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WHAT ATTRIBUTES BEST PREPARE STUDENTS FOR SPECIALIST SCIENCE SECONDARY SCHOOLS?

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SUBTHEME: Assessment

Specialist science secondary schools (SSSS) are secondary institutions having a mission of developing students with high potential in science, technology, engineering, and mathematics (STEM) to fulfil the STEM pipeline. Identifying student attributes that support this SSSS mission is essential (Erdogan & Stuessy, 2015). However, despite this importance, few studies have examined which attributes may be most relevant for SSSS students. This study investigates how SSSS stakeholders - school leaders, teachers, and students - perceive key pre-entry attributes for students and connections to student achievement. The Performance Model of Social Cognitive Career Theory (Lent et al., 1994) is used as the theoretical framework, as it integrates personal traits, experiences, and self-beliefs to academic and career outcomes. A mixed-methods approach was employed for the study, combining survey responses from 197 participants with semi-structured interviews from 35 interviewees across two SSSS. The quantitative and qualitative data was analysed using content analysis (Elo & Kyngäs, 2008; Rourke & Anderson, 2004), statistical analysis (Field, 2017), and thematic analysis (Braun & Clarke, 2006).

Through content analysis of 426 survey responses generated, six major pre-entry attribute categories of students well-suited to study at SSSS. The categories were described as Initiative (proactive learning), Cognitive Ability (thinking and reasoning), Motivation (drive to pursue STEM disciplines), Challenge (resilience and perseverance), Collaboration (teamwork and communication), and Altruism (contribution to society). Pre-entry attributes in the Initiative and Motivation categories were the most frequently proposed across all participant groups, reflecting a widespread belief in the importance of student self-direction and passion for science that would benefit students studying at SSSS. Statistical analysis of the survey data compared SSSS stakeholder perceptions by role, school, and student year level. Among these, the Cognitive Ability category showed no statistically significant differences between participant groups, indicating consistent agreement among all groups on the importance of cognitive skills for studying at SSSS. In addition, thematic analysis of 132 interview excerpts identified four core reasons why the interviewees had proposed specific student pre-entry attributes for SSSS: academic success, innovation, readiness for STEM pathways, and real-world adaptability. Differences in SSSS stakeholder perceptions were shaped by students' year levels, staff-student value alignment, and between two different SSSS. The findings from this study provide valuable insights for enhancing the identification of students best positioned to enter SSSS.

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