

GABRIEL DE OLIVEIRA FURTADO

Itajuba, Minas Gerais, Brazil | Email: gabrielofurtado@icloud.com | Phone/WhatsApp: +55 (35) 99955-5566

ACADEMIC PROFILE

Physics educator, independent academic tutor, and language instructor with a Licentiate Degree in Physics from the Federal University of Itajuba, Brazil, and a completed postgraduate specialization in Physics Teaching. My academic interests focus on Physics Education Research, formative assessment, student misconceptions, conceptual change, interactive tutorials, and curriculum redesign in undergraduate physics.

My experience includes individualized academic instruction, private tutoring, language education, diagnostic assessment design, and the development of pedagogical frameworks for adaptive learning. I am particularly interested in student learning in introductory Quantum Mechanics and Quantum Information Science, with emphasis on guided inquiry and research-based instructional materials.

RESEARCH INTERESTS

Physics Education Research; Introductory Quantum Mechanics Education; Quantum Information Science Education; Student Misconceptions; Formative and Diagnostic Assessment; Interactive Tutorials; Guided Inquiry; Curriculum Redesign; AI-supported Tutoring; Learning Analytics; Multilingual and Cross-cultural Science Education.

EDUCATION

Federal University of Itajuba - UNIFEI

Licentiate Degree in Physics | Itajuba, Minas Gerais, Brazil | Completed

Undergraduate degree in Physics with teacher education preparation. Relevant areas: Classical Mechanics, Electromagnetism, Thermodynamics, Waves and Optics, Modern Physics, Quantum Mechanics, Mathematical Methods for Physics, Physics Teaching, Science Education, Pedagogy, and Didactics.

Facuminas

Postgraduate Specialization in Physics Teaching | Brazil | Completed

Relevant areas: physics pedagogy, teaching methodologies, assessment practices, curriculum development, conceptual learning in Physics, and instructional strategies for science education.

Bachelor's Degree in International Relations

Brazil | In progress

Relevant areas: international systems, geopolitics, economics, scientific and technological development, cross-cultural communication, and global education.

PROPOSED GRADUATE RESEARCH DIRECTION

Formative Assessment and Interactive Tutorials to Mitigate Misconceptions in Introductory Quantum Mechanics and Quantum Information Science

- Investigate student difficulties in quantum states, measurement, superposition, probability amplitudes, uncertainty, spin, and entanglement.
- Design diagnostic questions and formative assessment instruments for abstract undergraduate physics topics.
- Develop interactive tutorials and guided-inquiry materials to support conceptual restructuring and reasoning.
- Use written-response analysis, pre/post assessment, and qualitative coding to evaluate student understanding.
- Explore adaptive feedback and AI-supported tutoring as scaffolds for learning without replacing human instruction.

TEACHING AND TUTORING EXPERIENCE

Independent Physics Educator and Private Academic Tutor

Brazil / Online

- Provide individualized instruction in Physics to secondary-school, pre-university, and independent learners.
- Support students in conceptual understanding, mathematical modeling, and problem-solving strategies.
- Teach mechanics, waves, electricity, magnetism, thermodynamics, and modern physics.
- Use diagnostic questioning to identify conceptual gaps before introducing formal equations.
- Develop step-by-step scaffolding strategies connecting physical intuition, mathematical representation, and procedures.

Private Tutor in Mathematics and Scientific Reasoning

Brazil / Online

- Support mathematical foundations required for Physics, including algebra, functions, equations, proportional reasoning, and problem interpretation.
- Help students translate word problems into mathematical and physical representations and distinguish conceptual, algebraic, and procedural errors.

English and German Language Instructor - Speaking Language School

South of Minas Gerais, Brazil

- Teach English and German to beginner and intermediate students using communicative and learner-centered methods.
- Develop oral assessment criteria based on fluency, grammar, vocabulary range, pronunciation, coherence, interaction, and task completion.
- Apply formative feedback and adapt instructional strategies according to students' learning profiles.

SELECTED ACADEMIC AND PEDAGOGICAL PROJECTS

Physics Education Research Proposal - Quantum Mechanics and Quantum Information Science Education

Independent academic project

- Developed a graduate research proposal focused on formative assessment, interactive tutorials, and conceptual difficulties in introductory Quantum Mechanics and Quantum Information Science.
- Emphasizes student misconceptions, mathematical-formalism difficulties, research-based instructional materials, and curriculum redesign.

Diagnostic Assessment Framework for Physics, Chemistry, and Mathematics

Independent pedagogical project

- Designed a diagnostic model to identify prior knowledge, conceptual gaps, algebraic difficulties, procedural fluency, and study habits.
- Included baseline reports, open-ended reasoning tasks, longitudinal progress comparison, and personalized learning pathways.

AI-supported Educational Technology Project - Adaptive Learning and Tutoring Design

Independent educational technology project

- Designed the conceptual framework for an educational platform integrating diagnostic assessment, student learning profiles, adaptive feedback, and AI-supported tutoring.
- Relevant elements include STEM diagnostic questionnaires, learning analytics dashboards, hint-based tutoring, micro-steps, concept review, and problem-data organization.

Oral Performance Assessment Framework for Language Learning

Independent pedagogical project

- Created structured oral assessment rubrics for English and German learners, with criteria for fluency, pronunciation, grammatical accuracy, lexical range, coherence, interaction, and sustained speech production.

RESEARCH PREPARATION AND METHODOLOGICAL INTERESTS

Formative assessment design; diagnostic testing; conceptual change in science learning; rubric-based evaluation; qualitative analysis of student reasoning; written-response analysis; pre/post assessment; learning analytics; guided inquiry; interactive tutorials; physics problem-solving instruction; mixed-methods research; semi-structured interviews; think-aloud protocols; and coding of student explanations.

TECHNICAL AND DIGITAL SKILLS

Educational technology design; assessment and rubric construction; diagnostic questionnaire design; curriculum mapping; learning analytics planning; AI-assisted tutoring system design; prompt engineering for educational applications; LaTeX for scientific and mathematical writing; basic programming and computational thinking; familiarity with Python-based educational tools and web-based learning platforms.

LANGUAGES

Portuguese - Native | English - Fluent | German - Intermediate | Chinese - Intermediate | Hebrew - Elementary/Pre-intermediate | Russian - Beginner | Ukrainian - Beginner

APPLICATION FOCUS

Target graduate fit: U.S. master's programs and research groups in Physics Education Research, Science Education, Quantum Mechanics Education, Quantum Information Science Education, research-based tutorials, formative assessment, curriculum design, and evidence-based STEM instruction.

REFERENCES

Available upon request. Recommended referees include a Physics professor from the Federal University of Itajuba, an academic mentor familiar with Physics or Physics Teaching preparation, and a supervisor or senior educator familiar with teaching, tutoring, or assessment work.