

An overview of the outcomes of the GIREP Malta Webinars 2020 and 2021

Joan BORG MARKS

Physics Department, University of Malta, Malta

Abstract. This paper offers a brief description of some of the outcomes from the GIREP Malta Webinars 2020 and 2021. A lot was presented and discussed through these webinars. All is deemed important. This presentation will, however, only highlight some of the predominant issues. The aim is to remind the readers of what participants felt were vital ways of how physics teachers can be better trained throughout their career so that students can be helped to achieve their potential. Issues that really matter in physics teacher education will be outlined.

Introduction

Some years ago, the GIREP Board accepted the proposal to hold a GIREP Conference in Malta. When preparations for the conference started, the world was hit by surprise with the COVID-19 pandemic and because of restrictions imposed worldwide, the conference could not be held as a face-to-face meeting. As a consequence, a first GIREP Malta webinar was held in 2020 and a second GIREP Malta webinar resulted in 2021. Both webinars were well attended and participants came from all over the world. The theme of both webinars was Physics Teacher Education – an important issue for the GIREP community, including lecturers at university and school teachers involved in the teaching of Physics. The webinars included keynote speeches by renowned authors / researchers / practitioners in physics teacher education, as well as parallel workshops focussing on various pre-set topics, where participants made oral presentations which were further discussed and developed.

From as early as can be remembered, the topics related to the formation of teachers of physics were always popular and in demand [1]. The perception of many students and teachers is that Physics is a challenging subject to learn and to teach. Thus, in educational research we find many a researcher who tries to find ways that improve the teaching of physics principles, for better learning and understanding of concepts.

Topics/Issues discussed through the webinars

At the GIREP Malta webinars 2020 and 2021, participants elaborated further on what research was being done related to how teaching and learning of Physics could be improved in schools and at University [2, 3]. If the learning of the subject was to be made more meaningful, then the method of instruction by the teacher also had to change. Both pre-service and in-service teachers need all the help they can get in terms of professional development and teaching resources. Initial teacher training and what topics could help the teacher at this stage were suggested. It was important to find out what can bring best experiences in new teachers, such that these experiences and enthusiasm gained could then be transmitted in the teaching and learning of students lower down.

Topics dealt with through the webinars related mainly to: 1) initial teacher training and what can offer best experiences to motivate new teachers; 2) delivery of content; 3) the importance of the development of experimental skills; 4) the involvement of digital technologies and the use of multimedia in physics teaching; 5) the importance of what teacher resources are required for the teaching of Quantum Physics; 6) the preparation of teachers at primary level; 7) the link between schools and university.

With participants from different countries, it was inevitable that teacher education and methods of teaching were compared. One learns not only from bad practice and knowing what not to be repeated but also from best practice – practice that can be used to promote success in one's own classroom.

The themes of the webinars had been indicated by active workgroup leaders within the GIREP community. Position papers were written by the workgroup leaders. Post webinar papers were submitted for review and publication. Some papers were published on the Journal of Physics: Conference Series [4, 5]. Other selected papers were published in book form by Springer [6, 7].

Implications and Conclusion

A brief look at the work of some researchers may make us realise that there seem to be some gaps that still need to be filled to improve teacher training.

Demkanin (2018) says that a successful teacher is one who is trained in each of three basic dimensions: knowledge, abilities and relationships [8]. During teaching, these dimensions become interwoven and the teacher must learn to apply them together. A teacher needs time and practice to evolve into someone students are happy to meet because class is a place where enthusiasm is shared and learning happens. It is felt that teacher training still needs to develop along these lines.

Moreover, we still have a lot to learn from John Hattie (2009) who indicates ways of teaching that induce visible learning [9].

And what about Eric Mazur and his drive for active learning and peer instruction? [10]. It is not just listeners that we need to produce, but doers. We need to allow the creativity of learners to flourish. We do not wish to dampen it by boring instruction and transfer of knowledge.

Our work in physics education is always evolving. Physics instruction needs to be differentiated so as to serve learners of different abilities. Teachers need to be trained to recognise when students need enrichment programmes to help them retain their enthusiasm towards learning.

The authors mentioned here are, of course, only some authors who have pointed to issues that we still need to improve upon in the teaching and learning of Physics. Most of us may already know about issues that improve teaching and learning, but for some reason, some teachers keep delaying the use of teaching methods that provide more positive solutions to their class. Most teachers mention the lack of class time as the reason behind not using teaching methods allowing for more active learning. But we must keep in mind that sometimes, time can be lacking because it is not being used well by those who are in a direct position to control what takes place in the classroom – namely the teachers themselves.

As educators, we still need to work further, trying to ensure a better future in terms of teaching and learning for physics students, at all levels. Effective teacher education is key towards offering quality education for all.

References

- [1] A. Tiberghien, E. L. Jossem. J. Barojas, *Connecting research in Physics Education with Teacher Education*. An I.C.P.E. book, 1998.
- [2] D. R. Sokoloff, Exploring Multimedia to adapt interactive lecture Demonstrations for home use, In *Physics Teacher Education: What Matters*, 2022.
- [3] E. Marshman, C. Singh, QuiILTs: Validated Teaching-Learning sequences for helping students learn Quantum Mechanics In *Physics Teacher Education: What Matters*, 2022.
- [4] J. Borg Marks et al. (eds) *GIREP Malta Webinar 2020*. J, Phys: Conf Ser 2297, 2022.
- [5] J. Borg Marks et al. (eds) *GIREP Malta Webinar 2021*. J. Phys: Conf Ser 2490, 2023.
- [6] J. Borg Marks et al. (eds) *Physics Teacher Education: What Matters*, 2022.
- [7] J. Borg Marks et al. (eds) *Physics Teacher Education: More About What Matters*, 2023.
- [8] P. Demkanin, Concept formation: Physics teacher and his know-how and know-why, *J. Balt. Sci. Educ.* **17** (2018) 4-7.
- [9] J. Hattie, *Visible learning: A synthesis of over 800 meta-anaylses relating to achievement*, London, Routledge, Taylor and Francis, 2009.
- [10] E. Mazur, *Peer instruction for active learning*, accessed 3/3/2024 <https://www.youtube.com/watch?v=Z9orbxoRofI>