1607-1623
10. Arends, R.I. 2012. *Learning to Teach*. Ninth Edition. USA: McGraw-Hill Company, Inc.
11. Arikunto, S. 2009. *Prosedur Penelitian, Suatu Pendekatan Praktek*. Jakarta: Rineka Cipta.
12. Bilgin, I. 2009. The effects of guided inquiry instruction incorporating a cooperative learning approach on university students' achievement of acid and bases concepts and attitude toward guided inquiry instruction, Scientific Research and Essay Vol.4 (10), pp 1038-1046, October, 2009 Available online at http://www.academicjournals.org/sre/ISSN 1992-2248 @ 2009. *Academic Journals*.
13. Brown, J.D. 1988. *Understanding research in second language learning: A teacher's guide to statistics and research design*. Cambridge: Cambridge University Press.

ISSN 1869-0459 (print)/ISSN 1869-2885 (online)

Talent Development & Excellence
Vol.12, No. 1, 2020, 4271-4283

14. Cohen, M.T. 2008. The Effect of Direct Instruction versus Discovery Learning on the Understanding of Science Lessons by Second Grade Students, NERA Conference proceedings 2008. *Northeastern Educational Research Association* (NERA) Annual Conference: 1-37.
15. Djaali and Mulyono, P. 2004. *Pengukuran dalam Bidang Pendidikan*. Jakarta: Program Pascasarjana Universitas Negeri Jakarta.
16. Floriani, R., Arafah, B., & Arafah, A. N. B. (2020). Emotional Management of the Main Character in Defoe's Robinson Crusoe. *Journal of Talent Development and Excellence*, *12*(3s), 1283-1290.
17. Gregory, R.J. 2015. *Psychological Testing: History, Principles, and Applications* (Seventh Edition). New York: Pearson.
18. Jes kova, Z.Luka c, Shanc ova, M.S. najder, L. Gunis, J. Balogova, B, and Kires, M. 2016. Efficacy of inquiry based learning in mathematics, physics and informatics in relation to the development of students' inquiry skills. *Journal of Baltic Science Education*, Vol. 15, No. 5, 2016: 559-574, ISSN 1648-3898.
19. Kaharuddin, Hikmawati, Arafah, B. (2019). Needs Analysis on English for Vocational Purpose for Students of Hospitality Department. *KnE Social Sciences*, 344-387.
20. Kashem, M.A. (2019). The Effect of Teachers' Dress on Students' Attitude and Students' Learning: Higher Education View, *Hindawi Education Research International* Volume 2019, Article ID 9010589, 7 pages, https://doi.org/10.1155/2019/9010589.
21. Khan, M.S. (2008). *Educational Research*, New Delhi: APH Publishing Corporation.
22. Kuhithau, C.C., Maniotes, L.K. and Caspari, A.K. (2007). *Guided Inquiry: Learning in the 21st Century*. London: Librarries Unlimited, ISBN-13:978-1591584353, ISBN 10: 1591584353.
23. Ling, M.K.D. and Loh, S.C. (2020). Relationship of creativity and critical thinking to pattern recognition among Sinagapore private scool students, *The Journal of Educational Research*. Volume 113,2020. Issue 1, Pages 59-76/ Received 19 Jul 2019. Accepted 05 Jan 2020, Published online: 28 Jan 2020, https://doi.org/10.1080/000220671.2020. 1716203.
24. Ningsih, P. and Said, I. (2017). Application of Guided Inquiry Learning Model with Mind Map toward Students' Learning Outcomes in Chemistry Material: Reaction Rate. First Indonesian Communication Forum of Teacher Training and Education Faculty Leaders International Conference on Education 2017 (ICE 2017), Atlantis Press. Advances in Social Science, *Education and Humanities Research*, volume 174: 586-589.
25. Pickard, A.J. (2013). *Research Method in Information* (Second edition), London: Facet Publishing.
26. Prahani, B.K., Limatahu, I. Soegimin W.W., Yuanita, L. and Nur, M. (2016). Effectiveness of Physics Learning Material Through Guided iInquiry Model to Improve Students' Problem Solving Skills Based on Multiple Representation, *International Journal of* Education and Research. Vol. 4 No.12 Decembe 2016: 231-242.

ISSN 1869-0459 (print)/ISSN 1869-2885 (online)

Talent Development & Excellence
Vol.12, No. 1, 2020, 4271-4283

27. Sani, R.A. Arafah.K. Azis, I. Tanjung, R., Suswanto, H. (2019). *Evaluasi dan Penilaian Hasil Belajar*, Tangerang: TSmart, ISBN: 978-602-6696-72-4.
28. Sardiman, A.M. (2012). *Interaksi dan Motivasi Belajar Mengajar*. Jakarta: PT Raja Grafindo Persada.
29. Sarwi, Suttardi, and Prayitno, W.W. (2016). Implementasi Pembelajaran Fisika Guided Inquiry untuk Meningkatkan Penguasaan Konsep dan Pengembangan Karakter Konservasi Siswa, *Jurnal Pendidikan Fisika Indonesia* 112 (2016) 1-7, p-ISSN: 1693-1246 e-ISsN 2355-3812 Januari 2016, DOI:10.15294/jpfi.v12i1.4264, http://journal,unnes.ac.id/nju/index.php/jpfi.
30. Slavin, R.E. 2017. *Educational Psychology: Theory and Practice* (12th Edition). Boston: Pearson, IsBN-13:978-0134895109, ISBN-10:013489510X.
31. Sudjana, (2005). *Metode Statistika*. Bandung: Tarsito.
32. Sugiyono, (2011). *Metode penelitian kuantitatif kualitatif dan R&D*. Bandung: Alfabeta.
33. Sulistijo, S.H., Sukarmin and Sunarno, W. (2017). Physics Learning Using Inquiry Student Team Achievement Division (ISTAD) and Guided Inquiry Models Viewed by Students Achievement Motivations, Jurnal Pendidikan IPA Indonesia, JPII 6 (1) (2017) 130-137, Http:// *Journal Unnes*.Ac.Id/Index Php/JPII, Doi:10.15294/Jpii. V611. 9601.
34. Supardi, (2013). *Aplikasi Statistika dalam Penelitian Konsep Statistika yang Lebih Komprehensif*. Jakarta: Change Publication.
35. Surapranata, S. (2004). *Analisis, Validitas, Reliabilitas, dan Interpretasi Hasil Tes Implementasi Kurikulum 2004*. Bandung: PT Remaja Rosdakarya.
36. Uno, B.H. (2010). *Teori Motivasi dan Pengukurannya : Analisis di Bidang Pendidikan*. Jakarta: Bumi Aksara.
37. Williams, S.R.G., Ziegbell, A.L., Thompson, C.D., and Overton, T.L. (2020). Inquiry, Problem, Context and Industry Based Laboratories: An Investigation into the Impact of Large-Scale, Longitudinal Redevelopment on Perceptions of Teaching Laboratories, I*nternational Journal of Science Education*, Volume 42, No.3, 2020: 451-468, https://doi.org/10.1080/09500693.2020.1714788.

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