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**Profiles of High-School Chemistry Teachers'  
Perceived Interactions with Gifted Students in a  
Regular Classroom**

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## **Abstract**

The majority of gifted high-school students spend most of their formal education time in regular (mixed-ability) classroom settings. Gifted students need to develop and strengthen their abilities, since excellence and nurturing of talent do not occur spontaneously. However, in mixed-ability science classes, teaching is not necessarily tailored to the needs of these students.

Gifted students have a range of unique abilities that characterize their learning process. Among their characteristics are a fast learning pace, an ability to rapidly comprehend abstract concepts in depth, an ability to learn advanced content, as well as creativity, and higher-order thinking skills. If gifted students are to develop their abilities and potential, and learn optimally in the regular classroom, the teaching must be adjusted to meet their special needs. In spite of the importance of tailored teaching, the existing literature indicates that this is not always done in practice. Chemistry high-school curricula have a built-in potential to cater to the special needs of gifted students in a mixed-ability class. Chemistry learning entails laboratory work, comprehension of abstract concepts, and pattern identification, as well as higher-order thinking and learning advanced scientific content. Therefore, chemistry as a subject was chosen as a context to examine teachers' interactions with gifted students in a regular class.

In the classroom, interactions between teachers and students are core occurrences that trigger other class events. Numerous factors influence these interactions, including the teaching and learning style, the extent of student interest, the teaching pace and style, the type of assignments, and teachers' personal preferences. The teachers' way of conducting and responding during interactions with students may also affect the learning opportunities provided for gifted students.

This thesis explored the way chemistry teachers perceive their interactions with gifted students in a regular (mixed-ability) chemistry class. The research goals are as follows: (1) Perceiving and describing the interactions as perceived by the teachers. (2) Perceiving and describing interactions that are specific to chemistry teaching. (3) Identifying and characterizing categories of teachers' responses to interactions with gifted students.

(4) Attaining a better understanding of feelings and thoughts that underlie different teachers' reactions.

This qualitative research investigates the teachers' narrative regarding the interactions. Two research tools were used: (i) CIT-based interviews were used to collect the teachers' stories about their experiences with gifted students in a regular chemistry class, and (ii) the cartoon completion projective method (CCPM) online questionnaire, which helped in revealing and identifying feelings and thoughts underlying the teachers' various responses to interactions with gifted students in class. The research participants consisted of thirty teachers, sampled so that Israel's different types of schools, regions, and sectors are represented.

Based on the teachers' reports, 27 different perceived interactions were identified. The perceived interactions consist of the triggering event, the teachers' responses to that event, the response of gifted students, and the subsequent events, all reported by the teachers. The interactions can be related to three different domains of interactions. For example, the perceived interaction "Fast learning pace of the gifted student" can be associated with the instructional support domain; "I find it boring" to the classroom organization domain; and "Criticism from a gifted student" to the emotional support domain. Teachers can respond differently to the same triggering event, that is, a perceived interaction can have several different teacher's responses. Third of the perceived interactions were specific to chemistry teaching. In the interactions identified as specific to chemistry teaching, the learning characteristics of gifted students were found to influence the nature of the interaction, e.g. "The gifted student destroys the lesson's opening, (an fascinating demonstration or challenging question)"; "Teaching in the chemistry laboratory"; "The gifted student offers an alternative way to solve a problem".

The analysis of the teachers' responses revealed that teachers tend to respond similarly to different interactions. This finding, led to characterize of five teacher response styles. Each style has its own characteristics and has a different effect on the learning opportunities available for gifted students in class. The five styles of teachers' responses are the blocker, the shelper, the strict teacher, the leverager, and the initiator. A case

study focused on one perceived interaction (“Excuse me teacher, but you made a mistake...”) in which the CCPM online questionnaire was used, revealed five sets of feelings and thoughts underlying the teachers' different responses. The results indicate that different sets of feelings and thoughts can generate the same teacher's response in the classroom. A generalization, based on the results of the case study, indicated a link between the sets of feelings and thoughts and the different teachers' response styles that were identified.

The perceived interactions, the different teachers' responses, and the response styles identified in this research add to the current knowledge on gifted students who learn in a regular chemistry classroom. The research also has practical implications, including recommendations for the professional development of in-service teachers' instruction of gifted students in a regular chemistry classroom. The conclusions drawn from this research have been implemented in a course developed for in-service teachers of regular chemistry classes.