CHAPTER I
INTRODUCTION

1.1. Background

Education has a role as a good container and means in the context of fostering and forming human resources so that every potential that is owned can be channeled properly so that quality human resources are formed (Winata *et al*., 2021). Education does not only aim to provide subject matter but emphasizes how to invite students to discover and build their knowledge so that students can develop life skills to solve problems faced in life. The way that can be done to build the potential that exists in students is through learning activities (Nafrin & Hudaidah, 2021).

Learning activities are said to be successful by the expected goals depending on several things, including teachers, students, management, curriculum, environment, society, and last but not least, infrastructure (Rahayu & Abidin, 2022). Broadly speaking, teaching and learning activities are said to be successful as seen from the achievement of learning completion from a predetermined target (Silalahi *et al*., 2021).

Learning can say to be success it can be seen from the achievement of learning outcomes obtained. Learning outcomes are the result of learning because learning outcomes describe the success or failure the learning process that conducted. Learning outcomes is the students ability that they have after participating in the teaching and learning process (Anjani *et al*., 2021). According to Lestariningsih *et al*. (2021), learning outcomes are changes in a person's behavior that can be monitored and measured in the form of knowledge (cognitive), attitudes (affective), and skills (psychomotor) after receiving learning experiences.

Student learning outcomes are strongly effected by two factors, namely internal factors and external factors of student. Internal factors of student can be in the form of health problems, body defects, psychological factors (intelligence, interest in learning, attention, talent, motivation, maturity, and readiness of students), and fatigue factors. While external factors that will affect the learning process and learning outcomes of students include family, school, and community factors (Amalia, 2021).

Interest has a considerable influence on the process and achievement of learning outcomes. Student interest in learning needs to be raised, because with interest student activeness and curiosity will arise (Berutu & Tambunan, 2018; Yuliansih *et al*., 2021). Interest is a sense of tendency or interest that is permanent to get involved or just pay attention to something consciously about the importance or value of that thing (Prihatini., 2017). Interest in learning is very influential on students. With interest, someone will do something that will hopefully produce something for that person (Tohir, 2022).

Learning interest has a positive and significant effect on learning outcomes. Thus, an increase in interest in learning will be followed by an increase in learning outcomes. This means that the better the students' interest in learning, the better the student's learning outcomes. Students learning outcomes and interests can determine whether or not the expected learning objectives are achieved (Rondoni *et al*, 2022). This is in line with research conducted by Sari & Sumarmin (2022) that students' interest can affect their difficulties in learning.

Based on the results of interviews with science subject teachers conducted at SMP Negeri 35 Medan, information was obtained that science learning activities are still classified as conventional, especially in class VIII, in its implementation the teacher tends to be more active than students where the teacher explains the material and students only hear, record and memorize the material delivered by the teacher so that students' knowledge is only limited to what is conveyed by the teacher. The description of learning materials that are not contextualized in phenomena that are close to everyday life also makes it difficult for many students to understand the subject matter so learning outcomes and student interest are low. In line with research conducted by Handayani *et al* (2021), it was found that learning with conventional methods was unable to improve student learning outcomes because students did not actively participate in learning so their knowledge was limited.

This is in line with research conducted by Malmia *et al* (2019) that the low learning outcomes of students are caused by teacher-centered learning, where the teacher explains more and does not provide opportunities for students to solve

problems and questions are usually asked by the teacher so that students do not understand what they are learning because they are not much involved in learning.

The low interest in learning science of students can be seen from; students' activeness in asking questions to the teacher, students' interest in learning, and whether students pay attention or not when the teacher is explaining the lesson in front of the class. The low interest in learning is also caused by students' boredom in the learning process which has not maximized the use of interesting learning media so that it seems monotonous and causes students to be passive in learning activities (Yuliansih *et al*., 2021).

Underlining the problems of the constraints experienced by students and the impact on low cognitive learning outcomes and student interest in learning, it is necessary to use a learning model assisted by learning media that can improve students' cognitive abilities and student interest in learning material, namely the Problem Based Learning model assisted by Kahoot!.

Students' learning outcomes can be improved by applying a learning model that can stimulate students' existing abilities and create an interactive learning atmosphere (Amalia, 2021). According to Arends (1991) in his book, the Problem Based Learning (PBL) learning model is a learning model that exposes students to problems to find solutions. Meanwhile, according to Laesa *et al*. (2021), the PBL model is a learning model that makes problems as reference in learning. The problems raised can be about things related to the daily lives of students. PBL learning activities that require students to actively think, communicate, search, and process data, then conclude, are considered capable of improving student learning outcomes (Setyani & Susilowati, 2022). According to Arends (1991), the PBL model involves cognitive processes ranging from basic processes of remembering, explaining, and identifying, to high-level cognitive processes of analyzing, evaluating, and creating. The results of research conducted by Robiyanto (2021) show that from literature studies from various scientific articles, the use of PBL learning models in learning activities is very good for improving student learning outcomes. In line with previous research, research at SMP Negeri 10 Kota Sungai Penuh conducted by Sutrisna & Sasmita (2022) obtained that the science learning outcomes of the experiment class students who used the PBL model obtained a

higher average score than the control class who used the direct learning model, with the average value of the experimental group is 79, 94 and the control group is 70,82. Based on these studies, it can be assumed that learning methods are based on the principle that problems can be used as a starting point for obtaining new knowledge. So, learning is not only receiving new knowledge but there is also a process of finding new information. Students build their knowledge through interaction with the learning environment that has been designed by the teacher, the interaction between students and the learning environment is expected to improve student learning outcomes. This learning not only looks at the results but also pays attention to the learning process that students have done.

PBL learning model is not only able to improve student's learning outcomes, but also able to increase students' interest in learning (Jones, 2006). This is evidenced by research conducted by Widiyanto (2022), that in each learning cycle carried out, students' interest in learning continues to increase, namely in cycle 1 of 53.3%, in cycle 2 there was an increase of 80.0% while in cycle 3 it became 93.3% so it is clear that the PBL learning model can increase students' interest in learning. The study has the same results as research conducted by Hamidah, *et al* (2022) that the PBL model can increase students' interest in learning with the underlying factor in increasing students' interest in learning is learning conducted in groups and the existence of learning media using paired card games which also support students' enthusiasm in learning so that students take learning seriously.

The many advantages of applying the PBL model in learning that can be utilized to improve student learning outcomes and interest, do not rule out the possibility that this model also has several weaknesses in its application in learning (Utari, 2022). According to research conducted by Naviri, *et al* (2021) through literature review research, obstacles that often occur in learning with the PBL model, namely, teachers have difficulty in determining the right problem so they are unable to stimulate a good discussion atmosphere and can stimulate students' intellectual development. In addition, the teacher as a facilitator in learning has difficulty focusing and attracting students' interest in the problem used as a reference in learning so this can take a long time and learning becomes ineffective while solving the problem itself requires a sense of interest and a good level of

focus to be able to analyze and find solutions to the problems given (Purwanto, *et al*., 2016).

Teachers' constraints in determining the right problem that can stimulate students can be overcome by finding problems or phenomena that are close to everyday life so that students not only feel connected to the phenomenon but also gain new knowledge (De Graaf & Kolmos, 2003). Another obstacle is the difficulty in focusing and attracting students' interest can be overcome with the help of learning media (Tafonao, 2018). Attract students' interest in the learning that is carried out, it can be done by providing innovation in learning, namely utilizing technological sophistication by using the latest technology-based learning media that can attract students' attention, create a sense of pleasure in learning activities, and stimulate students' curiosity about learning material so that students' attention can be focused only on learning (Zulham, 2021). Kahoot! is a quiz and game-based learning media application. It offers interactive and communicative learning (Wowuruntu, 2021). Mixing games with test questions as a learning evaluation will certainly help motivate student to collect data, test themselves on their knowledge, seek feedback and suggestions, come to conclusions, and make generalizations about how their knowledge is used later. This will create an atmosphere that is fun and not boring (Singh, 2021). Another advantage of Kahoot! application is that it can train students to be able to think quickly and precisely according to the time set to answer each question (Kohnke & Moorhouse, 2021).

The human circulatory system material was chosen as the sample material in the study because according to the science teacher at SMP Negeri 35 Medan, this material is one of the materials that is difficult for students to understand. The difficulty of students in understanding this material affects the acquisition of learning outcomes. In the material of the human circulatory system, students are required to be able to achieve several basic competencies, namely organs in the circulatory system, blood circulation mechanisms, disease of the circulatory system, and the prevention. A structural understanding of the characteristics of the circulatory system material is needed.

The low cognitive learning outcomes in this circulatory system material can be seen from the achievement of each cognitive level in the test questions. In the

C1 and C2 test questions, the ability of students to solve problems in the questions is still relatively low, for example, in remembering and explaining the functions of erythrocytes, leukocytes, and platelets (Sari, 2020). At the C3 cognitive level, for example, solving problems related to diseases of the human circulatory system, the average student is still unable to solve problems well in this material. At the C4 cognitive level, students' ability to solve problems is also still relatively low, for example, analyzing factors that affect hemoglobin levels in the blood, only about 19% of students successfully solve problems (Juniar *et al*., 2014). According to Adah & Qosyim (2019), students' ability to solve problems at the C4, C5, and C6 cognitive levels is very low. This is because, at this cognitive level, students are required to be able to think more complexly to solve problems such as the ability to analyze, evaluate, and conclude or create ideas as problem solutions. From the results of this study, it can be seen that the average problem-solving ability of junior high school students in class VIII on the material of the circulatory system is still relatively low starting from the cognitive level C1 to the cognitive level C6. This is also a factor in the low cognitive learning outcomes of students on circulatory system material.

Misconceptions often occur in this material, usually related to the constituent components of the circulatory system, blood clotting mechanisms, blood groups, blood circulation mechanisms, and disorders of the circulatory system (Dewi & Abdullah, 2022). Factors that cause students' misconceptions vary from the teaching methods used by teachers, less active students, and students who do not seek information and only get facilities from teachers and makeshift books. To reduce misconceptions, teachers can use methods or media that can increase students' understanding of the material (Alfionitari *et al*., 2019).

Based on the description above, researchers are interested in conducting research with the title **"The Effect of Problem Based Learning (PBL) Learning Model Assisted by Kahoot! on the Interest and Cognitive Learning Outcomes of Students on the Material of the Human Blood Circulatory System Class VIII at SMP Negeri 35 Medan".**

1.2 Problem Identification

Based on the above background, the following problems can be identified:

1) The low cognitive learning outcomes of students are caused by students' difficulty in understanding the material.
2) The conventional learning process does not involve students because the learning activities are teacher centered, resulting in low learning outcomes.
3) Learning in the classroom that is still conventional and tends to be monotonous causes students' interest in learning to be low.
4) The low interest of students in learning affects the low learning outcomes.
5) The utilization of learning media that has not been maximized

1.3 Problem Limitation

Seeing the breadth of the identification of existing problems, the problems in this study are limited to:

1) The learning model used is the PBL learning model to then see the effect of its application to improve student interest and cognitive learning outcomes.
2) The learning media used is Kahoot!.
3) The subject in this study is human circulatory system material in class VIII.

1.4 Problem Formulation

The formulation of this research problem is as follows:

1) Is there an effect of applying the Problem Based Learning (PBL) model assisted by Kahoot! on students' interest and cognitive learning outcomes on the material of the human circulatory system class VII at SMP Negeri 35 Medan?
2) Is there an increase in students' interest and cognitive learning outcomes after applying the Kahoot-assisted Problem Based Learning (PBL) model on the material of the human circulatory system class VII at SMP Negeri 35 Medan?
3) How is the relationship between learning interest and student learning outcomes with the use of PBL assisted by Kahoot?

1.5 Research Objectives

In accordance with the formulation of the problem, the objectives of this study are:

1) To determine the effect of the Problem Based Learning (PBL) learning model assisted by Kahoot! on students interest and cognitive learning outcomes on human circulatory system material class VIII at SMP Negeri 35 Medan.
2) To determine the improvement of students interest and cognitive learning outcome on human circulatory system material class VIII at SMP Negeri 35 Medan.
3) To determine the correlation between students interest and cognitive learning outcome on human circulatory system material class VIII at SMP Negeri 35 Medan.

1.6 Research Benefits

The benefits or contributions obtained from this research are as follows:

1) Theoretical Contributions

The results of this study are expected to provide an overview and information about cognitive learning outcomes in science learning, as well as increase knowledge about the importance of technology utilization, especially in science lessons on human circulatory system material.

2) Practical Contributions

(a) **For Students,** this research is expected to be able to improve students' learning outcomes and interest through the application of interesting and fun learning models and media.

(b) **For Teacher,** this research is expected to be a teaching about the utilization of technology with the help of Kahoot! application as an effective, efficient, interesting, and fun learning media for students and the application of PBL learning model as a learning model that can improve students' learning outcomes.

(c) **For School,** this research is expected to be used as material for evaluating learning in schools related to the use of good learning models and media for teachers to use in learning science, especially in the material of the human circulatory system.

(d) **For Researcher,** this research provides direct experience and becomes knowledge and a source of new learning references that can be applied when becoming a teacher.

1.7. Operational Definition

Operational definitions to understand the terms used in this study, namely:

1) The Problem Based Learning (PBL) learning model is one of the problem-based learning models with stages of learning activities, namely orienting students to a problem, organizing students to learn, guiding individual or group investigations, presenting discussion results, reviewing and evaluating the problem solving process.
2) Kahoot application is an online application based on learning games, this application can be used as a supporting media in the teaching-learning process because it contains games in the form of varied quizzes so that it can create a fun learning atmosphere. This application is also very practical to use anywhere and anytime.
3) Cognitive learning outcomes are in accordance with the cognitive levels in Anderson's revised Bloom's taxonomy, starting from level C1 to C6.
4) Interest in learning is seen from interest, attention, motivation and curiosity in learning without coercion. Because interest arises from one's soul.
5) Conventional learning is learning with the lecture method without learning media that has been used in schools.