

ISOMETRIES AND PATTERNS – A CREATIVE APPROACH

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Today's mathematics curricula for basic education confer an increasing emphasis on the topic of isometric geometric transformations on the Euclidean plane (Usiskin, Andersen & Zotto, 2010). Curricula also defend that recognizing patterns and regularities underlying some structures is considered the essence of Mathematics itself (Vale & Barbosa, 2010). That process will be favoured if students are comprehensively engaged in creative tasks that involve reproducing, continuing and completing patterns and identifying repeating sets. In fact, creative tasks, implemented in a creative way, demanding creative solutions and allowing student's imagination and actions grow free can be crucial to develop mathematical creativity, strongly underlined lately (Robinson, 2011). Dynamic software can be an innovative way to achieve those goals and to promote autonomy development and communication skills (Kasten & Sinclair, 2009) as well as to contribute to build a more positive view towards geometry.

Acknowledging that research encompassing these various topics is scarce, we conducted a qualitative case study (Huberman & Miles, 2002) with 9th grade students (14/15 years old), aiming at evaluating the impact of a creative approach to Isometries, centered on Patterns and using Geometer's Sketchpad (GSP), on the knowledge acquisition on isometries as well as on the development of mathematical communication and autonomy and of a positive relationship with Geometry. The main data collection techniques were enquiry, direct observation and documentary analysis supported, mainly, by questionnaires, field notes, logbook, tests, other students' assignments, including those computer related.

The research led to the conclusion that Isometries approach, centred on Patterns and using GSP, has contributed not only to deepen students' knowledge and skills on geometry, mathematical communication and autonomy but also to develop a closer relationship with the field of geometry itself.

References

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