

# Analyzing of a mediated activity in primary school science: a monograph

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## Abstract

This monograph oriented implementation and achievement of learning activity cycle in science 3 Elementary School, describes some of the expertise in the use of educational media by a professor of the group's schools school Les Houches in Haute Savoie. These can be considered to a repository of techno pedagogical expertise; in particular, the organization and procedural methods covering of cognitive activity of pupils in the field of identification calculations with GeoGebra tool on the touch pad. This study is carried out on both active and complementary methods: self-confrontation interviews during which the school teacher, faced with the observation of his publicized activities, reveals the intentions that guide its practice, and analyzes teaching instrumented that can account for its professional schemes.

**Keywords :** media content, business patterns, activity analysis, teaching instrumented, tool model.

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## Introduction

The pedagogical activity and its analysis in the teachers' world now brings up various orientations at the junction of new practices in educational sciences. All combined with ergonomics and a new form of teaching. She goes according Goigoux (2001, a), the information necessary for the proper conduct:

- Report of the variability of teaching practices or differentiation in context,
- Understand what builds their differential efficiency, namely equipping driving context
- Know and promote the growth of individual professional skills, "or collective also by the effects of the media"
- Know the pupils' learning by observing their dependence on teaching practices, "measure their level of participation and exchange that is part of the context in conduct" here and a digital media environment,
- Facilitate the development of new educational tools related to the didactic engineering.

The research proposed in this paper aims gradually the various pre-mentioned indications, and in a sequence of mediated activity, conducted in cycle 3 in the field of geometry. The perspective is declining references (foundations) of the techno educational expertise to school teachers to develop a resource media for their professional support in situations of use "digital". An educational media is complementary to the sequence, or use the tablet and GeoGebra application.

It seems essential that in vocational training or socio digital accompaniment of future teachers and motivated teachers in the place of exercise of their school, with the knowledge and skills which they are required to use, be utterables (Schwartz, 1988). The representation of achievable goals is crucial in spreading knowledge of some experts, adding the media for some time tooling and use of educational media.

The didactic strategy falls increasingly Model tool (Bachy, "A model tool to represent knowledge techno disciplinary teaching teachers" 2014). Sylviane Bachy reasoning in terms of integration, bringing a theoretical model "integrator" can be used to understand the different influences determining the teaching practices. Both the concept of profile, teaching culture, epistemological influences articulating with pedagogical knowledge and teaching skills. The "digital" technical associate.

For the theoretical framework proposed in this study, a model tool is utterer and complementary to a joint comprising three problem (Halté, 1992): development (the pole reference), ownership (the pupil center and its mode of acquisition) and intervention (teaching pole and publicized and mediated share) (Rezeau, 2002), each city cluster is

forming in the relationship that binds the others. We are in a context of inter-actors. According Goigoux (2001, b) a framework of this type is particularly appropriate that gives effective introduction to the analysis of teaching activity.

The didactic engineering designs and technical content specific to the ducts teachings, considering innovation in classroom practices and the obvious need to address the institutional expectations. The spirit of participant observation comes to joining the essential control in steering and support for innovations.

According Canelas-Trevisi, Moro, and Thevenaz Schneuwly (2000), it is useful to distinguish three focal issues under the poles of the pre-mentioned system (s) in teaching, namely:

- First, the analysis of trade in class, thus tending to identify the direction that takes the intervention of the teacher, especially in construction and re building objects used Dialogic (HALT, 1993; Nonnon 1999; Mondada, 2000) using the model tool (Bachy, 2014)
- The second time, it is good to reflect on the didactic transposition baseline knowledge learn digital, where the reading comprehension of techno-pedagogical scenario is associated with the conduct publicized,
- Third time, a deepening of the model tool for point of view mediated activity and mediated with the practicing teacher (Rézeau 2002 Bachy 2014).

This is related to the combination of its focal lengths and especially of the third "perspective", this monograph was approached with the challenge of formalizing assumptions about the repository base of professional support of existing and future school teachers. Namely, this article attached to a digital and institutional project in the classroom of the teacher, validated by the rector of the Academy of Grenoble, in association with the local commune of Les Houches and active participation of inspection riding of St Gervais les Bains / Chamonix Mont Blanc.

Pedagogy related to the implementation of a hyped-mediated activity and attaches great importance to new forms of professional practice. The teacher is distinguished by its classroom management, its public heterogeneity and its accompanying joint practices

## Problematic

It is developed Vygotsky party to the perception of the psychology of learning with pupils forging their skills in interacting with the teacher and other pupils, the facilitator support they receive becoming progressively "invisibly present" (Vygotsky, 1985, p. 28). In this monograph, we are committed to study how a mediated and mediated activity which constitutes an act of communicative co-construction

consisting of various media (tablet support and geometric application) could be realized under the direction of a school teacher in to integrate the socio digital ownership (the technical) and metacognitive each pupil in the driving context. The major objective is to discern how the schoolteacher went about organizing and guide this particular activity collaborative, collective and individuated (as later done by the pupil / group of pupils in the evaluation phase).

### 1. Research Organization

Observations and trails focused on the activities of the Geogebra application geometry using the touch pad and ENT Arthur and Lila. The field of geometry being decisive with disciplinary peculiarities in cycle 3 (CM1 / CM2). It was recorded in video 8 sessions spread over the months from April to June 2016. All the meetings were preceded and followed by a self-confrontation interview. The analytical work was developed for uniform framing. In this monograph, it will be reduced to address the issue of how communication mediated rated the guiding sessions implemented by the teacher. Otherwise it is mentioned that the activity mediated by educational tools according Rabardel includes two aspects, namely the artefacts and patterns of use resulting from own construction and ownership schemes for professional teachers.

Otherwise, in supporting the improvement of teaching practice as possible, we want to "give the benefit of doubt to the truth" (Serres and Farouki, 1998, p. 94) and allow our event to evolve verifiable conjecture (Goigoux, 2008 b) by a qualitative method.

#### Self-confrontation

The monograph is based on the analysis of the interviews, dialogic situation according to Mr B. during which he is encouraged to clarify its business, both in mediated and didactic dimension. It is restoring based on interviews given time.

These talks aim to reveal the conscious levels of activity with the given policy objectives by itself. They are conducted with carrier for ergonomic psychology (Faïta and Clot, 2000) but with a particularity. The observer defining the nature of the exposed problems or specific features of the comments of the activity. Here, Mr. B. verbalise the elements in a level of recommendations it owns. On the other hand and according to the initial application, it focuses its attention and comment on the invariant elements of its practice. It can develop in which the techno educational progress of its sequence is unique and how their own behaviors will correlate to those that may be in other comparative. It shows the way revealing elements of its mode of action and conduct on the accompanying media attention in geometry. The model used tool integrator support.

### Analyses on didactics instrumented

These are products from interviews and correlated with indicators describing educational situations encountered during the sessions. The extraction of patterns is perceived by the teacher's recommendations at verbalization phases with the peculiarities of invariant elements of its business.

#### Actions and operations

Following the perception of the teacher's intentions, he was kept in the referent investigations theoretical framework on educational mediated communication (Peraya and Ott, 2001) correlated tutoring (Quintin, 2008)). In compliance of these authors and cited the joint dimensions, the organization is focused on instructional design (Paquette, 2002 Depover, 2009), it shows the means and embodiments including a referral system which depends on the conditions of exercise, use of media. In other words, having limited the Reference Shares and communicating reflexive where aware of the teacher targets add by identified by the content analysis of self-confrontation interviews. It should consider the explicit actions to highlight procedures, speaking implicitly. The non-conscious dimension taking a similar direction.

#### The problem situation

It announces itself with an environment as described by Huber and Mr A. Dalongeville in "Train yourself by problems situations." The starting situation, individual research and group metacognitive activities, the sharing and confrontation in groups.

#### Census Elements of actions and operations identified on the sequence

To locate these operations, we cut the sequence sessions defined by the focusing changes the teacher's intentions. These changes were identified by analysing its verbalization and attitudes aimed at changing behavior or attitudes of pupils. For example when assigned new goals for pupils. (See summary).

Here is an excerpt of the result of this inventory which all can organize a training resource continues in the form of support for the analysis of how circumstances are made of the listed operations. Articulate the conscious levels and not aware of the teaching activity, to compare different options and integrative teaching, examine alternatives to withholding operations, to promote the work of representation of actual practices vital to any awareness, etc.

#### Summary:

**Action 1** - Facilitate media grip: allow recognition and identification of Geogebra on the tablet with the figures. Decode and create the figures. Discover the ENT.

**Action 2** - Exercising the media grip: guide the identification and use of Geogebra on the tablet with the figures. Analyzing the figure obtained. Use ENT.

Considering the computing discipline, the sequence with the use of the media will lead an experimental perspective in this kind of operation, or the investigative approach.

**Produced Operations:**

Organization and media management

- Request for recognition, pupils focus on media and use for understanding and creating the figures.
- Ensure co-reference, highlight the media features with identification figures.
- Remember the calculations / figures produced by the media.
- Develop collectively and systemically responses produced in relation to the problem situation. Enter analysis calculations.

**Summary of intentions:**

- Analysis of needs and learning difficulties
- Sequence analysis (Objectives and items that can be subsidized by the media)

**Type of activity**

- Strategy-related needs, provision of support to learning through illustration, giving direction, dynamic animation in a class on media space, support for understanding the teacher and peers, stimulating to develop a range of research and reflection.
- Training objectives: to consolidate knowledge, learn new concepts, think and argue, acquire skills.

Resources given above.

**Screenwriting :**

Before the activity:

Place the sequence and sessions in a meaningful context. Pupils including why the activity will be actors. State the requirements that the teacher wanted to create for this mediated activity.

Linking activity to the experiences of students, their knowledge, their difficulties, their preconceptions.

During the activity:

What are the instructions given to pupils to promote metacognition? What will be the role of the teacher and its intentions? Selection and use of educational media productions, sharing impressions.

After the activity: Back on the experience: discussion reflecting on the experience. Identification of new learning, the potential of interdisciplinary links.

Preparation:

Will the digital knowledge of the pupils be sufficient(self-important) in the activity? Do we have to plan an improvement, or conceive(design) tools of support? The digital knowledge (teacher) will they be sufficient(self-important) in the progress of the activity? Can he identify a resource, a technical support(medium)? In you he(it) determined a management of class or support(accompaniment)? In you he(it) makes a development plan? In you he(it) defines the teams and the roles? In you he(it) verified the functioning of the media? In you he(it) reserved the necessary resources? In you he(it) planned an activity or of the emergency equipment?

Achievement - Take notes and make any adjustments. What are the comments? Do pupils need a lot of troubleshooting? Is the pupil / good tools?

Back and evaluation:

Review notes in progress and check their consistency with the original objectives. Assess the strengths and weaknesses of the scenario. Perform the balance sheet. What difficulties students have encountered? Classroom management and logistics were they effective? The results of the evaluation, she has managed the activity achieve the objectives?

Suites:

Harnessing the impact of the learning activity. Based on the evaluation of the activity, enjoy the benefits of creating links with other concepts to study. Why not grow the business in a targeted interdisciplinary?

In other words, this descriptive approach outcome of actions and operations facilitated the identification of invariant forms of the organization of the teacher's activity is (Vergnaud 1996), his professional schemata.

It is extracted those relating to how Mr B. responding to errors and input of transactions, alongside the tool model.

**2. Analysis and data processing**

Methodology:

It is structured according to directions on the analysis of interviews and specific recommendations of Mr. B. to conduct analyzes of the activity.

Detail of self-confrontation and Love leads

Reference indications according invariants: an interesting time, favorable to learning sessions

(inputs) or problematic or uncertain supplemented verbal cues.

Specifications inferences and model tool:

Considering the inference in its definition (Mc Koon @ Radcliff (1992)) as information, not explicit in the text, mentally constructed by the reader to understand the text. The idea is to specify a list of inferences on areas of activity.

This in addition to the focal # 3. Namely: discipline (D), personal epistemology (E), pedagogical knowledge (P) and technology (T) and recognize that there may be more or less strong relationship between these various components based teacher profiles (Bachy, 2014).

The interrelationship is thus performed: PE - PD - TP - TE - TD - DE (six relationships with four dimensions).

### 3. Deductions errors

Systemically. The situation is critical problem in the script.

He identified a list of errors retained to determine the useful implications for self-confrontation.

verbalisations indications of Mr. B. inducing new sub-goals (educational reorientation)

Nature of the session 3 / indications

Examples of introductory verbalisations

Recall the notion of geometric calculation Remember me briefly sitting and exposure of the problem for the last time. Where were we?

Identifying media features What features are used? and work instructions. We have to do. Go is good. Which group found something?

Proofreading linear geometry indications Let the starting set, which Questioning the terms of calculations and can place myself in his exercise the embodiment of FIG. progression? Building a digital representation What does this calculation and his face? Mental mapping calculations and FIG. instructions because it is taken up difficult or easy

Is this better?

The specific error mobilized skills

Called social skills and digital tend to emancipate the fact that the skills and science skills are progressing in the pupil's needs. The goal is to combine the dimensions of school and educational context by means of remediation.

Example of a pupil / group of pupils

Relation to the learning process and acquisition modes. How was constructed geometric and mental representation of the pupil?

### Possible errors and objective

A specific time of learning acquisition process, errors provide teachers the opportunity to build skills it considers a stage of development. for easy playback processing errors occurred.

Each error appears located objectify the treatment of error (assimilation) by considering the combination of previous schemes in classical situation didactization activity. It shall be notified of new uses geometric calculations. How wrong can become a trigger event, an incentive to find solutions to the embodiment of FIGS.

It is rational in terms of accommodation pedagogical practices. Thus taking support on errors and stimulation similarities, active teaching similar instrumentation schemes, focused on a minimum number of operational invariants which he was made a list. These targeted nature of schemes based on specific goals (leading to the identification and use of media functionality) and assume the definition of sub-objectives (include the fact of recognizing the error made by the student or group and resume the decoding process). Using expectations are confirmed (consider re-calculations indicate / digital capabilities constitutive deficient process). Accompanying the teacher becomes adjusted at that time \*didactisé\* and organized through the activity. Each time the progress, adjustments occur (such as resorting to collective presentation of each tablet with the figure produced, indicating the differences produced when a studied item was omitted then identified).

Inferences are indispensable, based on a representation of calculations related to knowledge, achievement of pupils, procedures and processes used and the time of the activity decrease with the tablet. (Vergnaud, 1996) (Bernard Boulc'h, Arganini, 2013).

This study was reinforced by interviews in which Mr B. supported regularly on certain elements:

The need not to delay the processing of identification errors and even use whether to devote a significant part of the action.

Recourse to whisper to engage pupils in their group, get them to individually and collectively take the risk of exposing their work, informing the teacher on the procedures and knowledge in geometry process.

The need to clarify the media functionality to find solutions to problems decoding.

Beyond the problem situation and participation, Mr. B. relied on the extent supplemented the impact of instructions and procedures, which legitimize the fact to devote sufficient time. He chose to deal collectively with certain deficient situations because it may well demonstrate to the class (in the sense of making manifest and signify the nature of the "error" to address them). Using Geogebra promotes this task

by facilitating produced by the media usage. His choice proceeds from a principle of action that exposes the interviews, that a misinterpretation of a calculation must be corrected by the spontaneous group. The teaching is based on a saying in this (Vergnaud, 1987). Coming to affirm that it is possible to correct an error produced by reusing the benefit of the group - class. The tablet takes advantage of this type of intervention. The demonstration takes a relevant sense that the incomplete competence and socio cognitive conflict are crucial to learning progress.

#### Subjective estimated errors

These indicate advanced aspects of learning in geometry, and are processed in relative terms that the program is only partial at the time of the study.

Mr. B. has focused mainly on enhancing pupils consolidate their learning optimizing instructional time. He indicates that the conditions for the exercise of pedagogical expertise is to withdraw certain maneuvers to maintain control of the activity undertaken, or not to be caught by the movement of pupils, the agitation caused by the use of digital discovery. Distinguish the remarks of students in the relevance of the questions or their arrest mode. An ability to inhibit spontaneous actions that would be against-productive because learning needs.

This information led to reflections on activities using educational media, on the development of professional skills, development characterized by an increase in the use of tools, applications, becoming subject to objective control in a teaching situation (instructional time, issues of digital knowledge, scan jobs, the instrumented activity and attention of students) (Clark and Peterson, 1986 Yinger, 1986) (Henry, Account, Charlier, 2007).

The need of the expertise brought in new tasks will allow the teacher better control of its script, evaluate instructional adjustments that can be implemented according to the activities, and deal with new situations.

#### 4. The selected inputs

Systemically, the situation is critical problem in the screenwriting process. He identified a list of selected inputs determining the useful implications for interviews.

Mr. B. verbalisations indications inducing new sub-objectives

They advertise in a dynamic social and constructivist perspective.

The specific contributions related to social skills and digital / new knowledge

If we think in terms of interest and input in an educational context, it is good to express the issues about the intentions of contextualization and

deployment tools. particularly bring a vision of didactic complexity that is part of the structure of the sequence and learning.

Whether in the context of the selected error part, wherein the through remediation is required. Here, the size of contributions produced a singular phenomenon by the prospect of active stimulation.

Example of a pupil / group of pupils

Relation to the learning process and acquisition modes. How was constructed geometric and mental representation of the pupil? The ability of abstraction.

#### Possible contributions and objectives

At a specific time of the acquisition process, the cities provide inputs to the teacher the opportunity to build skills building it considers a stage of development. In connection with the increase in the degree program, the teacher he systematically extracted in the register connected geometric calculations to the program and indicated in the form of items, cues from elements on the observation of these contributions. Thereby facilitating the processing of reading product as part of the problem situation. Ergonomic dimension belongs.

Each objective located intake processing intake (by operant conditioning and positive reinforcement) by considering the combination of previous schemes in classical teaching situation of geometry. It is important to notify new calculations use on a tablet. Otherwise how the contribution can become a building event, a support to continue the gains in the embodiment of FIGS.

He then reasoned in terms of accommodation of teaching practices. Thus taking support on similarities of inputs and strengthening, active teaching similar instrumentation schemes, focused on a minimum number of invariants which he was made a list. These targeted nature of schemes based on specific goals (achieving the use of digital features) and assume the definition of sub-objectives (include the fact of recognizing the contribution by the pupil or group and take action share the decoding process). Using expectations are confirmed (consider recalculations indicate / constituent features solid process). The educational support of the teacher becomes settled and adjusted at that time "didactisé" and organized through digital activity. Each time the progress, adjustments occur (such as resorting to collective presentation of each tablet with the figure produced by the calculations of the GeoGebra application, indicating the differences in figures produced where a studied item was found then that 'previously identified).

Inferences are indispensable (ref. Page 12).

This part of the study was reinforced by interviews in which the teacher has regularly supported certain elements:

- The observation of treatment of beneficial contributions produced by the reporting of validated results.

- The active and productive participation of the group in the progress of calculations each figure. A real motivation, informing the teacher on the procedures and process knowledge in geometric calculations and the embodiment of fig.

- The reduced need to explain the digital features for finding solutions to problems decoding.

On resumption of the front part. Mr. B. has a legitimate concern of the effects of the explicit instructions or estimate a time sufficient achievement. He chose to collectively address some real obvious situations of understanding, to demonstrate to the whole class (in both senses of making aware and signify the nature of the resulting contribution to strengthen acquired). His choice proceeds from a principle of action that exposes the interviews, that a perceived and objectified contribution to understanding a calculation must be explained to be raises awareness by the group immediately.

The teacher is based on a class situation (Vergnaud, 1990, p.136), namely that where the pupil / group has at some point in its development and under certain circumstances, necessary skills almost immediate treatment of the situation. This coming to express that what characterizes this class is the organization by a single scheme. The operational scheme makes perfect sense to some and extended analogy possible.

It is also quite possible to argue that exposing the perceived and identified contribution, and by re speaking in favour of the group and the class. Digital use leverages this type of intervention; the tablet becomes a calculating exposure tool produced in association verbalization.

### Subjective estimated intakes

\* Recovery of the elements mentioned in the subjective estimated errors.

### Discussion

The resource support. How to register the inferences development and diversification in the procedure of the teacher, especially a sequence in geometry. The integration model (Bachy, 2014) complete the inquiry process regarding the instrumentation on the operative “didactisée” form.

Initiate intentional approach in an integrative goal. The educational media is primarily a support to learning department. In this sense, it is essential to conduct his own choices and his own actions in the pedagogical intention (mobilization, questioning, search for meaning ...) internal to the teacher. Then having identified and contextualized the intentional approach, it brought a number of specific questions

and supplemented by a combination of significant criteria related to professional practice.

The link between the intentions, actions and reflections led to develop a performance in learning and the intrinsic and extrinsic pathways. The scheme takes a revealing way. The media serves as a tool-use sequences to emulate links design and construction.

### Conclusion

The didactic adjustment is crucial in the educational process and practice as an expert of learning. Perform this type of operation requires operationalization capacity, and speaking of proximal area of pupil development during the activity and progression sequenced as sessions (Vygotsky).

The mutation of the primary school produced by the successive reforms leads essential changes with new dimensions of analysis. Educational technologies into their designs and their uses tend to focus the role of artefacts in a dynamic social context of the activity and to question the actual uses and pluralistic organization.

A concept of sustainability and efficiency is looming with the vision of the conditions of practice in teacher education. Bring a digital implementation of the scenario in a transitional perspective booming. This in addition to the need to consider the teacher of didactics as a teaching and socialization phenomenon (see No. 1 of the Education and didactic review).

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