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The Effect of Digital Snakes and Ladders of Human Excretion on The Motivation and Analytical Skills of High School Students

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Abstract

The excretory system material is a material that has complex concepts and problems. This complexity requires interesting learning media facilities such as digital snakes and ladders game media. The aim of this research is to analyze the influence of digital snakes and ladders in human excretory system material on motivation and to analyze the influence of digital snakes and ladders in human excretory system material on students' analytical abilities. This research is a quantitative research with a one group pretest-posttest pre-experimental design. The sampling technique is purposive sampling. The population of this study were all class XI students of SMA N 1 Mlonggo. The sample used was 90 students. The instruments used are self-reflection sheets and tests. In this research, student learning motivation was analyzed descriptively quantitatively. Students' analytical abilities were analyzed using the Wilcoxon Signed Rank Test. The research results can be concluded that the average learning motivation after using digital snakes and ladders media is in the high category with a percentage of 79%. The result of students' analytical skills is that Ho is rejected where the probability or significance level is 0.000 (p value ≤ 0.05). This shows that the average pretest and posttest scores are significantly different. Based on these results, it shows that digital snakes and ladders in the human excretory system material have an effect on increasing students' motivation and analytical skills.

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INTRODUCTION

The excretory system is one of the biological materials that cannot be seen directly by the five senses and is abstract (Adi et al., 2016). According to Rambe & Ristiono (2022), excretory system material is material that is difficult to observe and understand with a percentage reaching 87% because the excretory system process occurs in the human body. The excretory system has complex concepts and problems (Legiawan & Agustina, 2021). Such complexity makes the excretory system difficult to study. Biological material that has characteristics cannot be seen directly with high complexity, there needs to be visual media in order to increase student understanding (Yogica et al., 2014).

In the learning process, students can experience difficulties in learning. Such learning difficulties can be caused by internal and external factors. Internal factors of student learning difficulties include student learning interest and learning motivation, while external factors come from the environment and media used in the learning process (Amini et al., 2018). A factor that is quite influential on student success in the learning process is learning motivation (Marisa, 2019). According to Zamzami et al. (2020), lack of motivation is one of the contributors to learning difficulties with a percentage reaching 69% and is included in the high category.

Low student motivation is one of the main problems in learning biology. This is due to the lack of learning media that can visualize learning interestingly and easily understood (Aroyandini et al., 2021). Learning media that have been developed on human excretory system material have been widely studied, including android application-based learning media (Elci et al., 2021; Nuroifah & Bachri, 2015); booklet (Putri et al., 2021; P. P. Sari et al., 2020); Interactive LKPD (Naga et al., 2018); e-comic (Mery et al., 2022); and documentary films (Ekawati et al., 2017).

Android application-based learning media that has been developed is used as a learning support for excretory system material (Elci et al., 2021; Nuroifah & Bachri, 2015). The excretory system booklet was developed as a supplement to biology teaching materials for class XI high school (Putri et al., 2021; P. P. Sari et al., 2020). Interactive LKPD was developed to make it easier for students to understand excretory system material (Naga et al., 2018). The excretory system e-comic was tested for feasibility for class XI high school learning media (Mery et al., 2022). The documentary film was developed as a learning medium on the sub-material of excretory system disorders (Ekawati et al., 2017). All of these studies show that learning media in the human excretory system only focus on development and have not focused on examining whether to increase student motivation and learning outcomes.

Learning media needs to be facilitated to assist students in increasing student motivation and learning outcomes. The learning motivation received by students affects the learning outcomes received (Murti et al., 2021). The higher the learning motivation, the higher the learning outcomes (Syahid et al., 2022). One of the cognitive elements of student learning outcomes is analytical skills. Analytical skills are one of the focus goals of 21st century education (Osborne, 2013). The achievement of hampered learning outcomes can be caused by lack of analytical skills, so that good learning outcomes can be achieved by students when students have good analytical skills (S. Novita et al., 2019).

One of the interesting learning media to increase motivation and learning outcomes is game media (Zuhriyah, 2020). Game media is a learning media used in the learning process with certain rules. Learning with a fun atmosphere can be realized by using game media (Vijayta & Isnawati, 2021). Game-based learning is more innovative, effective and efficient in the learning process so as to further increase student learning motivation (Wibawa et al., 2021),in addition, game-based learning can also improve student learning outcomes (Irwan et al., 2019). The use of game media is also able to create a more fun and challenging atmosphere.

Game media that can be used on human excretory system material one of them is snakes and ladders. According to Berutu (2022), snake and ladder media in the excretory system material can effectively improve student learning outcomes, however, the media used is still conventional, which is still printed. Snakes and ladders media can increase student motivation because students feel not bored when learning is done with games (Haris & Nurjannah, 2022). Snake and ladder media that is still conventional

and proven to be able to increase student motivation and learning outcomes, it is necessary to develop digital snakes and ladders media.

Digital snakes and ladders media can make learning more active (L. Novita & Sundari, 2020). The use of snakes and ladders is expected to increase learning motivation, learning outcomes and be able to achieve learning outcomes on excretory system material in humans. The development of this digital snakes and ladders game media can be developed with the Genially website so that the game is more interactive and more modern. Genially has advantages such as being able to use for free and is a very dynamic and interesting digital learning application that does not create student boredom in learning (Ni'mah et al., 2022).

Based on the background description above, it is necessary to conduct research on the influence of digital snakes and ladders on human excretory system material (UTaSiMa) on student motivation and analytical skills.

RESEARCH METHOD

This research was carried out at SMA N 1 Mlonggo in the even semester of the 2023/2024 academic year. The research approach used in this research is quantitative research. The research design used was pre-experimental. The type of pre-experiment used was one group pretest posttest. The sampling technique is purposive sampling. The population of this study were all class XI students of SMA N 1 Mlonggo. The sample used was 90 students. The data in this research includes learning motivation and analytical skills. The motivation instrument uses a self-reflection sheet consisting of 20 statements. The analytical ability instrument uses a test consisting of 15 questions. The self-reflection sheet is guided by four indicators which include desire and desire to learn about the excretory system; desire and need to study the excretory system; hopes and aspirations to improve excretory system learning outcomes; and the desire to be interested in learning about the excretory system. Analytical ability questions are guided by two indicators which include identifying questions and analyzing statements. Analysis of motivation data uses descriptive quantitative percentages. Analysis of data analysis capabilities using the Wilcoxon Signed Rank Test. The percentage of motivation and analytical ability is calculated using the formula:

$$\text{Percentage}=\frac{number\ of\ scores\ obtained}{number\ of\ maximum\ scores}\times 100\%$$

The motivational score percentages are interpreted in Table 1:

Table 1 Learning Motivation Criteria

Percentage	Category
80% – 100%	Very High
60% – 79,99%	High
40% – 59,99%	Fair
20% – 39,99%	Low
0% – 19,99%	Very Low

(Fitriyani *et al.*, 2020)

Percentage score analytical skills are interpreted in Table 2:

Table 2 Analytical Ability Criteria

Percentage	Category
81,26% – 100%	Very Good
62,51% – 81,25%	Good
43,76% – 62,50%	Fair
25% – 43,75%	Low
0% – 24,99%	Very Low

(Prasetiyaningsih, 2020)

There are differences in analytical skills before and after the use of UTaSiMa media tested using

the nonparametric Wilcoxon Signed Rank Test. This is because the normality test data of pretest and posttest values are not normally distributed. The following are the results of the pretest and posttest normality tests.

Table 3 The Results of the Pretest and Posttest Normality Tests

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	,142	90	,000	,968	90	,027
Posttest	,107	90	,013	,964	90	,014

a. Lilliefors Significance Correction

Based on the results of the sig value normality test. Kolmogorov-Smirnov pretest 0.000 and sig value. Kolmogorov-Smirnov posttest 0.013. This indicates that the sig value ≤ 0.05 which means that the data is not normally distributed.

RESULTS AND DISCUSSION

This study aims to analyze the influence of UTaSiMa on student learning motivation and students' analytical skills. UTaSiMa can be said to affect students' motivation and analytical skills if: (1) students' learning activation after learning with UTaSiMa human excretory system material is in the high category, (2) students' analytical skills before and after learning with UTaSiMa human excretory system material have significant differences.

Student Learning Motivation

Data on student learning motivation were obtained by distributing self-reflection sheets. Learning motivation is measured after students are given treatment. Next, students' learning motivation is analyzed to find out the improvement. The results of the analysis of learning motivation of the human excretory system with UTaSiMa can be seen in Table 4 below.

Table 4 Results of Human Excretory System Learning Motivation Analysis with UTaSiMa

Indicators	**%**	**Category**
Desire and desire to learn excretory system	78	High
The desire and need to learn the excretory system	78	High
Hopes and aspirations to improve the learning outcomes of the excretory system	79	High
Desire to be interested in learning the excretory system	80	Very High
Average	79	High

Based on Table 4, it shows that the use of UTaSiMa media on human excretory system material can increase student learning motivation. The results showed that students' learning motivation consisted of high and very high categories. Based on this, the average learning motivation after using UTaSiMa media is in the high category. The use of UTaSiMa makes students' motivation high so that their analytical skills are also high. This is because at UTaSiMa there are questions that can train students on analytical skills. The statement is in accordance with Figure 1 where in each indicator, after using UTaSiMa, the average results of analytical ability have increased, especially in the indicator identifying questions. The results show that the indicator identifies the question as having a good category. The statement shows that high motivation can improve student learning outcomes. This statement is in line with Novita & Sundari (2020), the use of digital snakes and ladders media is able to create a fun and not boring learning atmosphere. The learning atmosphere can trigger the enthusiasm for learning and student learning motivation, so that it can improve learning outcomes, foster student motivation and interest in learning.

Learning with UTaSiMa makes students challenged to become a winner. The first student to reach the finish, then becomes a winner. Each box in UTaSiMa has several questions that students must answer

before advancing to the next box. This makes students challenged to answer questions in UTaSiMa. Learning with UTaSiMa makes students feel challenged and answer questions appropriately so that they are motivated to learn the human excretory system. UTaSiMa indirectly trains students in thoroughness and precision, because students must choose the right answer. This is according to the statement of Hidayah & Ain (2021), the snake and ladder game requires accuracy at every step so that students are more active and creative in understanding the material studied.

Learning using UTaSiMa is able to create a fun learning atmosphere that makes students more active. Before playing UTaSiMa, students need extensive knowledge to answer questions. Therefore, students must study together and answer questions in LKPD with their groups. This is so that students are more active in seeking information about the material of the human excretory system so that students have broad knowledge to answer the questions in UTaSiMa. This is in line with Purnamawati et al. (2014) learning using snakes and ladders requires students to have a wider ability to answer existing questions.

Learning with UTaSiMa makes students not feel bored when participating in learning, so the learning atmosphere becomes fun. Learning using UTaSiMa is able to make students show greater enthusiasm, focus on paying attention to material explanations, and answer questions. The use of snakes and ladders media can make learning more fun, creative and innovative, so as to increase student activities and students do not feel bored when participating in learning (Efendi et al., 2023).

The percentage of student motivation towards the use of UTaSiMa in each indicator has different categories, namely high and very high categories. This study shows that learning activities using UTaSiMa media are able to attract students to learn. On the indicators of desire and desire to learn, the excretory system falls into the high category. In this indicator, students try to complete the mission questions in the UTaSiMa game. This makes students encouraged to be more active in learning the excretory system so that students are able and successful in answering questions. This is in accordance with Maslow's theory (1943), that learning motivation is the tendency of students to carry out learning activities that are driven by the desire to achieve the best possible achievement or learning outcomes. This desire and desire to succeed must exist in students without any coercion from others so that students are active in learning so that learning goals are achieved (Uruk, 2021).

The use of UTaSiMa is able to increase student motivation to be the best for the hard work that has been done. In learning using UTaSiMa, students compete to win the game because the winning students get awards in the form of prizes. The use of UTaSiMa is able to make students become intensive and focused on learning. Students who have high learning motivation are more intensive, focused, and diligent during the learning process (Ricardo & Meilani, 2017). This indicator of desire and desire to learn excretory system is important so that students can appreciate themselves for all the achievements that have been obtained in the learning process. Therefore, students strive to improve their potential and achievement. Appreciation for student achievement must also be done by teachers and parents, so that students strive to get what they want. This is in accordance with Siahaan & Meilani (2020) that appreciation for an achievement can increase learning motivation and increase students' desire and desire to learn. Students who have high learning motivation get high learning outcomes. This is because students are motivated to strive hard to achieve the desired results (Kurniawan et al., 2018).

The next indicator is the desire and need to learn the excretory system. The desire and need to learn the excretory system belongs to the high category. This shows that students' learning needs are high. The encouragement to learn then makes students able to have the ability to think critically optimally (Lestari, 2014). Therefore, students who have the desire to succeed, then strive and are eager to learn both at school and at home. Success to meet students' learning needs cannot be obtained instantly so students must be active to learn. Students should try to study harder to answer the questions in UTaSiMa.

According to Gagne's theory in information processing theory, learning activities are the process of obtaining information, storing information, and recalling information controlled by the brain. In learning activities using UTaSiMa students get information on human excretory system material from the material provided, answer stimuli provided by teachers, discuss LKPD together with groups, and study independently to explore a wider learning experience. After that, the information that has been obtained is

stored by the student's memory by writing a summary of the material and writing answers to discussions that have been obtained together with the group. Furthermore, the information is always remembered by students when students reread the excretory system material. In addition, information is easy for students to remember when practicing answering questions repeatedly. Students can practice questions by answering questions in each box in UTaSiMa. The process of managing information becomes an important part of the learning system in determining the learning process and outcomes themselves (Aliyah et al., 2023).

The next indicator is the hope and aspiration to improve the learning outcomes of the excretory system. The results showed that hopes and aspirations to improve the learning outcomes of the excretory system were in the high category. This shows that the aspirations and expectations of high students get high excretory system learning outcomes as well. According to Rahiem (Rahiem, 2021)(2021), the existence of hopes and aspirations to improve learning outcomes makes students more motivated and tries to do everything to support the quality of learning. Learning outcomes are changes in behavior that are only experienced by someone who carries out the learning process. Therefore, high ideals and expectations encourage students to follow the teaching and learning process well. In the learning process, students try to study harder so that they are able to answer questions at UTaSiMa correctly and are able to do well on tests so that learning outcomes increase. Giving awards at the end of learning with UTaSiMa is also one way for students to have aspirations and hopes in improving the learning outcomes of the excretory system so that students get encouragement to study harder. This statement is in line with Darmawati (2017), students have high scores when in the learning process, students are given awards in the form of praise, numbers, and prizes.

The next indicator is a very high indicator, namely the desire to be interested in learning the excretory system. The use of UTaSiMa game-based learning media is a creative, innovative, and varied media, so that it can make the atmosphere in the learning process interesting. An interesting learning atmosphere causes the learning process to be meaningful, which will always be remembered and understood so as to motivate students to be more active in class(Uno, 2011). The use of UTaSiMa media is very appropriate to use because in the learning process students not only learn to use PPT and discussion, but use visual game media snakes and ladders. Learning motivation needs to be encouraged by a teacher with interesting learning media so that they can achieve learning goals. According to Harahap et al. (2021), learning motivation is needed by students so that students are able to select actions that must be done to achieve the goals to be achieved.

In the indicator of the desire to be interested in learning the excretory system, the teacher has an important role in the learning process, where creativity in the selection of media must be chosen that is interesting and in accordance with the character of students so that students feel happy and interested in learning the excretory system and motivated in participating in learning activities. This is in accordance with (Uruk, 2021), that teacher creativity is expected so that students are motivated and affect perseverance in learning, task completion, and learning outcomes obtained. Based on Dale's cone of experience, the more experience and sensory devices used to receive and process information, the more likely it is to be understood. However, the learning experience needs to start from the type of experience that suits the needs by considering the learning situation. The learning experience of students on UTaSiMa media is maximized by using the sense of sight. At UTaSiMa students focus more on looking at pictures of the excretory system and analyzing the relationships related to the excretory system. UTaSiMa is able to attract students to learn because in it students need to know the structure, function, mechanism, and disruption of the excretory system that are interrelated with each other.

Based on the cone of experience of Edgar Dale, UTaSiMa media is included in the visual stage of seeing the images presented in the questions in UTaSiMa. The highest sense of absorption of information received is the sense of sight so that it must be utilized to improve learning outcomes through the use of visual media (Khotimah et al., 2019). UTaSiMa media helps students in understanding concepts, analyzing and solving problems on human excretory system material. This is because in UTaSiMa media there is training on excretory system material so that students can process the information obtained. The use of UTaSiMa media in the human excretory system material facilitates the delivery of information that will be

conveyed by the teacher to students properly.

Students' Analytical Skills

Students' analytical skills were measured before and after students were given treatment. The results of the analysis of human excretory system learning motivation with UTaSiMa can be seen in Figure 1 below.

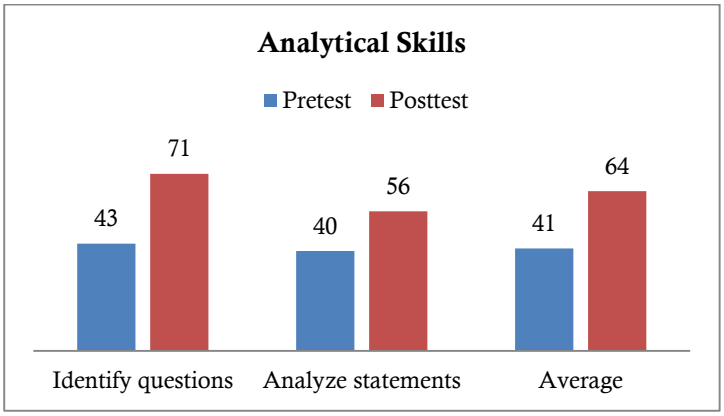

Figure 1 Results of Analytical Ability of Students Learning Human Excretory System with UTaSiMa

In Figure 1. the indicator identifying questions before using UTaSiMa has a percentage of 43% with low category. The percentage of these indicators increased after being given the use of UTaSiMa media to 71% in the good category. The indicator of analyzing statements has also increased from the low category to the fair category. The percentage on the indicator analyzing statements before using UTaSiMa is 40% to 56% after using UTaSiMa. The average analytical ability of students before using UTaSIMa has a percentage of 41% in the low category. The average analytical ability of students after using UTaSIMa increased by 64% in the good category. Analytical skills are skills that are needed by students that are useful for dealing with problems and problems in the 21st century. The importance of analytical skills needs to be trained during the learning process so that it becomes an important capital to face the world. This statement is in line with Fitriani et al. (2021), students need to have analytical skills to face increasing global problems and problems in the 21st century. The use of UTaSiMa is one of the media that can be used to train students' analytical skills. At UTaSiMa there are several questions that link between structure, function, mechanism, and disturbances related to the human excretory system. Before playing UTaSiMa, students also study together with groups and work on LKPD in accordance with learning objectives related to analyzing the relationship between structure, function, mechanism, and disorders that occur in the human excretory system.

Data on students' analytical skills are taken from test methods, namely pretest and posttest. The ability to analyze is measured based on test items that have been developed in accordance with the indicators. The analytical ability indicators used are identifying questions and analyzing statements. In identifying indicator questions, students are taught to determine the pattern of relationships in each concept that exists in the human excretory system both structure, function, mechanism, and disturbances that occur in the human excretory system. In this indicator, students are also taught to understand the questions and choose the right answers to existing problems in accordance with the concept. The ability to analyze needs to be trained so that students are able to identify abstract things (Ibda, 2015). In UTaSiMa media, students are trained to identify questions about the excretory system and then solve problems in the problem. Students are also given exercises by identifying some questions that exist in LKPD so that students are taught to solve problems regarding the human excretory system.

Based on Figure 1, the results show that on the indicator identifying questions have low to high categories. This shows that students begin to be able to identify and understand the meaning of the question so that they are able to provide conclusions related to the answers to the questions presented with the process of understanding the material that has been learned. The ability to identify is the first step in the

process of analyzing, so that the ability to identify becomes more honed if students are more trying and maximal in learning. According to Fitriani et al. (2021), the ability to identify is mastered by students if their identification skills are honed and improved.

The next indicator of analytical ability is to analyze statements. In UTaSiMa media, students are taught to associate one concept with another concept that still has a relationship with each other. Based on Figure 1, the indicator analyzing statements after using UTaSiMa media has increased from the low category to the fair category. In these indicators, UTaSiMa media trains students to analyze the statements that have been presented. Students are trained to solve existing problems on questions so that students' analytical skills increase. Students are also given LKPD before using UTaSiMa and are done in discussion with the group. This is so that students are more active in the learning process because by discussing, students exchange opinions so as to help solve problems and improve students' ability to analyze. At UTaSiMa, students must also be careful and must be able to think analytically in order to choose the right answers in answering questions. Analytical thinking can make it easier for students to think logically, so that they can connect between concepts (Kartikasari, 2022).

The indicator of analyzing this statement still needs to be improved. This is because it is still classified as sufficient. The indicator of analyzing statements is still quite sufficient because the questions in UTaSiMa are more on the indicator of identifying questions than analyzing statements, so students are better trained on indicators of identifying questions. This needs to be improved by multiplying questions with indicators analyzing statements. When more questions are about analyzing statements, students are more trained so that the results are better. These indicators need to be improved so that students are able to analyze statements so that they are able to connect a concept of excretory material so that students can conclude the right problem solving that can be taken. High analytical skills make students faster and more precise to solve problems, so that their achievements also increase (Purnamawati et al., 2014).

The difference in the average pretest and posttest analytical skills of students was tested using the Wilcoxon Signed Rank Test. The Wilcoxon test is a test used to determine whether there is an average difference between two interconnected samples (Arifin, 2017). This is in accordance with research where data is taken from students' pretest and posttest scores. This study used the Wilcoxon test because the results of the normality test data of pretest and posttest values were not normally distributed. The Wilcoxon test is very appropriate to use to analyze the effect of using digital snakes and ladders in human excretory system material on students' analytical abilities. The statistical test results show that the probability or significance level is 0.000 (p value $\leq$ 0.05), then Ho is rejected or the two population averages are not identical, where the average pretest and posttest scores are significantly different. This can be explained in the statistical description results based on Table 5.

Table 5 Wilcoxon Signed Ranks Test Descriptive Test Results

Descriptive Statistics

	Pretest	Posttest
N	90	90
Mean	41,31	63,12
Std. Deviation	14,480	17,520
Minimum	7	7
Maximum	73	93

Based on Table 5, it can be seen that the average pretest score and posttest score have a difference where the average pretest score is 41,31 and the average posttest score is 63,12. It can be concluded that there is a difference in the average value before and after the implementation of UTaSiMa so that it affects his analytical skills. Therefore, the learning strategy applied is appropriate to be applied in order to improve analytical skills on excretory system material.

Based on the results of the Wilcoxon Signed Rank Test, it shows that there is an average difference between the pretest and posttest scores for students' analytical abilities. These results are also proven in Figure 1 and Table 5, before using UTaSiMa in the learning process the analytical skills of students in the low category, after using UTaSiMa in the learning process are in the good category. This proves that there is

an influence of UTaSiMa media on students' analytical skills. This analytical ability has a very important role to achieve learning outcomes. This is because this human excretory system includes structures, functions, and disorders that must be analyzed for relatedness. UTaSiMa media makes it easy for students to practice analytical skills. This is because students practice to answer questions in UTaSiMa. Therefore, the use of UTaSiMa media in the learning process is the right learning strategy to improve analytical skills in excretory system material. This is in line with Agnafia (2019) analytical skills are one of the critical thinking skills. Snakes and ladders learning media can train students in improving critical thinking skills so that the learning process is more effective (Bahari & Yuliani, 2021).

Increased student analytical skills can be caused by student enthusiasm in the teaching and learning process. The learning process of students with UTaSiMa is able to make students active and responsible for solving problems. Learning with a pleasant atmosphere makes it easier for students to understand the excretory system material so that students' analytical skills increase. The use of UTaSiMa is able to facilitate students in gaining understanding and motivation in the learning process so that students' analytical skills become better This is in line with Haryanto & Adiwiharja (2015), the use of digital snakes and ladders media can make it easier for students to understand lessons so that learning runs effectively so that it is easily captured by students. The use of snakes and ladders media can also improve student learning outcomes for the better (Wati, 2021).

Correlation of Learning Motivation to Students' Analytical Skills

Correlation of learning motivation with students' analytical skills based on students' learning motivation questionnaire scores and students' posttest scores. The correlation of learning motivation with analytical skills was tested using the Spearman Rank test. The Spearman Rank test results show that the sig. (2-tailed) is 0.045. Based on the test results, the significance value is 0.045< 0.05, then the hypothesis is accepted. This shows that there is a relationship between learning motivation and students' analytical skills. The correlation coefficient in this study is 0.212, the correlation strength is included in the weak category. This shows that learning motivation does not greatly affect students' analytical skills. The direction of correlation in the correlation test is the direction of positive correlation. The direction of positive correlation shows that there is a unidirectional relationship where if student learning motivation increases, students' analytical skills increase.

Based on the Spearman Rank test, it shows that there is a relationship between learning motivation and students' analytical abilities. However, the level of relationship between learning motivation and analytical ability is weak. This shows that learning motivation does not greatly affect students' analytical skills. This is because in UTaSiMa only one game is done on each topic so playing UTaSiMa needs to be familiarized and done repeatedly so that students are trained to answer questions. In addition, the problem in UTaSiMa ratio is not balanced. The problem identifies more questions than analyzing statements in a ratio of 3:1. This causes students to be less trained in indicators of analyzing statements, so the number of questions needs to be corrected with the same ratio of 3:3. This statement is in line with Shahbana et al. (2020) repetition and training need to be done to form the desired behavior so that it becomes a habit. In the learning process, the TGT learning model is a learning model that is carried out for the first time, so it needs to be familiarized so that students are easier to remember and understand the learning material that has been given. This statement is in accordance with Azira et al. (2019) learning using TGT can make it easier for students to remember the lessons that have been taught.

The learning process using UTaSiMa is carried out in groups. This makes students take turns to play so that it is not necessarily when students who are playing and answering questions, other students pay attention. Before playing UTaSiMa, students working on LKPD is also carried out in groups and not necessarily each individual takes part in solving the LKPD. In the learning process, each individual must have their own responsibilities so that it is not imposed on one individual only because learning outcomes are determined on each individual. This is in line with Memorata & Santoso (2016), individual success is group success. However, if one individual fails then the group also fails. This needs to be improved again in the learning process using UTaSiMa so that each individual has the responsibility to complete the task well

and provide success to the group.

The correlation between learning motivation and weak analytical skills can also be caused by other factors outside the motivation indicators studied. Other factors such as motivation that comes from outside (extrinsic) such as the learning environment, encouragement from parents and teachers. According to Gagne, individuals and the environment have the most influence on learning activities. The environment in question is family, friends, and community. This is also in line with Siahaan & Meilani (2020), high motivation must also be supported by teachers and parents so that students have confidence in their achievements so that learning outcomes are also high. The learning motivation received by students affects the learning outcomes received (Murti et al., 2021; Nahak et al., 2019). The higher the motivation to learn, the higher the academic achievement. This means that student learning motivation needs to be developed so that it affects students' analytical skills. This is in line with Lutfiwati (2020) student learning motivation really needs to be developed because it can affect student achievement.

The correlation between learning motivation and analytical skills has a positive direction. This shows that if student learning motivation increases, students' analytical skills increase. This is in line with Nugroho (2017), student motivation is high, so analytical skills are also high. The learning motivation received by students affects the learning outcomes received (Murti et al., 2021). Motivation is one of the factors that affect student learning outcomes (Astiti et al., 2021; Tasya & Abadi, 2019). Therefore, students who have high motivation tend to be more enthusiastic and serious in the learning process so that the results of their analytical skills are high as well.

Students who have a strong learning motivation are able to make students study seriously. This is because students are able to push themselves to achieve optimal learning goals and as well as possible so that analytical skills are achieved. This is in line with Octavia (2020) where motivation is the main driving force for someone to achieve something they want. The use of interesting learning media is one of the factors that can influence student motivation and learning outcomes. In this study, the media used was UTaSiMa where the learning process was based on digital snakes and ladders games. The learning process makes students become active and not bored. This statement is in line with Sari & Nurcahyo (2018) that technology-based learning media eliminates boredom and increases student activeness so that it can increase student motivation as well as learning outcomes.

The use of UTaSiMa media can optimize students' motivation and analytical skills. This can be seen in Table 4 and Figure 1, where after using UTaSiMa students' learning motivation is in the high category and students' analytical skills that were originally low become good. This shows that UTaSiMa media affects students' analytical skills. UTaSiMa makes students more motivated to understand the material so that students' analytical skills increase. This is in accordance with Razak (2016), motivation supports students in mastering the material so that learning outcomes increase.

Learning motivation and student analytical skills have a close relationship because motivation is one of the factors that can come from the student's personality so that each student gains different analytical skills. Students who have high motivation for learning activities, will be earnest, have a high enthusiasm and desire in learning, have the desire to succeed, and make learning a necessity. Student learning outcomes will be obtained as desired. The intended learning outcome in this study is the analytical ability of students. Analytical skills are one of the cognitive learning outcomes (Nugroho, 2017). Conversely, weak motivation makes students lazy which makes students not serious and not excited so that their analytical skills do not meet student expectations. This is in line with Amalia et al. (2022) high low student learning motivation, always related to the learning outcomes achieved. This means, if learning motivation is high, then learning outcomes are also high, on the other hand, if learning motivation is low, then learning outcomes are also low.

CONCLUSION

Based on the results of the analysis and discussion, it is concluded that digital snakes and ladders in the human excretory system have an effect in increasing student learning motivation. In addition, digital snakes and ladders in the human excretory system are influential in improving students' analytical skills.

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