

From translation to transposition: Italian mathematics teachers as interlingual and intercultural mediators

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Introduction: The Mathematics Snapshot Project meets the SSPM Project

This work reports the early stages of an ongoing research aimed at shedding light on the issues faced by teachers when interacting with teaching material from another country. The research involves the Mathematics News Snapshots (MNS) Project of the Technion University, Israel (<https://mns.org.il/>) and the Scuole Secondarie Potenziate in Matematica (SSPM) - Mathematics Enhanced Secondary Schools Project of the University of Turin, Italy (<https://bit.ly/unitoSSPM>). The MNS Project aims at bridging the gap between contemporary research and high school mathematics by providing teachers with PowerPoint slides that present specific topics, including the history, underlying ideas, people involved, and new results. The MNSs are designed and written by teams of experts in mathematics and mathematics education directed by Prof. Nitsa Movshovitz-Hadar, they are freely available on the website and are conceived to be used for 30-minute lessons accessible to high school students. Since students often perceive mathematics as a static field where everything has already been discovered (Amit & Movshovitz-Hadar, 2011), the MNSs can be effective teaching resources to undermine this conviction and present students and teachers with an opening towards the new discoveries of contemporary mathematics. At the present date, the 25 MNSs on the website are available only in Hebrew and English; to make this resource accessible to a wider range of teachers and students, we need translations in other languages. Indeed, translation in this case is not an easy task, as it requires different skills. The translator should be proficient in the source and target languages, but should also understand the scientific content in order to render it in the target language with the right lexicon: this is when the MNS Project meets the SSPM Project. SSPM is a professional development program for secondary school teachers aimed at improving the quality of mathematics teaching in Italian secondary schools. The project focuses on teacher training and on the adoption of engaging teaching practices such as hands-on laboratory teaching (Arzarello & Robutti, 2010) and inquiry approach to problem solving aimed at increasing students' interest and motivation in learning mathematics. The project runs since 2016 and the initial group of around 30 teachers are now highly skilled and, under the guide of the researchers, started to design their own laboratory activities.

The research: Methodology and open questions

The research involves the group of 30 skilled SSPM teachers from September 22 to June 23, along the following timeline: (1 - Sept. 22) teachers choose the two MNSs to be translated through a social voting tool; (2 - Sept. 22 / Jan. 23) teachers translated the chosen MNSs into Italian; (3 - Feb 23) a first online questionnaire is administered, to collect teachers' feedback on the underlying idea of the MNS Project and on which aspect of the translation they found more challenging; (4 - Feb. 23 / May 23) teachers design complementary activities; (5 - September 23) a second online questionnaire is

scheduled and personal interviews aimed at digging deeper into the teachers' work. In this initial research phase, we report teachers' answers to the first questionnaire. All teachers responded positively to the question "Do you consider educationally interesting linking curricular contents to new discoveries in mathematics?", but they shared mixed feelings about the translation. Figure 1 (left) shows that what teachers considered as more complicated was the underlying teaching method, since the MNS are conceived to be used by teachers for a "25-30 minute "performance", which high school students [...] are invited to listen" (as described in the MNS website). SSPM Teachers perceive the MNS difficult to handle as a teaching resource because it is "totally different from the laboratory methodology which I am accustomed to and students now expect", "because it hardly asks for any (or little) direct participation from the student", and "because that's not the methodology we use as SSPM". Coherently, they felt that the translation enriched them from the linguistic and mathematical point of view, but not from the point of view of learning new teaching methods (Figure 1, right).



Figure 1: Teachers' perception of complexity in the translation (left) and personal growth (right)

Our interpretation is that that SSPM teachers as translators act as "interlingual and intercultural mediators" (Schaffner & Kelly-Holmes, 1995, p. 6). In this role, they successfully manage the language translation, but they are challenged by the cultural transposition (Mellone et al., 2019) elicited by an educational resource distant from their culture and teaching practice. In the next months, teachers will design complementary activities to align the MNS to the SSPM approach, and we will have new data to understand better the nature of these challenges and how teachers deal with them.

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