

Transcript-Based Lesson Analysis: Reward and Punishment Using Wordwall.net Toward Students' Self-Efficacy in Learning Excretory System

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Abstract

Among the many things that can improve learning, self-efficacy gives a careful thought, especially in difficult subjects like science. This study aims to analyze the effect of reward and punishment system using Wordwall.net on students' self-efficacy in learning excretory system by using Transcript Based Lesson Analysis. This study used descriptive method conducted in a private school in Bandung. The data was collected through direct observation then will be analyzed based on observation sheet, the teachers' lesson plan, questionnaire, but mainly using the documentation from videos and voice recording to conduct the transcript-based lesson analysis. The results shows that rewarded students have higher engagement and involvement in the teaching and learning process, as well as the higher average value which is 68% categorized as good. In contrast, punished students have lower engagement and involvement in the teaching and learning process, as well as the lower average which 37% categorized as poor. However, the value of Pearson correlation is 0.065 which averages there is no significance correlation between. Thus, reward and punishment system still can be implemented in science learning even there is no correlation between reward and punishment system toward students' self-efficacy since there is still a positive impact towards students' self-efficacy as well as participation.

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INTRODUCTION

Students who are engaged and excited in studying will benefit from science learning activities in the classroom. Many factors can cause effective learning not to be implemented, such as a lack of students' self-efficacy in science learning. In many nations and locations, students' passion for science education has drastically decreased (Thomas, 2015). Researchers have postulated that low science self-efficacy is a major factor contributing to students' disinterest in learning science, based on social cognitive traits (Ballen et al., 2017; Blotnick et al., 2018; Lamb et al., 2014).

Self-efficacy was defined as students' conviction in and capacity for action under specific circumstances based on qualities of scale, generality, and strength (Fadhila et al., 2020; Sunaryo, 2017). In cognitive processing, self-efficacy is shaped by combining four major information sources: mastery experience, vicarious experience, social persuasion, and physiological and affective states. (Bandura, 1986, 1997). Students with high levels of self-efficacy can be leveraged as assets to enhance academic performance, including science literacy (Fadhila et al., 2020). Conversely, students who have low self-efficacy in science are more likely to less participation in science learning and easily give up on science task (Kuo et al., 2014). Thus, Self-efficacy was taken into serious consideration as one of the many factors that can enhance the learning process, particularly in the more challenging subjects like science.

Many studies showed that self-efficacy is one of an important aspect in science teaching and learning process. Study found that high self-efficacy students chose performance goals that included getting good marks and outperforming others over mastering goals that included difficulties and new information (Motlagh et al., 2011; Yaman Köseoğlu, 2015). Nevertheless, research demonstrates that by highlighting the value of original thought and problem-solving strategies in students' pandemic self-efficacy, there has been a rise in each student's individual crisis management self-efficacy (Nguyen et al., 2024). However, insufficient research elucidated how the system of rewards and punishments affects students' self-efficacy.

Reward and punishment system in class, can be one of the efficient ways to increase students'

involvement and enthusiasm in science learning, as well as students' self-efficacy. A reward is an appreciation because of actions or work. For students who develop the confidence to carry out their responsibilities and duties with assurance to accomplish fulfilling goals, appreciation is an award that motivates them (Purwanto, 2006). A study found that rewarding students is one way of teaching them to feel pleased since their activities are recognized (Surbakti, 2019). Punishment, on the other hand, is an educational attempt to rectify and properly guide students (Hamid, 2006). The benefit could increase one's drive to act in accordance with the principles of character education (Misriyah, 2015). Meanwhile, punishment aims to stop the repetition of making the same mistakes. Both verbal (motivation, compliment, and acknowledgment) and non-verbal (gesture, touch, prize, and score) forms of reward can be used. Both preventive (warning) and repressive (assignments, scoring, etc.) methods of punishment are available (Lestari, 2018).

The implementation of reward and punishment, based on several studies, gave positive impact into different important aspects of teaching and learning. Students' self-confidence in speaking English will be enhanced by the use of rewards and punishment method (Lestari, 2018). Other study also showed that increased learning motivation results from using reward and punishment method, which encourages students to participate in a number of tasks while providing prizes as triggers not to fail (Fuad et al., 2021). A study also revealed that using rewards and punishment to develop character traits in young children can help youngsters develop discipline and improve their attitudes and behaviors (Yuningsih, 2021).

A range of interactive and solitary games, such as information matching, picture matching, quizzes, wheel of fate, riddles, and more, are available on the educational website Wordwall.net. (Çil, 2021). Teacher can create their own games besides only using the provided templates and add content in the games created by others. Wordwall.net has demonstrated its considerable value in assessing students' vocabulary, speaking, writing, and reading comprehension in an interactive manner (Diyora, 2022). Science teachers started to utilize Wordwall.net as their interactive learning media, which positively affected science teaching and learning process (Savira & Gunawan,

2022). The other study also showed that Wordwall.net positively impacted students' motivation in learning science (Gandasari & Pramudiani, 2021). However, few teachers use Wordwall.net as their media to implement a reward and punishment system that uses score types in class in the purpose of enhancing students' self-efficacy.

To deal with this problem, some research needs to be done on analyzing the effect of reward and punishment system toward students' self-efficacy in science learning. To conduct the classroom analysis, it needs a deep analysis on teacher and student interaction, conversation, also communication to get the accurate result. It can be carried out through Transcript-Based Lesson Analysis (TBLA) by analyzing the transcription from the conversation of teacher and student. Study that uses TBLA can showed the analysis of a pattern of teaching dialogue that includes pronunciation, exposition, and discussion is formed during learning, and this result demonstrates that a good teaching dialogue pattern that dominated by students and teachers' discussion will have a positive impact on students' scientific attitudes (Susanti & Aprian, 2022). Whether the classroom discussion is dialogic or authoritative, TBLA can assist teachers in identifying the lesson gap from the goal and exposing this tendency (Janah et al., 2019). However, there is a lack of study that uses TBLA analyzing to analyze the application of reward and punishment in science learning, especially while utilizing some interactive website for learning.

Based on the explanation above, this study aims to analyze the effect of the reward and

punishment system using Wordwall.net toward students' self-efficacy in learning excretory system based on Transcript Based Lesson Analysis. This study will record the whole class conversation in a form of video and recording. During the teaching and learning process, the observer will observe the activities based on the observational sheet. The hope in this research is by analyzing the effect of reward and punishment system towards students' self-efficacy teachers can adapt the as an alternative learning strategy.

METHODS

This research applied descriptive research method to analyze the effect of reward and punishment system using Wordwall.net toward students' self-efficacy in learning excretory system based on Transcript Based Lesson Analysis (TBLA). This study was conducted in eighth grade at a private school in Bandung. The subjects consist of one science teacher and 18 students. 7 students rewarded and 2 students punished was observed furthermore. Direct observation was used to gather the data, which was then examined using an observation sheet, the lesson plan created by the teachers, a questionnaire, audio and video recording. Type of observation on this study is non-participant observation. The observational sheet used in this study consist of three indicators: classroom management by the teacher, teachers' performance, and student activity during learning in the class. Three professionals in the field of education have qualified this observation sheet.

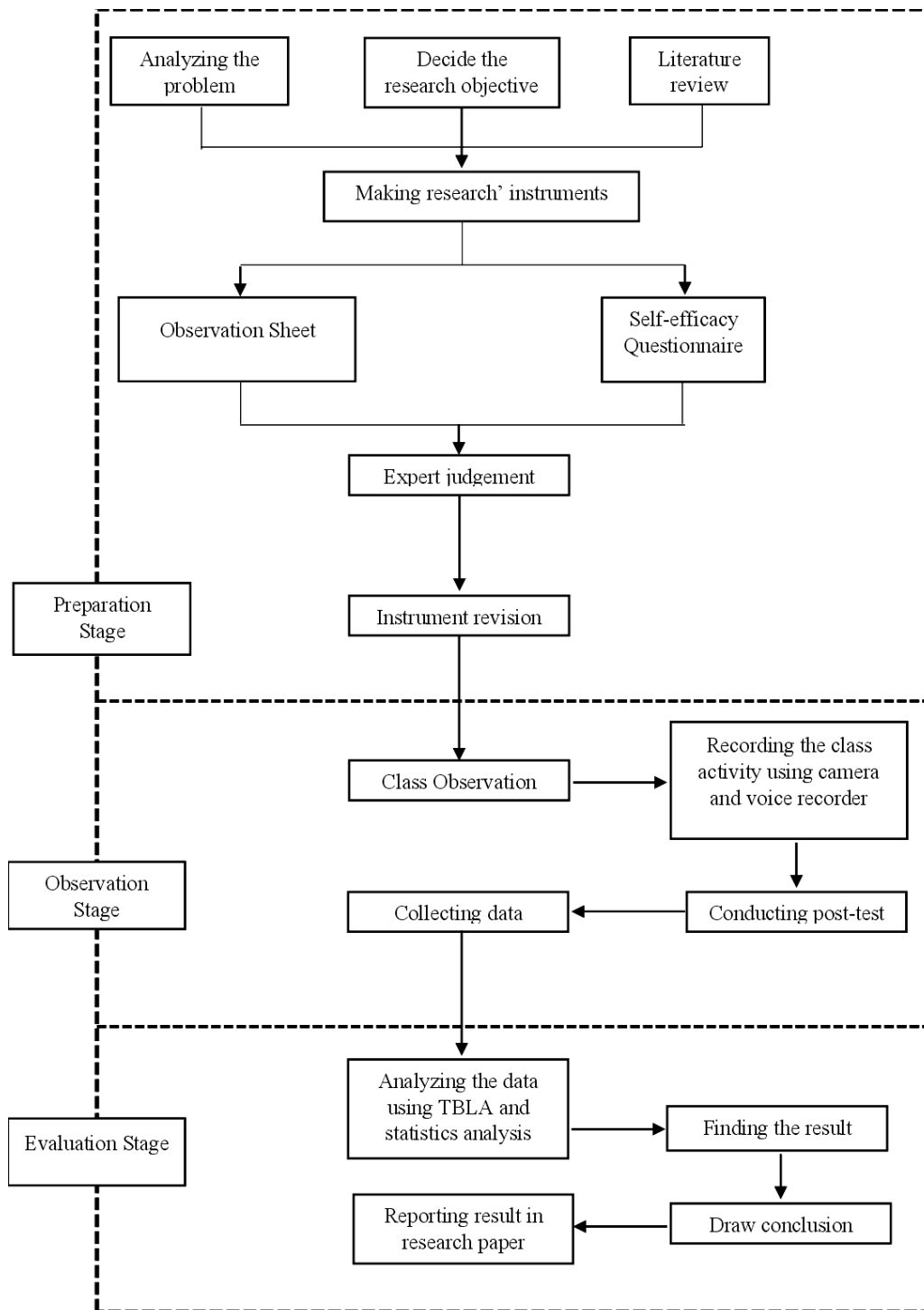


Figure 1. Flowchart of the research procedure

Transcript-based lesson analysis (TBLA) was used to examine the learning observation data that was captured during student-teacher conversations. The data was examined both quantitatively and qualitatively based on the transcript (Winarti et al., 2021). Based on the number of words said by the teacher and students as well as the count of transcribed text by name, the transcript was evaluated using an Excel program. Then, the

amount of teacher gave reward and punishment was recorded.

This study used self-efficacy in learning science questionnaire that consist five main indicators which are Conceptual Understanding, Higher-order Cognitive Skills, Practical Work, Everyday Application, and Science Communication (Hasanah, 2020). There are 28 statements on students' self-efficacy questionnaire that already

validated with reliability value 0.917 which categorize as high reliable. The scale that applied on the instrument is Likert scale from 1 until 4. 1 indicate "Strongly Disagree", 2 indicate "Disagree", 3 indicate "Agree", and 4 indicate "Strongly Agree". Then the percentage of the students' self-efficacy is calculated following the formula:

$$\%NP = \frac{R}{SM} \times 100\%$$

Where:

%NP = Percentage

R = Raw Score

SM = Maximum Score

The scoring percentage interprets the self-efficacy as it is classified into score criteria as it shown in Table 1.

Table 1. Classification Level of Self-efficacy (Arikunto, 2007)

Percentage	Classification level of students' self-efficacy
81 – 100	Very good
61 – 80	Good
41 – 60	Moderate
21 – 40	Poor
0 – 20	Very poor

The result from the questionnaire will be analyzed using Excel to find the standard deviation and the average value from the whole class, rewarded students, and punished students so that the effect of reward and punishment system toward students' self-efficacy can be observed. For further analysis, Pearson Correlation test by using SPSS was done to see the correlation between the variables. Figure 1 shows the whole stages of this study.

RESULTS AND DISCUSSION

The learning process observed is using 5E learning model by applying contextual approach and using lecturing, experiment, and discussion method. 5E learning model consist of five stages of learning that comprise *engage*, *explore*, *explain*, *elaborate*, and *evaluate* (Bybee, 1997). The learning process begin by checking the students' attendance and informs the learning objectives and the activities

to be carried out. The teacher starts to stimulate students' engagement by asking contextual questions relating to the topic, which is excretory system.



Figure 2. Classroom Activity

While the teaching and learning process happen, teacher give a reward in a form of plus one point to students actively involved in class such as answering question. But if there are students who does not follow the rules will be punished by getting minus one point. All rewards and punishments were recorded on Wordwall.net on each profile of students. The teacher uses a seating plan templates in Wordwall.net to accumulate students' reward and punishment scores. Teacher can pick the student who got or lose the score by only tap the students' name and click the 'Score +1' or 'Score -1' bottom as it illustrated on Figure 4 and Figure 5. actively involved in classroom activities.



Figure 3. Laboratory Activity

The teacher begins to give rewards and punishments on the engage stage. The number of words students count is still lower than the percentage of teachers' words, as seen in Graph 1 and Table 2. This happened because, in the teaching and learning process, teacher gave a long explanation: feedback and some clarification from students' answer related to the given question.

Moreover, the teacher only give one reward on engagement stage to S15 as the student can mention the excretory organ shown by the teacher. Relevant research shows that on this stage students will be provided by prompts to acknowledge the circumstance and take an interest in it (Gilbert et al., 2011). Thus, this stage will probably be dominated by the teacher because the teacher will tend to provide several contextual cases to trigger students' curiosity and engagement, and help students formulate their own alternative conceptions. The frequency of students responding the teacher relatively often averages that students are actively involved in teaching and learning. This phenomenon is in line with the other study that showed the approach of rewards and punishments involves pupils in a variety of activities. (Fuad et al., 2021).



Figure 4. Seating Plan Templates in Wordwall.net



Figure 5. Scoring Tools in Wordwall.net Seating Plan Templates



Figure 6. Teacher While Using Seating Plan Template

On explore stage was dominated by the teacher. This is in line with the Graph 2 and Table 2 that the teachers' word distribution and count is higher than the students. This happens because on this stage the teacher gives a lot of review and explanation related to the topic but still provide an interesting game and discussion by utilizing Nearpod website. Teacher gave one punishment to S9 as the students bother the other students. S3 get a reward from answering a question about one part of kidney from its characteristics mentioned by the teacher. Students ask more questions on this stage as a response to the teacher explaining the related topic. Students build on previously acquired ideas while also having the chance to come up with fresh concepts, explore novel questions and possibilities, and plan and carry out preliminary research (Van Dulmen et al., 2023).

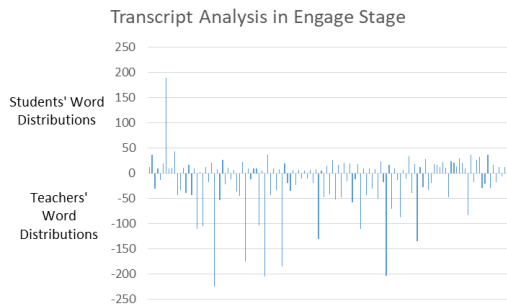
Table 2. Student and Teacher Word Count Percentages in Each Stages

Stage	Student/ Teacher	Words Count	%
Engage	Student	1328	27.87
	Teacher	3437	72.13
Explore	Student	1295	17.49
	Teacher	6110	82.51
Explain and Elaborate	Student	2357	57.19
	Teacher	1764	42.81
Evaluate	Student	284	39.94
	Teacher	427	60.06

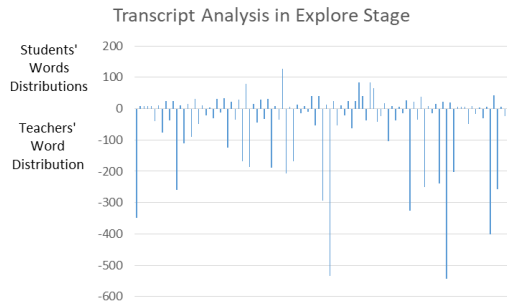
Students' conduct simple experiment of urine testing on explain and elaborate stage. Students dominated the dialogue and activities on this stage, as it shows in Graph 3 and Table 2. The students' words distribution and count are higher than the teacher even though the difference is not really high. This is in line with relevant research stating that deeper learning takes place on this stage, since fundamental ideas are emphasized while

introducing new ideas (Ummels et al., 2015). Then during the elaborate stage, Students are encouraged to connect ideas by being asked to apply their knowledge and transfer it to new contexts (Ummels et al., 2015). Thus, students' involvement on this stage will be higher than other stages.

Some students get their reward by answering a question related to each other on this stage.



Graph 1. Transcript Analysis in Engage Stage



Graph 2. Transcript Analysis in Explore Stage

Teacher : “can anyone mention what is the function of our skin?”

S14 : “I can Miss, to produce sweat.”

Teacher : “Why should sweat be released?”

S14 : “To cool down our body temperature.”

Teacher : “Ok good S14. For others, how is the process of sweat can cool down our body temperature?”

S18 : “Me Miss, so when our body temperature is hot it will be neutralized by the excessing the sweat.”

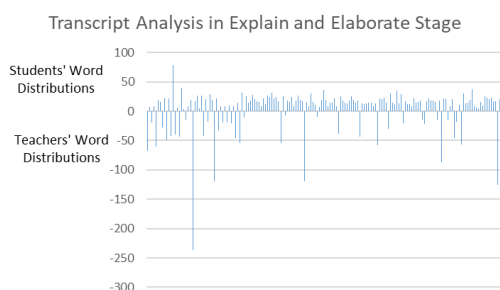
Teacher : “Good answer, but can anyone complete S18s' answer”

S5 : I can miss, when our body temperature is increasing our pores will be bigger, as it is bigger our body

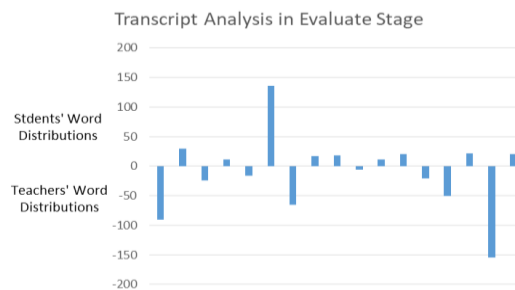
will directly excess the sweat to neutralize our body temperature.”

When students doing an experiment, S13 get a minus point because the student was playing with the other equipment on lab that is not used during the experiment. On the explanation stage, S11 explains the procedure and result of the experiments so S11 gets rewards point.

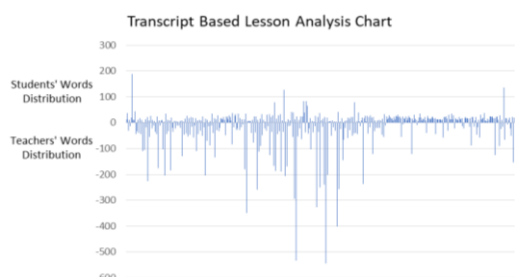
In the end of the learning process, teacher gave an elaboration, the information about the next meeting, and give some evaluation. As seen in Graph 5, teacher dominates the word distribution during the



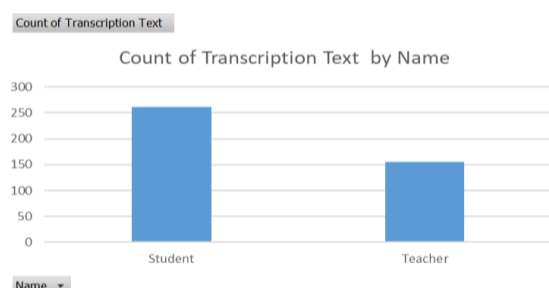
Graph 3. Transcript Analysis in Explain and Elaborate Stage



Graph 4. Transcript Analysis in Evaluate Stage



Graph 5. Transcript-Based Lesson Analysis Chart



Graph 6. Count of Transcription Text by Name

evaluation stage, but there is still student involvement because the teacher continues to pose questions about the material that has been presented. During this last stage, teacher will gauge the students' conceptual and competency knowledge, monitor their development, and determine whether they have met the learning objectives (Van Dulmen et al., 2023). The final reward the teacher gave was when S6 correctly answered a question concerning which part of the kidneys is damaged when glucose is in the urine.

Table 3. Overall Student and Teach Word Count Percentage

	Words Count	%
Student	5281	31.31
Teacher	11584	68.69

This whole teaching and learning activity can also be observed from the conversation and words of students and teacher distribution in the class shown in Graph 5. Based on the transcript-based lesson analysis chart, students' word distribution is higher than teachers' words distribution in explanation and elaboration stage. However, teachers' word dispersion on engagement, investigation, and evaluation stages is still greater than students' word distribution. Table 3 also shows that from whole teaching and learning process the teacher words count percentage is still higher than student words count percentage

Graph 6 shows that the count of transcription of students is higher than the teacher averages that the frequency of involvement in conversation of students is higher than the teacher. So even though the teachers' words count is higher than the students, the frequency of student involvement in the activity is relatively high. This happen because, in learning, students were mostly asked to answer questions that did not require a long explanation. Meanwhile, even though teacher only involve in several conversation, they mostly gave a long explanation and instruction of the related topic.

Thus, It is clear that implementing a reward and punishment system through the use of the Wordwall.net website in the teaching and learning process continues to have a favorable impact on students' participation in class and their confidence in their ability to learn science. This result can be supported by other research that stated the impact of reward and punishment on student accomplishment and behavior includes, but is not limited to, increasing student interest in learning, encouraging students to retain achievement, and fostering greater learning discipline (Indrawati et al., 2021).

Further analysis was done on students' self-efficacy as shown in Table 4 to analyze the effect of reward and punishment system toward students' self-efficacy. The average of students' self-efficacy in a whole student is 58% which categorize as moderate self-efficacy. The standard deviation of the population is 0.49 which the data indicate a well distribution since the standard deviation value is lower than the average value. However, the data does not have a high variation since the value of standard deviation is not really near to 1.

Table 4. Students' Self-efficacy

Student	Average (%)
S1	59
S2	53
S3	72
S4	69
S5	80
S6	62
S7	46
S8	38
S9	27
S10	44
S11	55
S12	53

Student	Average (%)
S13	47
S14	60
S15	76
S16	59
S17	67
S18	72
Overall Average	58

The students' self-efficacy from rewarded students, indicate as S3, S5, S6, S11, S14, S15, and S18, are relatively have higher average value either from students' self-efficacy overall average and students' self-efficacy of punished students as it shown on Table 5. The average of students' self-efficacy of rewarded students is 68% which categorized as good means that the students who actively involved in the teaching and learning process has a higher self-efficacy than students who does not. The implementation of reward to students will help them to identify their problems to solve their difficulties and they will not be scared though they face a failure in their learning process (Kusumastuti, 2020). It is also stated by Bandura that students who have self-efficacy and confidence in their abilities are more likely to engage in class, work harder, endure longer, and have less negative emotional responses to obstacles. (Bandura, 1997).

Table 5. Students' Self-efficacy of Rewarded Students

Rewarded Students	
Student	Self-efficacy Test Result
S5	80%
S6	62%
S11	55%
S3	72%
S14	60%
S15	76%
S18	72%
Average	68%

Meanwhile students' self-efficacy from punished students are relatively lower than the average as it shown on Table 6. The average of students' self-efficacy of punished students is 37% which categorized as poor means that the students who is not following the rules and not focus while studying has a lower self-efficacy. The student that

has lower self-efficacy has a contrast responds toward reward and punishment system. Students will be scared in expressing themselves since they are doubtful in making the same or new mistakes (Kusumastuti, 2020).

Table 6. Students' Self-efficacy of Punished Students

Punished Students	
Student	Self-efficacy test result
S13	47%
S9	27%
Average	37%

To get the accurate analysis of the effect of rewards and punishment system toward self-efficacy, Pearson correlation test by using SPSS done by using students' self-efficacy data and the accumulation score of students from Wordwall.net. The result test shows that the value of Sig. (2-tailed) is 0.065 which >0.05 averages that there is no correlation between reward and punishment system toward students' self-efficacy. This happen because from the accumulation score, only some rewarded students still have a high score and increasing score for punished students. It averages that there is an inconsistency of students' involvement in the learning activity.

Table 7. Students' Accumulation Score from Wordwall.net

Student	Accumulation Score
S1	0
S2	2
S3	5
S4	0
S5	5
S6	4
S7	0
S8	1
S9	1
S10	1
S11	0
S12	0
S13	2
S14	3
S15	9
S16	7
S17	1
S18	8

In view of the examination, it showed that the execution of reward and punishment framework towards self-efficacy by using Wordwall.net doesn't show a critical effect. The difference value of students' self-efficacy averages in all students and rewarded and punished students does not really show a significant difference and from the statistical Pearson Correlation test it also shows that there is no correlation between reward and punishment system toward students' self-efficacy. This happens due to the lack of this study which only observes the application of reward and punishment in the learning process only on one meeting. Along these lines, many variables can influence students' self-efficacy including growth opportunity and information, feedback and reward, correspondence and collaboration, social impact, motivation and attitude (Peechapol et al., 2018). Besides, there are still many meetings that possible gave a different score and involvement in different meetings. The result is supported by other study that stated teacher ought to think a lot of in applying reward and punishment whether it very well may be really great for their understudies, particularly, students' self-efficacy since there are so many different factors that can give a commitment on students' self-efficacy (Kusumastuti, 2020).

The implications of this study results indicate that the reward and punishment system can be as one of the learning strategies to develop students' participation as well as self-efficacy. Moreover, Wordwall.net also can be suggested to be used in science learning as alternative tools. For further study about the effect of rewards and punishment system using Wordwall.net towards self-efficacy, this study suggests that the strategy on applying reward and punishment system in the teaching and learning activities need to be more considered and the observation should be done not only in one meeting to get more accurate result. Considering the strategy applied is important to avoid the feeling of eery on expressing their ability or involvement in class. Moreover, the results of this study can be useful for constructing better observation on analyzing reward and punishment using Wordwall.net toward students' self-efficacy by applying transcript-based lesson analysis.

CONCLUSION

From the result obtained based on the analysis, it is shown that the execution of reward and punishment framework towards self-efficacy by using Wordwall.net doesn't show a critical effect. The results from TBLA reveals that the reward and punishment system still give a positive impact towards students' involvement as well as self-efficacy. Rewarded students have higher engagement and involvement in the teaching and learning process and the higher average value of self-efficacy. In contrast, punished students have lower engagement and involvement in the teaching and learning process and the lower average value of self-efficacy. However, based on the statistics analysis, this study showed that implementing a reward and punishment system using Wordwall.net does not correlate with student self-efficacy in learning excretory system.

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