

**FOUR-TIER DIAGNOSTIC TEST AS A TOOL TO ASSESS  
STUDENT MISCONCEPTIONS ABOUT THE HUMAN  
CIRCULATORY SYSTEM**

**RESEARCH PAPER**

Submitted as Requirement to Obtain Degree of *Sarjana Pendidikan* in  
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UNIVERSITAS PENDIDIKAN INDONESIA  
2024**

# **FOUR-TIER DIAGNOSTIC TEST AS A TOOL TO ASSESS STUDENT MISCONCEPTIONS ABOUT THE HUMAN CIRCULATORY SYSTEM**

Oleh  
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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar  
Sarjana Pendidikan pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan  
Alam

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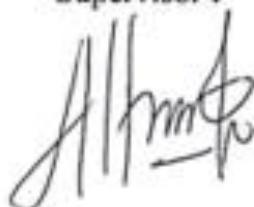
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## **DECLARATION**

I hereby declare that what I wrote in my thesis **entitled FOUR-TIER DIAGNOSTIC TEST AS A TOOL TO ASSESS THE STUDENT MISCONCEPTIONS ABOUT THE HUMAN CIRCULATORY SYSTEM** is my work written independently. The use of quotations in this work has been written correctly based on all available sources. The research carried out in this thesis is original and has not been made available in any other form as a requirement for any degree, qualification or qualification. By signing this statement, I acknowledge that I have read and understand the ethical policies relating to research and have complied with relevant guidelines throughout the research process.

Bandung, July 20<sup>th</sup>, 2024

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## **FOUR-TIER DIAGNOSTIC TEST AS THE TOOL TO ASSESS STUDENT MISCONCEPTIONS ABOUT THE HUMAN CIRCULATORY SYSTEM**

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### **ABSTRACT**

Misconceptions continue to be an issue in the field of education, obstructing the accomplishment of learning objectives. The purpose of this study is to identify and explain issues that arise when students attempt to comprehend the circulatory system concept. A multiple-choice questionnaire based on the Four-Tier Diagnostic Test question model that have been validated serves as the instrument. Additionally, students have had the validity of the question instrument tested by distributing it and using the R-Table test to determine its validity is greater than the R-Count. Three experts delivered an average value of 0.73, which was then used in the Aiken's Test. The 28 questions on the second validity test administered to students, 24 questions were found to be valid and represent concepts related to the circulatory system that were utilized as research tools. The data is statistically collected using quantitative research techniques and a survey research design in order to test and characterize hypotheses. The study was carried out in a number of Bandung Regency state junior high schools. Students encounter each category of student understanding in each question item, according to the research's findings. According to this study, the majority of students had a weak grasp of the subject, which contributed to their lack of confidence. In addition, with a percentage of more than 25%, misconceptions among students rank second in terms of conceptual understanding. The proportion of scientific understanding, false positives, and false negatives, on the other hand, all fall between 10 and 15 percent.

**Keyword:** Four-Tier Diagnostic Test, Human Circulatory System, Misconception

## **TES DIAGNOSTIK EMPAT TINGKAT SEBAGAI ALAT UNTUK MENILAI MISKONSEPSI SISWA TENTANG SISTEM PEREDARAN DARAH**

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### **ABSTRAK**

Miskonsepsi terus menjadi permasalahan dalam bidang pendidikan sehingga menghambat tercapainya tujuan pembelajaran. Tujuan penelitian ini adalah untuk mengidentifikasi dan menjelaskan permasalahan yang muncul ketika siswa mencoba memahami konsep sistem peredaran darah. Instrumen yang digunakan berupa angket pilihan ganda berdasarkan model soal Four-Tier Diagnostic Test yang telah divalidasi. Selain itu siswa juga telah menguji validitas instrumen soalnya dengan cara menyebarlakannya dan menggunakan uji R-Tabel untuk mengetahui apakah validitasnya lebih besar dari R-Hitung. Tiga orang ahli memberikan nilai rata-rata sebesar 0.73 yang kemudian digunakan dalam Tes Aiken. Dari 28 soal uji validitas kedua yang diberikan kepada siswa, 24 soal valid dan mewakili konsep-konsep terkait sistem peredaran darah yang digunakan sebagai alat penelitian. Data dikumpulkan secara statistik dengan menggunakan teknik penelitian kuantitatif dan desain penelitian survei untuk menguji dan mengkarakterisasi hipotesis. Penelitian dilakukan di sejumlah Sekolah Menengah Pertama Negeri di Kabupaten Bandung. Ditemukan setiap kategori pemahaman siswa pada setiap item pertanyaan, sesuai dengan temuan penelitian. Berdasarkan penelitian ini, sebagian besar siswa memiliki pemahaman yang lemah terhadap mata pelajaran sehingga menyebabkan mereka kurang percaya diri. Selain itu, dengan persentase lebih dari 25%, miskonsepsi siswa menduduki peringkat kedua dalam hal pemahaman konsep. Sebaliknya, proporsi wawasan ilmiah, hasil positif palsu, dan negatif palsu semuanya turun antara 10 dan 15 persen.

**Keyword:** Miskonsepsi, Sistem Peredaran Darah Manusia, Tes Diagnostik Empat Tingkat

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