WORKING ON RESOURCES QUALITY ASSESSMENT ON I2GEO

Frédérique BOURGEAT[1], Anne CALPE[1], Marina DIGEON[1], Esmaël ESFAHANI[1], Isabelle LEYRAUD[1], Sophie SOURY-LAVERGNE[2], René THOMAS[1], Olivier TOURAILLE[1], Jana TRGALOVA[2]

[1]Institute for Research on Mathematics Education (IREM), Lyon, France

[2]National Institute for Pedagogical Research (INRP), Lyon, France

Corresponding author: Isabelle Leyraud:

Phone +33472503160 • Fax +33472901198

ileyraud@gmail.com • http://math.univ-lyon1.fr/irem/

Abstract

Our group's mission is working on quality assessment of resources available on i2geo platform while testing the platform itself to suggest improvements. Resources are analysed using a questionnaire reviewing their pedagogical, didactical and technical aspects. The reviews are done after an analysis of the resources, before any test in class, and sometimes after a test with our pupils. The work is comparable to the "guide du routard" (backpacker's guide): it aims at bringing to light activities the group identified as pedagogically sound and interesting in the multitude of those proposed. To keep track of everyone's work and share it with the group, we use a "logbook" in which we record the progress of our research: results obtained by the search engine, choices of resources to review, their subsequent use (or not) with our students, their possible modifications… Using the platform has changed our teaching practices: the platform has become a tool (like a textbook) for the design of our teaching activities. Instead of creating activities from scratch, we first have a look if the platform proposes resources corresponding to our expectations. We do not necessarily use the resources directly: while appropriating them, we modify them or take some inspiration from them according to our needs and aims. During our collaboration on the project, we often had doubts, essentially due to technical difficulties but the last months' evolution is significant. After two years working on the i2geo platform, it is time to share this tool and our experiences with our colleagues.

Keywords

Dynamic geometry - Quality assessment - Pedagogical resource – i2geo platform

1 Group presentation

Dynamic geometry systems (DGS) exist and are used in education since 25 years. In the early 90's, the Institutes for Research on Mathematics Education (IREM[1]) began working on integration of these tools into usual math lessons.

Our group has been created within the IREM of Lyon. It aims at proposing teacher training courses focusing on using DGS. We regularly need to adapt to software evolutions. Being both secondary mathematics teachers and teacher educators allows us gaining a sound pedagogical and didactical experience required for the teacher education and we aim at developing in teachers a better knowledge and technical skills with the software that are useful to their everyday practice.

In June 2008, we have been invited to join the Intergeo project. The platform has been developing and we were invited to work on the resource quality assessment issues. A new teacher and two researchers have joined us: our i2geo group has been born. Thus, the Intergeo project is not at the origin of our group, but it has brought us a "fresh blood".

2 Evolution of our mission

2.1 The mission we were assigned initially

In 2008, the project has been launched since one year and more than 3000 contributions were already available, called traces at that time. The platform evolved and traces were converted to resources and migrated to a new interface. The huge amount of resources required tools to help users make choices and thus make quality resources emerge. A preliminary version of the quality questionnaire has already been elaborated (Jahn *et al*. 2008; Mercat *et al*. 2008). Our mission consisted in testing available resources and assessing their quality.

We did not hesitate to accept to join Intergeo: interoperability of DGS and sharing resources in a large scale was a strong argument which attracted all of us. Working on DGS for years, we have built our own data base gathering around 50 resources, however their sharing was limited via usual teacher training courses. In order to prepare such courses, we spent hours browsing the internet and looking for new ideas and resources: it was always time consuming but rarely fruitful.

A collection of 3 000 resources deposited on the i2geo platform was a real gold mine. Furthermore it was an occasion to share our experience with DGS with other platform users, hoping that less experienced teachers would be able to take advantage of our contribution to the resource quality assessment.

[1] The IREMs form a network associating primary, secondary and university teachers and researchers to carry out together research on mathematics teaching and learning and hence to provide teacher education drawing on research results.

2.2 Evolution of our tasks

During our first work meetings, we worked on the initial version of the quality questionnaire: we discussed the meaning of every item, the difficulties due to translations and our understanding of the French version. These discussions allowed the questionnaire to evolve into a version accessible to ordinary teachers. We also produced a few resource reviews together.

Face to face meetings took place every two months, meanwhile we worked on our own. The meetings allowed us to share our expectations, questions and findings. Providing resource reviews by filling out questionnaires had to be our main activity during the first year. However we faced many difficulties due mainly to technical problems and a lack of search tools. The platform was not yet fully operational, the translations into the different languages were not complete, the connection time was very long (more than five minutes were needed for a page to be displayed), and bugs were still quite frequent. Moreover, the search program often gave blank results and a random search rarely gave activities usable in our classrooms. At that time, we were getting discouraged. Finally, we assessed very few resources. Our own quality requirements were due to our experience as teachers and teacher educators and we did not want to give negative rating to activities. Our aim was to highlight activities that deserve it.

We have deposited several resources: when we looked for an activity and available resources did not match our expectations, we posted our own contributions. Besides, contributing made us being more objective in the quality assessment as our understanding of platform tools offered to contributors has improved. We also explored various tools of the platform such as groups, group contributions, collections...

The improvement of the search program and fast technical enhancements of the platform since the last year has given us more motivation and pleasure in our work. Moreover we have started using a new methodological tool, called "logbook". The researchers in our group realized that we always applied a first selection while searching for activities on i2geo and that we only assessed resources we considered as the most interesting. In this way, we lost a big amount of information, why and how we choose the resources to be reviewed.

The "logbook" comprises the following steps:

Step 1: The initial motivation for searching for resources

Step 2: Searching for resources on i2geo

Step 3: Exploring the proposed resources

Step 4: Selection (or contribution) of a resource to review

Step 5: Review of the selected resource (before using it in class)

Step 6: Test of the resource in a classroom

Step 7: Review of the resource after a test in a classroom

Thanks to the "logbook", we keep traces of our navigation on i2geo. It details every step of our search, our motivations for the choice of the resources we review. We can also explain whether we contribute or not when we do not find resources matching our expectations. The “logbook” is thus a precious tool not only for monitoring our documentation work (Gueudet and Trouche 2009), but also to get feedback on the efficiency of the search engine.

3 Impact of i2geo platform on our practices

The impact of our participation to the project is conspicuous at three levels: at the level of our teaching practice, of our group and of the educational community.

As mathematics teachers, an important part of our work consists in planning our classroom sessions. To do this, we have textbooks, books, Internet, our knowledge and experience at our disposal. Although Internet offers an immeasurable amount of resources, it is not always easy to find what we look for. For instance, using Google search engine, "médiatrice géométrie dynamique (segment bisector dynamic geometry)" leads to about 11200 results: a lot of resources are available but how to choose those that correspond to our expectations? Are they all usable?

Before our involvement in the project, we used official websites with a few resources in relation with DGS, or various personal websites, without necessarily finding what we were looking for. As a consequence, we often ended up by building an activity from scratch including the DGS file if needed.

Since then our habits have changed as regards to our practices. The search program becoming efficient, i2geo has become a tool for the design of our teaching. We first look for resources matching the subject that interests us. If we do not have any precise idea about the activity, the proposed resources can provide us with an activity we want to test or at least give us some ideas or make us discover unknown software potentialities. Otherwise, it can be very difficult to find an activity we can use without any change. In any case, we begin to get familiarized with the first resources related to our request, we analyse them and fill in both the logbook and the questionnaire (leading to a review). When a resource comprises a student worksheet associated to a dynamic figure which fits, we use the resource after having appropriated it (which is easier if a resource comprises a teacher worksheet with information about its implementation). If needed, we modify it according to our specific classroom context or take inspiration from them according to our aims. Once tested, we deposit the modified resource on the platform.

As teachers involved in the Intergeo project, we can share our experience with colleagues, especially those who contribute to the platform. We analyse and improve our practices thanks to the debates and the tools we introduced (questionnaire, logbook). Our activities related to in-service teacher training help us identify some explicit items for "quality" that seem indispensable to us, such as a sound mathematical content, usability and potential of appropriation. They also help us being more accurate on assessed resources.

Besides, the work on the project has echoed on the in-service teacher training our group is responsible for: we present the platform to trainees, we use resources available on the platform. We also think that the questionnaire can be used in pre-service teacher training:

it can help future teachers identify benefits of using DGS and what its use implies (difficulties, complexity of classroom management...).

To a larger extent, the questionnaire and reviews bring an external point of view that contributes to the improvement of resource quality and provides "resources all inclusive" reviewed (and thus easier to adapt and customise), and hopefully encouraging teachers to use ICT.

4 Conclusion and perspectives

We are involved in the Intergeo project since two years now. We realize that the platform matches more and more our expectations. And still there is a lot to improve so that the platform becomes used by a large community of teachers around Europe. The objective we wish to achieve is that most of the available resources are shared and useful in classrooms. We started working within the project and then we began sharing resources and our experience with colleagues when technical difficulties were wearing off.

We are now concerned also with the search tool efficiency. Our group wishes to get involved in the platform improvement. It is a logical continuation of our contribution to the project. There are plenty of available resources: the users need a tool allowing them to find quickly and easily the ones that will be useful. Otherwise i2geo would not be more than any other catalogue where one will spend hours searching with no insurance to find what s/he is looking for.

Another issue we are concerned with is the evolution of resources. It is easy to transform a resource and make it evolve. It is one of the great advantages of i2geo. But a multiplicity of resources with the same title or with parallel contents will make the search of resources more complicated.

Finally, we are willing to develop 'best practices' on the platform. Reviews of a resource are useful since they aim at improving it or providing it with a pedagogical added value. This is a topical issue still to be developed.

For these reasons we will continue working with i2geo platform and help improve it. We got a lot from our involvement in the project in terms of the evolution of our practices and it has a lot to offer to new users.

References

Gueudet G., Trouche L. (2009) Towards new documentary systems for mathematics teachers? *Educational Studies in Mathematics*, 71(3), 199-218, doi: 10.1007/s10649-008-9159-8.

Jahn, A. P., Trgalová, J. & Soury-Lavergne, S. (2008), Analyse de ressources pédagogiques et amélioration de leur qualité : le cas de la géométrie dynamique. *Actes du 2° SIPEMAT* (Simpósio Internacional de Pesquisa em Educação Matemática), 28 juillet-1 août, Recife (Brésil), 2008, CD-Rom, ISBN 978-85-87459-81-7.

Mercat C., Soury-Lavergne S., Trgalova J. (2008), *Quality Assessment*, Deliverable n°6.1, Inter2geo Project, March 2008. http://i2geo.net/files/D6.1.pdf . Accessed 14 June 2010.