GeoGebra in the context of the IT Surrounding Environment

Valerian Antohe

GeoGebra Institute of Timişoara, România

valerian_antohe@yahoo.com

Introduction: The development of information technology radically changes our way of living, of communicating with the others, of receiving the information. In the future, it is expected that the role of computers in our life become essential; any student will have to master this field in order to achieve easily what he wishes. This presentation covers some ideas that were developed after the first activities carried out under the GI Institululi Romania and our strategies in connection with the development of a broad community of users nationwide.

1. IT surrounding environment

We live in a world subject to dynamic changes. The level of information and its flow on different communication channels, its impact on the individual are more and more difficult to quantify.

Filters of the informational flow, imposed by the educational system, may lead to progress when this approach is in agreement with a modern and well planned educational desideratum or may lead to disasters when it is imposed by social or political manifestations which are not focused on the development of the individual.

We speak today, at the beginning of the third millennium, looking at the young generation, of an evolution towards "homo - informaticus". This evolution cannot be hindered by the socio-political phenomenon or by the environment, the latter being seen as an information-bearer.

Environmental policies seek to preserve a clean environment for future generations. Most of the time, the human component of what we call environment does not occupy the first place or is not seen as an essential factor. Additionally, little attention is paid to approaches centred on a clean informational environment which might have a positive impact on human nature.

The cleanliness or degradation of this environment, the control over it, may be designated as the ecology of the IT surrounding environment (ITSE).
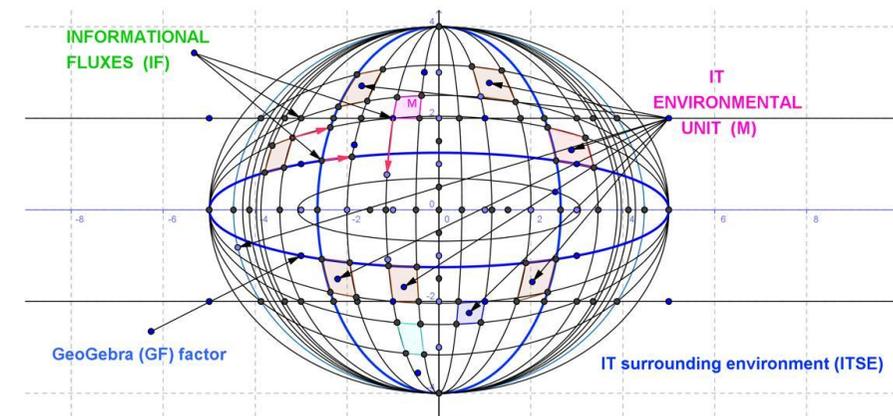
Fig. 1. IT surrounding environment

Attention is being drawn towards global warming and steps have been taken in order to control this phenomenon. Studies and researches are being carried out on tactics, methods and solutions for defeating cancer, and their results are promising.

People speak of maintaining a clean environment and the ecosystems are monitored, controlled by scientists, while the human factor tends to become more and more aware of its role in this context.

Therefore, we can speak of a clean environment for the individual and global development of people interacting with the (ITSE) environment so as to be able to attain the homo - informaticus ideal. They will then be able to act on a clean environment and the created environment will act beneficially on their development as individuals and community, the human component of (ITSE).

The phenomenon of fake scientific sites, fake socialisation networks, the copy-paste phenomenon, voluntary or involuntary access to the false truth, all these grind at the structure of knowledge, affecting the clean environment we wish to maintain for present generations, and the mentioned aspects are only few of the unbeneficial communication channels.

We will look into the concept of homo - informaticus and the extent to which it can be influenced by the GeoGebra (GF) factor.

2. The structure of the GeoGebra (GF) factor

The starting moment of the GeoGebra software operation is considered the moment in which this software was created and launched in the universal informational environment (It took place in the 1990s under the umbrella of "open source" systems) and was meant to be a dynamic structure, focused on the following goals:

- to provide free access to a dynamic educational software;
- to offer free teacher training courses;
- to support and develop materials both for students and teachers with a view to improving education in the fields of mathematics, sciences and technology;
- to contribute to and to promote collaboration between practitioners and researchers in order to create a national users community.

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In the meantime, simultaneously with the achievement of the optimal dynamics of the informational flow and the use of "catalysers" proper to self-multiplying structures, the IT surrounding environment M units passed from latency to development, under the impact of an unsuspected informational flow.

Thousands and thousands of users were activated and the interaction of M units began.

3. The interaction of M units, MLM context

At first sight, the phenomenon is structured similarly with the Multi Level Marketing (MLM), however, its main benefit was to be the profit in science, profit in useful information, able to create superior information, able to produce high quality education.

In contrast with the MLM context, aiming at material profit, M units were activated and their centres were called GeoGebra Regional Institutes, which develop other structures and do not act punctually.

Informational flows, benefits gather not only towards the top of the pyramid, as in the case of MLM, but reverberate on the basis as well, the new system members benefitting from the entire support of the system.

The cascade, pyramidal development of the structure is due to the international environment, but to periodical meetings as well, in various parts of the world, within workshops. Thus, the informational flow goes vertically and horizontally as well.

If in a MLM chain, a network knot is removed or if it excludes itself, being eliminated from the system, in our case, the individual is informed about the phenomenon, enters into the structure and, if it does not participate, it will not ruin the GeoGebra users network.

The network will continue to function, focusing on its own development, as its development aims at the development of the informational flow and this, in its turn, participates to the development of the network.

Which can there be the purpose of the comparison with a MLM pyramidal structure?

Precisely the fact that some of the (almost always) criticised MLM tactics, which creates false gain structures, may be welcomed in this informational environment, for the development of the universal informational environment (UIE).

4. Development tactics, strategies

MLM structures are supported by publicity or promotional methods, some visible, other only present in common language. Once created, the brand accompanies any network action.

Within the GF structure, the publicity carried out in certain university educational environments or in scientific research, will remove barriers in the knowledge spectacle. MLM networks bear the rigours of multilingualism, especially in transnational structures. GeoGebra universal language is similar to mathematical language, which has used the same terms for thousands of years, so that all M units can be correlated, can collaborate and communicate.

Including in this book successful experiences both from the educational field and from the system of scientific research, the system will be opened. The system will be understood as a system of communication and of concrete action and not of a virtual

environment, of the imagery of the introvert individual, enslaved by the computer around which he builds a fake virtual life.

5. The example of the science virtual shop

Everyone is familiar with the structure of virtual shops, whose products can be known only through their virtual image.

One must accept that even in such an environment the best products, the best rated products are on the "front shelf".

We have become the administrators of the GeoGebra phenomenon. We have acted so as to achieve this. However, it will be beneficial if, by votes, the best achievements will be brought sooner before the new users.

The level of voting tolerance can be seen from three directions:

- the one of the "scientific level" category;

- the one of level and utility in a concrete educational approach, included in the curriculum;

- the one of flexibility and adaptability of the model to new didactic strategies.

Information will be beneficially filtered, both from the point of view of science and of the affective - cognitive factor, guiding more carefully the product-related information (GeoGebra final products), obtaining quality and increasing the speed of informational flow. This creates system operationalization and stresses actions and reactions between M units, turned now into GeoGebra and ITSE units.

The newly founded Timişoara GeoGebra Institute aims at promoting this approach of GeoGebra material selections, but, at the same time, focuses on acting on the lines of an educational product virtual shop, filtering and selecting the materials produced by its members, in the categories: pedagogical research, mathematical research, inventions and innovations specific to the e-learning system.

Additionally, it promotes collaboration, being open to all partnerships with training centres, research centres, on a local and international level.

The virtual shop of the institute is at present in the "Research" and "Teachers resources" sections of the www.geogebra.tibiscus.ro site, but accepts its inclusion in other educational material virtual shops in Romania, such as RoMate, on http://romate.bluepink.ro/news.php .Therefore, the GeoGebra specific products migrate towards other educational fields which accept the open - source model.

6. Accepting or refusing system virtuality

This depends, first of all, on the structure of the info - educational environment from different areas and on the informational filters present in various areas, such as, lack of access to Internet or the conservatism of certain decisional factors.

Timişoara GeoGebra Institute, Romanie, brings before educators and learners, at various levels, the invitation to come together, laying the foundation of an M structure. This fact gave rise to questions such as: "How will I use it in class if it does not exist in the curriculum?", "How will I carry out the activities and for whom?" "Must I join the network, even if I have used the GeoGebra soft for a longer period of time?"

We have reanalysed the virtual level of the M structure, finding that the human element can act on education filters, removing the ones which are not beneficial to the system or at least rendering them less and less harmful. We have found that even the ones who are not included in the system can act beneficially on it; this because they have always meant for their actions to take place in a flexible and welcoming environment. And they have identified this environment within the GeoGebra system.

Consequently, we have identified various types of M structures, generically rendered in the picture below.

Fig. 2

Analysing the virtual model of the M structure, thus understanding that individuals act on informational filters, wish to get involved and to be involved in the structure in order to make the M structure an ideal one.

The ideal M system will contain:

1 GeoGebra User
GeoGebra Users have the skills to successfully use GeoGebra materials with students in their classrooms. GeoGebra Users should demonstrate the following skills to be certified by a GeoGebra Institute.

2 GeoGebra Expert
GeoGebra Experts have the skills to create and share GeoGebra teaching materials, as well as support other educators in their schools or regions.

3 GeoGebra Trainer
GeoGebra Trainers have the skills to give workshops and presentations at conferences. They may offer GeoGebra workshops that allow participants to apply for certification as GeoGebra Users and GeoGebra Experts at their local GeoGebra Institutes.

If we take into account the finished product as well, the superior information, the unit of M IT surrounding environment, it will have to act in the purpose of information maximisation, all these reverberating on the individual.

Conclusions

- In the structure of the (ITSE) environment, we cannot overlook the beneficial presence of the GeoGebra (GF) factor. This can pave the way towards knowledge and accelerates the clean evolution of homo - informaticus from the youngest ages.

- Environmental factors, the ecology of systems in general, cannot leave aside the action on the ITSE structure. Efforts for maintaining a clean environment must lead to long term results.

We cannot consider today the interaction of the human factor with the environment without taking into account the (ITSE) environment in which it develops.

- The structure of the GeoGebra (GF) factor can be improved so as to become operational and its action, as educational factor, to be a successful one. Finding those catalysers which can stimulate the information flow and cast away barriers is a goal and a desideratum.

- The interaction of M units, their continual development envisages MLM strategies when we speak of the educational products market or of flows of information beneficial to the education.

Development tactics must be chosen so as to integrate: ideas of successful sites, promotion, adaptability, dynamism and the idea of multiculturalism.

Last but not least, this didactic approach advanced by the GeoGebra software can turn into an international didactic approach, based on the common language of mathematics and, especially, on the language of the third millennium (accepted by an ever-growing community) - GeoGebra language.

References:

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