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Editorial

The Journal of the International GeoGebra Institute of São Paulo (IGISP), ISSN 2237-9657, of biannual regularity, is an electronic publication of the GeoGebra Institute of São Paulo based at the Faculty of Exact Sciences and Technology, Program of Post-Graduate Studies in Mathematics Education of the Pontifical Catholic University of São Paulo (PUC-SP), Brazil, with Qualis CAPES A2.

Free of charge, it aims to offer a space for the dissemination and circulation of researches and works developed with the use of the software GeoGebra, mainly in Latin America.

This second issue of volume 13 of the 2024 journal presents five articles, an experience report, and three proposals for action that seek to encompass the different possibilities and paths with which GeoGebra can be investigated.

In the first article *"Teaching of Spatial Geometry through GeoGebra: an experience involving Euler's relation"* the authors Carlos Aparecido Ajala Ojeda and Adriana Fátima de Souza Miola aim to present an experience report with GeoGebra to understand the Euler Relation for a high school class, addressing the content of Spatial Geometry and developed in a constructionist approach according to Papert.

In the second article *"Spatial Thinking and Movements in Geometry: GeoGebra with a Focus on the Construction of Animated Scenarios"* the authors Camila Maria Koftun and Maria Ivete Basniak present a theoretical essay and, as an objective, discuss the potential of the construction of Animated Scenarios in GeoGebra in/for the recognition of plane and spatial geometric objects, articulated with the movements associated with spatial thinking.

"A geometric approach to relations between Fibonacci and Leonardo numbers with the contribution of GeoGebra" is the third article and the authors Milena Carolina dos Santos Manguiera, Carla Patrícia Souza Rodrigues Pinheiro, Francisco Regis Vieira Alves and Paula Maria Machado Cruz Catarino aim to present a geometric interpretation of the Fibonacci and Leonardo sequences and their interrelationships, using the GeoGebra software, in the field of Mathematics Education.

In the fourth article *"Simulation of internal forces in beams using dynamic software GeoGebra applied to teaching"* the authors Humberto Gabriel Gallo, Florencia Seiler and Carlos Gabriel Herrera, present a didactic proposal for the study of internal forces in simply supported beams, using simulations in dynamic software GeoGebra as a technological tool.

Eliane Pereira and André Sandmann are the authors of the fifth article *"Deterministic chaos of the elastic pendulum: a study using GeoGebra"* in which, based on numerical solutions, they built an applet in GeoGebra that allows studying the behavior of the elastic pendulum through the spaces of phases, trajectory and

numerical solution and an animation of the system that allows visualizing the movement of the elastic pendulum.

The work of the section "Experience Report", by the authors Márcio Adriano de Oliveira Júnior and Wellington Piveta Oliveira, *"Mathematical modeling with technologies for calculating of the area of an irregular region: the case of Rosário de Nova Fátima-PR"*, presents the Mathematical Modeling of a situation of reality in which they use the GeoGebra software to calculate the area of an irregular region, where the Rosary of Nova Fátima is located in the State of Paraná.

In the first work of the "Proposals for Action" section, *"GeoGebra Virtual Tutorial: Creation of a Dynamic and Interactive Open Educational Resource"* the authors Nara Bobko and Laís de Souza Rocha describe the conception and creation of the virtual tutorial "Introduction to GeoGebra (Classic)", a virtual, interactive, dynamic and open access educational resource, developed with the purpose of supporting both educators and students in familiarizing themselves with the GeoGebra software. to fully exploit the potential of this technological resource.

Katiane Souza de Oliveira, Rudimar Luiz Nós and Olga Harumi Saito are the authors of the second work *"Using GeoGebra 3D to reinterpret the facade of the Oscar Niemeyer Museum"* using conic sections, such as the parabola and hyperbola, to make the prismoid that represents the part of the façade that has the shape of an eye and prisms to describe the base of the eye and the original structure. With the construction, they aimed to relate geometry and art and to apply concepts of spatial geometry and analytical geometry with a digital technology.

Finally, in the third paper, *"Expanding the semiotic scope of GeoGebra: Teaching it to Speak"*, the authors Humberto José Bortolossi, Dirce Uesu Pesco and Wanderley Moura Rezende detail how, through JavaScript programming in GeoGebra, it is possible to integrate GeoGebra with Google's Text-to-Speech (TTS) service, giving the software speech synthesis functionalities. This integration not only enriches GeoGebra with new capacities for verbal expression, but also significantly broadens its semiotic scope, facilitating a richer and more diverse representation of the concepts covered.

The works presented here highlight the possibility of interdisciplinarity and transdisciplinarity in the context of Mathematics Education.

We express our gratitude to all who contributed to the realization of this volume of the issue and to the academic research of Mathematics Education.

Celina A. A. P. Abar - Editor