

CURRICULUM CHANGE AND COMPETENCY-BASED APPROACHES: A WORLDWIDE PERSPECTIVE

CURRICULAR REFORMS GUIDE

SCHOOLS: BUT, WHERE TO?

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Abstract

8 The article deals with a particular aspect of the competencies-based approach in the
9 curricula of basic and secondary education: the role of complex situations in learning.
10 What should their role be so that education systems gain both in effectiveness and
11 equity? Many research outcomes have shown that it is important to stress first and
12 foremost complex “post” situations in learning knowledge, know-how and life skills. It is
13 a matter of complex situations (integrative pedagogy) in which the pupil is invited to use
14 the knowledge, know-how and life skills already acquired, not as ends in themselves, but
15 as resources that the pupils employ to confront the complexity of their environment. It
16 shows to what extent using the problem-solving approach to inculcate knowledge and
17 know-how, in other words using complex situations for “prior” learning, represents a less
18 suitable innovation.

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20 **Introduction**

21 For around a decade vast educational reforms have been under way in the majority of
22 countries, both in the North and South. This movement is undoubtedly the most
23 important one since the curricular changes that had been introduced at the time of the
24 adoption of the “objectives-based learning” approach. While these new reforms generally
25 claim to be inspired by the competencies-based approach, the movement appears to be
26 less uniform than it was at the time of the introduction of objectives-based learning – for
27 several reasons. First of all, despite the impact of globalisation, education systems show a
28 considerable degree of diversity (Halaoui, 2003), both with respect to the teaching
29 languages used, the number of years of study, the level of teacher training or the manner
30 in which the education systems are structured – to speak only of the most obvious
31 variables. Even today, this variety continues to make each curricula context specific.

32 But there are also other reasons, related to the very orientation given to reforms said to
33 be competencies-based. The debate centres around two primary questions. The first
34 concerns the use of the concept of “competency” in education. This is a superficial
35 controversy, which masks the second – a much deeper one – related to the priorities to be
36 defined with regard to the learning process.

37 THE CONCEPT OF COMPETENCY IN EDUCATION: A SUPERFICIAL
38 CONTROVERSY

39 From one individual to another, competency in education and, hence, the competency-
40 based approach, is variously understood. For some, it consists in grouping several specific
41 objectives into disciplinary competencies, retaining the aspect and form of specific objec-
42 tives, and which are evaluated as specific objectives. This is the “skills” approach to com-
43 petency. For others, the competencies-based approach is synonymous with the
44 development of “life skills”, meaning the development of people’s capacity to actively
45 exercise their role as citizens, to protect the environment, and to safeguard their own health
46 and that of others. Still others see the competencies-based approach as a means of making
47 learning more end-driven, oriented towards social integration and professional life. Others,
48 lastly, see the competencies-based approach to be associated with interdisciplinarity,
49 consisting of breaking down the disciplinary structure of school curricula, deemed to over-
50 simplify the complexity of life.

51 Such diversity of representations is normal for a polysemic, multi-faceted concept, such
52 as that of competency. It is nonetheless symptomatic of a number of misconceptions that
53 need to be clarified if its introduction in the classroom is to be a genuine source of progress.

54 *Competencies-based approach and action*

55 One of the largest misconceptions with regard to the term “competency” comes from its
56 narrow association with a certain kind of “knowledge to act”: mechanical, limited

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57 action-oriented knowledge and, above all, knowledge to act geared towards the
58 production of goods and services. For some people, the competencies approach has
59 become a sort of militant wing of the market-driven steamroller. Linking knowledge to
60 act with mechanical, stereotyped gestures, such people assume – on the basis of ques-
61 tionable evidence – that knowledge to act is an over-simplification. They oppose
62 knowledge and action, instead of making them complementary and interdependent.

63 Yet, today, action – especially active citizen participation – is the topic of much debate
64 in a society in which the gap separating people and the authorities who make decisions
65 affecting their everyday lives¹ is growing ever wider, due to the combined impact of
66 globalisation, on the one hand, and to increasing individualism, on the other. At the
67 same time, vital questions, such as how to guarantee the survival of the human race, are
68 clamouring for answers. These factors will no doubt have a decisive impact on the very
69 values upon which education is founded. Whereas the mission of education during the
70 past several decades was to instil such values as “autonomy” or “learning how to learn”,
71 different values are likely to impose themselves, such as “identifying what is at stake”,
72 “thinking critically”, “daring to state an opinion”, “daring to disagree”, “presenting
73 arguments”, “acting with discernment”, “becoming genuinely involved”, “acting out of
74 solidarity”, “learning how to share” etc. Given the challenges the world is facing today,
75 action should become the main driving force – perhaps the very purpose – of any
76 educational intervention. Of course, education must continue to instil knowledge and to
77 teach how to think, but it must above all teach how to “take action”. Not action in the
78 narrow sense, meaning individual or immediate action; but rather, carefully reflected
79 action, responsible action and civic-minded action, founded on the principles of sharing,
80 of solidarity and of sustainable development.

81 *The competencies-based approach and meaning*

82 A second misconception concerning the concept of competency is due to its alleged
83 association with the fragmentation of learning processes. Competency-based learning is
84 thus seen as a succession of individual learning elements, as in the case of objectives-based
85 learning. This misconception has led certain individuals to equate the competency-based
86 approach with a loss of meaning for the learning process, because it is disconnected from
87 the growing complexity of life.

88 On the contrary, the educational implications of recognising competency in education
89 as a means of grasping the notion of complexity (and hence completely opposed to
90 fragmentation), at the same time as that of concreteness (i.e. directly related to action),
91 and therefore meaningful, are considerable. For example, measuring a soil’s pH value is a
92 concrete situation, but not a complex one. On the other hand “respecting the
93 environment”, is a complex situation, but not a concrete one. However, “proposing well-
94 argued ethical and realistic measures to deal with a situation of pollution within certain
95 limitations” involves both a complex and a concrete situation. The combination of
96 complex and concrete underpins the concept of knowledge integration, a subject we will
97 come back to later.

98 *Competencies-based approach and evaluation*

99 The third misconception consists of linking the notion of competency too narrowly with
100 learning processes, neglecting the relationship between competency and evaluation. For
101 many, developing competencies can only be achieved through active teaching. This is
102 true to a certain extent, but another element to consider is the specific profile expected of
103 the student and the means used to assess whether this profile has been achieved or not. At
104 present, and probably for some time to come, schools will need to evaluate student
105 achievement. The concepts upon which curricula are founded must constitute a genuine
106 basis on which to carry out this evaluation, otherwise they are merely decorative.

107 The question concerning the meaning of the term “competency” remains nonetheless
108 a superficial debate. Indeed, while this complex, action-oriented and assessable entity
109 appears at present to be indispensable if the challenges of education are to be met, it need
110 not necessarily be designated by the term “competency”. The future will decide whether
111 the educational world will continue to call it “competency” or whether it will be replaced
112 by another term.

113 On the other hand, this controversy conceals another, deeper controversy concerning
114 priority setting in learning.

115 PRIORITIES IN LEARNING: A DEEP-REACHING CONTROVERSY

116 Countries in both the North and the South seem to give preference to two options in
117 curricular reforms of basic education.² Since they are based on the same principle of
118 work in complex situations in the classroom, and on the same changes they propose to
119 introduce overall in the classroom, these options are not contradictory, but differ in that
120 they propose to introduce changes to the curriculum in different sequences, since not all
121 education systems are able to, or wish to, absorb all the changes at one time. Our task
122 here is to highlight the fundamental principles which both models have in common, as
123 well as the specific contributions and limitations of each of them, depending on the
124 contexts in which they are implemented.

125 We will distinguish the two current models by using the concept of *situation*, around
126 which there is a certain consensus in the literature and representations that diverge little,
127 rather than that of *competency*, which has various interpretations and about which, as we
128 have just seen, there are misconceptions.

129 **The problem surrounding the introduction of complex**
130 **situations**

131 CONCERNING SITUATIONS AND RESOURCES

132 The debate about “how to learn in the classroom” today seems to crystallise around the
133 articulation between resources and situations. The term “resources” is still quite new in
134 pedagogy. Introduced by Le Boterf (1995), it refers to the knowledge, the skills for action
135 and the life skills which the student, like anyone else, mobilises to solve a complex

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136 situation. Complex situations or problem situations refer to a contextualised set of
137 information to be interpreted in order to perform a specific task, the result of which is
138 not immediately self-evident (Roegiers, 2003). It combines two concepts, that of
139 situation, which refers to a specific context, and that of problem (Poirier Proulx, 1999),
140 involving an obstacle and a task to be performed on the basis of pieces of information
141 that must be articulated.

142 PRE-RESOURCES-LEARNING SITUATIONS
143 AND POST-RESOURCES-LEARNING SITUATIONS

144 *Two complementary paths*

145 Problem situations can be exploited as the starting point for resources-learning. It is in
146 coming into contact with these situations that students extract concepts, rules, formulae
147 and procedures. These problem situations are regarded as constructive destabilisation
148 aimed at helping the student to progress (Dalongeville & Huber, 2001). They have
149 various names such as “learning situations”, “source tasks” (Tardif, 1999) or “didactic
150 situations” (Roegiers, 2003). Since such situations are introduced prior to resources-
151 learning, we will refer to them for the purposes of our discussion as “prior situations”.
152 Often, this involves complex situations which students are asked to solve in small groups
153 following certain directions and with the help of appropriate documents and learning
154 materials, for example, a survey, research, observation etc.

155 However, problem situations can also be utilised later in the learning process as a
156 means of mobilising the resources acquired depending on the competencies to be
157 achieved by the student, which in turn correspond to a carefully defined profile. This
158 type of situation has various names, for example, “integration situations” (De Ketele
159 et al., 1989; De Ketele, 1996), “reinvestment situations”, or “target situations”
160 (Roegiers, 2003). We prefer the term “post-resources-learning situations”; for conve-
161 nience’s sake, we will refer to them as “post situations”, indicating that these situations
162 are presented after resources-learning. They involve complex situations which students
163 are asked to solve, usually on their own; for example, producing a significant written text
164 in a communication situation, solving a mathematical problem situation, producing a
165 piece of artwork etc.

166 At the education system level, the introduction of “prior-situation” problems and the
167 introduction of “post situation” problems may be taken as two distinct innovations, and
168 they can be introduced simultaneously or in succession (one after the other).

169 *A postulate concerning the reform absorption capacity of an education system*

170 Some privileged education systems can afford to introduce “prior” and “post” complex
171 situations at the same time, because the context makes it possible: the level of teacher
172 training, classroom facilities and teaching/learning materials, small class sizes. Others,
173 however, are obliged to resort to two (or more) stages, because introducing two changes

174 at the system level would demand too much of teachers at one time and, thus, doom the
 175 reform to failure: too much change at one time results in no change within an education
 176 system.

Author Proof

177 *A key question*

178 Once it has been accepted that two innovations need to be introduced – prior situations
 179 and post situations – and that the context makes it impossible to introduce both of them
 180 simultaneously, the question arises: which one, at country level or at regional level, do we
 181 start with?

182 This question is crucial for a large number of countries: (1) where classroom activities
 183 are limited to the teacher’s presentation; (2) where the need to make classroom practices
 184 evolve is urgently felt; and (3) where introducing two changes at once exceeds the
 185 absorption capacity and, in the final analysis, would result in maintaining the status quo.

186 In these countries, should priority be given to a sequence in which prior situations
 187 (sequence 1) are installed first or in which post situations are installed first (sequence 2)?
 188 This question can be represented as in Figure 1 by a stairway which the education system
 189 has to climb progressively, with two different choices for the first and second steps:

190 WHAT SCHOOLS WOULD LIKE TO DO VERSUS WHAT THEY CAN DO

191 Before taking up arguments in favour of either sequence, let us begin our discussion by
 192 examining two extreme theories of the learning process: the “situations only” theory, and
 193 the “resources only” theory.

194 *The natural “situations only” theory*

195 In everyday life, a debate over resources and situations has no meaning. In fact, it has no
 196 reason to take place. We mobilise resources all the time to confront naturally complex
 197 situations, but we do not think about decomposing these resources or ask ourselves which
 198 resources we are mobilising. So, why the debate?

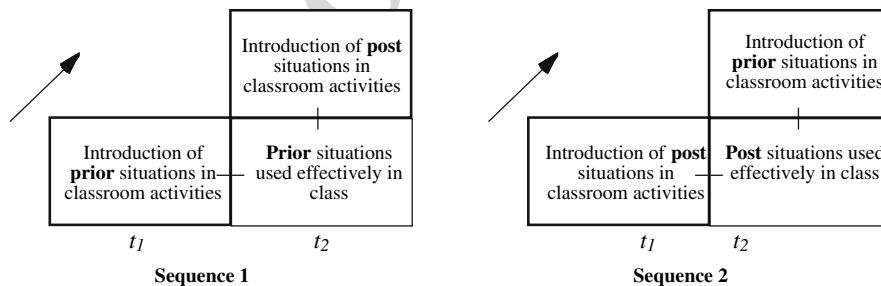


FIGURE 1. Different choices of the first and second steps for an education system.

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199 It springs from the school's fundamental inability to ensure that resources are acquired
200 naturally in random situations, that is, its inability to reproduce natural learning models,
201 such as the self-directed learning model and the spontaneous learning model, where the
202 individual learns from the random situations with which he or she is presented, and the
203 *compagnonnage*³ model, where the specialist teaches the novice – master and student
204 work hand-in-hand in a dynamic process in which both are players. Learning experiences
205 arise within various natural situations: one need only to think, for example, of the
206 conception of a work-of-art for a musician, a stonemason or a goldsmith.

207 Why are these natural models so powerful? Essentially, because they are self-regulating.
208 In a self-directed learning situation, it is the learner who regulates the level of difficulty of the
209 situations via which he or she acquires the competencies required and the pace at which they
210 are dealt with. In the *compagnonnage* model, the master enjoys a dynamic relationship with
211 his student, and can select and orient the situations at will, ensuring that the resources are
212 provided at the time required, allowing the student then to go on to new situations. Not
213 only does the master choose the situations, but he can also adapt them so that the student, in
214 dealing with them, assimilates the elements of which they are composed. The to-and-fro
215 between resources and situations is so subtle that differentiating them does not make any
216 sense. The situations are unique and therefore poignant. Each one is a learning opportunity
217 not to be missed. Situations and resources are so intimately intertwined that the learner does
218 not ask himself whether he is learning the resources because a given situation allows it, or
219 whether he can solve the situation because he masters the resources required (Figure 2).

220 *The “resources” theory*

221 These self-directed learning and *compagnonnage* models are practically impossible to
222 reproduce in the classroom, because in the classroom it is not possible to give each
223 student the opportunity to learn at his or her own pace, according to the random
224 situations with which he or she is presented. This constraint, which every education
225 system experiences, contributes to the isolation of schools vis-à-vis society, isolation
226 which authors such as Ivan Illich and A.S. Neill, in his famous work *Summerhill: a*
227 *radical approach to child rearing* (1996), have tried to overcome.

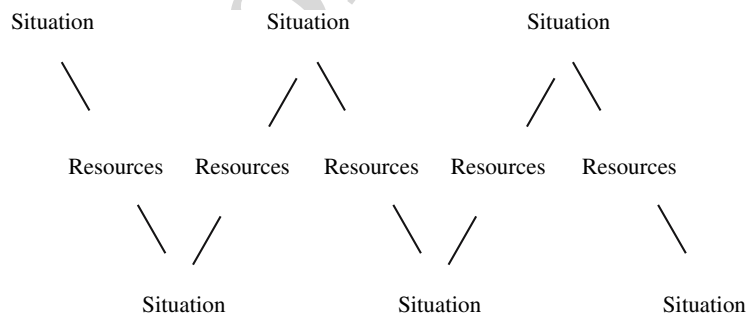


FIGURE 2. The to-and-fro movement between situations and resources.

228 Schools have, however, attempted to come as close as possible to this model, some –
229 Bloom, Krathwohl, Simpson, Harrow, Mager, Hameline – by trying to delineate the
230 resources it contains, and others – Dewey, Wallon, Freinet, Decroly, Montessori – by
231 trying to recreate the natural situations which make these resource-learning experiences
232 possible.

233 No doubt, realism dictated the orientation taken by education for over a century: the
234 “subject-related resource” approach. This is the approach which became predominant,
235 first via content-based models, and then via various models based on objectives, in
236 particular objectives-based learning. This “resources/applications” model, with its nar-
237 row scope of application, limited to one or two resources, chooses to disregard complex
238 situations. It is still widely used today.

239 An oversimplified model? Probably, but it is no doubt the best educators have found
240 for mass education, taking into account the great challenge that education for all
241 represents: fractioning into small parts because small parts constitute the largest common
242 denominator for all students. All of them at some time will inevitably learn addition or
243 subject/verb agreement.

244 Both the content-based and objectives-based learning approaches have locked schools
245 into the narrow resource-learning model, where individual detail is the rule.

246 The “subject-related resource” concept is far from being a thing of the past. Not only
247 are effective practices based on this concept still very much alive in the world of
248 education, but modern forms of it are still in the process of being developed.

249 In particular, after a period rich in attempts to introduce the principles of
250 socio-constructivism in various places and at various levels, but also having seen how
251 socio-constructivism led to certain distortions (Péladeau et al., 2005), the debate with
252 regard to the merits of a “resources” approach has been rekindled, in particular within a new
253 movement know as “instructivism”. This movement, of cognitivist inspiration, extensively
254 backed up by a large body of research and currently supported mainly by North American
255 researchers, rests on the principle that, in order to learn, the student needs to decompose the
256 learning process into simple elements, and then from that point, increasingly complex
257 exercises and applications may be developed (Anderson et al., 1996, 1998, 1999).
258 Instructivists do not reject complex situations in the learning process; these situations can
259 play a role at the pre-resources-learning level as a motivating element for students, and at
260 post-resources-learning level, as a means of extending the applications. But, according to
261 instructivist thinking, complex situations are not considered to be the main component of
262 the learning process.

263 One form of this movement is explicit teaching, which is carried out progressively and
264 aimed primarily at the student’s proper understanding of concepts. It is composed
265 essentially of three phases (Gauthier et al., 2004). First is the modelling phase in which
266 the teacher explains the links between the various parts of the subject matter, using a
267 number of examples and counter-examples. This is followed by “guided practice”, where
268 the teacher verifies whether students have understood the subject by giving them tasks
269 similar to the one carried out during the modelling phase, whether it be solving
270 mathematical problems (Fuchs et al., 2003), or written expression (Baker et al., 2003).

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271 In the third phase, self-directed practice allows the students to take on new tasks which
272 will facilitate long-term retention.

273 According to advocates of this approach, it is particularly effective in a socio-culturally
274 underprivileged context where a structured approach is more appropriate, whereas the
275 approach using situations as the point of departure for deriving resources is deemed more
276 elitist.

277 INTRODUCING COMPLEX SITUATIONS IN THE CLASSROOM

278 Since the time that educators became aware of the limits of the “resources” concept,
279 especially after witnessing the weaknesses of objectives-based learning, they tried to
280 restore meaning by introducing complex situations into the learning process, but fre-
281 quently in a frantic, disorderly fashion, without taking into account the potential for
282 change on the part of teachers or the context.

283 Having accepted that mass education makes the return to a “situations only” format
284 illusory, schools are searching for a more realistic, but no less ambitious format: that of a
285 “situations/resources/situations” approach, in which situations constitute the starting
286 point and the end-point. The expression “contextualisation/decontextualisation/
287 recontextualisation” (Tardif & Meirieu, 1996) appropriately reflects this desire. Akin
288 to the natural “situations only” concept, this concept differs in that the resources are the
289 object of an explanation, unlike the “situations only” model in which the resources are
290 acquired and are reinvested automatically and implicitly.

291 The introduction of prior situations and the introduction of post situations are the
292 two necessary steps in the transition from the “resources” approach to natural models
293 based on *compagnonnage* or self-directed learning approaches (the “situations/resources/
294 situations” concept).

295 *Introducing prior situations*

296 One of these changes in classroom practices consists of encouraging the teacher to make
297 use of “prior” complex situations as a means of installing resources in students. With this
298 approach, students acquire the resources naturally by working on complex situations. To
299 complement the work on complex situations, a variable amount of work is devoted to
300 structuring and applications. This innovation has its origin in both constructivism, as
301 defined by Piaget, and socio-constructivism (Perret-Clermont, 1980; Doise & Mugny,
302 1981). It reflects a primary concern for the autonomy and socialisation of the student. By
303 placing participatory methods in the forefront, it especially seeks interaction among
304 students as a means of building knowledge. Socio-constructivism demonstrated the value
305 from the social and the cognitive points of view of students working together, and
306 developed the notion of “socio-cognitive” conflict: the student learns by confronting his
307 representations with those of others.

308 *Introducing post situations*

Author Proof

309 The other change consists of utilising complex post situations in the learning process,
 310 whereby these complex situations are a reflection of the final “profile” expected of each
 311 student. This change is based, on the one hand, on the need for schools to develop a
 312 student profile corresponding to categories of complex situations which the student
 313 should be capable of solving and, on the other, on the need for prior work developing
 314 resources in preparation for complex situations. First, the resources are introduced, then
 315 are used in structures and applications, and then are reinvested several times in complex
 316 situations. A situation differs from a mere application by virtue of the fact that it is
 317 contextualised and meaningful to the student but, most importantly, because it requires
 318 the use of several resources that the student must articulate after first having identified
 319 them. Indeed, students do not automatically know which resources are to be mobilised;
 320 they must find them themselves according to the situation presented.

321 The principle of developing resources before solving complex situations is of
 322 cognitivist origin, as defined by Ausubel and Reigeluth.

323 Yet, the main characteristic of this approach is to foster the effective transfer of
 324 learning. By being regularly reinvested in complex situations by the student, the
 325 knowledge is acquired, becomes stable over time because internalised, and is ready to be
 326 mobilised for and in action. These two changes are illustrated in Figure 3.

327 The complementary nature of these two changes in progressing towards the “prior and
 328 post situations” approach, or even towards the natural “situations only” approach, is

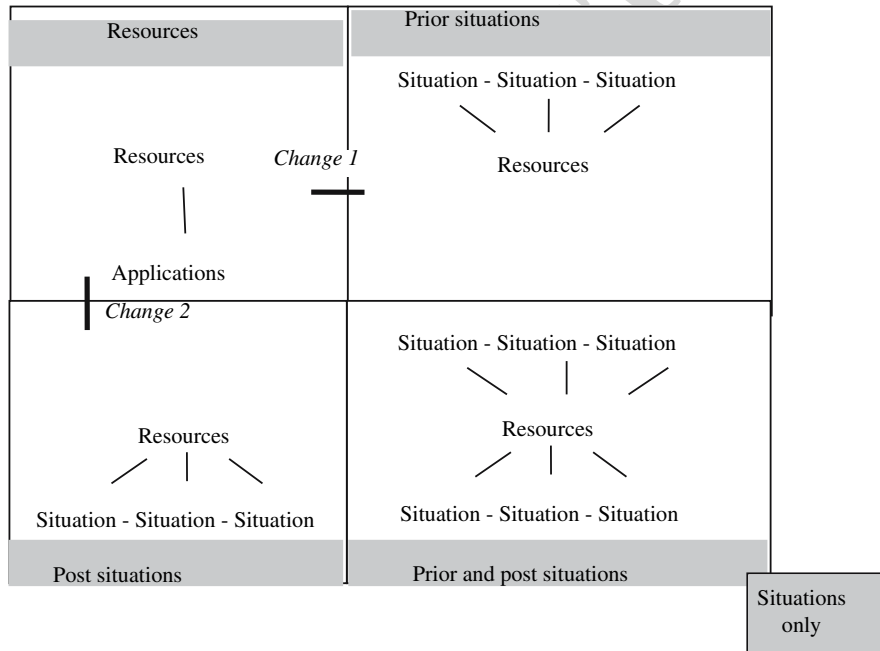


FIGURE 3. The effective transfer of learning.

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329 obvious. Both involve a significant amount of work on exercises of a complex nature, and
330 aim at higher-order cognitive operations in a school context (Bloom et al., 1971;
331 D'Hainaut, 1980). The only outstanding question is the order and pace of their
332 introduction in the education system.

Author Proof

333 TWO CURRICULAR REFORM MODELS

334 *The “priority to the introduction of prior situations” model*

335 According to this model (or sequence) activities involving complex prior situations come
336 first, and systematic learning of resources is secondary or even superfluous. This approach
337 considers everything as an opportunity for students to enrich themselves on various
338 planes: the cognitive, social and emotional (Meirieu & Develay, 1992; Jonnaert, 2002;
339 Jonnaert & Masciotra, 2004; Legendre, 2004; Meirieu, 2005). In other words, students
340 acquire knowledge primarily in prior situations. This point of view consists essentially in:

- 341 1. asserting the importance of solving problem situations as the point of departure for
342 any learning process;
- 343 2. promoting the principles of socio-constructivism as the preferred method for
344 solving problem situations.

345 One of the commonest forms of working with complex prior situations is an approach
346 known as PBL (problem-based learning): learners are divided into small groups and asked
347 to attempt to solve complex situations at a given pace, each situation being seen as a
348 challenge to overcome. Then, lessons are conducted to extract resources in order to structure
349 the learning process (Prégent, 1990). Currently, this approach is used particularly in
350 medical and engineering schools with positive results.

351 Sometimes these PBL exercises in the broad sense are followed by having students
352 solve complex post situations, corresponding to the achievement profile anticipated.

353 The phase of work on complex post situations is often deliberately left out, because the
354 transfer component is considered to be the responsibility of the student, whereas the
355 school's role is limited to presenting the student with stimulating prior situations to be
356 solved. The absence of post situations results in an inadequate number of opportunities
357 for students to solve complex situations by themselves. It also raises the thorny problem
358 of evaluation: either the student is evaluated according to resources or on the mere
359 transposition of a situation dealt with in class, which would not be consistent with the
360 approach adopted; or the student is evaluated on the basis of complex situations, which
361 may be perceived by the student as being arbitrary insofar as post situations had not been
362 presented as the standard for the kind of problem he or she was supposed to solve.

363 *The “priority to the introduction of post situations” model*

364 A second model (or sequence) proposes the opposite approach: to begin by introducing
365 post situations in classroom activities, and then to gradually introduce prior situations
366 throughout the entire education system. The generalised introduction of post situations

367 before introducing prior situations may seem unusual. Yet, this does not present a
368 problem. On the contrary, the teacher develops resources and then submits complex
369 situations – post-resources-learning – to the students. Ideally, resources will be taught
370 using a method which places the student at the centre of the learning process (*complex*
371 *prior situations*), as in the first sequence.⁴ Otherwise, this can be achieved in accordance
372 with each teacher’s style or the methods in place. What matters in the initial stage is
373 that these resources are reinvested in complex situations, upon multiple occasions.
374 This approach is known as “integrative pedagogy” (De Ketele, 1996; Roegiers, 2000,
375 2003, 2004; De Ketele & Gerard, 2005; Miled, 2005). It is currently applied in around
376 20 French, Arabic, Portuguese and Spanish-speaking countries.

377 These complex situations automatically incorporate a number of competencies,
378 referred to as “basic competencies” (Cameroon, Central African Republic, the Comoros,
379 Djibouti, Gabon, Madagascar, Mauritania and Senegal), “end competencies” (Algeria
380 and Tunisia), “macro-competencies” (Belgium and Guatemala) or simply “competen-
381 cies” (Lebanon). They correspond to the profile expected of every student. For example,
382 at a given level of instruction, a student would be expected to have the competency to
383 solve a problem situation which uses the four basic arithmetic operations on whole
384 numbers from 0 to 10,000; at another level he or she would be expected to be able to
385 produce, in a communication situation, an intelligible text of one page, based on the
386 comprehension of a written text given as a source. In order to define as precisely as
387 possible what the student is expected to do, a maximum number of details are given
388 describing the type of medium the student will be working on, the nature of the
389 assignment he or she is being given, and the evaluation criteria.

390 As with the first model, this model is based on teaching the student how to deal early
391 on with complexities, by interacting with other students when desirable. For this reason,
392 this model is also socio-constructivist in nature. It essentially differs from the first model
393 in that:

- 394 1. it asserts the importance of solving complex problem situations as the end-result of
395 a set of resource-learning exercises;
- 396 2. it asserts the necessity of ensuring that these problem situations adequately corre-
397 spond to a given profile to be achieved;
- 398 3. it relies on the principles of socio-constructivism for resolving post situations and, if
399 possible, for resources-learning.

400 As with Model 1, integrative pedagogy relies on exercises using prior and post complex
401 situations (see in particular, Roegiers, 2000, pp. 177–178). The first stage consists of
402 introducing post situations in the entire system; the second stage consists in progressively
403 promoting complex prior situation.

404 How does the learning process proceed in the first stage? Two types of learning
405 alternate: discrete content learning and integration learning. For a given period – for
406 example, 5 weeks – the teacher develops the resources that the student will need for the
407 problem situations to be solved subsequently: the rules of grammar, conjugation, spelling
408 and arithmetic. These discrete content learning episodes are conducted according to the
409 best methods contained in the repertoire of each teacher. In the sixth week, called the
410 “integration week” or “integration module”, the teacher stops the presentation of new

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411 resources. For the entire week, and in all disciplines, students are given complex situa-
412 tions in which they have to mobilise everything they have learned in the preceding
413 5 weeks (the “resources”). Students work in small groups to tackle these situations.
414 Several different situations, but of similar complexity, are proposed, either as practice or
415 for evaluation:

- 416 – one for practice in finding a solution interactively in small groups;
- 417 – another for practice in finding a solution individually;
- 418 – another to evaluate the knowledge achieved;
- 419 – if necessary, another to deal with the difficulties encountered by the student.

420 This is followed by five further weeks of resources-learning, and then a new week of
421 integration, and so on, four or five times per school year.

422 In this first stage, the brunt of the work on complex situations is carried out after
423 having developed specific resources and not before or during the development of
424 resources. Evaluation is also incorporated into the process: student achievements are
425 measured using complex situations. This first stage of integrative pedagogy is not a
426 departure from objectives-based teaching, since it recognises that resources-learning may
427 be introduced on the basis of objectives-based teaching principles, along with other
428 techniques for introducing these resources.

429 In a second stage, complex prior situations are introduced generally throughout the
430 entire school system.

431 Ultimately, the same end is achieved, whether one chooses Model 2, to which prior
432 situations are then added, or Model 1, to which post situations are added.

433 **Delicate choices for school systems**

434 For countries that cannot afford to introduce two changes simultaneously, or who do not
435 wish to do so in order to increase the chances of the reforms’ success, should prior
436 situations or post situations be introduced first in classrooms?

437 In other words, on what model should educational reform be based, particularly in a
438 developing country, handicapped, for example, by such factors as a low initial level of
439 teacher training and a lack of material resources? And based on which criteria? The
440 answer to this question involves four parameters:

- 441 • the relevance of the reform;
- 442 • the effectiveness of the reform;
- 443 • the equity of the reform;
- 444 • the efficiency of the reform.

445 THE RELEVANCE OF THE REFORM

446 The question of the relevance of a reform touches on its very nature: is it really this
447 reform the education system needs in light of its mission? It raises the question of the
448 relationship of the reform to the values to be promoted within society and to society’s
449 needs in socio-economic terms.

450 *Concerns at the local level*

451 The first consideration is the kind of citizen desired, given the societal problems which
452 exist at the local level, especially in situations of under-employment, illiteracy, envi-
453 ronmental damage, violence and war. This is what the development of competencies for
454 life (“life skills”), dear to multilateral organizations, aims to achieve. An important
455 question then arises: what is the place of these skills in the curriculum? Should they
456 constitute a new discipline? A special activity? An area of training? To answer this
457 question, both models offer interesting alternatives: whether complex prior or complex
458 post situations are introduced first, complex situations remain the ideal means for
459 addressing these concerns, be they disciplinary or interdisciplinary. This does not exclude
460 by any means also making individual resources specific to the problem situations the
461 focus of certain, specific learning activities. With regard to either model, we are far from
462 reducing these life skills to ancillary content “grafted” on to existing syllabuses.

463 Another aspect is that of meeting socio-economic demands and, especially, of allowing
464 every individual to develop the necessary basic skills to fit into the socio-economic fabric:
465 the ability to produce a competent piece of writing in correct language, to solve a
466 complex problem in mathematics by mobilising the knowledge acquired etc. In
467 economically challenged countries, the first concern is to allow students who have
468 received schooling to be able to confront everyday situations adequately. There is a direct
469 concern to combat functional illiteracy – absolute priority in countries where poverty is a
470 direct consequence of dependence – which in turn is the result of an elementary lack of
471 access to information and of critical thinking. In this regard, the second model (priority
472 to post situations) is certainly, by its very nature, the more powerful. To illustrate this,
473 there is the case of Rwanda, where children were trained to be “heads of families”,
474 obliged to maintain the household following the death of their parents during the
475 genocide. These children were between 10 and 14 years of age and were attending school
476 for half a day so as to be able to take care of their households. These children went on
477 strike when the teacher wanted to do away with the integration modules, arguing that the
478 syllabus was not being covered. “The integration activities are precisely the ones that are
479 most useful,” the children said.

480 *Concerns at the global level*

481 More urgently, there is also the goal of developing “active citizen participation” at the
482 global level, in the presence of the threat to the very preservation of the human race on
483 this planet, a complete reassessment of education from a sustainable development point
484 of view is crucial. How can this major challenge be met? It can be met by fostering the
485 emergence of individuals who possess four essential qualities (Roegiers, 2006a):

- 486 1. They are competent and well-versed in their expertise;
- 487 2. They are endowed with a sense of solidarity and are willing to help close the
488 growing gap between rich and poor;
- 489 3. They are capable of analysing key issues and decision-making channels;

Curricular reforms guide schools

490 4. They are willing to become genuinely involved and to speak out: who dare to dare
491 express an opinion, to say “no” to a certain form of globalisation. Questioning the
492 relevance of a reform in this regard boils down to asking which model will be more
493 effective in achieving this type of profile.

494 Introducing prior situations first (Model 1) essentially places the priority on the student’s
495 autonomy, as well as on his or her social and civic education. The aim of cognitive
496 development is also pursued, but the manner of achieving it is *divergent* (as defined by
497 D’Hainaut, 1983): students “learn how to think” in multiple situations, openly, rather
498 than how to solve situations of a defined type with which they are presented and which
499 they must be able to solve. The process takes precedence over the result. First and
500 foremost, the student learns how to learn. It is the “thinking” citizen that is promoted.

501 Introducing post situations first (Model 2) places the main emphasis on the opera-
502 tionalisation of learning, on going into action. The end pursued takes precedence over
503 everything else, and that end is the students’ competencies, which must be verifiable. The
504 socio-affective component is very evident, because the challenge is to develop the stu-
505 dent’s competency to take action in a given situation. The goal of cognitive development
506 is also pursued, but in a *convergent* way (D’Hainaut, 1983): the primary result sought is
507 that, at a given age, each student will be able to solve a well-defined category of problems.
508 It is the “acting” citizen who is promoted.

509 *Contextualisation of the curriculum and potential for change*

510 Another aspect of a curriculum’s relevance is whether it takes local realities into account
511 (Halaoui, 2003, 2005; Miled, 2005). This implies knowing what is desirable for the
512 education system in terms of its specific context, in particular in terms of the educational
513 methods being currently used and the cultural values on which they are based. This
514 aspect touches on the very identity of teachers,⁵ as well as feelings concerning the
515 legitimacy of a reform introduced at the level of the education system (Bourgeois &
516 Nizet, 1995). In other words, to what extent can teachers identify with the reform?

517 The introduction in the learning process of the prior problem situation fits better with
518 some teachers more than others. Some cannot conceive of another way of working, while
519 others hasten to return to their old habits as soon as the pressure of new programmes or
520 of inspections slackens. This is a phenomenon known as *habitus*, as analysed by Bourdieu
521 (1980).

522 The second model, which favours the introduction of post situations first, is by nature
523 more respectful of the style of individual teachers and of cultural practices insofar as,
524 initially, it is in harmony with the entire spectrum of educational practices, including
525 those based on participation and on transmission models. Teachers subscribe willingly to
526 the approach, as was evidenced by certain studies, in particular, a study carried out in
527 Tunisia by Altet and Develay (1999). This assessment shows that stakeholders generally
528 accepted the change, that the reform was a catalyst for creativity on the part of
529 schoolteachers, and that it was a potential catalyst for new professional identities.

530 *Relevance and evaluation methods*

531 These considerations can be further developed by introducing the problem of evaluating
532 students.

533 When prior situations are introduced first (Model 1), the emphasis is placed partic-
534 ularly on evaluating formative learning: it is while students are dealing with complex
535 situations that adjustments can be made, giving students experiencing difficulties the
536 possibility of overcoming them (Legendre, 2004; Scallon, 2004). In contrast, the
537 understanding of what certificatory evaluation involves is still sometimes quite vague:
538 should the manner in which the students solved the situations that were part of the
539 learning exercise be taken into account? Or, on the contrary, should students be given a
540 clear opportunity to demonstrate their ability to solve entirely new problems? And above
541 all, what should the level of the situation be, if it is not defined by a specific profile? For
542 want of precise, credible solutions in this direction, teachers often resort to traditional
543 forms of evaluation.

544 This ambiguity is exacerbated by programmes which make transversal competencies
545 the entry point, considered by everyone at present to be misguided. Teachers often
546 experience difficulty with evaluating their students' achievement: how are such general
547 competencies as "respecting the environment" or "processing information" to be eval-
548 uated? Such skills can only be evaluated by means of a mechanism that requires
549 numerous tests in order to cover all the facets of the transversal competency. For
550 example, in New Zealand, evaluating the six dimensions of the sole competency of
551 information research required 14 tests at three different levels.⁶

552 This absence of points of reference – in the first model – for use in evaluating learning
553 achievements has, as its first consequence, a destabilising effect on teachers, especially in
554 countries where the passage from one grade to the next is dependent on an evaluation of
555 the level achieved. A second consequence is the absence of a specific remedial structure to
556 help those students who are in difficulties to make progress.

557 When the introduction of complex post situations is the point of entry (Model 2), the
558 question of evaluation is automatically simplified, since the very situations the students
559 are supposed to be able to solve at the end of the learning experience are an ideal basis on
560 which to carry out these evaluations and correspond to the profile expected. Evaluations
561 are thus carried out on the basis of complex situations, chosen from a category of
562 situations defined according to specific parameters, criteria and indicators (Roegiers,
563 2004; Scallon, 2004). For around a decade, this new form of evaluation has been gaining
564 general acceptance, because it solves the thorny problem of the relevance of evaluation:
565 students are evaluated in terms of their competency to solve complex situations corre-
566 sponding to a defined profile, rather than on their ability to reproduce knowledge or
567 apply rules and techniques.⁷ However, thus far some questions have been answered only
568 partially, especially with regard to equivalence among tests and their validity (Roegiers,
569 2004; De Ketele & Gerard, 2005).⁸

Curricular reforms guide schools

570 THE EFFECTIVENESS OF THE REFORM

571 The effectiveness of the reform means its capacity to meet the objectives assigned to it.
572 The question is posed in both quantitative terms: for example, “Are student outcomes
573 better?”; and in qualitative terms: for example, “Are attitudes on the part of students
574 more in accordance with the values on which the programmes are founded?”, where
575 internal effectiveness is concerned, and “Are students better able to respond to the
576 demands of everyday and professional life, as well as pursuing his or her studies?” where
577 external effectiveness is concerned. What does research say about the effectiveness of
578 these two models?

579 *Effectiveness and prior situations*

580 The findings of research into the effectiveness of learning processes based on solving
581 prior-situation problems are mixed. Although this kind of approach has produced clearly
582 interesting results at the higher education level,⁹ particularly with regard to process
583 variables such as self-regulation strategies and learning strategies (Galand et al., 2005), it
584 has not produced conclusive results at the basic education level as reflected in students’
585 scores. The impact according to studies carried out in English-speaking countries is
586 apparently indecisive. Zahoric et al. (2000) show that effective teachers are those whose
587 practices promote structured learning rather than discovery learning based on problem-
588 solving activities. Chall (2000), after conducting an extensive review of studies examining
589 the most effective methods, concurs with these conclusions. At the pre-school level,
590 Connor and Morrison (2004), while not dismissing the importance of implementing
591 self-regulatory strategies, highlight the importance of learning the letters of the alphabet
592 and the relationship between letters and sounds, as well as prior exposure to basic
593 mathematical concepts.

594 Research in this area is sorely lacking in French-speaking countries. Whether this is due to
595 an unwillingness to assess innovations or to difficulties in isolating the effects caused by one
596 educational innovation among other factors influencing students’ scores, the result is the
597 same: it seems that no study at present proves that teaching practices based on prior-
598 situation problems have a positive impact on students’ scores at the basic education level and
599 on a large scale. To our knowledge, the only available studies are those involving language
600 learning: for example, the investigations of Braibant and Gerard (1996), which show the
601 superiority of a reading method based on decoding over a functional reading method.
602 Likewise, Goigoux (2000) points out the limitations of the ideovisual approach, which
603 minimises the importance of explicit teaching of the relationship between the oral code and
604 the written code in teaching reading to beginners. These conclusions are comparable to
605 those of the studies conducted in English-speaking countries.

606 *Effectiveness and post situations*

607 With regard to the introduction in the learning process of complex post situations
608 (integration situations), interesting results are beginning to emerge. However,

609 interpreting research results requires caution, for this approach is recent (it has been
610 around for 15 years) and the available research results are still fragmentary. Six studies
611 have been carried out to-date in six different countries¹⁰ (Altet & Develay, 1999; Aden
612 & Roegiers, 2003; Amin, 2004; Buchau & Lorent, 2004; Didiye et al., 2005; Rajonhson
613 et al., 2005). The results of these studies appear to be reliable insofar as they are broadly
614 convergent. They bring out several positive aspects of the approach in terms of effec-
615 tiveness.

616 First, on a qualitative level, the main observations from stakeholders are:

- 617 1. From the formative evaluation standpoint, the reform has significant value as a
618 means of diagnosis and differentiation, making it possible to better pinpoint the
619 difficulties encountered by individual students and to find remedies.
- 620 2. It is associated with higher standards.
- 621 3. Evaluation is more relevant and more reliable.

622 Likewise, on the quantitative level, the results are very encouraging. Educational
623 achievement improved significantly among all categories of students, both the most and
624 least advanced.

625 A trial was conducted in Cameroon in 2004 involving 300 schools, composed of a
626 control group of 150 and an experimental group of 150. The experimental group was
627 divided into two equal sub-groups – the first group practiced remediation only, without
628 integration models, and the second group practiced remediation, but following imple-
629 mentation of integration modules. While the percentage of repeaters among the control
630 group was 36%, it was only 26% in the remediation-only sub-group, and only 19% in
631 the sub-group using integration modules *and* remediation. With regard to successful
632 passage of the exam to reach the 6th level, the success rate was 34%, for the control
633 group, 40% for the remediation-only sub-group and 47% for the remediation plus
634 integration modules sub-group.

635 In Tunisia,¹¹ the results of a cohort of nearly 5,000 students in “IP” (integrative
636 pedagogy) who had been followed up throughout their primary schooling were com-
637 pared with those obtained in similar tests among “non-IP” students. The following
638 results were obtained:

- 639 1. Depending on the discipline, a significant increase of between 1.5 and 3 points out
640 of 10 (depending on the discipline) among students in “IP” classes on tests
641 involving “situations”;
- 642 2. An increase of 0.5 point out of 10 among students in “IP” classes on tests involving
643 “resources” (non-significant);
- 644 3. Higher retention rates over time: instead of a regression during the summer
645 vacation period of 25% to 30%, the regression is only from 1% to 5% in languages,
646 and 20% in mathematics.

647 In Djibouti, Mauritania and Madagascar, series of data were collected among a study
648 sample of “IP” (integrative pedagogy) students and an equivalent “non-IP” control
649 group comprised of students studying under the old curricula. The differentiating ele-
650 ment between the groups is the organization of “integration modules” in the experi-
651 mental classes. Resources teaching, that is the teaching of classical subject-matter content,
652 was carried out equally in all classes, but after 5 or 6 weeks, students in the experimental

Curricular reforms guide schools

653 classes were confronted for 1 week with complex situations belonging to the category of
654 situations corresponding to the competency being worked on.

655 It is neither possible nor relevant here to provide a detailed presentation of the results
656 obtained by these studies, carried out in extremely different contexts and at extremely
657 different levels. We will limit ourselves to presenting aggregate data (Table 1), conscious
658 of the limitations of such a presentation. In particular, only within-country comparisons
659 are possible, to the exclusion of inter-country comparisons.

660 In measuring effectiveness, the results converge towards the same conclusion: imple-
661 mentation of integration modules providing for systematic work with complex situations
662 makes it possible to gain nearly one and a half points out of 10, or 15% in tests for
663 evaluating competencies composed of complex situations.¹² All the observed differences
664 are significant or very significant. For these economically underprivileged countries, an
665 average improvement of 15% is exceptional. Indeed, it means that many students who
666 had been failing were now able to pass thanks to the basic competencies approach, and
667 even on tests of a higher taxonomic order.

668 These results concern the pilot phases of integrative pedagogy implementation. At
669 present, results following scaling-up to national level are being obtained, such as in
670 Djibouti and Gabon. Since the introduction of integrative pedagogy modules constitutes
671 the sole change made in these education systems, a large part, if not all, of these results
672 can reasonably be attributed to the introduction of these modules.

673 In Gabon, where integrative pedagogy was implemented nationally 3 years ago in the
674 CP1,¹³ pass rates went from 53% in 2003 to 68% in 2006, representing an increase of
675 15%.¹⁴ There is insufficient experience to say that this increase will be confirmed at the
676 CP2 and CE1 levels, where integrative pedagogy was introduced system-wide much
677 more recently, but preliminary results point in the same direction.

678 The case of Djibouti is even more interesting, because in that country, integrative
679 pedagogy was introduced system-wide at all primary schools. The results speak for
680 themselves: the passing rate in CP classes, which was around 40% in 2002, rose to nearly

TABLE 1. Average gain over 10 on tests based on complex situations (IP = Study sample, integrative pedagogy, (N-IP = Control sample, non-integrative pedagogy)

Country	Levels tested	Sample size	Gain, IP in Language 1 ^a	Gain, IP in French (L2)	Gain, IP in Mathematics	Gain for IP group: overall average
Djibouti	2nd AF	IP (161); NIP (174)	/	+1.37 pts over 10	+1.42 pts over 10	+1.39 pts over 10
Mauritania	6th AF	IP (133); N-IP (104)	+0.43 pts over 10	+1.23 pts over 10	+2.16 pts over 10	+1.27 pts over 10
Madagascar	1st AF	IP (676); N-IP (352)	+0.92 pts over 10	/	+1.26 pts over 10	+1.09 pts over 10

^aMauritania: language = Arabic; Madagascar: language = Malagasy.

681 80% in 2005. In other words, the percentage of students who had acquired the basic
682 competencies to go on to the CE level, went from 40% to 80% in 3 years. These results
683 are encouraging, especially considering that the students who passed genuinely possessed
684 the necessary competencies to continue their education further.

685 Again, with regard to Djibouti, in June 2006 students going from 6th level primary
686 school (non-IP) and from 5th level primary (IP) took the same secondary-level entrance
687 exam nationwide. The passing rate for non-IP students is around 54% after 6 years of
688 schooling, and 78% for IP students with 5 years.¹⁵ This means that students who were
689 taught using integrative pedagogy had, after 5 years of studies, a passing rate which is
690 approximately 25% higher than those who received traditional instruction for 6 years.
691 These raw results remain to be validated and require further analysis to see whether other
692 factors could explain these significantly better results achieved by integrative pedagogy.

693 The lessons to be learnt are:

- 694 • Reliance on complex prior situations appears to have an uncertain impact in terms of
695 improving student achievement rates;
- 696 • Reliance on complex post situations (integrative pedagogy) seems to have an unquestionably
697 favourable impact on student achievement scores: an average increase of from 15% to 25%.

698 *How can the positive outcomes of Model 2 be explained?*

699 There are three main explanations for the poorer effectiveness of system-wide intro-
700 duction of prior situations. The first reason is theoretical, related to the very concept of
701 learning. The second is educational, related to the proportion of individual work by the
702 student. The third is organizational, related to the teacher's exposure to the innovation
703 and his or her comprehension of it.

704 *The concept of learning.* First, there are the educational or theoretical explanations for
705 the different effectiveness of these two models. No doubt children need systematic,
706 analytical exercises from time to time, especially when class sizes are small (Gerard &
707 Roegiers, 2003). They also need to make sense of what they learn, to link together the
708 various types of learning and to integrate them into a cognitive structure (Ausubel, 1968;
709 Reigeluth & Stein, 1983). The "integrative pedagogy" approach meets these two needs.
710 In contrast, the approach giving priority to prior situations generates a certain amount of
711 confusion in the minds of students, especially when the exercise involving complex
712 situations is not always followed by systematic, analytical exercises. However, since this
713 approach is very time-consuming and is based on socio-constructivist ideology, which
714 considers systematic work on resources to be taboo and resources to be devoid of
715 meaning, students' needs are ignored and effectiveness in terms of a given group of
716 students is compromised.

717 *The amount of individual work by the student.* A second reason relates to the relative
718 amount of individual work by the student, which is especially significant for post situ-
719 ations, the majority of which are solved individually. For prior situations, meanwhile, the
720 exercise is often carried out in groups: if it is not followed by individual work on post
721 situations, the amount of individual work by the student is insufficient, which has a
722 direct impact on his or her performance.

Curricular reforms guide schools

723 *Accessibility to the innovation on the part of the teacher.* Last, the use of prior situations is
724 very demanding if implemented correctly:

- 725 1. It requires a high level of qualification on the part of teachers;
726 2. It demands a favourable environment and adequate conditions for its implemen-
727 tation;
728 3. It makes students' achievements very difficult to evaluate, and thereby hampers
729 effective remedial action for under-achieving students who are experiencing diffi-
730 culties.

731 In certain contexts and on a certain scale, it is certainly interesting to begin by intro-
732 ducing prior situations, provided certain contextual factors are present, for example,
733 small class sizes, well-qualified teachers and adequate teaching/learning materials. These
734 factors are more readily found in schools benefiting from what is known as "positive
735 discrimination" measures, or special support measures, such as aid provided to the school
736 or a group of schools by an NGO.

737 But, at the level of an entire school system, the situation is entirely different, for
738 teachers must possess a high level of training if using prior situations is to obtain positive
739 results: if misunderstood, this approach could lead to more problems than solutions. For
740 example, in certain developing countries, the "La Martinière"¹⁶ process is replaced by a
741 process using pseudo-research situations, whereby teachers have students work in groups
742 of six, seven or even 8 or 10; this completely reverses the effectiveness of prior situations,
743 which are extremely sensitive to changes in the way in which they are implemented.
744 What is acceptable or desirable on an individual scale or in special contexts is therefore
745 not necessarily acceptable or desirable at the system-wide level – quite the contrary.

746 In contrast, the introduction of post situations is an innovation within the reach of
747 every teacher and better understood by them because the assignment is clear: students
748 will solve the integration situations individually. The improved effectiveness for all
749 students is a direct consequence of these student-related factors on the one hand, and
750 teacher-related factors on the other.

751 THE EQUITY OF THE REFORM

752 The equity of the reform refers to the personal benefits for students, schools and teachers:
753 Did the least-advanced student at the start obtain benefits at least equivalent or superior to
754 those obtained by those most advanced? Has the gap between the two narrowed or widened?

755 Effectiveness and equity are notions that are increasingly seen by researchers in edu-
756 cation to be inseparable (Sall & De Ketele, 1997; Solaux, 2005). Indeed, the best means
757 of increasing the effectiveness of school systems, according to these authors, is by
758 improving the performance of all students, particularly the lowest achievers and, hence,
759 attaining greater equity.

760 *Equity and prior situations*

761 In the English-speaking world, several studies on the relationship between equity and the
762 management of prior situations have been carried out. In the area of vocational training,

763 a review was conducted by Baldwin and Ford (1988) involving seven studies on the
764 transfer of competencies in a work environment. Among the variables examined, these
765 authors show how the learning situations proposed must not exceed the learners' level by
766 too great an extent if the transfer to the work setting is to succeed: it appears that learning
767 situations of a high-level of complexity are of little benefit to learners with low skill levels.

768 With regard to basic education, research in English-speaking countries shows that
769 educational approaches focussed on PBL or project-based learning may be less effective
770 than approaches based on prior resources-learning, in particular, for students with low
771 achievement levels. Delpit (1995) shows that to help students from socio-culturally
772 underprivileged backgrounds, it is better to rely on explicit teaching methods, which will
773 be carried on and reinforced at home, rather than instruction based on "classroom
774 jargon", which is only accessible to those able to acclimatise themselves to this kind of
775 educational discourse at home.

776 Few studies exist in the French-speaking world. The scant findings available seem to
777 point in various directions. At the higher education level, the "priority to prior situa-
778 tions" approach (Model 1) seems to result in improved effectiveness, but this
779 improvement is coupled with a decrease in equity (Galand & Frenay, 2005).

780 At the basic education level, the limited results available point in various directions,
781 depending on the discipline. For reading, approaches favouring direct word recognition,
782 skipping the analytic phase, appear to handicap students from socially underprivileged
783 backgrounds (Braibant & Gerard, 1996). In contrast, for spelling, the prior situations
784 approach appears to be more equitable, as borne out in the investigations of Allal et al.
785 (1999).

786 *Equity and post situations*

787 Concerning the introduction of post situations (integration situations), certain results in
788 terms of equity are also beginning to emerge.

789 In Gabon, experience shows that the introduction of integrative pedagogy results in
790 more improvement among first-time school-goers and repeaters than those who had
791 attended pre-primary school.

792 In Djibouti, the findings are as follows:

- 793 • A study mentioned earlier (cf. supra) shows a significantly higher gain for students with
794 lower achievement levels than for those with higher levels, especially with regard to
795 writing (Aden & Roegiers, 2003);
- 796 • Buchau and Lorent (2005) show how stakeholders in the system consider that the
797 reform benefits underprivileged students more than students of other groups;
- 798 • The results of the 6th level qualification exam of June 2006 seem to show that
799 improvements achieved as the result of integrative pedagogy in urban areas are
800 significant, but even more significant in rural areas.

801 The gain in equity is essentially linked to the implementation of integration modules: on
802 one hand, there are no "prior situations", since the great majority of teachers rely on
803 teaching practices based on transmission-model methods for discrete content learning

Curricular reforms guide schools

804 between two integration modules; on the other hand, no other major innovation had
805 been introduced in the period.

Author Proof

806 *Why is there a gain in equity with Model 2 and not with Model 1?*

807 The reasons for the gain in equity for Model 2 are by and large the same as those which
808 explain the gain in effectiveness. Since students with low achievement levels benefit
809 especially in both cases, both effectiveness and equity are affected:

- 810 1. The existence of structured phases primarily benefits low-level students, who need
811 this phase to improve their cognitive structures;
- 812 2. The emphasis on individual work, particularly during the integration phase,
813 especially benefits students with low levels, for the simple reason that better stu-
814 dents will be able to transfer achievements spontaneously. They may be assisted in
815 this process by the school in order to enhance the quality of the transfer, but this is
816 by no means indispensable for them. Lower-level students, meanwhile, who are not
817 capable of transferring achievements spontaneously, need the school to give them
818 opportunities to transfer. Integration situations provide these opportunities;
- 819 3. An innovation which imposes fewer implementing conditions is more accessible to
820 all teachers.

821 *Equity and evaluation mechanisms*

822 To complete these findings, other studies show interesting results concerning the rela-
823 tionship between equity and the kinds of tests used to evaluate student performance (Rey
824 et al., 2002, 2003; Letor & Vandenberghe, 2003). The studies examined, whether
825 evaluating students in terms of resources (“resources testing”) or in terms of situations
826 (“situation testing”), had an impact on equity.

827 These studies would seem to indicate that lower-achieving students or those from
828 underprivileged backgrounds were by no means less successful in “competency” tests
829 than in “resource” tests – on the contrary. This is explained by a cultural factor: students
830 living a cultural setting which is richer in stimuli have a better chance of being successful
831 with “resource” tests, while with problem-solving all students are on a more equal
832 footing, whatever their socio-cultural origin.

833 Thus, with regard to evaluation, the fact of using “situation” tests is not only more
834 relevant, but also more equitable.

835 THE EFFICIENCY OF THE REFORM

836 A further question to be raised is that of efficiency. For a given education system with
837 limited resources, and hence limited energy to carry out a reform, what input will yield
838 the best “cost/benefit ratio”?

839 *The effort to train teachers*

840 A first aspect concerns enlisting the involvement of teachers and making the effort to
841 train them.

842 Plans to introduce the prior situations approach on a countrywide basis presuppose a
843 large training effort and could have outcomes that are uncertain, or in any case, diverse,
844 depending on the context, as was stated above. In the western world, a large proportion
845 of teachers will naturally ease into an approach relying on participatory methods, in-
846 terdisciplinarity and PBL. How many? Three-quarters? Two-thirds? It is difficult to say,
847 but in any case, a significant number.¹⁷ There are, however, regulatory mechanisms that
848 oblige teachers to call themselves into question and to evolve in their teaching tech-
849 niques: competition between schools, pressure on the part of parents etc. Yet, new
850 practices take a long time generally to become durably installed. It is estimated that it
851 takes between 5 and 10 years at least for a teacher to spontaneously adopt PBL in
852 replacement of teaching practices based on transmission-model practices.

853 In developing countries, not only is the proportion of teachers who, for different
854 reasons, do not change their practices much greater, due in part to the conditions in
855 which they work,¹⁸ but also, the regulatory mechanisms often do not exist.

856 The second model makes it possible for the teacher to change his or her practices in
857 two stages. First, emphasis is placed on integration. The teacher provides resources
858 instruction according to the usual procedure. Participatory methods in the learning
859 process are not required. What is required is that at regular intervals students are pre-
860 sented with complex situations in which they utilise the resources they have acquired,
861 whether this concerns knowledge, know-how or life skills – these are the integration
862 modules. In the second stage, the teachers are asked to modify their everyday practices –
863 towards participatory methods, in particular – but at their own pace and according to
864 their own personal teaching style. This change will make it possible to maintain a balance
865 between bringing change about and respecting the speed at which teachers can assimilate
866 new classroom practices.

867 This strategy makes it possible to first focus training efforts on installing integration
868 modules, without worrying about changing practices with regard to discrete content
869 learning. Installation takes between 6 months and a maximum of 2 years. Now, it is to
870 these integration modules that the positive impact on students' achievement, as men-
871 tioned earlier, is attributable. Once these integration modules are in place, teachers are
872 encouraged to begin adapting their classroom practice, unless they take the initiative
873 themselves to transform them. Indeed, it often arises that the teacher, who applies other
874 pedagogical methods during the integration modules, asks why they should not be
875 integrated across the curriculum. Instead of continuing to use lecture-based teaching, the
876 teacher is transformed into a learner of how to implement progressive instruction which
877 places each student in the centre of the learning process.¹⁹

878 The second model, therefore, because it involves less effort and greater results, proves
879 to be more efficient.

Curricular reforms guide schools

880 *Teaching/learning materials*

881 A second aspect concerns the teaching/learning materials required by the reform.

882 The introduction of prior situations (didactical situations) does not necessarily require
883 a great many teaching/learning materials: several good documents for research, learning
884 materials from the student's environment. It would be counter-productive to tie these
885 research activities to over-consumption of educational materials, which is a boon for
886 publishers and purveyors of supplies: files, textbooks, computers, folders etc., raising
887 suspicions about the influence of economic considerations on certain reforms, to the
888 dismay of educators who genuinely supported the reform and who repeatedly stress the
889 necessity of using real, functional, everyday-life learning materials.

890 The introduction of post situations (integration situations) has a disadvantage in terms
891 of the material which it requires. For the exercise to be effective, students must dispose of
892 the tools needed for solving complex situations, because they can only achieve compe-
893 tency by learning how to solve the problem situations on their own. In several countries
894 where this method has been implemented, this drawback has been overcome by pro-
895 viding students with a "complex situation notebook" in addition to the usual textbooks,
896 making it unnecessary to change schoolbooks immediately. It is not until later on that
897 the integration modules are introduced into textbooks. This process can be accompanied
898 by the next level of reflection, namely with regard to the integration of disciplines (Peyser
899 et al., 2006).

900 To conclude the discussion concerning efficiency, it can be said that Model 2 is more
901 efficient in terms of efficiency of strategies, and Model 1 is more efficient in terms of
902 efficient use of material resources.

903 **Conclusion**

904 ARE THESE MODELS INCOMPATIBLE?

905 *Similarities*

906 These two models converge in significant ways. By definition, they agree on the necessity
907 of setting up specific, educative structures to train autonomous, creative, responsible and
908 critically thinking individuals. They agree on the status to be given to complexity in
909 learning processes and are both concerned about making the learning experience
910 meaningful, by promoting student motivation, by making students more proactive and
911 by giving them situations to work with which make apparent to them the value of what
912 they are doing in the classroom.

913 Both also aim at the permanence of knowledge acquisition. They strive towards a
914 vision of education as a long-term investment and of schools as genuine catalysts for the
915 social integration of each and every individual.

916 All these goals can be associated with the concept of sustainable development, which is
917 a central concern for everyone today – at UNESCO in particular – and can be referred to
918 as sustainable education.

919 *The differences*

920 Despite these similarities, the two models differ in several respects.

921 The first difference concerns the way in which competency is defined. In Model 1,
922 priority to “prior situations”, the emphasis is placed on competencies mobilised with
923 regard to learning processes: researching information, processing information, interacting
924 with other students, learning how to learn etc. In Model 2, which begins by introducing
925 complex post situations first, “competencies” consist of what the student must master at
926 the end of the learning process. The emphasis is thus placed on the final profile expected
927 of each student, whether in terms of knowledge “to act” in everyday life, in a job setting
928 or in pursuing further studies. The outcome sought, rather, is the operationalisation of
929 knowledge.

930 The two models also differ on to how to evaluate student achievements. In Model 1,
931 the evaluation is essentially a formative assessment focussed on the strategies used by the
932 student. It is often combined with a more classical evaluation of resources, which is still
933 often used as a condition for certification. In Model 2, both certificatory and formative
934 evaluation is essentially turned towards the mastery of complex situations of a given level,
935 corresponding to the expected profile. It thus compares the students’ achievement to the
936 profile expected.

937 *Is one model better than the other?*

938 The order, as illustrated by the models presented above, in which the innovations are to
939 be introduced depends on further questions – questions of policy and questions about
940 the kind of society to be built, as well as practical questions about the performance of the
941 education system at a given time and the qualitative leap it can be reasonably expected to
942 make, taking into account the resources available, in particular, the level of teacher
943 training and the conditions in which they work.

944 It cannot be said with absolute certainty that it is preferable for an education system to
945 resort to Model 1 or Model 2. Both have advantages and disadvantages. The foregoing
946 discussion, however, shows that the model which gives priority to “prior situations”
947 seems better-adapted to general education (non-specialised upper-secondary or university
948 levels). It is especially appropriate for highly conceptual areas of education, for example
949 civil engineering, philosophy or mathematics, in which the main focus is on the
950 development of pure thought and in which the learners involved are capable of struc-
951 turing by themselves the knowledge acquired.

952 In the case of technical and vocational training, Model 2 is better adapted insofar as
953 the integration situations tie naturally in with the occupational skills to be developed.

Curricular reforms guide schools

954 With regard to basic education, Model 2 – integrative pedagogy – which proposes to
955 begin by introducing post situations over the entire education system, appears to be
956 particularly adapted to ensuring the acquisition of basic skills, namely, reading, writing
957 and arithmetic. It also guarantees that students will have knowledge which is sufficiently
958 solid and stable to continue their education further. Thanks to the introduction of
959 integration modules in classrooms, this model has resulted in undeniable improvements
960 in student performance, especially in terms of relevance, effectiveness and equity, without
961 even requiring changes of classroom procedures with regard to content learning and
962 acquiring skills for everyday life.

963 Clearly, the questions with which education systems are confronted have no single
964 answer, but there are answers which are more relevant, effective, equitable and efficient in
965 one context than in another – answers that are compatible with the values of the system,
966 and the result of a genuine and carefully thought-out epistemological process. Serious
967 answers are beginning to appear on the horizon and integrative pedagogy is one of them,
968 unquestionably.

969 Notes

- 970 1. One need only think, for example, of the problems related to the patenting of life forms,
971 electronic chips, record-keeping, the release of personal information, the centralised storage
972 of data on off-site locations etc.
- 973 2. That is, covering primary school and early secondary school (around 9 years of school
974 attendance).
- 975 3. This term is to be taken in the strongest sense of a learning relationship between two indi-
976 viduals, a specialist and a novice, and not in the sense of technical apprenticeship.
- 977 4. Teachers who do so should even be encouraged.
- 978 5. Adriana Gorga, IBE/UNESCO, Global E-Forum, November–December 2005.
- 979 6. New Zealand Council for Educational Research: Essential skills assessments (www.nzcer.org).
- 980 7. The current systems of evaluation in Quebec, Switzerland and Belgium (official tests at the
981 completion of primary and secondary school and, in Quebec, at the end of college studies)
982 are worth mentioning.
- 983 8. And hence, inferences concerning whether competency has been achieved.
- 984 9. In particular in medical schools and applied science institutes.
- 985 10. In Cameroon, the study involved 20,000 students. The five other countries, namely Tunisia,
986 Djibouti, Madagascar, Mauritania and Gabon, rewrote their curricula to include integrative
987 pedagogy; training was provided to inspectors and teachers; appropriate teaching tools were
988 developed; and a system of evaluating achievement based on complex situations was
989 implemented. A pilot phase of 1 year involving a representative sample made it possible to
990 adapt the various tools made available to teachers and students. Publication of the studies in
991 Gabon is pending.
- 992 11. CNIPRE, Tunisia.
- 993 12. With regard to “resource” exams, the gain is also positive, but not significant.
- 994 13. CP: first and second primary levels (CP1 and CP2); CE: third and fourth primary levels
995 (CE1 and CE2).
- 996 14. Study conducted concerning scores gathered in six school districts, representing half of the
997 total number of students.

- 998 15. Results extrapolated from the average passing rate on the exam into the 6th level
999 (www.rtd.dj/actualites, 8 June 2006) on the one hand, from the rate achieved by students in
1000 “IP” classed, on the other. The Djibouti government has not yet confirmed these figures.
1001 16. All the students write their answer on their slate, and raise it at the same time when the
1002 teacher gives the signal.
1003 17. A researcher at the Facultés Universitaires Saint Louis, who collaborated with the French
1004 Community on a study on the impact of the reform, estimates at less than 10%, and perhaps
1005 less than 5% (to use his own words) the teachers who, on a daily basis in the French
1006 Community of Belgium, teach using the problem-based approach.
1007 18. In several countries, although the communication approach to language learning has been
1008 encouraged for 15 years in continuing education programmes and in school textbooks, only
1009 a small percentage of teachers have adopted it.
1010 19. We say “each student in the centre of the learning process” because, to our way of thinking, the
1011 usual expression “making students the focus of the learning process” is too often understood as
1012 an invitation to place a few (good) students in the centre of the learning process, whereas the
1013 challenge is to place *every* child in the centre of learning.
1014

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