

THE GLOBALIZATION OF CHEMICAL EDUCATION: THE TRANSLATION FROM ENGLISH TO ITALIAN

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Although the objective of the IUPAC project is the bi-directional translation of chemical education material by the use of machine translation, some limitations are imposed by the quality of the available software. In ordinary speaking or reading, the context is important too. It is the correlation between the words, the context, the tone of the voice, etc. that determine their meaning. As long as English – Italian is concerned, two translations have been made (1). Problems with machine translations are mainly related with the difficulties of the correct construction of the phrase; not with the chemical terms. This is mainly due to the richness of Italian grammar, that uses singular/plural; masculine/feminine, much more verb tenses than English and more prepositions.

The translation takes place in three stages:

1. Machine translation
2. Training the software with a superimposed dictionary
3. The final version is improved manually

Comparison of the initial output with the final version

Five different possibility are considered:

- a) wrong words
- b) the phrase needs to be reconstructed/the word/s must be changed (because of the reconstruction)
- c) the position of the word in the phrase is wrong/unsuitable word
- d) wrong because: singular/ plural ;masculine/feminine; verb tense/wrong verb; wrong preposition
- e) missing words

Results

The Atkins' paper: Total Words: 1436

Wrong translations:	70; 70/1436 = 4.87%
wrong words	63 = 4.39%
the phrase needs to be reconstructed/the word/s must be changed	225 = 15.67%
the position of the word in the phrase is wrong/unsuitable word	71 = 4.94%
singular/plural ;masculine/feminine; verb tense/wrong verb; wrong preposition	67 = 4.66%
missing words	39 = 2.72%
Correct translation	1010 = 70.33%

The Agapova et al paper: Words: 2998

Wrong translations:	91 = 3.04%
wrong words	106 = 3.54%
the phrase needs to be reconstructed/the word/s must be changed	403 = 13.44%
the position of the word in the phrase is wrong/unsuitable word	159 = 5.30%
wrong genre/singular/plural/verb tense/wrong verb; wrong preposition	143 = 4.77%
missing words	87 = 2.90%
Correct translation	2187 = 72.94%

In the two papers, more than 70% of the translation is correct. I tried the translation from Italian to English and the result is even worse than from English to Italian. Starting from an Italian paper, a translation in English and then again in Italian was made. The result is not satisfactory: some sentences are awkward; other are almost impossible to understand.

Bibliography

P. Atkins, Chemistry Education, *Chemistry International*, 2003, 25 (1).

Agapova, et al., Encouraging Independent Chemistry Learning through Multimedia Design Experiences, *Chemical Education International*, 2002, (3), 1, AN-8.