College Chemistry Self-Efficacy Scale (CCSS)

Developers: Esen Uzuntiryaki & Yeşim Çapa Aydın

Suggested citation: Uzuntiryaki, E., & Capa Aydin, Y. (2009). Development and validation of chemistry self-efficacy scale for college students. *Research in Science Education, 39*, 539-551.

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Language(s): Turkish and English

Format: 21 items
9-point rating scale from "very poorly" to "very well"

Dimension(s): 3 dimensions (self-efficacy for cognitive skills, self-efficacy for psychomotor skills, and self-efficacy for everyday applications)

Characteristics:

	No. of items	Reliability
• *self-efficacy for cognitive skills*	12	.92
• *self-efficacy for psychomotor skills*	5	.87
• *self-efficacy for everyday applications*	4	.82

Sample items:

- *self-efficacy for cognitive skills* "To what extent can you explain chemical laws and theories?''
- *self-efficacy for psychomotor skills* "How well can you work with chemicals?''
- *self-efficacy for everyday applications* "To what extent can you propose solutions to everyday problems by using chemistry?"

Scoring: To determine the subscale scores, we compute unweighted means of the items that load on each factor. Groupings are as follows:

Self-efficacy for cognitive skills
Items 1, 2, 3, 4, 6, 7, 9, 10, 14, 17, 18, 19

Self-efficacy for psychomotor skills
Items 5, 11, 13, 15, 20

Self-efficacy for everyday applications
Items 8, 12, 16, 21

Respondent: College students taking any general chemistry class

Administration time: 10-15 minutes

Other References:

Capa Aydin, Y., Uzuntiryaki, E., & Demirdogen, B. (2011). Interplay of motivational and cognitive strategies in predicting self-efficacy and anxiety. *Educational Psychology, 31(1), 55-66.*

Uzuntiryaki-Kondakçı, E., & Çapa-Aydın, Y. (2013). Üniversite Öğrencilerinin Eleştirel Düşünme Becerilerinin Bilişüstü Özdüzenleme Becerileri ve Kimya Özyeterlikleri ile Yordanması [Predicting Critical Thinking Skills of University Students through Metacognitive Self-Regulation Skills and Chemistry Self-Efficacy]. *Kuram ve Uygulamada Eğitim Bilimleri Dergisi, 13*(1), 666-670.

Uzuntiryaki, E., Capa Aydin, Y., Kirbulut, Z. D., & Beeth, M. E. (2011, September). *Predictors of chemistry self-efficacy among college students*. Paper presented at European Science Education Research Association (ESERA) Conference, Lyon.

Demirdogen, B., Uzuntiryaki, E., & Capa Aydin, Y. (2009, April). *Freshmen students' chemistry self-efficacy in relation to goal orientation, gender, and academic achievement*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

	Very poorly		Poorly		Average		Well		Very well
1. To what extent can you explain chemical laws and theories?	1	2	3	4	5	6	7	8	9
2. How well can you choose an appropriate formula to solve a chemistry problem?	1	2	3	4	5	6	7	8	9
3. How well can you establish the relationship between chemistry and other sciences?	1	2	3	4	5	6	7	8	9
4. How well can you describe the structure of an atom?	1	2	3	4	5	6	7	8	9
5. How well can you work with chemicals?	1	2	3	4	5	6	7	8	9
6. How well can you describe the properties of elements by using periodic table?	1	2	3	4	5	6	7	8	9
7. How well can you read the formulas of elements and compounds?	1	2	3	4	5	6	7	8	9
8. To what extent can you propose solutions to everyday problems by using chemistry?	1	2	3	4	5	6	7	8	9
9. How well can you interpret chemical equations?	1	2	3	4	5	6	7	8	9
10. How well can you explain the particulate nature of matter?	1	2	3	4	5	6	7	8	9
11. How well can you construct laboratory apparatus?	1	2	3	4	5	6	7	8	9
12. To what extent can you explain everyday life by using chemical theories?	1	2	3	4	5	6	7	8	9
13. How well can you collect data during the chemistry laboratory?	1	2	3	4	5	6	7	8	9
14. How well can you interpret graphs/charts related to chemistry?	1	2	3	4	5	6	7	8	9
15. How well can you use the equipment in the chemistry laboratory?	1	2	3	4	5	6	7	8	9
16. How well can you understand the news/documentary you watched on television related to chemistry?	1	2	3	4	5	6	7	8	9
17. How well can you interpret data during the laboratory sessions?	1	2	3	4	5	6	7	8	9
18. How well can you write a laboratory report summarizing main findings?	1	2	3	4	5	6	7	8	9
19. How well can you solve chemistry problems?	1	2	3	4	5	6	7	8	9
20. How well can you carry out experimental procedures in the chemistry laboratory?	1	2	3	4	5	6	7	8	9
21. How well can you recognize the careers related to chemistry?	1	2	3	4	5	6	7	8	9

For **Turkish** form of the CCSS, please contact esent@metu.edu.tr