

**PENGEMBANGAN INSTRUMEN TES DIAGNOSTIK *FOUR-TIER*
UNTUK MENGIDENTIFIKASI MISKONSEPSI PESERTA DIDIK PADA
MATERI FAKTOR PENGARUH LAJU REAKSI**

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ABSTRAK

Instrumen yang digunakan untuk mengidentifikasi miskonsepsi peserta didik masih belum banyak dikembangkan dan kurang mampu dalam membedakan level konsepsi peserta didik. Saat ini, instrumen tes untuk mengidentifikasi miskonsepsi peserta didik belum pernah dikembangkan dan digunakan di SMA Negeri 8 Yogyakarta. Miskonsepsi belum pernah dianalisis oleh guru, namun guru menemukan kesulitan belajar peserta didik pada sub topik faktor pengaruh laju reaksi. Penelitian ini bertujuan untuk mengembangkan instrumen tes diagnostik *four-tier* yang valid, efektif, dan praktis dalam mengidentifikasi miskonsepsi peserta didik pada konsep faktor-faktor pengaruh laju reaksi. Penelitian ini merupakan *Research and Development (R&D)* yang mengadopsi model pengembangan Wilson, Oriondo, dan Antonio yang dimodifikasi menjadi dua tahap yaitu perencanaan produk dan uji coba produk. Subjek penelitian ini adalah 12 orang peserta didik kelas XI SMA Negeri 8 Yogyakarta yang dipilih melalui teknik *purposive sampling*. Instrumen penelitian yang digunakan berupa lembar wawancara, lembar validasi, butir soal pilihan ganda bertingkat, dan lembar angket respon peserta didik. Data dianalisis menggunakan SPSS 23, statistik Aiken's V, AnBuso, dan analisis deskriptif. Hasil penelitian menunjukkan bahwa: (1) Instrumen tes yang dikembangkan sesuai dengan model pengembangan Wilson, Oriondo, dan Antonio karena memiliki tahapan yang tepat untuk pengembangan instrumen tes. (2) produk yang dikembangkan memenuhi kriteria sangat valid dengan persentase rata-rata 92%; uji validitas menunjukkan nilai r_{xy} pada *tier 1* dan *tier 3* sebesar 0,401 dan 0,522 dengan kriteria cukup valid; Uji reliabilitas menunjukkan nilai *Alpha Cronbach* pada *tier 1* dan *tier 3* sebesar 0,642 dan 0,815 dengan kriteria reliabel; Proporsi tingkat kesukaran soal kriteria mudah sebesar 60%, kriteria sedang sebesar 37%, dan kriteria sukar 3%; Proporsi tingkat daya beda soal dengan kriteria baik sebesar 63%, kriteria tidak baik sebesar 30%, dan kriteria cukup baik 7%.; rata-rata nilai peserta didik setelah uji coba adalah 74 yang menunjukkan hasil baik dan produk tergolong cukup efektif; rata-rata respon peserta didik terhadap produk sebesar 88% yang menunjukkan bahwa produk sangat baik dan sangat praktis, dan (3) Rata-rata persentase level konsepsi peserta didik pada materi faktor-faktor pengaruh laju reaksi yaitu sebesar 68,5% peserta didik paham konsep, 19,4% peserta didik tidak paham konsep, dan 11,1% peserta didik mengalami miskonsepsi, yang termasuk kategori rendah.

Kata Kunci: Instrumen Tes, miskonsepsi, faktor-faktor pengaruh laju reaksi

**DEVELOPMENT OF A FOUR-TIER DIAGNOSTIC TEST INSTRUMENT
FOR IDENTIFYING MISCONCEPTIONS OF STUDENTS ON THE TOPIC
OF FACTORS AFFECTING THE RATE OF REACTION**

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ABSTRACT

Instruments used to identify students' misconceptions are still not widely developed and are less able to distinguish the level of students' conceptions. Currently, a test instrument to identify students' misconceptions has never been developed and used at SMA Negeri 8 Yogyakarta. Misconceptions have never been analyzed by the teacher, but the teacher found students' learning difficulties on the sub-topic of factors affecting the reaction rate. This study aims to develop a valid, effective, and practical four-tier diagnostic test instrument for identifying students' misconceptions about the concept of factors affecting the reaction rate. This research is research and Development (R&D) that adopts the Wilson, Oriondo, and Antonio development model, which is modified into two stages, namely product planning and product testing. The subjects of this study were 12 students of class XI SMA Negeri 8 Yogyakarta who were selected through the purposive sampling technique. The research instruments used were interview sheets, validation sheets, multilevel multiple-choice items, and student response questionnaires. The data were analyzed using SPSS 23, Aiken's V statistics, AnBuso, and descriptive analysis. The results showed that: (1) The test instrument developed is in accordance with the Wilson, Oriondo, and Antonio development model because it has the right stages for test instrument development. (2) The developed product meets the criteria of being highly valid with an average percentage of 92%; the validity test shows the r_{xy} value on tier 1 and tier 3 of 0.401 and 0.522 with fairly valid criteria; The reliability test shows the Cronbach's Alpha value on tier 1 and tier 3 of 0.642 and 0.815 with reliable criteria; The proportion of the difficulty level of easy criteria questions is 60%, medium criteria is 37%, and difficult criteria is 3%; The proportion of the level of differentiation of questions with good criteria is 63%, bad criteria is 30%, and good enough criteria is 7%. The average score of students after the trial is 74, which shows good results and the product is classified as quite effective; the average response of students to the product is 88%, which indicates that the product is very good and very practical; and (3) The average percentage of students' conception level on the material of factors affecting the reaction rate is 68.5% of students understand the concept, 19.4% of students do not understand the concept, and 11.1% of students experience misconceptions, which are in the low category

Keywords: *Test instruments, misconceptions, factors affecting reaction rate*