GUEST EDITORIAL

At exactly ten years ago, the Brazilian Federal Network of Professional, Scientific, and Technological Education (*Rede Federal de Educação Profissional, Científica e Tecnológica* – RFEPCT) was estabilished by then president Luiz Inácio "Lula" da Silva through public law 11.892 of December 29, 2008. The initiative constituted an effort to expand access to higher education into underserved areas of the country, with priority given to STEM courses in the professional and technical education modality. An important part of the network are the Federal Institutes of Education, Science and Technology (*Institutos Federais de Educação Ciência e Tecnologia* – IFs), which are multilevel (basic, secondary, and higher education), multicampi and multicurricular Technical and Vocational Education and Training (TVET)[1] institutions by definition (laid out in chapter I, art. 2 of the 11.892 Act).

It is our contention that the resignifications that the education of the workforce has undergone throughout the history of the Brazilian system of professional and technical education serve as a perfect backdrop for the discussion of mathematics education as a component of TVET in its various forms throughout the world. In this editorial, we explain this view, which was the rationale behind proposing this special issue of the International Journal for Research in Mathematics Education – RIPEM, with the theme "*Mathematics Education in and for the World of Work"*.

One may ask how the celebration of the decennial anniversary of the founding of the IFs relate to the discussion of the role of mathematics in TVET and in the workplace. In our view, in at least the following ways:

1. The IFs represent the creation of new types of educational endeavor, of thinking outside the box, since they are innovative in that they include not only teaching and training, but research, service, and development within the realm of TVET. Similarly, the mathematics education community has always fostered innovative thinking and the link between research and practice in the educational *praxis* (Kemmis, 2008; Sfard, Hashimoto, Knijnik, Robert, & Skovsmose, 2004).

2. The IFs presuppose the practical nature of knowledge – as opposed to a separation between theoretical and applied knowledge. The link between the applied and the theoretical nature of mathematics has also been discussed in mathematics education since the origins of the discipline (Freudenthal, 1968, 1987; Noss, Hoyles, & Pozzi, 2002).

3. Democratization of education and inclusion of diverse populations is at the basis of the creation of the IFs. Mathematics educators have traditionally held the aim of mathematics for all but the issue is still current topic of debate (Damerow & Westbury, 1985; Llewellyn & Mendick, 2010; Pais & Valero, 2011; Schubring, 2015).

4. The philosophy of education and of work at the foundation of the creation of the IFs states that the alienation of work and the separation of manual and intellectual labor

[1] Education for careers, work and world of work take different names in different countries at different times. Technical and Vocational Education and Training (TVET) is a contemporary term often used internationally. For example, in Brazil, the term used is Professional and Technical Education (*Educação Profissional e Técnica* – EPT), whereas in the United States of America the terminology is Career and Technical Education (CTE). Note that both countries opt to avoid the use of the word *vocational* to describe their TVET systems.

denies the worker the control and the perception of the production process as a whole, treating people as disposable or easily replaceable pieces of machinery. Similarly, the view of learning as developing a knowledgeably skilled identity as a member of a community, espoused by many mathematics educators, alerts to the dangers of the fragmentation of learning and of its separation from practical activities (Lave, 1991; Watson & Winbourne, 2008).

5. Educational reforms and initiatives are inherently political actions, as evident from the brief history of the creation of the IFs we offer above. Similarly, the political aspect of mathematics education has been highlighted in recent decades (Gutiérrez, 2013; Pais & Valero, 2011; Pais & Valero, 2012; Skovsmose & Valero, 2001; Valero, 2004).

After reading the five topics presented, it is easy to see that the establishment of the RFEPCT and the creation of the IFs were originated not only from governmental agenda. Actually, it was a demand of various social sectors involved in TVET in Brazil, which defended the expansion and democratization of access to professional education in public institutions, and the replacement of the sometimes neglected and sometimes elitists modes of TVET – in either way, classist in nature (Segundo & Martins, 2018).

The rationale behind the creation of the IFs is, in sum: the expansion of public professional education as a counterpoint to neoliberal policies; the creation of a capillary educational system that reaches traditionally underserved communities and that is inclusive of diverse populations; the view of work as a formative activity and of professional and technical education as education *through* work for the world of work, not as training for the job market; the integration of research and service to institutions of professional and technical education, as is common in any university; the possibility of obtaining professional and technical education at all levels, from primary to tertiary, with the implementation of a vertical, all-encompassing, multilevel system.

Within the movements that pushed for the creation of the IFs there was a strong influence of the polytechnic model of education, as well as of the pedagogies based on the formative and educational character of work, in turn initially acclaimed by Karl Marx e Friedrich Engels (Pacheco, 2010). The discourse made official in the 2008 federal law represents a certain compromise and is "milder" in tone (Segundo & Martins, 2018), but the fact that it establishes the "integrated" model of schooling at the secondary level shows a foundation on polytechnic ideals. The provision for secondary integrated schools in the 2008 federal law also represented a definite rupture with the agenda of the previous government, which basically tried to abolish this type of institution and which had more neoliberal premises, considering that the role of TVET was to fulfill the demands of the market.

Although the secondary integrated school proposed by the IFs resembles the polytechnic model, its presuppositions are not practiced in their totality by those who work in EPT. For example, the international academic community has already pointed out how mathematics education can, in addition to subsidizing technical and scientific training for students, contribute to the emancipation of the working class through critical and problematizing approaches (Aslan Tutak, Bondy & Adams, 2011; Bartell, 2013; Frankenstein, 1983; Powell & Frankenstein, 2002; Skovsmose, 1994). On other hand, Marxist and Freirean pedagogies, although acknowledged, are regrettably rejected by those who reduce the world of work to the everyday labor. This poses a challenge for the continuation of the ideal represented by the creation of IFs in 2008, especially on the verge of a change in government with the result of this year's presidential elections in Brazil.

During the planning of this thematic issue, we have tried to imprint an inclusive character to the call for papers, along the lines proposed by the Topic Study Group "Mathematics education in and for work" of the ICME conference. Inclusivity was intended in relation to conceptions of mathematics (academic, situated mathematical reasoning, etc.), education (all levels and modes), and work (formal or informal, lay or professional, paid or unpaid, institutional or not). We hope this special issue brings contributions to the confluence of studies in mathematics education and TVET. We are proud to have the support of the UNESCO-UNEVOC International Centre for TVET and the Brazilian Council of Institutions of the Vocational, Scientific and Technological Education Network (Conif), for the dissemination of the call for articles in the TVET community.

We also would like to thank for the authors who submitted 13 papers for this thematic edition and the reviewers, most of them teachers and researchers of TVET, for their commitment to our publishing process. In this special issue, ten full papers written by authors from United States of America, Sweden and Brazil have been published on-line. The articles seek to encourage the integral, integrated, interdisciplinary and critical education of all students in TVET. It is important to point out that this posture does not belong to any particular individuals or group, but to the community of which SBEM – the Brazilian Society of Mathematic Education – is a part. "No one lets go of anyone's hand" is currently a popular maxim in Brazil.

Finally, we would like to congratulate all, students, teachers and administrative servers, who have worked and who are currently working to make the vision of the Brazilian Federal Network of Professional, Scientific, and Technological Education in these ten year of hard work and accomplishments.

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