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QUELQUES ASPECTS DE LA RÉFORME CURRICULAIRE EN ROUMANIE

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ABSTRACT. The paper is focused on the main coordinates of the curricular reform in Romania, which is analyzed like a relevant part of the educational reform, in the context in which the concept *"curriculum"* was introduced in our country just in 1996. We realize an approach for a segment of this reform, respectively the explanations and the correlation between the central concepts correlated with the curriculum: *contents*, *objectives* and *competencies*. In order to make an authentic and relevant accent on the formative dimension, the new curricular actions center the educational processes not on contents (like in the traditional education) but on the construction and development of educational complex competencies. The new curricular design considers the contents like tools, like instruments in the difficult process of formation and development of intellectual, motor, affective-attitudinal, communicational and other competencies.

Un changement de paradigme: des contenus aux expériences d'apprentissage

Le concept de *curriculum* a commencé à être utilisé dans le domaine de l'éducation à partir de la deuxième moitie du XVI siècle dans quelques universités des Pays-Bas et d'Ecosse et, plus tard, dans d'autre pays, en conservant des significations plus ou moins proches. Au fur et à mesure, ce concept a été valorisé et on est arrivé à l'acception moderne du terme, sur laquelle les spécialistes se sont accordés, qu'il s'agisse de théoriciens au de practiciens.

Ce terme est considéré unanimement, un *concept intégrateur* qui exprime *la totalité des expériences d'enseignement proposées à ceux qui apprennent par l'intermédiaire des programmes d'études*, offerts aux différents niveaux: profil d'enseignement, cycle curriculaire, aire curriculaire, discipline d'enseignement, semestre ou activité didactique effective. Les réflexions, les opérationalisations et les confrontations des opinions, en ce qui concerne le curriculum, ont à la base un élément commun, plus précisement la négation de la superposition entre le curriculum et le contenu de l'enseignement et *le déplacement de l'accent des contenus proprement-dits sur la transposition didactique des contenus en expériences d'apprentissage actif et interactif et en acquisitions de l'apprentissage*: habilités intelectuelles et pratiques, capacités et compétences complèxes et diversifiées, comportements, connaissances disciplinaires et interdisciplinaires etc.

Du point de vue systémique, moderne, le curriculum représente un projet/ programme pédagogique réalisé pour une certaine période de temps qui articule et valorise dans une structure unitaire et cohérentes les composantes suivantes et les relations qui s'établissent entre elles: les objectifs educatifs (qui sont de différents degrés de généralité, en fonction du niveau auquel nous nous situons), les contenus instructifs-éducatifs valorisés, les stratégies didactiques préconisées (et leurs composantes: système méthodologique, ressources matériales, formes d'organisation de l'activité des sujets etc.), les stratégies d'évaluation préconisées (leur spécificité et leurs composantes).

La réforme curriculaire en Roumanie - essence et directions d'action

Les recherches de pédagogie comparée et de prospective éducationnelle ont inventorié les différences existant entre les réformes éducatives qui se réalisent dans des divers pays, différences qui sont dues à la spécificité de ces systèmes éducatifs, aux directions des politiques éducatives, à la dynamique sociale, aux exigences actuelles et à la perspective de la société etc. En même temps, toutefois en général, on admet aujourd'hui qu'une condition nécessaire à la réalisation des réformes éducatives est représentée par la réforme curriculaire, le curriculum constituant le principal opérateur des réformes réalisées à l'intérieur des système éducatifs d'Europe.

La réforme curriculaire représente un aspect large et complexe de la réforme éducationnelle, car celle-ci se propose d'assurer les prémisses de la manifestaton réelle des interactions et des interdépendances entre les composantes du curriculum (supra) et non pas d'assurer une simple réélaboration des plans, des programmes et des manuels scolaires (soient uniques ou alternatifs).

La complexité du concept de curriculum et son extension dans le temps ont fait de la (ré)élaboration du curriculum, respectivement du projet curriculaire au niveau macro - le niveau du système d'enseignement dans sa totalité, un processus complexe, laborieux et qui a des multiples implications.

Dans le contexte de la réforme curriculaire de l'enseignement préuniversitaire qui se déroule en Roumanie, les deux composantes importantes du curriculum écrit, établies au niveau national - les plans-cadre et les programmes scolaires, ont au départ une vision curriculaire moderne. Ainsi, les actuels plans-cadre d'enseignement ont comme avantages principaux, en matière d'éducation: la tentative d'introduction de quelques changements de type démocratique en ce qui concerne les pratiques éducatives dans les écoles, l'assurance des premisses nécessaires aux écoles par avoir une réelle décision curriculaire, par parvenir à l'implication des familles et de la communauté locale dans leur vie, la promotion des programmes basés sur des modèles de projection curriculaire flexibles et ouverts, la projection d'un système d'évaluation formatif, la promotion des pratiques didactiques de type interactif etc.

Contenus, objectifs et compétences - la reconsidération de leurs rôles dans le contexte de la réforme éducationnelle de Roumanie

Comme nous l'avons vu plus haut, la réforme curriculaire représente une composante complexe de la réforme générale de l'enseignement et de l'éducation. Dans les pages qui suivent, nous nous proposons d'aborder un aspect de celle-ci, respectivement l'éclaircissent, l'opérationalisation et inter-relation de trois concept-clé qui s'associe au concept de curriculum et qui sont importants pour la réforme de l'enseignement qui se déroule en Roumanie, en matière de contenus, d'objectifs et de compétences. En pratique, le concept de curriculum est devenu opérant dans la pratique éducative roumaine relativement recent, à l'occasion de l'introduction du Curriculum National et de différents documents curriculaires élaborés au niveau central et qui promovaient un changement de vue radical. C'est pour cela que nous lui accorderons une attention à part, en essayant de donner, à la fois, une définition de ce concept et aussi, de réaliser une analyse dans une perspective pédagogique.

La perspective curriculaire moderne, concernant les programmes scolaires roumains, renonce à la considération des contenus instructifs-éducatifs en tant qu'élément central et en tant que point de départ dans l'activité didactique aux niveaux macro et micro. Dans la réforme actuelle du système de l'enseignement préuniversitaire roumain, il ne s'agit pas de la négation de l'importance des contenus, mais du fait qu'ils sont considérés de manière systèmique comme des éléments du curriculum qui se trouvent en étroite interdépendence avec les autres composantes de celui-ci.

Le point de départ pour l'étude curriculaire, au niveau macro, en Roumanie est représenté par le fait que la connaissance qui s'appuie sur l'apprentissage scolaire ne peut plus représenter un but en soi; les résultats du processus de connaissance scolaire n'ont pas d'importance par la personalité de ceux qui se forment, si'ils ne sont pas liés à des compétences et à des attitudes, destinées à contribuer à leur insertion, à leur intégration et à leur implication sociale active et efficace. Ainsi, vu le fait qu'on a l'intention de réaliser un déplacement de priorité réel et significatif de la dimension informative vers la dimension formative du processus d'enseignement, la nouvelle démarche curriculaire situe l'action éducative non au niveau des contenus (comme cela se passait dand l'éducation traditionnelle, les contenus étant considérés comme des vecteurs principaux de l'éducation) mais au niveau de la formation des compétences éducationnelles complexes et variées qui se trouvent à un niveau supérieur. Il ne s'agit pas non seulement de compétences inteléctuelles/ cognitives mais aussi de compétences psychomotrices et affectives, toutes ces catégories assurant le caractère fonctionnel des connaissances et des acquisitions des élèves, qui pourront être appliquées et transférées dans de nouveaux contextes, même problématiques. Aujourd'hui, tous le contexte educatif roumain, on soutient l'idée que "savoir" ne représente plus un but en soi mais un intermédiaire qui assure les premisses du "savoir faire", "savoir être", "savoir vivre ensemble" et "savoir devenir". Il est évident qu'entre ces voies de la connaissance il existe de multiples interactions et échanges qui forment en pratique une unité.

À présent, le principe essentiel dans le contexte éducatif roumain soutient la nécessité de situer l'élève et les activités d'enseignement et de formation de celui-ci au centre du processus éducatif. La conséquence en matière d'éducation de ce déplacement d'accent est la mise en évidence d'une nouvelle pratique de projection curriculaire, conformement au nouveau curriculum et à la nouvelle perspective curriculaire.

La nouvelle pratique de projection curriculaire ne suppose plus l'élaboration des soi-disants "programmes analytiques", assimilés aux inventaires des différentes segments/ unités de contenu - chapitres, thèmes, sujets ponctuels, auxquels on avait attribué un nombre d'heures fixe, sans préciser clairement les finalités éducatives. *La nouvelle projection curriculaire considére les contenus comme des moyens proposés, comme des intermédiaires par la formation des compétences éducatives* intellectuelles, motrices, affectivement-attitudinales, de communication et de relation sociale, de prise de décisions, de prise en compte des risques, d'adaption de solutions personelles, d'attitudes et des comportements de ceux que l'on éduque.

Les programmes scolaires roumains actuels sont centrés sur les compétences éducatives ceux qui sont destinés aux classes I-IX font appel à des objectifs cadre[1] et de référence[2] qui "sont axés sur la formation de capacités/ compétences" (Le Ministère de l'Éducation Nationale, le Conseil pour le Curriculum, (1999), *Curriculum National. Programmes scolaires pour la IX^{ème} classe*, vol. II, Aire curriculaire: mathèmatique et sciences naturelles, pag. 53), activités d'enseignement et contenus, et ceux pour les classes X-XIII opérent même avec des inventaires de compétences éducatives générales et spécifiques, ces dernières étant associées à des unités de contenu. D'ailleurs, pour venir en aide aux praticiens, les programmes scolaires actuels pour les classes X-XIII contienent, pour chaque discipline étudiée dans une année scolaire donnée, des inventaires d'attitudes et de valeurs qui pourraient être construits en interdépendence avec la formation des compétence éducatives générales et spécifiques, ainsi que des suggestions méthodologiques générales.

Ce type de projection curriculaire, basé sur la structuration des programmes scolaires, sur la réalisation des objectifs ou sur la formation de compétences éducatives, est centré sur les résultats/ les acquisitions finales de l'enseignement et sur la valorisation de la dimension de l'action dans la formation et la modélisation de la personnalité de ceux qui reçoivent l'instruction, en tenant compte, biensûr, de la demande sur le marché du travail.

[1] Les objectifs cadre sont des objectifs ayant un degré élevé de généralisation et de compléxité, qui se rapportent à la formation des compétences et des aptitudes spécifiques à la discipline et sont suivies tout au long de plusieurs années d'études. Ils sont définis uniquèment au niveau national.

[2] Les objectifs de référence comprennent les résultats attendus de l'enseignement par chaque année d'étude et surveillent la progression dans l'acquisition des compétences, des capacités et des connaissances spécifiques à la discipline, d'une année d'étude à l'autre. Ils sont définis uniquement au niveau national.

Grâce au fait que le curriculum comprend non seulement le domaine du formel mais aussi de l'informel, *nous parrions définir les compétences comme des ensembles intégrés de capacités et des habiletés d'application, d'opération et de transfert des acquisitions qui permettent le déroulement efficace d'une activité, l'utilisation de façon fonctionnelle des connaissances, du savoir faire et des habitudes acquises, dans divers contextes formels ou informels*. À l'aide des compétences qu'elle possède, une personne peut agir avec efficacité, avoir une pensée critique, choisir rapidement, prendre des décisions pertinentes, faire une séléction, peut analyser et réaliser une synthèse des informations, raisonner, argumenter, identifier et solutionner des problèmes, improviser en connaissance de cause, faire face à des situations diverses etc. "La compétence naît et va être évaluée au carrefour des verbes: savoir, savoir faire, savoir être, savoir devenir. Donc, elle n'est pas le résultat de l'action éducative seulement dans le domaine cognitif mais elle se rapporte aussi aux domaines affectif et psycho-moteur (R.M. Niculescu, coord., 2001, p. 226).

Tenant compte des observations faites plus haut, nous considérons comme nécessaire l'utilisation des compétences dans le cadre du Curriculum National, à partir de la dixième année d'étude, car, c'est autour de cet âge-là, de point de vue du processus du développement intellectuel, que les élèves dépassent le stade des opérations préformelles et entrent dans celui des opérations propositionnelles. Les capacités acquises s'enrichissent, s'élargissent, se diversifient et, surtout, s'organisent et se structurent, offrant à celui qui se forme de nouvelles perceptions des sens, de nouvelles significations, de nouvelles perspectives, de nouveaux horizons, en le dotant, en pratique de capacités d'ordre supérieur, organisées en structures/ ensembles, només compétences.

Dans le cadre du paradigme de la compétence, on peut discuter *d'un champ des compétences*, ayant les suivantes éléments argumentatifs:

- les compétences sont en corrélation avec toute les formes de l'éducation
- les compétences acquises et dévéloppées dans le cadre de l'éducation formelle, peuvent être disciplinaires ou tranversales/ transférables
- leur acquisition et leur dévéloppement se réalise en interdépendence.

Un tel champ este composé de compétences caractéristiques à l'éducation formelle, qui représente les résultats du système d'enseignement, "le flux de sortie" du procèssus que celui-ci suppose (I. Radu, 2001, p. 32) dans un cycle curriculaire et des compétences qui connaissent un spéctre plus large, valorisées dans des situations diverses, dans des contextes informels. Philippe Perrenoud (1997) attire l'attention sur le fait qu'une compétence mobilise certaines connaissances, éventuellement acquises durant la scolarité mais elles ne représentent que des conditions nécessaires, jamais suffisantes, pour développer de manière efficace une activité. Maîtriser une compétence ne signifie pas seulement savoir faire ou détenir une téchnique mais cela présuppose *la capacité* à attacher une situation à part à une famille de situations et d'aborder de façon adéquate, en partant de quelques

schémas disponibles; *la compétence suppose l'existence des ressources mobilisables mais ne se confond pas avec elles*. De même auteur considére qu'*une compétence représente un moyen fort pour le traitement d'une classe de problèmes complexes*. De même, la notion de compétence étant en corrélation avec celle de rôles et de fonctions, il est normal qu'à l'intérieur de ce champ des compétences, respectivement dans le contenu des compétences, des rôles et des fonctions, on rencontre un noyau de sollicitations conmmunes, *respectivement un noyau de compétences ou de rôles*, qui attirent les capacités bien dévelopées et les rôles exercés à un niveau supérieur du point de vue qualitatif. Nous considérons comme oportune l'introduction, danc ce contexte, du mot rôles et nous croyons qu'on peut aussi discuter d'un noyau de rôles nous assumés, pour lesquels les éduqués et les éducateurs apprécient le fait qu'ils ne sont pas suffisament préparés par être assimilés et exercés. Par exemple, les éduqués, souvent, font de petits pas vers l'autonomie cognitive et éducative, en assumant plus difficilement des rôles d'organisateur de leur propre activité de connaissance et de formation, de participant effectif à l'activité didactique, de gérant et d'évaluateur de leur propre activité, de personne en charge des prochaines activités éducatives etc. En ce qui concerne les éducateurs, nous rappelons le fait qu'étant nous assumés les rôles d'organisateur, de réalisateur et de coordonateur des activités réalisées dans des contextes informels, les rôles d'organisateur et de coordonateur des activités qui se trouvent en corrélation avec les dimensions de l'éducation, comme: l'éducation morale, l'éducation estehétique, l'éducation en vue de la paix, l'éducation pour le changement etc.

La rélation compétences éducatives - objectifs éducatifs dans le design curriculaire

La concrétisation de l'ideal éducationnel en buts éducatifs et de ceux-ci en objectifs curriculaires, cadre, de référence et, ensuite, opérationnels, se réalise par la précision et la particularisation/ concrétisation des performances ou des compétences que les éduqués doivent posséder à la fin d'une période d'instruction. La démarche de *dérivation pédagogique*, réalisée de haut en bas, par un passage progressif de l'idéal éducatif aux objectifs opérationnels, concrets, correspond au design curriculaire, respectivement au processus de construction/ élaboration du curriculum.

D'habitude, on utilise deux critères d'élaboration et d'apréciation de l'opérationnalité d'un objectif, respectivement la performance (le critère comportamental) et la capacité intelectuelle (le critére de la compétence), critères qui ne doivent pas être considérés réciproquement exclusifs mais plutôt, complémentaires, Pour cela, il est nécessaire de réaliser un lien plus étroit entre les objectifs spécifiques et opérationnels (R.B. Iucu, M. Manolescu, 2001, p. 98-100).

Les performances sont mises en corrélation avec le niveau de réalisation d'une tâche d'apprentissage: l'indicateur le plus concret est représenté par le comportement, respectivement la manifestation visible du celui qui s'éduque. *Par rapport à la performance, la compétence est réalisable dans des delais plus longs:*

la spécification d'une compétence suppose la précision des capacités visées, qui s'appuient, à leur tour, sur certaines opérations mentales. Assez souvent, on prend comme éléments de référence les procèssus psychiques (perception, pensée, mémoire, imagination etc.) et les opérations spécifiques à chacun. Ainsi, les objectifs centrés sur les compétences insistent sur la formation des opérations proprement-dites qui assurent la réalisation d'une performance, de telle manière *que la compétence est comprise dans la performance*. L'avantaje majeur des objectifs axés sur des compétences est qu'ils accentuent le caractère formatif de l'enseignement. Un possible inconvenient de ceux-ci pourrait être la réduction de l'opérationnalité, ce qui pourrait générer une certaine ambiguité et des difficultés pour la projection, réalisation, l'évaluation et le reglement de l' activité éducative (idem, p.100).

D'autre part, l'acquisition et la modélisation des compétences représente un processus continu et graduel - *en partant des compétences derivées et spécifiques, on arrive, par intégration, à des compétences derivées et specifiques, on arrive, par intégration, à des compétences ayant un degré de généralisation, toujours plus élevé*. Il s'agit d'une démarche réalisée de bas en haut et qui correspond au plan pratique et d'action. Ainsi, *avec chaque leçon et avec chaque activité didactique, on contribue, par la formation et par le développement des compétences dérivées, à la réalisation des compétences éducatives spécifiques (qui se trouvent en corrélation avec les objectifs de référence et avec ceux qui sont opérationnels) et des compétences générales - psychosociales et professionnelles (en corrélation avec les objectifs cadre et curriculaires) de la discipline étudiée durant unei année, dans le cycle curriculaire et à la réalisation de celles correspondant à toutes les disciplines de l'aire curriculaire ou du cycle curriculaire*. De façon graduelle, on essaie de réaliser les compétences éducatives finales, avec un degré maximal de généralité et visées pour le déroulement du processus éducationnel. Par leur structuration en systèmes plus vastes, on assure la réalisation des compétences psycho-sociales et professionnelles visées et des compétences qui explicitent le modèle projectif de personnalité tracé par l'idéal éducatif. De même, il ne faut pas perdre de vue les compétences transversales/ transférables, qui mettent en valeur les schémas d'action à sens large et qui sont formulées en termes d'acquisitions transférables et non pas strictement disciplinaires. Quelques exemples de compétences transversales/ transférables utiles pour former et développer sont: formuler un thème/ un problème de recherche, définir une problématique, une situation-problème, formuler des hypothèses de départ, s'informer, aborder de point de vue critique l'information, traiter l'information, structurer et hiérarchiser l'information, structurer les réponses et répondre clairement et précisement aux questions posées, rédiger un texte, un exposé, un essai, un produit média, apprendre à comprendre et à évaluer les réactions, les vécus, les opinions, les réponses des partenaires d'activité, travailler en groupe et participer à l'administration collective etc.

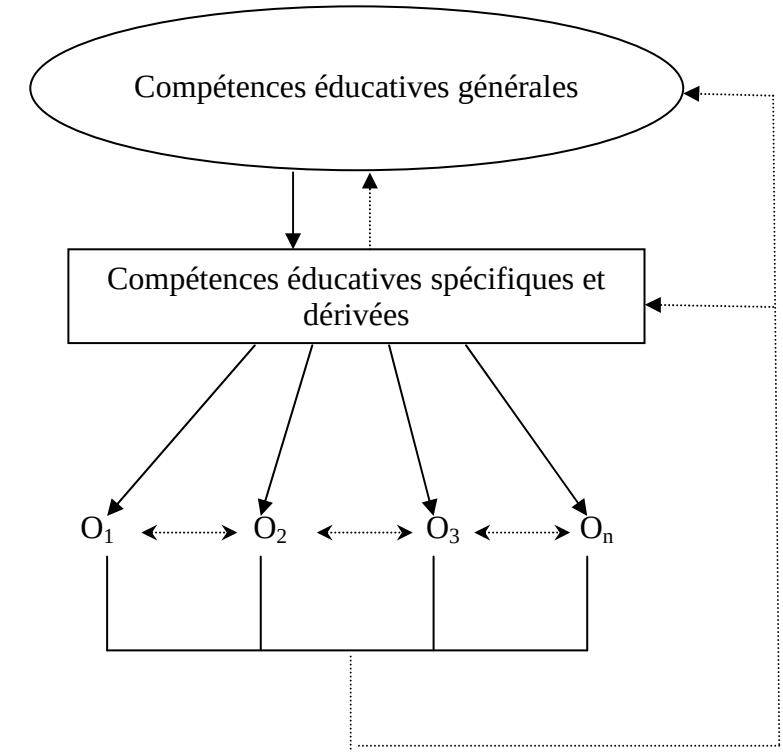
De ce qu'on a affirmer plus haut il résulte *qu'entre les objectifs éducatifs et les compétences éducatives, s'établit un lien d'interdépendence fonctionnelle*. Une compétence désirable et qui eut être atteinte dans le cadre du processus éducatif détermine l'apparition des objectifs éducatifs tous ceux-ci sont bien formulés, du point de vue opérationnel et si, ultérieurement, dans les conditions de la valorisation de certains contenus instructifs-éducatifs et d'un système de ressources humaines, méthodologiques, matérielles, d'espace et de temps, ils sont suivis, atteints et évalués, ils assurent à la fin de la période d'instruction, la formation chez les personnes éduquées, de la compétence éducative visée.

En guise de conclusion, nous pouvons affirmer *qu'entre les composantes éducatives et les objectifs opérationnels s'établit un lien biunivoque qui peut être valorisé même en tant qu'élément de référence dans les activités de projection didactique, d'organisation, de réalisation, d'évaluation et d'autoévaluation (formative et sumative) et de réglement de l'instruction*.

Dans la figure présentée (Figure 1), nous proposons une illustration simple des relations qui s'établissent entre les compétences éducatives et les objectifs opérationnels dans les démarches didactiques entreprises au niveau micro.

Pour que le système des compétences éducatives générales et spécifiques devienne opérant, il est nécessaire que le processus d'enseignement, qui se veut (inter)actif présuppose l'articulation des compétences, des attitudes et des connaissances dans des structures opérationnelles, valorisables dans le cadre de la résolution créatrice des problèmes de natures intelectuelle et pratique. Il est vrai que la modalité d'articulation dans des structures personnelles opérationnelles et l'efficience de cette articulation sont déterminées par le contexte dans lequel intervient l'enseignement, par l'âge de ceux qu'apprenent, par leur personnalité, par les caractéristiques du milieu d'enseignement, par les ressources matérielles utilisées etc.

Pour une formation et pour une modélisation plus éfficiente des compétences éducatives générales spécifiques et dérivées, il est récommandé de réaliser un design curriculaire différencié, tenant compte des niveaux de complexité et de difficulté, de façon à ce qu'on prisse assurer "la différenciation des personnalités" et donner la possibilité à ceux qui apprennent de choisir seuls les trajets de leur propre formation et de leur connaissances, en tenant compte de leur propre profil d'intelligence, de leurs besoins et de leurs attentes en matière d'éducation, de leurs intêrets cognitifs, de toutes les articulations et des secrets de leur personnalité. De même, dans de telles conditions, le rôle de l'auto-évaluation systématique du processus didactique, autant de la part de l'enseignant que de la part de ceux qui se forment, est plus important. L'auto-évaluation offre des informations concernant le niveau de formation et de développement des compétences de ceux qui s'instruisent et offre pour le futur des suggestions pour les activités visant à régler les démarches pédagogiques différenciées, de façon à ce que tous les élèves puissent atteindre les standards curriculaires de performance prévues dans les documents scolaires officiels.



générent

réalisent

lien biunivoque (possible)

$O_1, O_2, \ldots O_n$ objectifs opérationnels

Figure 1. La modélisation des relations qui s'établissent entre les compétences éducatives et les objectifs opérationnels

Conclusions

L'expérience pratique commune cristallisée jusqu'à présent démontre le fait que le design curriculaire, respectivement la (re)construction du curriculum représente un processus continu, mais nonuniforme: il présuppose autant d'étapes de changements profonds, majeurs, de changement de paradigme, respectivement de réforme curriculaire que d'étapes de relative stabilité, dans laquelle se réalise l'application du curriculum dans la pratique éducative, au moment où on enregistre et on evalue l'impact, les effets et les résultats de celui-ci au niveau de la personnalité des élèves.

La reforme curriculaire représente une composante essentielle d'une réforme compréhensive de l'enseignement préuniversitaire, conçue comme un processus complexe et graduel, en étapes, car celle-ci vise un groupe-cible très nombreux. Elle se réalise dans des domaines complexes de la projection de la politique éducative entre lesquels s'établissent des relations et elle suppose, assez souvent, un changement de mentalités.

Actuellement, le système éducatif de Roumanie traverse une semblable période de relative stabilité, puisque le segment de curriculum national est terminé à tous les niveaux de l'enseignement préuniversitaire. Les préoccupations des spécialistes, mais aussi des praticiens, sont liées à la vérification du processus d'implémentation du nouveau curriculum, à l'étude de l'impact de la réforme de curriculum et de ses implications et à l'évaluation de l'efficience du nouveau paradigme que cette réforme soutient.

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L'APPROCHE RELATIONNELLE DU STYLE COGNITIVE ET DU STYLE D'APPRENTISSAGE

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ABSTRACT. The Relational Approach to the Cognitive Style and to the Learning Style. This article describes the impact of cognitive style on the learning style and on the way students manage their learning. From neuropsychology (Luria, Flessas and Lussier) and from constructivism (Piaget, Inhelder, Bruner, Feuerstein, Paour, Tardif) learning requires both the student and teacher to develop a plan for perceiving, memorizing and understanding each newly presented item of information. To be effective, this plan takes into account the cognitive style favoured by both the student and teacher. The students, by listening to their peers, discover that there are ways other than their own to perceive, memorize and understand. They may therefore be able to diversify their approaches to learning and improve their cognitive efficiency.

Key-words: cognitive style, learning style, constructivism, neuropsycholoy, metacognition, mediation, cognition, cooperation, cognitive efficiency,

La psychologie cognitive a permis de mieux compredre le rôle actif joué par la personne en situation d'apprentissage, tant au plan des stratégies qu'elle utilise pour être efficace qu'au plan des représentations qu'elle invoque pour donner du sens à son activité. L'approce constructiviste, la theorie métacognitive et les strategies de l'appretissage coopératif a aussi mis en évidence le rôle important de l'organisation des connaissances en mémoire et des interactions sociales dans l'élaborations sociales des nouvelles connaissances (Doise et Mugny, 1981; Flessas, 1997; Lussier et Flessas, 2001; Tardif, 1997).

L'une des thèses généralement acceptée dans le milieu éducatif, dans les classes régulières et dans les écoles spécialisées, veut que l'efficacité et le succès d'une intervention éducative dépendent, en grande partie, de la compatibilité entre le style cognitive, le style d'apprentissage et stratégies d'enseignement (Perradeau,1996; McCarthy, 1997; Tardif, 1997).

1. La définition du style cognitive

Le ***style cognitive*** est la façon propre à chacun de percevoir, de mémoriser, d'évoquer et donc de comprendre l'information perçue à travers les différentes modalités sensorielles qui sont à sa disposition face à une connaissance nouvelle (Flessas, 1997).

Les modalités sensorielles les plus sollicitées dans l'apprentissage sont certainement l'ouïe et la vue, même si l'on sait aussi à quel point le geste et le toucher peuvent être nécessaires à certains enfants, en particulier ceux qui présentent une déficience visuelle ou même auditive. Partant de cette constatation, De La Garanderie (1989) a tenté d'explorer le monde des *visuels* et des *auditifs*, afin de concevoir une pédagogie appropriée pour chacun de ces groupes.

On peut dire que la perception et la mémoire, tant visuelles qu'auditives, constituent les fonctions initiales qui permettront à l'apprenant d'encoder de la meilleure façon possible l'information nouvelle qui lui est proposée au cours d'un enseignement. Ici se joue en particulier la qualité des évocation mentales de nature verbale ou visuelle, qui assurera l'efficacité de l'encodage et du stockage de l'information reçue.

2. L'approche neuropsycholoqique sur la typologie du style cognitive

Neisser (1967) fut le premier psychologue à décrire deux processus cognitifs bien diférenciés permettant un traitement soit *sériel* soit *parallèle* des informations. Après Neisser, le mot *"sériel"* réfère essentiellement à la nature séquentielle des stimuli qui nous parviennent par la voie auditive. Le mot *"parallèle"* quant lui, évoque directement la nature globale des stimuli qui nous parviennent à travers la voie visuelle. Luria (1973) présentait cette dichotomie du fonctionnement cognitif sous les termes *séquentiel* et *simultané.* L'originalité de la conception de Luria repose sur la mise en évidence des processus simultanés, de nature non seulement visuo-spatiale mais ausi linguistique. C'est sur ces derniers que reposerait la compréhension par le sujet de structures logico-grammaticales complexes, requérant les plus souvent une représentation visuelle imageé "quasi-spatiale". Ainsi, il ne suffit pour l'apprenant de connaître isolément le sens de chacun des mots, il lui faut saisir les relations entre ceux-ci ou de constructions grammaticales dans lesquelles l'ordre des mots diffère de l'ordre temporel.

Pour Neisser, le mode *sériel* repose essentiellement sur le fonctionnement de l'hémisphère gauche; il se caractérise par un traitement verbal analytique, temporel, centré sur les détails et les particularités du stimulus étudié et il s'exprime à travers une pensée logique et rationnelle. Le mode *parallèle* se trouve, au contraire, l'apanage de l'hémisphère droit et se caractérise par un traitement synthétique, largement visuo-spatial, privilégiant le contour et la gestalt des stimuli et se traduisant à travers une pensée intuitive et créatrice. Donc, il s'agit ici d'une dichotomie gauche-droite, sau plan des structures cérébrales. Pour Luria, au contraire, chacun des modes *séquentiel* et *simultané* a son siège dans chacun des deux hémisphères, le premier mode étant relié davantage au fonctionnement des zones cérébrales antérieures (fronto-temporales) alors que le second serait plutôt l'apanage des zones postérieures (essentiellement pariétales). Ces correspondrait donc à une dichotomie avant-arrière *(Tableau I).*

Tableau I

Descriptif des styles cognitifs avec leurs caractéristiques (selon B. Virole, 2002)

	SEQUENTIEL (Analitique)	***SIMULTANE (Spatial/holistique)***
Dimension /objets cognitifs	Temps	Espace
Localisation neuro-anatomique majoritaire	Hémisphère gauche frontal	Hémisphère droit parieto-occipital
Fonction perceptive privilégié	Audition Structures temporales	Vision Structures "instantanées"globales
Ressources attentionnelles	Fortes Mémoire immédiate	Faibles Mémoire iconique ("sketch")
Prise de sens	Différée	Immédiate (par hypthèses flottantes)
Mode d'apprentissage	Séries, répétition, règles	Forme globale, intuition, savoir-faire
Structure probable de la mémoire sémantique associe à ce style cognitif	Taxonomie de classes Lexique structuré par phonologie	Scripts Connaissances compilées pragmatiques
Logique	Déductive	Inductive (essais/erreurs généralisation)
Valeurs scolaires	Savoir se relire, rigueur, attention, concentration	Vivacité, inventivité

Les auteurs tels que Luria (1973), Brown (1976), Hecaen et Dubois (1969), Flessas et Lussier (1995), Flessas (1997) s'entendent pour dire que *l'hémisphère gauche* sert de suport privilégié aux processus utilisant le langage, et ceci pour une grande majorité des humains (incluant même un bon nombre de gauchers). Inversement, *l'hémisphère droit*, par sa nature, serait le siège des processus impliquant plûtot la visualisation et la manipulation de l'espace. Cette double dichotomie du fonctionnement cérébral, gauche-droite et avant-arrière, suggère donc la présence de *quatre styles cognitifs.* Les travaux de Flessas et Lussier (1995) ont cherche à définir ces quatre styles auxquels ils ont donné le noms suivants: *séquentiel verbal, séquentiel non-verbal, simultané verbal* et *simultané non-verbal (Tableau II).*

Tableau II

Fonctions cognitives rattachées aux 4 quadrants d'appretissage

Séquentiel verbal	**Séquentiel non-verbal**	**Simultané verbal**	**Simultané non-verbal**
- Fluidité dans l'élocution - Précision du vocabulaire - Mémorisation de séries (chiffres, lettres, mots …) - Perception et discrimination de sons - Enchaînement logique et chronologie des idées.	-Fluidité dans l'enchaînement des gestes -Précision et dextérité manuelle -Mémorisation de séries (gestes, notes de musique …) -Perception et discrimination des détails -Encaînement logique et chronologie des étapes d'exécution.	-Synthèse d'informations multiples -Répresentation mentale imagée construite à partir d'énonces verbaux -Compréhension des symboles graphiques -Utilisation d'analogie et de métaphores.	-Synhèse perceptuelle en gestalt visuelle -Évocation mentale de formes, d'objets, de lieux, de visages … -Compréhension des rapports spatiaux à 2 ou 3 dimensions -Création par analogie ou induction à partir de l'expérience.

Toutefois, Flessas et Lussier (1995) ont refusé toute prétention localisatrice étroite et considèrent que ces styles cognitifs ont d'abord l'intérêt de présenter différentes façons propres aux individus. Au cours des années, chacun développe sa façon de percevoir, de retruover en memoire, d'évoquer et de compredre les duverses informations ou connaissances auxquelles il est exposé. Même si ces différentes fonctions cognitives s'opèrent nécessairement dans les structures du cortex cérébral, Luria (1976, p. 31) reconnaît "qu'elles relèvent de systèmes fonctionnels complexes et qu'elles ne pouvent être localisées à l'intérior de zones étroites du cortex, ni même de groupes cellulaires isolés. Elles dépendent, au contraire, de plusieurs zones qui travaillent en interaction, chaqune d'entre elles ayant son propre rôle à jouer à l'intérieur de ce système fonctionnel complexe (…) De plus, les interactions entre ces diverses zones (…) se modifieront tout au long du développement de l'enfant, en fonction du niveau de compétences auquel il accédera (…)".

Partant de la définition des quatre quadrants, il est possible de concevoir, en référence au cadre pédagogique que certaines matières sont faciles à maîtriser que d'autres à travers un processus donné. De plus, même à l'intérieur de chaqune des matières, les divers objectifs de'apprentissage rejoignent différemment les habilités propres à chacun des quadrants. Même à l'intérieur de chacune des matières les divers objectifs d'apprentissage reposent différemment sur les habiletés propres à chacun des quadrants (*Tableau III* et *Tableau IV).*

Tableau III

Apprenstisage des mathématiques *(selon Lussier* et *Flessas, 2001, p. 83).*

Séquentiel verbal	*Séquentiel non-verbal*
- Mémorisation des tables - Cardination, sériation, réversibilité - Maîtrise des algorihmes. - Résolution du problème en étapes successives. - Opération sus les droites numériques et les fractions. - Lois algébriques.	- Précision dans les mesures. - Souci de la présentation des calculs et des opérations.
Simultané verbal	*Simultané non-verbal*
- Résolution du problèmes raisonnés par représantation visuelle imagée des situations. - Mise en rélation des données du problème sous forme de schémas, diagrammes ou graphiques.	- Disposition spatiale des calculs complexes (multiplications, divisions). - Représentation des volumes des surfaces, des relations en géometrie. - Compréhension par expérimentations concrètes.

Tableau IV

Apprentissage d'autres matières à travers les quatre quadrants
(selon Lussier et *Flessas, 2001, p. 83).*

Séquentiel verbal	*Séquentiel non-verbal*
Histoire -Compréhension de la chronologie -Analyse des événements **Musique** - Lecture de solfége	**Arts plastiques** - Ordre et méthode des l'exécution. - Attention aux détails et à la présentation.
Simultané verbal	*Simultané non-verbal*
Géographie - Évocation des caractéristiques associées aux différentes cultures en géographie humaine. **Histoire** - Évocation des événements et des époques, à travers le contexte historique.	**Géographie** - Lecture des plans et de cartes. - Compréhension des volumes, altitudes, trajets, positions et distances relatives en géographie phisique. **Arts plastiques** - Créativité et esthétisme.

Les exemples suggérés ici, selon Lussier et Flessas, sont évidemment loin d'être exhaustifs. Il serait certainement possible de décomposer encore plus finement chacune des habiletés identifiées dans les tableaux III et IV. Les exemples se veut simplement une tentative d'illustration de la complexité des cessus cognitifs en jeu dans l'apprentissage.

Selon Flessas (1997), être un bon pédagogue requiert donc une grande souplesse dans les moyenns à utiliser pour rejoindre tous les enfants de son groupe, quel que soit leur style cognitif préfrérentiel. Pour que chaque enfant puisse évoluer de façon optimale, ses pédagogues doivent donc appredre à le respecter dans son style cognitif, afin de tirer le meilleur parti de ses forces et lui donner tous les moyens requis pour que leur enseignement porte fruit, car personne n'apprend tout à fait de la même façon.

Gregorc (1982) propose d'adapter notre façon d'enseigner en fonction des différents circuits neurologiques que l'apprenant devra mobiliser pour percevoir, puis traiter l'information. Selon cet auteur, ces circuits se divisent en deux types, soit ceux qui déterminent la perception et ceux qui influencent la réponse. Le premier se scinde en deux composantes: *abstraite* – qui visualise, symbolise, raisonne - et *concrete*, qui est réaliste, directe et fait usage des cinq sens. Il conçoit d'une même manière bipolaire le deuxième type de circuits, soit celui portant sur le type de répose. Le premier pôle est défini comme séquentiel, c'est-à-dire linéaire, en arbre ou en chaîne, étapiste, méthodique et prédéterminé. Le deuxième pôle est dit aléatoire c'est-à-dire holistique, circulaire et présentant une structure complexe où chaque axe recoupe les autres. Ceux deux dimensions produisent quatre combinaisons représentées sur un plan cartésien, ce qui permet de noter le style dominant de même que le style complémentaire (abstrait séquentiel, concret séquentiel etc.) d'une personne. Pour Butler (1984), un style d'enseignement susceptible de s'adapter au style d'apprentissage aléatoire devrait mettre l'accent sur la compréhension alors qu'un style d'enseignement adapté au style d'apprentissage séquentiel devrait insister sur la planification et l'attention aux détails pour réusir à son tour sur l'importance pour réusir une tâche. Cette thèse est en accord avec la théorie du Sperry (1973), qui insiste sur l'importance pour le système éducatif de s'attarder à l'hémisphère droit. Donc, il existe deux modes de pensée, l'une verbale et l'autre non-verbale, représentés, assez séparément, par l'hémisphére gauche et l'hémisphére droit respectivement. Notre système éducationnel tend à negliger l'intelligence non-verbale. La difficulté de'apprentissage, que ce soit durant l'enfance, à l'adolescence et aux différents stades du développement adulte, est spécifiquement académique et se réfère aux deux formes d'intelligence valorisées par l'institution scolaire, à savoir les intelligences *linguistique* et *logico-mathématique.*

La perspective des intelligences multiples (Gardner, 1983, 1996) propose non pas deux formes d'intelligences, mais huit: *linguistique, logico-mathématique, visuo-spatiale, corporelle/kinesthésique, musicale, intapersonnelle, interpersonelle* et, enfin, *naturaliste.*

Le modèle des intelligences multiples s'insère dans un trajectoire développementale où tout humain construit trois types d'apprentissage et quatre vagues de symbolisation complémentaires. Selon Gardner (1993, 1996), chez toute personne, trois types d'apprenants se co-construisent: a) *l'apprenant intuitif* (ou naturel, naïf, universel) – dans les premières 6-7 annés de la vie; b) *l'apprenant* devient *scolaire* avec l'entrée à l'école; c) type *d'apprenant habile* – dans une ou plusieurs disciplines ou celle qui a acquis une expertise disciplinaire. Le tableau suivant résume le cadre géneral du développement de la compréhension du monde chez l'apprenant.

Tableau V.

Cadre géneral du développement de la compréhension du monde (selon Gardner, 1991).

Caractères	Apprenant intuitif (naturel, naïf, universel**)**	Apprenant scolaire (ou traditionnel)	Expert disciplinair (ou personne habile)
Âges	Jusqu'à 7 ans	Âge scolaire	Tout âge
Contraintes	Neurologique Développementale	Institutionelle Historique	Épistémologique Disciplinaire
Performances	Compréhensive Intuitive	Compréhension Conventionelle (ritualisée)	Compréhension Disciplinaire

Gardner (1983, 1993) conçoit l'intelligence humaine non seulement comme une capacité de résoudre des problèmes variés, mais aussi comme la création de produits qui enrichissent la culture. L'intelligence se construit en fonction de dispositions naturelle cultivées. Chaque forme d'intelligence se construit selon une histoire et un rythme qui lui sont propres. Quatre vagues de symbolisation servent de base à la construction des intelligences multiples. Ces vagues sont foncièrement sémantiques et comprend au départ un premier système de symboles (*représentation des événements*) qui s'allie avec le temps et l'experience aux autres systèmes de symboles (*symbolisation topologique et relations temporales et spatiales; relation de quantification* – le nombre devient significatif; *la notation au langue écrit* comme instrument de symbolisation).

La conjonction *intuitif-scolaire* marque plus spécifiquement les formes d'intelligence linguistique et logico-mathématique dans des contextes à la fois informales et formales tout particulièrment à un jeune âge et formels surtout à l'école. L'alliance *scolaire-disciplinaire* comprend plus spécifiquement les formes musicale et spatiale d'intelligence, apprises d'abord de façon spontanée et ensuite consolidées par un entraînement technique et stratégique. Enfin, la liaison *intuitive-disciplinaire* fgavorise les intelligences corporelle/kinesthésique et personnelle (intrapersonnelle et interpersonnelle).

À partir d'une conception constructiviste et socioculturelle, le modèle des intelligences multiples conçoit l'éducation comme un projet de compréhension profonde des différentes styles cognitives et des styles d'apprentissage, projet qui suscite une pensée critique et créative.

3. La definition et les caractéristiques des styles d'apprentissage

Le *concept de style d'apprentissage* apparaît extrêmement polysémique, donnant lieu des conceptions parfois opposées. Certains auteurs mettent l'accent sur les caractéristiques du comportement lui-même, d'autres sur le processus ou la structure inférée à partir du comportement. Pour certains, le style d'apprentissage émerge d'un ensemble de caractéristiques définissant le profil d'apprentissage unique d'un élève; pour d'autres, il renvoie à une typologie caractérisant des types de personnes (Chevrier, Fortin, LeBlanc, Théberge, 2000).

Pour certains auteurs, le style d'apprentissage désigne une certaine manière caractéristique, c'est-à-dire personnelle et distincte, d'agir et de se comporter dans un contexte d'apprentissage. Voici donc quelques exemples de cette type de définition:

a) "Si l'on peut définir le style d'apprentissage d'une personne comme sa façon à elle d'appredre, modelée par son style cognitif (sa façon de fonctioner) et son vécu en matière d'enseigner-appredre" (Patureau, 1990, p. 117).

b) "Le style d'apprentissage est la manière don't chaque élève commence à se concentrer sur une information nouvelle et difficile, la traite et la retient" (Dunn et Dunn, 1993, p. 2).

c) Le style d'apprentissage est "l'ensemble de facteurs cognitifs, affectifs et physiologiques caractéristiques qui agissent à titre d'indicateurs relativement stables de la manière don't l'apprenant perçoit son environnement d'apprentissage, interagit avec cet environnement et y répond" (Keefé, 1987, p. 36).

Ces régularités caractérisant les apprenants dans leurs conduites d'apprentissage font dire Reinert (1976) et Curry (1990) que le style d'apprentissage coresond à une sorte de progamme intérieur qui gère notre comportement cognitive. Ce programme serait différent d'une personne à l'autre et permettrait alors de caractériser chacun. Le style d'apprentissage renvoie à l'existence d'une structure psychologique chez l'individu, structure correspondant à une prédisposition qui se manifesterait dans le comportement cognitive de l'apprenant (Das, 1988).

Beaucoup de chercheurs considèrent que cette prédisposition chez la personne à agir d'une certaine manière s'accompagne d'une préférence pour celle-ci. Ainsi verra-t-on des définitions du style d'apprentissage avoir pour concept essentiel celui de préférence. Après Legendre (1993), le style d'apprentissage est le mode préférentiel modifiable via lequel le sujet aime maîtriser un apprentissage, résoudre un problème, penser ou, tout simplement, réagir à une situation pédagogique. Cette caractéristique propre à chacun se traduit par une orientation marquée vers les personnes ou vers les tâches, par des capacités perceptuelles différentes, par une sensibilité plus ou moins grande à un encadrement extérieur,

par une propension à travailler seul ou en équipe, par une préférence pour un enseignement structuré etc.

Pour Riding et Rayner (1998, p.51), le terme "style d'apprentissage" renvoie à un ensemble individuel de différences qui incluent non seuelment une préférence personnelle exprimée concernant l'enseignement ou une association avec une forme particulière d'activité d'apprentissage, mais aussi à des différences individuelles que l'on retrouve en psychologie de l'intelligence ou de la personnalité.

Certains auteurs trouvent important d'introduire la condition d'efficacité dans la définition de style d'apprentissage.

La réflexion sur les styles d'apprentissage a amené les chercheurs à identifier un certains nombres de propiétés: multidimensionnalité, l'interdépéndance de ses dimensions, sa généralisabilité, sa neutralité, son origine et sa modificabilité.

La prèmiere question est celle de la multidimensionalité du style d'apprentissage. Les facteurs susceptibles d'influencer le résultat de l'apprentissage sont: des caractéristiques de l'apprenant lui-même (aspects cognitif, affectif, conatif), que du processus d'apprentissage et de l'environnement. Les dimensions correspondent souvent à des de base dans le fonctionnement humain: rapport au savoir (abstrait versus concret; cognitiv versus affectiv), rapport d'autorité, motivation etc. Curry (1983) propose de classer les modeles de style d'apprentissage en trois groupe de niveaux différents: a) les préferences pour des condiotions d'enseignement et d'apprentissage particuliéres (*instructional preference*); b) le style de traitement d'information (*information processing style*); c) le style cognitive de la personnalité (*cognitive personality style*).

Pour les autres auteurs, le style d'apprentisagge se compose de trois ou quatre groupes ou catégories de dimensions: le cognitif, l'interpersonnel et l'environnement (Grasha, 1983); le processus d'apprentissage, l'orientation à l'égard de l'étude, les préférences à l'égard des méthodes d'enseignement et le développement d'habilités cognitives (Riding et Rayner, 1998).

Le probleme de la multidimesnionnalité du style d'apprentissage pose celui de la relation entre dimensions. Dans quelle mesure peuvent-elles coexister chez un même individu? Ainsi, le style théoreticien et le style actif peuvent-ils coexister chez un même individu? Kolb (1984) considère incompatibiles les pôles *concret* et *abstrait* ainsi que le pôles *actif* et *réfléxif.*

Honey et Mumford (1992) conçoivent le style d'apprentissage comme résultant du profil de l'individu sur les quatre dimensions. Selon Honey et Mumford, les quatre styles d'apprentissage sont: le *style actif, le style réfléchi, le style théoricien* et *le style pragmatique.*

a) Le style actif se caractérise par le goût de s'impliquer concrètement dans une expérience, de prolonger dans l'activité "ici et maintenant". Ce goût est particulièrment stimulé lorsque l'expérience comporte un élément de nouveauté ou de défi et qu'il y a possibilité de jouer un rôle actif en interaction avec d'autres personnes. Le style actif est aussi marqué par le goût de s'engager avec les gens, de

confrunter ses idées aux leurs et de relever des défis ou résoudre des problèmes en équipe. Il se caractérise aussi par la présence d'ivention d'idées en absence de constraintes de structure ou de normes.

b) Le style réfléchi se caractérise par l'importance du recul et de la distance prise par rapport aux gens et aux choses. Il est marqué par la prudence et la réflexion approfundie avant de predre des décisions et d'agir. L'observation, l'écoute, l'accumulation exhaustive de données avant d'émettre une opinion apparaissent essentielles. Revenir sur les événements et réviser ce qui s'est produit sont des conduites importantes. Il se caractérise aussi par le désir de prendre des décisions sans contrainte de temps.

c)Le style théoricien se caractérise par la recerche de logique et cohérence dans l'organisation des informations accumulées. Il se caractérise aussi par le goût de l'analyse et de la synhèse, un intérêt pour les présupposés de base et les principes sous-jacents, une valorisation du rationnel et de l'objectivité. Ce goût est stimulé lorsqu'il s'agit de comprendre et d'expliquer en explorant de façon méthodique les liens entre les idées ou en étant confronté à des systèmes, des modèles ou des théories. Suivre une démarche systématique est très important lorsque des problèmes sont abordés.

d)Le style pragmatique se caractérise par un intérêt pour la mise en application des idées, des théories, des techniques dans le but explicite d'en valider le fonctionnement. Il se caractéise aussi par une préférence marquée pour les solutions réalistes et pratiques, par le goût de predre des décisions utiles et de résoudre des problèmes concrets. Répodre à un besoin immédiat bien identifié, trouver des bénéfices concrets, voir des avantages pratiques sont considérées comme des dimensions importantes de l'apprentissage.

La valeur des styles d'apprentissage est relative. Certains styles sont plus adaptés dans certains circonstances que autres et inversement. La question de la valeur des styles d'apprentissage nous a conduit à soulever celle de l'influence du context dans lequel l'apprenant se trouve. Le style d'apprentissage é semble pas indépendent du context qui lui donne existence . Ainsi, des lycéens n'adoptent pas nécessairement les mêmes styles d'apprentissage en situation d'apprentissage scolaire et en situation d'apprentissage d'une activité de loisir (Orly-Louis, 1995). Le style d'apprentissage n'est pas indépendant du sens que la personne donne à la situation d'apprentissage.

Selon *la vision dinamique et constructiviste* (Chevrier, Frortin, LeBlanc, Théberge, 2000), le style d'apprentissage est une caractéristique essentiellement acquise, avec une origine neurophysiologique innée. Les caractéristiques devrait pouvoir se modifie, voire méme s'accommoder de l'adoption de caractéristiques propres à d'autres styles. L'acquisition d'un nouveau style n'est pas vécue comme la modification de "son style" d'apprentissage, mais l'ajout d'une nouvelle manière de faire à son répertoire. Il est dans l'intérêt de l'apprenant de dévgelopper un style flexibile, correspondant à la possibilité d'adopter plusieurs styles d'apprentissage

selon les circonstances. Dans une manière heuristique, il semble plus valable de considérer que le style d'apprentissage se construit et peut se modifier. L'apprenant peut générer trois processus de construction du style d'apprentissage: *l'adaptation ou l'action de retrouver son style; le perfectionnement de son style; l'adoption d'un nouveau style.*

Le style d'apprentisagge ne peut être foncièrement personnel que dans la mesure où il est social. Sans la presence de diverses personnes qui apprennent de différentes manières, il n'y aurait pas de style d'apprentissage. La dimension sociale du style d'apprentissage apparaît donc tout aussi importante que la dimension personnelle. Donc, le travail en équipe et *l'apprentissagge coopératif* a pour objet d'améliorer la réussite des élèves, en misant sur la qualité des relations interpersonnelles lors des activités proposées. L'apprentissage coopératif met donc l'accent sur le travail en groupes restrents où de élèves, de capacités, de styles cognitif, de styles d'apprentissage et de talents différents, s'efforcent d'atteindre un objectif commun. Le travail est structuré de façon que chaque élève participe à l'accomplissement de la tâche proposée. Cette strategie pédagogique favorise l'acquisition d'habiletés cognitives et sociales qui ne sont pas innées (Abrami, 1993; Arcand, 1996).

4.L'application pédagogique des modèles du style cognitif et du style d'apprentissage

Être un bon pédagogue requiert une grande souplesse dans les moyens à utiliser pour rejoindre tous les enfants de son groupe, quel que soit leur style cognitif préférentiel.

L'enseignant doit être conscient de la nécessité à développer son empathie cognitive. La syntonie des styles entre maîtres et élèves favorise l'efficacité de l'apprentissage. Une définition de l'apprentissage, ouvertement holistique, est proposé par Maryvonne Sorel (cité par Perraudeau, 1996, p. 151): "Apprendre, c'est mettre en oeuvre des activités mentales et des stratégies, négociées avec l'ensemble des variables de situations en compte par le sujet".

Selon Perradeau (1996, p. 151), "les méthodes cognitives s'imposent comme une réponse plausible aux nombreuses questions soulevées actuellement: elles constituent un pôle alternant à l'enseignement de type accumulatif et linéaire".

Les méthodes cognitives sont centrées sur les conditions de l'activité mentale, sur la gestion mentale, sur la (re)construction des opérations mentales des élèves, pour ameliorer le style cognitif, le style d'apprentissage et la capacité d'apprentissage des élèves.

Connaître le style personnel autant que celui des élèves est un enjeu commun à toute pratique cohérente d'éducabilité (Perradeau, 1996, p. 53).

Dans le *encadré 1* et *encadré 2* sont énumérées les recommandations très générales propres à développer chez les enfants de meilleures srtratégies cognitives.

Encadré 1.

Pédagogie préconisée pour augmenter l'efficience des processus simultanés chez l'enfant qui privilégie un traitement séquentiel (selon Lussier et Flessas, 2001, p. 85)

- Décompenser pour lui le matériel en étapes successives. Proposer à chacun niveau des unités progressives (dont la complexité dépendra du niveau de maîtrise de l'enfant) et attirer son attention sur leur déroulement temporel.
- L'amener à verbaliser ce qui doit retenir du déroulement de l'activité, en numérotant l'ordre des étapes à parcourir. S'aider au besoin de pictogrammes disposés de façon linéaire et illustrant chacun un détail visuel pertinent pour faciliter le rappel ordoné des étapes de déroulement, en mobilisant la mémoire visuo-séquentielle.
- Répéter la démarche à partir de situations similaires jusqu'à ce que le sujet semble avoir bien automatisé le déroulement de l'activité et attirer son attention sur la similitude des situations, afin qu'il développe une capacité de généralisation.
- L'amener à avoir une vue d'ensemble de la procédure acquise et à générer pour lui-même des situations similaires.

Encadré 2.

Pédagogie préconisée pour augmenter l'efficience des processus séquentiels chez l'enfant qui privilégie un traitement simultanés (selon Lussier et Flessas, 2001, p. 85)

- Proposer préalablement au sujet un matériel à manipuler ou une situation concrète lui permettant de concevoir une relation entre le nouvel apprentisssage proposé et ses expériences antérieures.
- Lui présenter une vague vue générale de l'activité à entreprendre, mettant l'accent sur l'objectif final ou sur le but qu'il doit viser dans sa réalisation.
- Attirer son attention sur les détails importants qu'il é doit pas négliger, ainsi que les étapes don't l'enchaînement est indispensable à la cohérence du produit final.
- L'engager à prendre le temps nécessaire pour se faire un plan de travail qui respecte toutes les exigences de la tâche et à se vérifier pour finaliser sa production.

Ces "moyens" d'enseignement devront pouvoir tenir compte spécifiquement des competences séquentielles ou simultanées propres à chaqun des apprenants ainsi que de leur mode préférentiel d'évocation mentale de nature auditive ou visuelle. Il apparaît donc judiceux généralement de présenter un même concept à travers des modalités variées plutôt que de se répéter consciencieusement.

Les enfants en difficultés d'apprentissage sont généralement ceux qui n'ont pas appris à se construire de bonnes évocations mentales (auditives ou visuelles) en partant de leur style cognitif préférentiel (séquentiel ou simultané).

Ainsi, bon nombre d'enfants hyperactifs présentent des forces dans le registre simultané non-verbal, du fait même que leurs capacités attentionnelles réduites leur ont rarement permis de développer les habilités d'écoute et de discrimination auditive propres au registre séquentiel verbal. Or, l'apprentissage des matières, surtout en 1-re et 2-e années du primaire, repose initialement sur la mise en mémoire des correspondances phonèmes-graphèmes et des tables d'opération en calcul mental, habiletés qui rejoignent naturellement les élèves plus séquentiels. Les enfants hyperactifs sont donc fréquemment en difficultés d'apprentissage, dès le debut du primaire. Une strategie pédagogique plus visuelle et kinesthésique, stimulant la formation d'associations entre le son de la lettre et sa forme, avec le support de pictogrammes et de mouvements corporels reproduisant dans l'espace la graphie (comme les gestes Borel-Maisonny) a certainement plus de chances de rejoindre ces enfants. Cette pédagogie s'appuie en effet sur leurs forces dans le registre visuo-spatial et dans le domaine de la créativité tout en leur permettant de "mentaliser" les gestes à accomplir et donc, de canaliser leur agitation motrice (Lacroix, cité par Flessas, 1997).

Une fois maîtrisées les techniques du décodage grapho-phonétique en lecture, c'est à présent les enfants trop séquentiels dans leur style cognitif qui risquent à leur tour de se retrouver en difficultés d'apprentissage. En effet, les enfants hyperactifs ont naturellement tendance à n'utiliser qu'un décodage son à son et mot à mot, ce qui ne leur facilite pas l'extraction du sens global du texte. Pour eux, le pédagogue devra utiliser un enseignement très explicite de la signification des mots dans leur sens figuré et un entraînement à une reconnaissance visuelle "eidétique" des mots les plus familiers, afin qu'ils puissent accélérer leur vitesse de lecture et apprendre à utiliser des indices lexicaux pour en deviner le sens. Les enfants hyperactifs bénéficiera donc généralement d'un enseignement très "verbal" dans sa modalité, mais qui s'assurera d'équilibrer les processus séquentiels et simultanés dans la maîtrise du langage afin que ces enfants ne développent pas exclusivement leurs compétences dans l'apprentissage par coeur. Par ailleurs, il n'est rare de constater qu'un enfant ed difficultés d'apprentissage continue d'utiliser de façon non efficiente des stratégies contraires á son style cognitif préférentile, possiblement parce qu'elles lui ont été enseignées comme telles. Il est alors nécessaire de lui faire predre conscience de son mode particulier de fonctionnement, afin qu'il parvienne à mettre en place de façon

progressive de meilleures habitudes de traitement d'information qui respectent à la fois son mode d'évocation et son style cognitif (Flessas, 1997).

L'évaluation neuropsychologique ne se limite pas seulement à l'identification des déficits mais accorde un intérêt égal, sinon plus grand, aux fonctions préservées chez l'enfant et sur lesquelles il pourra s'appuyer afin de proposer des pistes de rééducation ou des voies de compensation pour l'amener à mieux traiter l'information .

Les études empiriques sur les capacitées des élèves en difficulté d'apprentissage révèlent sept forces marquantes chez certains sujets de cette population: a) la perception visuo-spatiale; b) l'expérience concrète; c) l'ancrage dans le présent; d) l'écriture conceptuelle; e) la pensée divergente; f) un intérêt pour l'informatique; g) une disposition musicale.

Dans un perspective du modèle des intelligences multiples, Armstrong (1987, cité de LeBlanc, 1997), rapporte que les élèves en difficulté d'apprentissage manifestent des forces, de diverses grades, dans toutes les formes d'intelligence. Toutefois, deux formes d'intelligence sont plus fréquemment jugées comme dominantes, et notamment les intelligences visuo-spatiale et corppoelle-kinesthésique, alors que deux autres sont considérés comme plus faibles, à savoir les intelligences linguistique et logico-mathématioque. Selon les résultats d'Armstrong, un contexte qui renforçe les pratiques et les activités d'apprentissage artistiques, spatiales et corporelles serait optimal pour les élèves en difficulté d'apprentissage.

À la lumière des forces particulières des élèves en difficulté d'apprentissage dans les formes d'intelligence visuo-spatiale et corporelle-kinesthésique d'une part et l'expérience concrete, ll'ancrage dans le présent, l'écriture conceptuelle, la pensée divergente, intérêt pour l'informatique et la disposition musicale, d'autre part, des options pédagogiques adaptées s'avèrent frucueuses. Le profil des intelligences multiples chez l'enfant et adolescent avec des difficultés d'apprentissage pourrait aider l'élève et son enseignant à identifier les forces spécifiques de l'élève.

5. Les styles et stratégies d'enseignement

Le style d'enseignement se rapporte à la manière personnelle d'établir la relation avec les élèves, de gérer une classe ou un groupe d'apprentissage, sans préjuger des méthodes ou des techniques mises en oeuvre.

Therer et Willermart (1988) ont tenté d'identifier et de décrire quatre **styles d'enseignement** représentatifs des pratiques pédagogiques observables. Ces styles se définissent à partir d'un modèle bidimensionnel qui combine deux attitudes de l'enseignant: attitude vis-à-vis de la matière et attitude vis-à-vis des apprenants. Chacune de ces attitudes s'exprime à des degrés divers, faibles ou forts, désintérêt ou intérêt. La combinaison de ces deux attitudes permet d'identifier **quatre styles de base**: a) ***transmissif –*** centré davantage sur la matière; b) ***incitatif*** – centré à la fois sur la matière et sur les apprenants; c) ***associatif*** - centré davantage sur les apprenants; d) ***permissif*** - très peu centré tant sur les apprenants que sur la matière.

Quatre critères doivent être retenus pour choisir un style d'enseignement: a) la nature des objectifs à atteindre; b) le degré de motivation des apprenants; c) la capacité cognitive des apprenants; d) le style d'apprentissage des élèves ou des étudiants.

Therer et Willemart (1988) formulent hypothèse que chacun de ces quatre styles peut se révéler efficace ou inefficace en fonction des situations et en fonction des interventions plus spécifiques de l'enseignant ou du formateur. Il n'existe donc pas un"bon style" valable en toutes situations et circonstances.

La plupart de nos interventions, avant tout celles qui devraient améliorer la capacité d'apprentissage à un niveau général, produisent des effets remarquables chez les élèves les plus forts, mais des effets seulement modestes chez les plus faibles.

Pour que chaque enfant puisse évoluer de façon optimale, ses pédagogues doivent donc apprendre à le respecter dans son style cognitif, afin de tirer le meilleur parti de ses forces et lui donner tous les moyens requis pour que leur ensegnement porte fruit, car personne n'apprend tout á fait de la même façon.

À ce jour, ***l'enseignement stratégique*** (Tardif, 1997, p.295-296) est le modèle d'enseignement qui semble les plus approprié et le plus efficace pour créer et réaliser des interventions avec l'élève, qui soient cohérentes avec la conception cognitive de l'enseignement et de l'apprentissage, avec les principes de la psychologie cognitive. En classe, les conséquences de l'enseignement stratégique sont nombreuses et variées. *L'enseignant stratégique* intervient non seulement dans le contenu, mais également dans les stratégies cognitives et métacognitives relatives à ce contenu. Il est un penseur et un penseur de décisions qui connaît très bien le contenu des programmes, et les stratégies cognitives et métacognitives relatives à ces contenus. *L'enseignement stratégique* comprend trois phases: préparation à l'apprentissage, la présentation du contenu et l'application et le transfert des connaissances.

L'enseignant stratégique est un "éducateur-médiateur", au service de l'émergence d'un développement positif des élèves. Témoin privilégié du débat sujet/environnement, il observe le comportement pour en évaluer et en favoriser les progrès des apprenants. L'espace pédagogique, celui dans lequel s'exerce ce "savoir organiser les circonstances", est alors, au sens strict, un "espace de médiation", selon le terme cher à Feuerstein (1989). La médiation a deux rôles de jouer dans la théorie de la modificabilité cognitive et affective. Le premier rôle relève d'un *facteur explicatif*: les éléments constitutionnels et structuraux de l'homme font partie de la capacité qu'a l'être humain de se modifier constamment. Cette modification ne se fait pas uniquement en réponse à un écosystème mais à cela s'ajoute un acte de volonté. Il faut aussi prendre en compte la plasticité cérébrale et de l'esprit humain, car l'homme a pour modalité d'action entre lui et le monde une modalité médiatisante. Le deuxième rôle de la médiation qui relève d'un *factor applicatif* consiste à prendre tous les ingrédients de cette interaction responsible de la modificabilité pour les utiliser là où cette modifiabilité existe peu ou n'existe pas. Un système d'application tel que "Learning Potentiel Assessment

Device" (LPAD) a pour élément pivotal l'expérience médiatisante. Le Progamme d'Enrichissement Instrumental (PEI) appliqué lui aussi la théorie de la médiatisation ainsi qu'un troisème système derivé deux autre: la Formation des Environnements Modifiants (Feuerstein, 1996, p. 151-152).

La tâche essentielle de l'enseignant stratégique est d'organiser la contexte éducatif, en imaginant et en proposant les situations-problémes adéquates. Il instaure une relation d'aide. Qui est là, non our sanctionner, mais pour aider les élèves, pour faciliter les apprentissages et pour favoriser les progrès. L'éducateur est un intermédiaire: entre l'élève et son milieu, entre l'élève et le savoir, entre l'élève et l'élève. Son action est, par essence, la médiation; c'est ce qui rend possible la dynamique "médiatrice" du développement du apprenants (Hadji, 1996, p. 64-65).

L'enseignant stratégique est un entraîneur qui place constamment l'élève dans un contexte de résolution de problèmes et un médiateur entre les informations et l'éléve. L'enseignant stratégique agit directement sur la construction de la connaissance dans la mémoire et il organise toujours avec l'élève les connaissances en schémas.

L'enseignant doit considérer que l'élève est non seulement cognitif, mais également affectif. Dans ce sens, sens interventions au regard des composantes de la motivation scolaire sont fréquentes et elles concernent autant les conceptions de l'élève que ses perceptions.

L'enseignant stratégique agit sur les facteurs affectifs qui contribuent à l'engagement, à la participation et à la persistance de l'élève dans la tâche. Il est un motivateur qui tient compte de la perception que l'élève a de lui-même comme apprenant et comme personne. Selon Tardif (1997, p.466), les fondaments et les caractéristiques de la communication pédagogique stratégique sont à la base de toute intervention pédagogique axée sur la construction du savoir par l'élève et l'enseignement est nécessairement systhémique. L'un des buts universellement reconnus à l'approche pédagogique est d'apprendre à l'élève à penser et de lui ouvrir l'esprit de telle sorte qu'il soit en mesure de diversifier ses intérêts et de rechercher constamment des champs nouveaux d'invesatigation.

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L'ANALYSE DE LA MÉTHODOLOGIE UTILISÉE POUR L'ÉTUDE DES DOCUMENTS AU CADRE DES TRAVAUX DIRRIGÉS

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ABSTRACT. In our paper we present the mothodology for studying a text document. This methodology was used during the *Travaux dirriges* associated to the course *Political History of Europe in the 19th century.* The course was organised by Marne-la-Valee University during the Master de Sciences Politiques – Ides Politiques et Intelligence du monde contemporain. We also present the methodology for realising a presentation and an example of presentation is presented (this was realised by the M.Sc. student during these *Travaux dirriges).* During our study we used the following methods of qualitative research: observation, interview, document study, and analysis.We drew several conclusions after analysing the organising of the seminars, the methodology, the M.Sc. student's opinions and her results.

1. Le contexte de la recherche

Dans cette épreuve on analyse la méthodologie de l'étude d'un document texte utilisée au cadre des travaux dirigés associés au cours *Histoire politique du XIX^e siècle.* A ce cours ont participés des étudiants qui suivent le master *Études européennes comparées* de la Faculté d'Etudes européennes, l'université «Babeş-Bolyai» de Cluj-Napoca, et qui ont obtenu une bourse Erasmus-Socrates. Le cours est organisé à l'Université de Marne-la-Vallée, au cadre du master *Sciences Politiques – Idées Politiques et Intelligence du monde contemporain.* Les travaux dirigés associés au cours ont lieu deux heures, deux fois par semaine, pendant douze séances. A la première séance, le professeur a offert aux étudiants le programme des activités. Pour chaque séance on a précisé la date, le sujet abordé, les activités qui vont avoir lieu (exposés, commentaires de documents en groupe, les devoirs), on a précisé les indications méthodologiques et on a indiqué la bibliographie. Le but de l'étude est de voir dans quelle mesure la méthodologie utilisée en France pour l'étude des documents peut être appliquée dans les séminaires organisés pour d'autres cours de l'enseignement universitaire. Pour cette étude on a utilisé les méthodes de la recherche qualitative: l'observation, l'interview, l'étude des documents, l'analyse.

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2. La méthodologie utilisée dans l'étude d'un document

Pour chaque séance des travaux dirigés, on a demandé aux étudiants de rédiger un exposé en analysant individuellement un document. Généralement, on considère comme document dans le système français d'enseignement les documents suivants: des articles de journaux et de revues, des fragments de livres, les diagrammes, les cartes, les affiches, les photos, etc. Lorsqu'on étudie un livre, pour éviter le chargement et pour assurer une meilleure lecture, on choisit seulement un fragment essentiel, généralement, avec une longueur de quatre pages pour une séance.

L'étude du document se déroule pendant plusieurs étapes. A la première lecture –globale - du texte, le lecteur se familiarise avec le texte et se fait une idée générale du contenu. A une deuxième lecture – analytique - on souligne les mots clés, on identifie les thèmes et les idées principaux, on identifie la problématique à partir du texte. Dans cette étape on identifie les dates, les personnages, les éléments obscures et ceux manquants, mais qui peuvent être importants pour la bonne compréhension du texte. Après l'analyse du document, on doit ordonner et hiérarchiser les dates, on doit précisément expliquer chaque élément inconnu et sélectionner les informations conformément à la problématique identifiée au début.

La dissertation ou l'exposé se réalise à partir d'un plan qui suit le contenu du document. La dissertation comprend l'introduction, le récit argumenté, les conclusions et la bibliographie. Dans l'introduction on indique l'auteur et le destinataire et on précise la nature du document (normatif, officiel, intime: correspondance, mémoires etc.) Après la délimitation des termes et la définition du sujet, on encadre le sujet en temps et espace, et on établit le contexte historique du document. En introduction on annonce aussi la problématique et le plan de la dissertation. La problématique doit être formulée à partir du texte et elle est ciblée sur le sujet du document. La problématique représente une question qui nécessite une réponse réflexive et argumentée. En introduction on spécifique aussi si le texte est authentique, cohérent ou crédible.

Le plan de la dissertation peut être chronologique ou thématique en fonction du document. Le plan chronologique met en évidence la continuité des événements ou la rupture de l'évolution des événements. Le corps principal de l'épreuve est structuré en trois parties, chacune avec un titre noté avec numéros romains (I, II, III). Chaque grande partie commence avec une phrase d'introduction et finit par une petite conclusion. Chacune de ces trois parties principales est structurée à son tour en trois parties, chacune avec un sous titre noté avec majuscule (A, B, C). Pour chaque sous partie on précise l'idée principale, l'argument ou les arguments qui la soutiennent, et les exemples ou les preuves. Les exemples sont tirés du texte ou, dans certaines situations, on peut donner des exemples d'autres sources (d'autres lectures, de la vie quotidienne). Dans les conclusions finales, on répond à la problématique, on met en évidence la contribution historique du document, son importance, ce qu'il a apporté de nouveau ou quels changements il a causé.

Dans les exposés on utilise des citations courtes du texte étudié (maximum deux ou trois lignes), qui doivent être commentées. Pour rédiger le texte on utilise l'expression impersonnelle, et lorsqu'on fait référence à l'auteur du texte on utilise la première personne du pluriel, et pas singulier. Dans l'analyse de ces textes on doit éviter l'expression des opinions personnelles pour garder l'objectivité.

3. Résultats

On a proposé la tâche suivante: Expliquez, en suivant l'ordre du texte ces lignes de Pierre Manent, extraites de son «Cours familier de philosophie politique» paru en 2001.

«Au fond, les Européens voudraient que le principe démocratique se suffise à lui-même, qu'il suffise à définir l'Europe démocratique comme corps politique. Mais ce n'est pas possible. Le principe démocratique ne suffit pas à définir le cadre politique dans lequel il s'exerce. Le principe démocratique, c'est le principe du consentement: il n'y a pas d'obéissance légitime, pour l'individu ou pour le groupe qu'à une loi ou à une institution, à laquelle, l'individu ou le groupe, a donné au préalable son consentement, par lui-même ou par ses représentants. Ce principe peut être mis en œuvre dans les communautés les plus diverses: dans la famille, dans le village, dans la cité, dans la nation, etc. À la question: dans laquelle? Le principe par lui-même ne permet pas de répondre. Cela n'est pas inclus dans le principe. Les démocraties européennes se développent dans des communautés, les nations précisément, d'abord élaborées par des régimes non démocratiques, par des nations. […] Il fallait que la France fût faite, en effet, c'est-à-dire que le peuple français fût *défini*, pour qu'il puisse entreprendre de se gouverner par lui-même comme il le fit à la révolution, avec une soudaineté et une radicalité qui firent vaciller l'Europe. […] La démocratie, le principe démocratique, a besoin, pour devenir réalité, d'un *corps* – d'une population *définie*. […] Il semble que la démocratie, dans la construction européenne, s'efforce d'échapper à la triste nécessité d'avoir un corps. Alors qu'elle se donne un corps sans limites, cette Europe en extension indéfinie, cette Europe contradictoirement définie comme extension indéfinie.»

Le plan de l'exposé réalisé par l'étudiant est le suivant:

Introduction

I. La définition de l'Europe
   - A. Différentes perspectives sur l'idée d'Europe
   - B. Définition politique de l'Europe
   - C. Le principe démocratique du consentement

II. L'Europe - produit national
   - A. À partir des monarchies absolues…
   - B. …vers la naissance des démocraties européennes modernes
   - C. Les origines de la démocratie

III. La construction européenne
   A. La nécessité d'un «corps»
   B. Une Europe sans frontières?
   C. Une Europe sans frontières?

Conclusions
Bibliographie
On a réalisé la dissertation suivante.

INTRODUCTION

Ces lignes font partie du chapitre VI, intitulé «L'Europe ou l'avenir de la nation» du livre de Pierre Manent: *Cours familier de philosophie politique*. La problématique est annoncée par l'auteur dés le début du chapitre: «l'ambivalence qui caractérise la relation entre la nation et la démocratie[3]». L'auteur réfléchit à la signification de ces deux notions dans le nouveau contexte politique, c'est-à-dire l'Union européenne; il réfléchit à la relation qui s'établit entre la nation et la démocratie. Est-ce que la nation est le dernier obstacle dans l'accomplissement de la construction européenne? Est-ce que la démocratie suffit-elle pour dépasser l'hétérogénéité des pays européens? Comment envisager la construction européenne: comme effacement des nations (par dépolitisation et dénationalisation) et uniformisation, homogénéisation des individus ou comme accentuation des spécificités régionales et soumission à un régime commun (la démocratie)? Pierre Manent essaie de répondre à ces questions et de trancher ce débat car cette ambiguïté «plus elle se prolonge, plus elle risque de devenir ruineuse[4]». Il faut à tout prix que les Européens donnent des scénarios pour l'avenir, qu'ils prennent la responsabilité de l'avenir. Il faut que les Européens envisagent des solutions et des projets à long terme, sans attendre que les choses viennent à leur gré, sans attendre que les événements arrivent et qu'ils créent eux-mêmes les événements.

LA DÉFINIFION DE L'EUROPE

«*À l'unité, la culture dit toujours oui, l'économie à peu prés ou; la politique reste réticente.*» (Fernand Braudel). Cette citation surprend très bien l'évolution de la perception de la notion d'«Europe» pendant les siècles. Même si la signification de ce mot a toujours été mise en question selon la conjoncture historique du moment, même si chaque époque a produit sa propre représentation de l'Europe, on peut pourtant surprendre une évolution du point de vue, de la perspective des définitions.

[3] Pierre Manent, *Cours familier de philosophie politique*, Paris, Gallimard, 2001, p. 101.
[4] Pierre Manent, *op. cit.*, p. 107.

Différentes perspectives sur l'idée d'Europe

Au début, pendant l'Antiquité, l'Europe a été définie du point de vue géographique; cette notion représentait le nom du continent, donc une notion neutre. Bien sûr, la perspective géographique a évolué pendant le temps, à présent admettant qu'il n'y a pas une unité géographique, que l'Europe est formée d'une extrême diversité de paysages, de climats, de formes de relief. Ensuite, une nouvelle perspective a pris contour sous l'émergence de l'Islam conquérant: la définition culturelle de l'Europe. En fait, à présent, cette définition reste très restreinte car, d'une part, la civilisation européenne a déferlé sur le monde entier et, d'autre part, l'Europe est formée d'une variété de compartiments culturels locaux, régionaux, nationaux. La Révolution Française de 1789 a donné une dimension historique au mot «Europe», car les changements apportés par la Révolution ont donné naissance à des confrontations politiques, à des débats politiques, à des regards rétrospectifs sur l'histoire de l'Europe. Seulement au XX^{e} siècle les Européens ont envisagé l'Europe du point de vue économique et politique, mais après l'échec de la Communauté européenne de défense, on a continué seulement sur le chemin économique.

Définition politique de l'Europe

Plus tard, on s'est rendu compte de la nécessité d'une conception politique et on a créé des institutions comme la Commission européenne, le Parlement européen; on a créé la citoyenneté européenne; on a envisagé une politique de sécurité commune. Mais ce processus s'avère trop lent et très controversé. Souvenons de la position divergente des pays européens en ce qui concerne la guerre d'Iraq ou des referendums négatifs en France et aux Pays-Bas sur la Constitution européenne. À présent la seule chose commune qu'aient les pays européens, c'est le caractère démocratique et «les Européens voudraient que le principe démocratique se suffise à lui-même, qu'il suffise à définir l'Europe démocratique comme corps politique».

Le principe démocratique

Pierre Manent affirme catégoriquement que le principe démocratique ne suffit pas à définir l'Europe ni du point de vue du territoire («tous les pays démocratiques seraient membres du droit de l'Union européenne, à commencer par le Japon et l'Australie[5]»), ni du point de vue politique. En quoi consiste le principe démocratique? La démocratie est la mise en œuvre de la souveraineté du peuple.

[5.] Pierre Manent, *op. cit.,* p. 109.

Cette souveraineté du peuple s'exerce par le vote, par l'élection périodique des institutions exécutives, législatives. Par le vote les individus arrivent à commander et à contrôler les institutions qui à leur tour les commandent et les contrôlent. Le principe démocratique devient ainsi «le principe du consentement», car les individus n'obéiront pas à des institutions ou à des lois auxquelles ils n'ont pas donné leur accord, leur assentiment, leur permission. Mais le principe du consentement n'est pas propre seulement à l'Union européenne (les États consentent à renoncer à une partie de leur souveraineté), mais il est mis en pratique dans des communautés très diverses: la nation, la cité, le village et même la famille.

Donc, il est évident que le principe démocratique ne suffit pas lui seul à définir l'Europe. Tous les pays de l'Union européenne sont démocratiques, soit républiques, soit monarchies; pour qu'ils forment un corps politique, il faut qu'ils cherchent d'autres choses communes, il faut qu'ils créent de nouvelles institutions communes.

L'EUROPE - PRODUIT NATIONAL

«C'est l'État-nation qui a formé la démocratie. Sans la référence au sentiment national, il n'y aurait pas cette merveilleuse évolution vers la démocratie et l'État de droit». (Bronislav Geremek) On a vu quel rôle joue le principe démocratique dans l'Union européenne, mais on doit bien préciser que ce régime politique a été mis en place premièrement dans des communautés très bien définies, très bien individualisées: les nations. Dans ce raisonnement, jusqu'ici il n'y a aucune discordance. Mais les nations européennes se sont consolidées pendant des régimes monarchiques, pendant les monarchies absolues, régimes politiques non démocratiques, où presque toutes les valeurs d'aujourd'hui étaient violées.

À partir des monarchies absolues …

Selon Edgar Morin «l'État national est une réalité originale, plus ample que la cité antique, la république ou les principautés médiévales, moins hétérogène que l'Empire. Il se forge à partir d'une monarchie élaborant progressivement son État et sa Nation par conquête des provinces et par intégration séculaire de ses ressortissants dans une identité nationale commune[6]». Donc, pour qu'une nation se forme, pour qu'on ait une cohésion entre les individus, il faut d'abord une administration centrale qui assure la liaison entre tous les territoires de l'État, qui prélève un impôt permanent, qui permette l'accès des citoyens aux services publics. Ensuite, il faut une armée qui protège la population et l'État contre les envahisseurs. À l'époque, ces choses pouvaient être assurées seulement par un pouvoir central.

6. Edgar Morin, *Penser l'Europe*, Paris, Gallimard, 1987, p. 56.

À la formation de l'esprit national ont contribué aussi l'opposition et la concurrence entre les États, la permanente menace des ennemis étant un facteur important pour la cristallisation de l'identité nationale. Le Moyen Âge est une période de guerres entre les États pour empêcher la prédominance d'un seul État en Europe. C'est à cette époque-là que s'affirment les États souverains et que les nations commencent à se former en France, Angleterre, Espagne, Autriche, Suède, Russie. Mais on sait avec précision le moment où la nation s'est manifestée dans toute sa puissance. Pierre Manent affirme que ce moment, la première manifestation de l'esprit national a été la Révolution Française. Celle-ci représente un véritable changement, car elle a substitué à la souveraineté du roi la souveraineté du peuple.

… vers la naissance des démocraties européennes modernes

Les idées de la Révolution Française se sont prolongées dans toute l'Europe et la Révolution Française a été un modèle pour les autres peuples de s'organiser en États-Nations: la Belgique se sépare de Pays-Bas, Serbie, Grèce, Roumanie s'émancipent de la domination turque. À la monarchie du droit divin succèdent en Europe les monarchies démocratisées et les républiques. Mais ce passage fut possible seulement par l'existence de la nation: «La démocratie, le principe démocratique a besoin, pour devenir réalité, d'un corps, d'une population définie». Certainement «la population définie» désigne la nation, «une communauté liée par une culture commune comportant le plus souvent une langue commune[7]».

Les origines de la démocratie

L'affirmation de Pierre Manent trouve ses arguments dans le passé historique de l'Europe. Dés le début on doit faire la précision que l'Europe n'est pas à l'origine de la démocratie; le modèle fourni par l'Athènes du V^{e} siècle avant J.-C. n'étant pas complète, car on sait que les esclaves ne bénéficiaient pas de droits. Toutefois on a eu encore d'autres tentatives d'imposer la démocratie comme régime politique pendant le Moyen Âge: les communes italiennes du XI^{e} - XII^{e} siècle, les cantons suisses du XIII^{e} - XIX^{e} siècle, où les esclaves n'étaient pas exclus de la citoyenneté. Mais c'était des essais rares, presque exceptions sur la carte politique de l'époque. On peut dire que l'échec de ces tentatives a comme cause aussi l'inachèvement des nations respectives. On connaît qu'en Grèce il y avait de nombreuses cités, chacune avec son propre gouvernement, que les Italiens étaient séparés dans plusieurs États, que les Suisses étaient eux aussi séparés en cantons.

C'est en Angleterre qu'apparaissent deux événements liés à l'instauration d'un régime démocratique: la grande Charte des Libertés imposée à Jean sans

[7.] Edgar Morin, *op. cit.,* p. 196.

Terre en 1215 et la création du Parlement bicaméral en 1265. On peut supposer que ces faits novateurs soient liés à la position géographique du pays, que l'isolement de l'archipel anglais ait contribué à la cristallisation plus rapide du peuple anglais. Ensuite, c'est en France que sont formulés la souveraineté du peuple et les Droits de l'Homme à l'occasion de la Révolution. Mais pour que la Révolution Française fût possible, «il fallait que le peuple français fût défini», c'est-à-dire qu'il y ait une mémoire commune, des normes et des règles communes, des expériences collectives, qu'il s'agisse de gloire et des victoires ou de souffrance et des défaites. Toutes ces choses sont transmises de génération en génération et aboutissent à un esprit national, à une âme nationale.

La nation est finalement la façon de dépasser l'individualisme, une façon de penser l'homme dans la société. Mais la grande question du débat européen est comment faire entrer la nation dans la construction européenne.

LA CONSTRUCTION EUROPÉENNE – CONSTRUCTION ARTIFICIELLE?

«Pour arrêter les limites de l'Europe, il faut regarder la géographie, tenir compte de l'histoire et trancher politiquement». (Hubert Védrine) On a vu dans la partie précédente que la démocratie a eu besoin pour s'imposer d'un «corps», a eu besoin d'une nation. Si on regarde cette relation au niveau de l'Union européenne, on se rend compte qu'on a manqué une étape dans l'évolution naturelle des choses. Le principe démocratique est l'un des fondements de l'Union européenne. Car, bien que partiellement et insuffisante démocratique dans son histoire, l'Europe de l'Ouest est devenue démocratique dans sa totalité. Et si les pays d'Europe dominés par l'URSS n'étaient pas démocratiques, ils ont voulu cette démocratie et certains ont réussi à l'imposer, certains essaient encore (Biélorussie). Le principe démocratique est la première condition parmi les critères politiques d'adhésion pour les États candidats, critères posés par le Conseil européen de Copenhague en 1993: «être une démocratie stable et qui fonctionne, respecter l'État et la règle de droit, respecter les droits de l'homme, respecter et protéger les minorités[8]». Ainsi la démocratie est devenue le caractère politique commune de l'Europe. Mais «la démocratie dans la construction européenne s'efforce d'échapper à la triste nécessité d'avoir un corps».

La nécessité d'un «corps»

Lorsqu'on dit «l'Union européenne», on pense premièrement aux 25 États composants. Avant de se nommer, de se sentir «Européen», on se dit, on se sent d'abord «Français», «Allemand», «Suédois», etc.

8. Gilles Pécout, *Penser les frontières de l'Europe du XIXe au XXIe siècle*, Paris, Presses Universitaires de France, 2004, p. 15.

La nation garde le rôle le plus important dans toute géopolitique européenne. D'une part, la nation a rassemblé des royaumes, des principautés et des villes sous l'autorité de l'État, d'autre part, on assiste à l'apparition de nouvelles nations par la chute des empires. Il y a des exemples récents: Croatie, Ukraine, mais aussi Biélorussie, Moldavie qui cherchent encore leur identité. On peut dire que les pays donnés comme exemple ne font pas partie de l'Union européenne, mais, même dans le cadre de l'Union, on assiste au réveil des nations «internes»: l'Ecosse, le Pays Basque, la Corse etc. Contrairement aux désirs de ces qui souhaitent le fédéralisme européen, la nation continue à exister et elle est conçue comme le dernier obstacle qu'on doit franchir pour avoir une véritable construction européenne. Parfois les nations les plus anciennes dans l'Union sont les plus réticentes à la dévolution de la souveraineté; la France est le dernier exemple, étant accusé par la Commission européenne de protectionnisme économique.

La nation européenne – réalité ou utopie?

Est-ce qu'il y a vraiment une «nation européenne»? Si non, est-ce qu'elle est possible? Edgar Morin cite le théoricien austro-marxiste Otto Bauer qui dans son livre *La question nationale et la social-démocratie* (1907) a formulé l'idée que «c'est la *communauté du destin* qui donne à une nation son identité, son unité, son vouloir-vivre, en dépit de toutes les diversités humaines[9]». Si l'on regarde l'histoire européenne, la seule chose commune a été la guerre, l'opposition, la concurrence, l'inimitié. Ces conflits quasi-permanents ont créé la diversité culturelle du notre continent, qui est l'élément essentiel de l'identité européenne, mais ces conflits ont contribué aussi à la création des nations.

L'esprit européen existe d'une façon autonome, il existe en soi, sans qu'il soit mis en pratique. C'est-à-dire il n'est pas évident le jour au jour, dans les jours habituels des gens. L'Union européenne est conçue comme, soit un état de bien-être, soit une multitude de contraintes, soit les deux en même temps. Une identité européenne se construit par une «circulation plus intense des arts et des créateurs par l'ouverture des éducations nationales à une dimension collective nouvelle, par la diffusion de savoirs linguistiques aptes à l'intercommunication et par un engagement accru des médias, qui restent eux aussi trop nationaux[10]». On peut ajouter une circulation plus intense des personnes dans les pays européennes qu'il s'agisse des programmes d'échange ou des voyages touristiques.

Une Europe sans frontières?

Il faut préciser du début que le continent européen n'a pas de limites fixes. L'Europe est un toponyme aux limites variables et constamment interrogées

9. Edgar Morin, *op. cit.*, p. 195-196.
10. Michel Foucher, *La république européenne*, Paris, Belin, 2000, p. 140.

pendant l'histoire. Du point de vue géographique, l'Europe n'a pas de vrais frontières car elle est délimitée aux trois parties par les océans et la limite à l'est n'est pas très bien fixée (l'Europe peut apparaître comme une large péninsule de l'Asie). Du point de vue historique les frontières ont changé selon le contexte politique. Du point de vue culturel les choses se compliquent encore, car l'Europe a «exporté» son modèle culturel dans le monde entier par la domination des puissances européennes sur le monde mais aussi par la colonisation: «Elle a européisé le monde et mondialisé l'européisme[11]».

Au contraire, l'Union européenne est délimitée par décisions successives. Pendant quarante années, pendant la guerre froide, la question des frontières ne se posait pas. La Communauté européenne et encore quelques pays situés à l'ouest du rideau de fer utilisaient exclusivement le terme d'Europe, l'autre moitié du continent étant «l'Europe de l'Est» ou même «l'Est». Mais les choses ont changé après les révolutions des années 90 et avec les premières demandes d'adhésion à l'Union. La Commission de Bruxelles a été obligée de faire des précisions. Dans sa perspective, le terme d'Europe «combine des éléments géographiques, historiques et culturels qui, ensemble, contribuent à l'identité européenne. Leur expérience partagée de proximité, d'idées, de valeurs et d'interaction historique ne peut être condensée en une formule simple et reste sujette à révision à chaque génération successive. Il n'est donc possible ni opportun d'établir maintenant les frontières de l'Union européenne dont les contours se construiront au fil du temps» (Conseil européen de Lisbonne, 1992)[12]. Donc, dès le début l'Union européenne, par généralisation l'Europe, est conçue comme une «extension indéfinie».

Même en ce qui concerne l'espace intérieur, il y a des difficultés. Car, à mesure que l'Europe politique s'élargit, elle devient plus hétérogène et on a été obligé de reformer les institutions, d'adopter comme mode de décision la majorité qualifiée. À présent, l'Union européenne fonctionne «à plusieurs vitesses». Les États membres peuvent aller de l'avant dans l'intégration sans être bloqués par les autres pays qui ne sont pas encore préparés à assumer les actions respectives. Les États de l'Union ne sont pas tous engagés en même temps dans les mêmes directions de sorte que des unions restreintes se sont constituées. Par exemple, l'application de l'accord de Schengen, signé en juin 1985, a crée à l'intérieur de l'Union européenne un sous-ensemble: les pays qui font partie de l'espace Schengen et ceux qui ne sont pas signataires (Irlande, Royaume-Uni, Danemark, Suède, Finlande). Puis, l'introduction de la monnaie unique a crée un autre sous-ensemble: seulement onze pays sur quinze ont introduit la nouvelle monnaie. De plus, la géographie de Schengen diffère de celle de l'euro.

Si l'on regarde l'élargissement de point de vue politique ou économique, on voit clairement les limites de l'extension: un régime presque totalitaire en Biélorussie, des hésitations inquiétantes en Ukraine, des économies en transitions

11. Edgar Morin, *op. cit.*, p. 143.
12. Michel Foucher, *op. cit.*, p. 94.

en Bulgarie et Roumanie, mais si l'on considère l'Europe comme un concept et comme un état d'esprit, alors ses limites pourraient être reculées! Mais tout de suite apparaît la question: «Jusqu'où?». «Est-ce que cet état d'esprit se trouve en Balkans?». «Est-ce que la Turquie est un pays «européen»?». Pierre Manent finit ce chapitre sur ces considérations, tout en soulignant l'importance capitale des frontières. L'Europe doit tracer ses limites à l'est par rapport à la Russie et au sud-est par rapport à la Turquie et aux pays balkaniques et, bien que ce fait soit très délicat, il faut le faire quelle que soit la décision. Ensuite l'Europe doit assumer son rôle politique, «dépasser cette indéfinition politique[13]»; cela c'est l'enjeu de la survie et du succès de l'Union européenne.

CONCLUSIONS

L'unification allemande et ensuite les premières négociations d'élargissement de l'Union européenne confèrent à l'idée d'Europe une signification nouvelle. Celle d'un principe organisateur du continent, sue une base démocratique. Les Etats se sont beaucoup impliqués pour institutionnaliser l'idée en une forme de communion conférant ainsi à l'Europe une identité construite. Les acteurs en ont été et restent des Etats-nations, soucieux de leurs de leurs intérêts. Par conséquent, l'idée d'Europe organisée et l'idée nationale constitue un couple presque antagoniste. Il faut dépasser le niveau national pour vraiment avoir un «corps européens», pour que l'Europe joue aussi un rôle politique sur la scène internationale.

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4. Remarques sur la méthodologie et sur les résultats obtenus

La conception du plan a été difficile pour l'étudiant, premièrement, parce que sa spécialisation est Géographie-Langue et littérature française et parce que le contenu étudié appartient au domaine philosophique. D'autre raison pour laquelle l'élaboration du plan a été difficile a été la manque de pratique en ce qui concerne la méthodologie. Puisqu'en France cette méthodologie est utilisée d'une manière unitaire dans l'enseignement préuniversitaire, mais aussi dans l'enseignement

[13.] Pierre Manent, *op. cit.*, p. 113.

universitaire, on assure la qualité de l'apprentissage. Même si les étudiants des autres pays ne connaissent pas cette méthodologie pour l'étude d'un document, les professeurs offrent toutes les informations nécessaires, d'une manière détaillée, pour pouvoir appliquer la méthodologie et rédiger des exposés de qualité. On remarque, comme bonne pratique, le travail interdisciplinaire du contenu étudié par le transfert de méthodologie d'un domaine à l'autre; on assure aussi le travail multidisciplinaire par l'analyse du document de plusieurs perspectives (géographique, historique, littéraire, sociale, économique, etc.) Si, en France, les compétences acquises sont corrélées avec des contenus de plusieurs domaines, dans l'enseignement universitaire roumain, il y a la tendance de spécialisation d'un seul domaine de recherche (par exemple, seulement la géographie, seulement la biologie), comme théorie et comme pratique.

La dissertation réalisée est lue, corrigée et évaluée très attentivement par le professeur à partir d'une grille d'évaluation. Même si cette épreuve ne correspond pas totalement aux demandes spécifiées au commencement, elle est un produit authentique, qui montre les résultats auxquels on est arrivé dans les conditions nommées antérieurement.

5. Conclusions

Pendant la recherche on est arrivé aux conclusions suivantes:

1) Pour assurer l'acquisition des compétences par les étudiants pour élaborer une dissertation de bonne qualité les professeurs planifient l'activité d'une manière rigoureuse, ils communiquent aux étudiantes cette planification des activités et offrent toutes les informations concernant la méthodologie et les demandes qu'ils doivent respecter. Travaillant de cette manière, les étudiants savent clairement ce qu'ils doivent faire, comment ils doivent réaliser leur tâche et jusqu'où.

2) On fait l'évaluation des produits - exposés, dissertations - d'une manière systématique, rigoureuse, par la spécification en écrit sur chaque épreuve des remarques du professeur. Après l'évaluation des épreuves par le professeur et leur présentation devant leurs collègues, on discute en groupe pour identifier les points faibles et les points forts de l'épreuve. Pour certains travaux dirigés les professeurs présentent comment ils ont réalisé le devoir proposé aux étudiants et ils offrent le produit pour que les étudiants puissent l'analyser à la maison et le comparer avec leur propre produit.

3) La méthodologie utilisée n'est pas spécifique à un seul domaine de connaissance, mais elle a un caractère interdisciplinaire.

4) Dans la manière de travail du contenu on insiste sur l'étique de la recherche. Les étudiants apprennent comment utiliser les citations, comment utiliser les propres idées dans le texte pour pouvoir les différencier de celles prises d'autres sources. Les étudiants risquent l'exclusion de l'établissement d'enseignement lorsqu'ils ne respectent la loi des droits de l'auteur.

STUDIA UNIVERSITATIS BABEŞ-BOLYAI, PSYCHOLOGIA-PAEDAGOGIA, LI, 2, 2006

LITERARY CRITICISM, ENTROPY AND THE "DISORDERLY TEXT"

ALINA PREDA

Motto: *"In the face of flattened difference, or the stamp of sameness, it is up to critical readers and writers to find chaos, or disorder. Thus we must be aware of disorder as a potentially productive concept, even when its so-called "common sense" valence would suggest otherwise (that is, would suggest disorder as a negative condition, one connoting break-down, loss of control, and inefficiency)."* Jason Snart (2001)

ABSTRACT. The evolution of literary writing has mirrored the displacement of notions such as linearity, entropy, determinism, fixity, and their replacement by the opposing concepts of non-linearity, disorder, indeterminacy, fluctuation. Whereas linearity connotes a congruity between cause and effect, non-linearity cannot be associated with this kind of proportionality. This mathematical reality is mirrored in the literary field by a tendency towards spiral rather than linear story lines. Similarly, the notion of disorder, borrowed from thermodynamics and information technology, comes to inform literary writing. This is enough to prove the cultural relevance, for the development of literary criticism, of such conceptual systems usually associated with science and technology, and to show that they **can be** and, indeed, **are** employed beyond their respective scientific fields.

KEY-WORDS: linearity, non-linearity, entropy, disorder, fixity, fluctuation, determinism, indeterminacy, science, culture, literature

The interdependent relationships between scientific and cultural fields constitute the hallmark of contemporary social and cultural analysis, forging their way into literary criticism as well. These multivalent interconnections between science and culture are not a novelty pertaining to the 21st century, but have been studied at least ever since the 1950s, prompted by the increasing global complexity of the period – economically, technologically, and environmentally, but also by the political movements of the time. The more recent transition from modern industrial to network culture, and the revaluation of the 'differential' and 'nonsystemic' thinking of late 20th century literary and humanistic studies – gender, class, race and psyche issues – gave an energic impetus to chaos theory, which has been applied to a wide

range of disciplines, such as science, psychology, economics and literature, proving to have an astonishingly broad cultural significance. Gleick (1987: 5) explains that

> "[c]haos breaks across the lines that separate scientific disciplines. Because it is a science of the global nature of systems, it has brought together thinkers from fields that had been widely separated. [...] It makes strong claims about the universal behavior of complexity."

Purporting that order can come from chaos – since complex, apparently chaotic systems evolve to new levels of complexity, so that order exists simultaneously with chaos, and that tiny changes in the initial conditions can trigger enormous changes in complex systems, thus causing some nonlinear systems to be unpredictable (***the butterfly effect***), this theory is by no means entirely new: as far back as 1908, Henri Poincaré, wrote that "[a] very small cause which escapes our notice determines a considerable effect that we cannot fail to see, and then we say that that effect is due to chance" (1952: 66-7). As Hayles points out,

> "On a deep level [chaos theory] embodies assumptions that bring into question presuppositions that have underlain scientific conceptualizations for the last three hundred years. [...] Changed are not the disciplinary procedures and criteria of normal science but the epistemic ground on which it — and much else in contemporary culture — rests. When a dichotomy as central to Western thought as order/disorder is destabilized, it is no exaggeration to say that a major fault line has developed in the episteme" (1990: 16).

Drawing a comparison between the theories put forward by N. Katherine Hayles in *Chaos Bound: Orderly Disorder in Contemporary Literature and Science* and Vladimir Tasic in *Mathematics and the Roots of Postmodern Thought*, J. Linn Mackey (2004) attempts to answer the question "Is Chaos Theory Postmodern Science?"[1]. Arguing against Hayles's explanation of the similarities shared by chaos theory, postmodernism and literature being grounded in the influence of the same cultural complex, Mackey (2004) states that the three "independently discover in their accounts the unusual, the unpredictable, and the uncertain", and that literature was the pioneer in this respect. Long before Henri Poincaré made reference, at the end of the 19th century, to *the unusual*, *the unpredictable*, and *the uncertain* in scientific representations, shows Mackey (2004), these were present in the origins of the novel: 18th century England "is an interesting period to contrast the viewpoints of classical science and the humanities since the impact of Newton's work was felt throughout the culture of the time and the Enlightenment was flowering." The 18th century novels, shows Mackey, not only took the new

[1] *Postmodern Science Reconstruction*, Fall 2004: Volume 4, Number 4. Guest Editors: C. Jason Smith and Robert Froemke

scientific order of Newton into account, but "they went beyond this scientific order in conveying human experience", as the work of Henry Fielding illustrates. Mackey (2004) goes on to quote J. Paul Hunter on Fielding's novels:

> "There are no supernatural agents in Fielding (if we except Fielding himself), no actual violations of nature's steady and discoverable laws. And yet we do his art (and the art of the novel in general) a disservice if we fail to observe the emphasis upon *the unusual, the unpredictable, and the uncertain* (my emphasis) — strange and surprising events calculated to inspire, in readers, open-mouthed wonder without transporting them to a world involving different laws of probability. (31) "

The answer Mackey (2004) offers to the question "Is Chaos Theory Postmodern Science?" is a surprising one – postmodern science does exist, and literature just may have anticipated it:

> "The novelists' insistence on incorporating the unpredictable, the unexpected and the uncertain into their description of the world makes it antithetical to the classical Laplacian point of view of science striving for certainty and predictability." (Mackey, 2004)

Thus, it seems, the parallels between the sciences and the humanities can be illustrated in more ways than one, as they may influence each other in a reciprocal manner, which justifies Ilya Prigogine's fascination with bringing together "the two cultures".

In an attempt to show how important chaos theory is, "not only for the technology of the future, but for our understanding of the cosmic role of intelligence and of the narratives it spins", David Porush[2] (1991) explains that Prigonine's new alliance is warranted in that literary discourse has been "unburdened by the prime directives of simplicity, transparency, and absolute authority" and thus is more likely to be able to render some kinds of reality than the classical scientific discourse is, since the latter was maimed by the naïve realism of Newtonian mechanics and of the Second Law of Thermodynamics:

> "Literature in its hyper-evolved discourse can capture and describe the time-bound, fluctuant, unstable growth of organic life and of human activity in the macroscopia. As Prigogine and Stengers note, creativity "breaks the temporal symmetry of the object" so that out of "the noise in which we live arises music" (311). In short, the new science of chaos demonstrates that narrative discourse has epistemological potency." (Porush, 1991)

[2] Porush, D, (1991). "Prigogine, Chaos, and Contemporary Science Fiction" in Science Fiction Studies #55 Volume 18, Part 3, November 1991. At:http://www.depauw.edu/sfs/backissues/55/porush55art.htm

It is not surprising, shows Porush, that Prigogine should strive for the reconciliation of the two cultures – the sciences and the humanities – since his work drew on the theories of the French philosopher Henri Bergson, who had, in turn, been inspired by literary sources:

> "Prigogine's theory reconciles the austerity and time-idealizations of Newtonian mechanics with the indeterminacy and chaotic growth of the macroscopic world. It also puts science back in the realm of human language and the frame of human time, which abide by macroscopic (social or biological), not microscopic (mechanical) rules." (Porush, 1991)

As a matter of fact, the traditional novel has always focused on the macroscopic level, has always displayed a complex view on causality and space-time relations, so it is only fair to say that now, finally,

> "by virtue of the new paradigmatics of Chaos Theory, this appreciation for human-bound (and one might say, subject-bound) discourse has now insinuated itself into the belly of science's grand Weltanschauung. Physics has caught up with Fielding, Dickens, Austen, Trollope, Flaubert, Tolstoy, and every other novelist for whom small accidents send the hearts of mortals and their fates wheeling out of their appointed Newtonian orbits into grand twists of fate and destiny." (Porush, 1991)

The evolution of the novel, from its origins to the present, seems to have been based, among other things, on the role played by "the butterfly effect" in the development of human lives, with its impact on human destiny; whereas, "before Chaos Theory, such a view of human experience was alien to science, dismissed as pertinent only to the realm of accident, coincidence, kismet, and messy human affairs" (Porush, 1991). Literature seems to have anticipated science, in this respect, probably because the literary discourse was not confined by the naïve realism of classical science:

> "Though Newtonian time and causality were strictly idealized (symmetrical, formal, operating best at the microscopic level where non-linear effects like friction might be discounted), the paradigm was—and still is—mistaken for "common sense," while the common and sensible events of everyday life and in the biosphere were and are beyond the ken of classical dynamics." (Porush, 1991)

But it is with the arrival of postmodern literature, – based on the fundamental tenet that "the system invites you to attempt to map it by holding out the promise of determinism but then *through the force of a law of nature*, it denies you any answers" – that "the mechanics of chaos, the narrator of the novel, the novel itself,

and its subject all collide and collaborate to become the same sort of thing: *they are all engines of difference, dissipative structures, generators of complex and complicating discourses*" (Porush, 1991). Still, once again, literature was the forerunner, as before the new theories of chaos and complexity there was, in the discourse of science, no "scientific language to describe what postmodern fiction seemed to understand implicitly – Nature's ultimate tease: you never know which way it's going to leap across the bifurcation" (Porush, 1991).

As Snart[3] (2001) argues, in complex, or even in chaotic systems, "cause and effect relationships are still in place, they may just not be linear". Thus, we witness the displacement of notions such as linearity, entropy, determinism, fixity, and their replacement by the opposing concepts of non-linearity, disorder, indeterminacy, fluctuation. Whereas linearity connotes a congruity between cause and effect, non-linearity cannot be associated with this kind of proportionality. This mathematical reality is mirrored in the literary field by a tendency towards spiral rather than linear story lines. Similarly, the notion of disorder, borrowed from thermodynamics and information technology, comes to inform literary writing. This is enough to prove the cultural relevance of such conceptual systems usually associated with science and technology, and to show that they **can be** and, indeed, **are** employed beyond their respective scientific fields.

Starting from Bernard-Henri Levy's assertion that it is likely for literary critics to reach, at a certain point in their analysis, "the time to stop, the moment of reflection and regaining equilibrium", to which Michel Foucault replied by calling for "the moment of new mobility and new displacement", to show that critical work and inquiry should resist the temptation to order themselves, and preserve if not enhance their mobility, Snart (2001) points out that it is only this kind of mobility that may prevent any critical project from "falling into dogmatic kinds of closure (at which point they operate to flatten difference, not to explore it)". Snart (2001) notices that both Louis de Broglie[4], the Nobel laureate in physics, who stated that "Nothing is more misleading than a clear and distinct idea", and Michel Foucault, though belonging to different fields, express a similar "concern for

[3] Snart, J. (2001). "Disorder and Entropy in Pynchon's "Entropy" and Lefebvre's The Production of Space" at *CLCWeb: Comparative Literature and Culture: A WWWeb Journal*, December 2001 Available: http://clcwebjournal.lib.purdue.edu/clcweb01-4/snart01.html © Purdue University Press

[4] Louis Victor, Prince de Broglie (1892-1987), contributed significantly to the theory of quantum mechanics with his studies of electromagnetic radiation and wave mechanics: *Matter and Light* (1939), *Revolution in Physics* (1953), *Current Interpretation of Wave Mechanics* (1964), and *Quantum, Space, and Time* (1984). His attempt to rationalise the dual nature of matter and energy, was followed by the discovery that both the former and the latter are composed of corpuscles and move in waves. Broglie's 1923 theory describing the wave nature of electrons earned him the 1929 Nobel Prize in physics.

immobility [...] within a body of knowledge, whereby the potential for change or growth is suppressed", and equates this growing concern with "a fear of heat death"[5].

Continuing the work of Ludwig von Bertalanffy, a pioneer in systems science, who "formulated the theory that general systems, including thermodynamic systems just as much as cultural systems, can be self-regulating", in that "the energy flow of an open system tends towards a steady state, corresponding to a minimum of entropy production, and thus stabilizing the system", Snart (2001) chooses the term **disorder** instead of others such as movement, mobility, or displacement, and discloses the two-fold origin of the concept, and its two different interpretations: in information studies **disorder** "connotes a state of potential or choice", while in thermodynamic theory it refers to "movement or energy". Snart (2001) shows that disorder "need not be seen as a state of confusion, but rather as a state of potential energy and productivity", even though "its so-called "common sense" valence would suggest otherwise", namely that disorder is "a negative condition, one connoting break-down, loss of control, and inefficiency". Then he goes on to argue that since "the cultural drive toward "total accomplishment" [...] flattens difference", it is the task of writers and readers alike to discover and explore "what chaos can actually mean in critical thinking" and, by engaging in the process of writing and reading, "to navigate the space between meaningful communication and entropic, monologic order" (Snart, 2001).

Entropy is the next concept to be analysed by Snart (2001), who finds it extremely useful, since "it speaks across a number of disciplinary lines", and therefore enjoys an array of definitions: from A.B. Çambel's *Applied Chaos Theory* (1993) where entropy is defined as "the ability to reach equilibrium", "a measure of chaos" or "an indication of transmitting information" (Çambel, 1993: 130-31), Snart goes on to N. Katherine Hayles's *Chaos Bound* (1990), where entropy is regarded as a "statistical measure of disorder [whose] full implications

[5] Snart tries to clarify the meaning of such notions as entropy, disorder and heat death, by giving an every-day life example: "Molecules (bodies) in a cup of tea are considered disordered if you've just poured milk in. There are pockets of "hot" and "cold" molecules; that is, molecules with more or less energy. But the cup will tend towards uniformity (a process aided by your stirring) in which energy passes from areas of hot to areas of cold; entropy increases. Finally, the cup of tea reaches, more or less, a state of uniform heat distribution, at which point entropy is high, since the disorderly molecules have become ordered. In terms of disorder and entropy, the measure is inverse: Low disorder ---> high entropy ---> uniformity. Heat death, a concept tied to entropy, is when the universe has run out of energy, in that its particles (molecules, if you like) have reached a state of completely uniform distribution. There are no differences which can generate energy (or generate energy transfer since, technically, energy is never created). True or total "heat death" does not really happen in the tea cup because it is not a perfectly closed system. The tea is in contact with the cup which is in contact with your hand, the air, etc. But, for the purposes of the model, heat death is that point at which the system has reached thermodynamic uniformity and there is no energy available unless it comes from "outside" the system (you add more hot water or cold milk or you spill the whole cup in your lap, in which case there is a sudden burst of energy)" (Snart, 2001).

are still being explored" (Hayles, 1990: 42), and then to Webster's *New Compact Dictionary*, which offers a slightly different explanation: "entropy: a measure of the unavailable energy of a system: an ultimate state of inert uniformity".

Just like **disorder**, shows Snart (2001), **entropy** has different meanings, according to the field it is used in. Thus, in thermodynamics, it refers to "the disorder of bodies in a system": low disorder means high entropy characterising the state of thermodynamic uniformity, which means that the system has no available energy inside, and unless a burst of energy comes from outside it, the system reaches a state of "heat death". On the other hand, in information theory, entropy is "a measure, not of bodies, but of immaterial potential." However, Snart (2001) pertinently points out that "low entropy in both thermodynamic and information systems connotes a state of disorderliness (or unpredictability), or, put more positively, potential." Moreover, "heat death in information systems occurs at the same conceptual moment as it does in thermodynamic systems: when entropy reaches maximum" (Snart, 2001).

In light of these considerations, Snart (2001) concludes that scientific concepts like chaos and entropy are widely applicable not only in specifically scientific taxonomy, but also in literary studies, since metaphoric heat death is likely to occur in the case of narrative communication and critical interpretation, because "[o]ften, critical reading depends upon a kind of disordering of existent orders"[6]. It is clear that

> "critique requires a certain energy, although often the subject of critique (industry, capital, media, etc.) presents itself as so highly ordered, so clear and distinct, as to make critical work extremely difficult. [...] Entropy provides us, conceptually, with a way of seeing disorder as productive and full of potential, especially in terms of providing energy for developing new ways of thinking about things, and of counteracting the deeply political effects of intellectual, or critical, heat death: the point at which critique is no longer possible because the energy which drives it is nonexistent; in some cases, our subjects of study become so well ordered as to be impenetrable and unreadable". (2001)

[6] Snart offers one of Hayles's examples from *Chaos Bound* (e.g., 52-53): "Imagine I am communicating to you a three letter word (which we can call a message): -- -- --. None of the letters are given. This we might imagine as a state of randomness (not to be confused with chaos) wherein almost any combinations of letters could be put in place to form a recognizable word. There are, in fact, a finite number of possibilities so it is not truly random, but for our purposes, the message is at least meaningless. But what if I give you some of the letters, for example A X --. The message to be sent is clearly A X E, as no other letters will fit the space and make sense; in fact, "ax" is an accepted alternative spelling for "axe." Thus the number of possible forms the message can take is low; the entropy is high, since entropy is actually an inverse measure of potential. But next imagine that instead of giving you A X --, I give you A -- E. The number of possible forms the message can take is much higher; the message, as it is, seems disordered (noisy), and entropy is low. Notice that low entropy in both thermodynamic and information systems connotes a state of disorderliness (or unpredictability), or, put more positively, potential. Any number of letters might be inserted to create a meaningful word -- AXE, ATE, ACE, ARE" (Snart, 2001).

The novel has always been a rather impure narrative form, characterised by hybridity, always willing to enlarge its repertoire of effects by drawing on a variety of other forms, be they the older myth, legend and fairy tale, or the more recent personal diary, travelogue and epistolary writing, and even recent scientific, medical and technological discoveries. Jeanette Winterson's work can offer a telling example regarding the flexibility of the novel as a literary form. Underlying the density of Winterson's writing is her persistent dismissal of plot and traditional story line, only used as a premise for amassing a novel-length excursion in her high-style poetic prose, which offers the readers yet another treat. In each clause, sentence and paragraph she handles words magically. Potent observations about love and death, time and space, fiction and history blend with autobiographical snapshots in descriptions of vivid imagery. The chaos Winterson creates by spinning long spirals of stories makes readers lose track continually, but also leaves them a lot of spaces to fill in for themselves. Winterson's "disorderly text" keeps high entropy levels at bay, turning the reading process into a highly rewarding experience.

Of all Winterson's novels *GUT Symmetries* is probably the most representative for the ways in which scientific discoveries may be used for literary purposes. As we follow the scientific excursions outlining the physicists' search for a Grand Unification Theory able to explain how the Universe came to life and how it functions, we, the readers, are drawn into "the nightmare of narrative" (GS 24)[7], invited to embark on a journey of our own, through the maze of seemingly tangential themes, and forced to seek unity in the structurally fragmented narrative discourse. Bruce Bower (1997) notices that, once again, Winterson "refuses to shift into narrative drive" and still "favours the bumpy, meandering byways of interior landscapes"[8]. Most critics were, of course, taken aback by the "disorderly text" of Winterson's novel, consisting of apparently disconnected fragments of narrative, as well as by the scientific interludes, so that a wide array of negative reviews followed:

> "*Gut Symmetries* promises a drama and a resolution, but by the end of the book the storytelling element has all but evaporated and it would be indulgent to describe the plotting as ramshackle." — Adam Mars-Jones, *Electronic Mail & Guardian*[9]

> "*Gut Symmetries* strains for the fluidities of poetry, and actually conveys the sense of a writer grappling with language; indeed, it feels like it may have been fun to write. But it is mortifyingly dull to read." — Anthony Quinn, *Daily Telegraph*[10]

[7] Winterson, J. (1998 [1997]). *Gut Symmetries*. London: Granta Books. Subsequent page references in the text are to this edition.
[8] Bawer, B. *The New York Times Book Review*. Available: http://www.amazon.com/gp/
[9] http://www.complete-review.com/reviews/wintersj/gut.htm#author
[10] *Ibid.*

> "*Gut Symmetries* is extraordinarily difficult to get through; […] full of tiresomely amateurish explanations of the `new physics' which are then pressed into service as distressingly overbearing metaphors […]."— David Sexton, *The Spectator*[11]

The critics mentioned above failed to overcome the first, and least serious of the "hurdles" encountered when "forging a place for science in fiction"[12]: the fact that science is difficult to understand. The next set of critical appraisals shows that other critics managed to deal with this first obstacle, but succumbed to the second hurdle, seeing science as a mere "collection of facts and rules" and failing to notice that Winterson is not trying to make physics meaningful, she is using physics metaphorically, in order to "give meaning to her characters' experience"[13]. These critics, while acknowledging the fact that the novel is not easy to read, still manage to see some of the obvious qualities displayed in this work, but since it is only natural for human beings to reject what they do not understand, complaints about the topics and themes, the disjointed structure, the "disorderly text", or even about Winterson's self-reflexivity do not fail to surface, now and again:

> "Winterson's attempts to link physics to passion read like *The Song of Solomon* as recounted by the cast of *Star Trek*." — Amanda Craig, *New Statesman*[14]

> "Aside from the melodrama, *Gut Symmetries* contains some of Winterson's loveliest and most lapidary prose. But the presence among the three principal characters of two physicists and a poet tilts the book toward erudite abstractions and encourages the author's tendency to dwell in a dreamily inward, self-mesmerized tone." — Carey Harrison, *San Francisco Chronicle*[15]

> "The author and the reader are saved by the objectifying quality of the narrative, and by Winterson's gift for conjuring up an environment filled with feeling. [...] Nevertheless, there is still a tendency to lurch between story, theory and self-regarding subjectivity with barely a thought for the breathless reader. [...] This is a beautiful, stirring and brilliant story, but it does not really make sense." — Katy Emck, *Times Literary Supplement*[16]

Fortunately, there are many critics who succeeded in clearing not only these two hurdles, but even the third, namely that science is generally perceived as "the property of scientists who guard it jealously" (Nieman, 1995). Their comments on

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[11] *Ibid.*
[12] "hurdles" identified by Adam Nieman in his review of *Gut Symmetries*: Nieman, A. (1995). *Love and Guts*. http://www.uwe.ac.uk/fas/wavelength/wave16/nieman.html
[13] Nieman, A. (1995). *Love and Guts*. http://www.uwe.ac.uk/fas/wavelength/wave16/nieman.html
[14] http://www.complete-review.com/reviews/wintersj/gut.htm#author
[15] *Ibid.*
[16] *Ibid.*

Winterson's insightful appropriation of a subject usually perceived as unavailable to the fictional realm prove the success of the author's endeavour:

> "Beyond comparison.... Few writers can contend with Jeanette Winterson.... She writes like a demon drunk with love, and if there's a sentence in *Gut Symmetries* that doesn't startle readers with its bravery and wit, then they're not reading hard enough." — *The Chronicle-Journal*[17]

> "Fascinating, provocative. ... Jeanette Winterson proves she is as literarily nimble as she is intellectually stimulating." — *The Montreal Gazette*[18]

> "Riveting ... [Winterson] expresses the range of the human soul with startling ingenuity." — *The Vancouver Sun*[19]

> "As improbable as the narrative connections become, they make perfect sense on the level that really matters here: Winterson's "aerodynamics of risk". Winterson cleverly undercuts her highbrow riffing with puns, playlets, and poetry, reasserting in her art the most essential of points: "Love bears all things, believes all things, hopes all things, endures all things." A major book, by any standard." — *Kirkus Reviews*[20]

> "I found that *Gut Symmetries* kept me on my toes, not the most comfortable way to walk, but one that made me aware of the steps I took. A kind of walking meditation, the book asks us to think our way toward insights that only our guts can know and to feel our way toward mysteries that lie beyond our analytical minds. The path is, of course, not straight and it leads in multiple directions simultaneously, but in a Winterson book, you learn by going. Even if you don't follow every turn and angle, the journey is well worth the walk." — Audrey Bilger, *The Los Angeles Times*[21]

> "Although the novel is about people and their relationships, it is in the physics that Winterson's self-assurance really shows through and her boldness pays off. […] For her, ideas from physics are more than facts in the way that somebody's life history is more than a chronology. On whatever level it is understood, physics is evocative. To non-physicists maybe only the language is evocative, but at least the words are available even when actual knowledge and experience of the natural world is lacking." — Adam Nieman[22]

[17] http://www.complete-review.com/reviews/wintersj/gut.htm#author
[18] *Ibid.*
[19] *Ibid.*
[20] *Kirkus Reviews*. Available: http://www.amazon.com/gp/
[21] http://www.complete-review.com/reviews/wintersj/gut.htm#author
[22] Nieman, A. (1995). *Love and Guts*. http://www.uwe.ac.uk/fas/wavelength/wave16/nieman.html

As Nieman (1995) pertinently points out, "[i]t is not, of course, physics itself that Winterson is interested in but the characters"[23]: the novel's heroine, Alice (short for Alluvia) Fairfax, a Cambridge graduate in New Physics on her way to The Princeton Institute for Advanced Studies, meets Giovanni Baptiste Rossetti, Jove for short, one of the most famous theoretical physicists working at the aforementioned institute. The two begin an affair, though Jove is married, and when Alice meets his wife, Stella, they fall in love, and become lovers. Living in a world of 'scraps', "each lover seeks wholeness, whether in God or science"[24]. The stories of Alice's parents, an English working-class lad and a beautiful Irish lass, and of Stella's parents, a German and a Jew forced to flee Nazi Germany in World War II, are spun together alongside the love triangle, in a spiral-like form, like strings of narrative DNA, in Winterson's characteristic style. The DNA analogy is extremely significant here, as *GUT Symmetries* presents an analysis of various relationships, not only between lovers, but between children, parents, and grandparents as well. Susana Onega sees the novel as structured "by means of similar random coincidences" which gradually spin "a web of 'symmetries' comparable to the chaotic arrangement of elements in fractals" (2006: 156).

Physics informs not only the novel's structure, but its array of themes as well. Moreover, physics is also used as a metaphor for love, and the relationships between the characters are explained on the basis of principles of attraction, unification, heat death, exchange of energy, disorder and entropy. Chaos theory and complexity theory are employed to explain the triangular relationship presented in the novel[25], which can be seen as an analysis meant to show how stable family systems and heterosexual lifestyles are when faced with perturbations from strange attractors. From the point of view of chaos theory, Alice could be perceived as a strange attractor, attracting towards herself the system formed by Jove and Stella. Since strange attractors are symmetrical across scale, what results from the chaos created by Alice is actually an ordered love triangle. Nieman mentions that in contrast with the usual representation of science in fiction, meant to "provide balance" for "the emotional journey taken by the characters", Winterson's approach is "more sophisticated":

> "The way Alice (the physicist) and Stella (a poet) respond to their circumstances is contrasted in the book but not in the way we might expect. Neither character is a symbol or a stereotype. Both women are complex and whole, equally rational and equally emotional. Where they do differ is in the way they articulate their feelings - the imagery they use, the resonances they pick up. The overall effect is of two women blending into one. We get a single character with two voices and two histories."[26] (Nieman, 1995)

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[23] *Ibid.*

[24] *Kirkus Reviews*. Available: http://www.amazon.com/gp/

[25] Moreover, these recent scientific trends also find their place in the description of New York as a complex system requiring its inhabitants or mere visitors to make a choice at every bifurcation, only to find that "every firm step [they] win out of chaos is a firm step towards … more chaos" (GS 102): "This is a city of edges, grand sharp, precipitous, unsafe. It is a city of corners not curves. Always a choice has to be made; which way now? A city of questions, mouthy and insolent, a built Sphinx to riddle at the old world." (GS 25)

[26] Nieman, A. (1995). *Love and Guts*. http://www.uwe.ac.uk/fas/wavelength/wave16/nieman.html

Alice often describes her feelings and emotions in a poetic, metaphoric way:

> "I wanted her to be happy. I did not want my own feelings to capsize us.
>
> My feelings dismay me. I so rarely control them. They are their own kingdom, too primitive to be a republic, and when they want to, they send their armies to batter me. My total self should include feeling but I do not know how to make a treaty with that warrior state. When I was growing up I rebelled against feelings and now my feelings rebel against me." (GS 204)

> "I don't own my emotions unless I can think about them. I am not afraid of feeling, but I am afraid of feeling unthinkingly. I don't want to drown. My head is my heart's lifebelt." (GS 25)

> "I am much better at saying what I feel when I no longer feel it." (GS 201)

And Stella's narrative either combines poetic metaphors and scientific references, "What is the moment of death? The moment when the heart stops? The rupture of command from brain to body? The soul climbing out of its dark tower?" (GS 44), or takes the shape of scientific discourse, borrowed from medicine or from physics, as in her outburst of jealousy:

> "While he sleeps I will trepan the back of his head and with my fingers pull out his dream of her. […] First sever the headboard. Second, disembowel the mattress. Third, gut the springs. Fourth, amputate the footboard. Fifth, neatly arrange the halves at either side of the room, one dazed blanket each." (GS 30)

> "I opened the windows of his study and conducted an experiment in gravity. If I drop a CD player and a lap top out of the same window at the same time which one will hit the ground first?"(GS 31)

> "He frowned at me as though I were an inelegant equation; necessary but cumbersome, a bore to manipulate. I was no longer his living beauty of physical laws. No doubt he was telling her about the poetry of numbers." (GS 34)

> "We transfused each other. Now you want me to bleed to death so that no one can tell what wound it was we shared. It is not so simple. Vows can be broken; usually they are, but the wound tunnels deeper into the body one day to recur." (GS 37)

> "He might displace me as a heavy solid displaces water." (GS 139)

This choice of characters and these scientific metaphors are no accident: Winterson has repeatedly mentioned the influence of T. S. Eliot's work on her own creation, and it is well-known that in a 1922 essay entitled *Tradition and the Individual Talent*, Eliot advocated a rather impersonal approach to poetry, and likened it to science:

> "Poetry is not a turning loose of emotion, but an escape from emotion; it is not the expression of personality, but an escape from personality. [...] The progress of an artist is a continual self-sacrifice, a continual extinction of personality. [...] It is in this depersonalization that art may be said to approach the condition of science."

Consequently, the relationship between the two women is rendered in such a way as to make the readers feel that Alice and Stella form together one stable unified entity, and thus to argue in favour of interdisciplinary knowledge, and suggest that scientific rational thought can never penetrate to the final ultimate truth in the absence of the specific mediations and connections made available by the 'literary irrational'. Science is no longer perceived as the sole generator of truth, not even as the dominant one. As if to show the interconnections between the two fields of inquiry, Alice's broad vision of the world combines with the poetic sense that Stella infuses in all the topics she addresses, as if physics were the poetry of scientific discourse, and poetry the physics of literary creation. Both explicitly, in their dialogues or narratives, and implicitly in their manner of relating to each other, Alice and Stella supply relevant examples regarding the metaphorical applications of scientific discoveries.

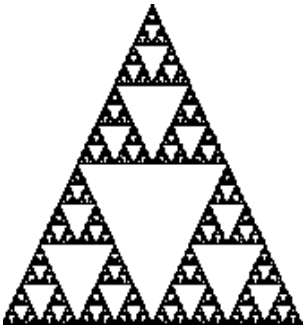
Alice uses the Standard Model in order to redraw the romantic triangle so as to make it fit the post-Einsteinian universe – the three lovers are equated to the strong, weak and electromagnetic fundamental forces described by the Standard Model: "The attraction of the Model is that it recognises the symmetries of the three fundamental forces, weak force, strong force, electromagnetic force. Difficulties begin when these three separate forces are arbitrarily welded together" (GS 97). Just like the Model exhibits a hierarchical problem which requires fine tuning, so does the romantic triad, which is presented in continuous movement, as a rotating triangle:

> "One plus one is not necessarily two. I do the sum and the answer is an incipient third. Three pairs of two: Jove and Stella, Jove and Alice, Alice and Stella, and under the surface of each the head of the other." (GS 119-120)

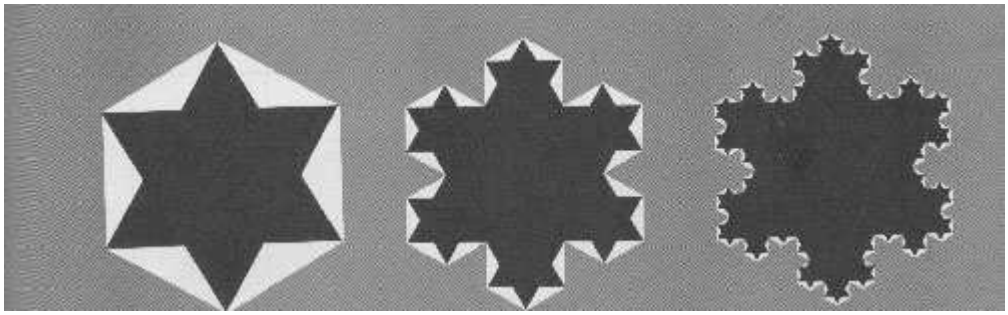
Susana Onega (2006: 180) pertinently argues that the multiplication of the triangles formed not only by the three main characters, but also by "members of the earlier generation" (Uta+David and his wife) exhibiting similar 1+2 arrangements "brings to mind the multiplication of fractals in dynamic models like the 'zooming Sierpinski', reproduced below, or, more appositely, the 'dancing triangles', whose elements move in spirals"[27] because, "as quantum theory predicts", the three points

[27] Robert L. Devaney (2004). 'The Dynamical Systems and Technology Projects at Boston University'. Available: http://math.bu.edu/DYSYS/

of the love triangle "cannot stay in fixity: parallel lines will meet, and their divided selves converge"[28] (Patrick, 1997):



Fractals are geometrical shapes, either regular or irregular, identified by their 'broken' dimension, which is neither one, nor two, not even three, but something in between. As Dirk Vanderbecke (2004) points out, fractal geometry is one of the fields in which the concept of self-similarity has gained prominence, given that the Koch Snowflake, probably the most famous example of fractals, an abstract construction with a dimension of 1.2618 "in which ultimately every part resembles the whole", exhibits a "strict form of self-similarity"[29].



Koch Snowflake (from Mandelbrot 43)[30].

[28] Patrick, J. (1997). *The Eye Net Review of GUTs*. Available: http://www.eye.net/eye/ issue/ issue_ 06.26.97/plus/books.html

[29] Vanderbeke, D. (2004). "Of Parts and Wholes Self-similarity and Synecdoche in Science, Culture and Literature." In C. J. Smith and R. Froemke (Guest Editors) *Reconstruction*: *Studies in Contemporary Culture*. Fall 2004: Vol. 4, No 4. Available: http://reconstruction.eserver.org/044/home.htm

[30] Reproduced in Vanderbeke, D. (2004). "Of Parts and Wholes Self-similarity and Synecdoche in Science, Culture and Literature." In C. J. Smith and R. Froemke (Guest Editors) *Reconstruction*: *Studies in Contemporary Culture.* Fall 2004: Vol.4, No 4. Available: http://reconstruction.eserver.org

The essential feature of self-similarity, shows Vanderbecke (2004) namely that "in a geometrical structure, in a mathematical set or in other phenomena every part or at least one part resembles the whole", gives this principle a distant analogue in the literary field: synecdoche, or *pars pro toto*, or *mise-en-abîme*. Vanderbeke (2004) prefers the first of these terms because of all the literary devices, the tropes are essential in structuring our way of thinking, and the examples he gives, from fields as diverse as cybernetics, physics, alchemy, biology, philosophy, myth, language and literature prove that these frequently recurring self-similar patterns are "one of the persistent ways in which the human mind structures its experience and knowledge of the world." Vanderbecke (2004) explains that the synecdoche has been "an aesthetic principle in language and literature for a long time", and having had "a long pedigree in our culture as a whole" it is easily understood by both scientists and non-scientists, which accounts for the transdisciplinary use of self-similar patterns. It was in the 18th century that this particular trope was singled out by Giambattista Vico in his *New Science* where he mentions that synecdoche developed into metaphor only when "particulars were elevated into universals or parts united with other parts together with which they make up wholes" (Vico, 1984: 130)[31], but the idea was present even in the medieval philosophy of Nikolaus Cusanus, who had already claimed that "everything partakes of the whole" (Vanderbecke, 2004), mirroring the much older theory of Anaxagora, the pre-socratic philosopher quoted in Aristotle's *Physics*: "any part is a mixture in the same way as the All, on the ground of the observed fact that anything comes out of anything". Winterson's *GUT Symmetries* contains many meditations and dicta recalling not only these philosophical ideas, and the alchemical axiom "as above, so below" turned leit-motif of the novel, but even the
later theories in physics, developed at the beginning of the 20th century by Niels Bohr, who said about the structure of the atom that: "In this picture we at once see a striking resemblance to a planetary system, such as we have in our own solar system" (Bohr, 1922: 316)[32]

> "First there is the forest and inside the forest the clearing and inside the clearing the cabin and inside the cabin the mother and inside the mother the child and inside the child the mountain. […] Paracelsus, physician, magician, alchemist, urge, demiurge, *deus et omnia* was born under the sign of the occult, ruled by Mars and driven by a mountain in his soul." (GS 1)

[31] Quoted in Vanderbeke, D. (2004). "Of Parts and Wholes Self-similarity and Synecdoche in Science, Culture and Literature." In C. J. Smith And R. Froemke (Guest Editors) *Reconstruction*: *Studies in Contemporary Culture.* Fall 2004: Vol.4, No 4.
Available: http://reconstruction.eserver.org/044/home.htm

[32] Quoted in Vanderbeke, D. (2004). "Of Parts and Wholes: Self-similarity and Synecdoche in Science, Culture and Literature." In C. J. Smith And R. Froemke (Guest Editors) *Reconstruction*: *Studies in Contemporary Culture.* Fall 2004: Vol.4, No 4.
Available: http://reconstruction.eserver.org/044/home.htm

> "The poisoner and the scientist are one. And both." (GS 2)

> "Paracelsus was a student of Correspondences: 'As above, so below.' The zodiac in the sky is imprinted in the body. 'The galaxa goes through the belly.' " (GS 2)

> "Where is the Archimedean point? Inside? Outside? What is the proper perspective on my existence?" (GS 181)

> "Diamonds deep in the earth's crust. Diamonds deep in the stellar wall. As above, so below. Uniting carbon mediated in my gem-stole body. When a baby is born, its anterior fontanelle, at the back of the skull and diamond-shaped, is the last of the sutures to close. Resisting ossification, it is an eloquent wound. What has been, what will be, star-dust that we are. Uniquely the carrier of history, this vulnerable human cell, cosmos-hurled." (GS 187)

> "The Miracle of the One that the alchemists sought is not so very far from the infant theory of hyperspace, where all the seeming dislocations and separations of the atomic and sub-atomic worlds are unified into a co-operating whole." (GS 2)

As if to illustrate Henry James's (1948: 404) view of the novel as a living entity, "all one and continuous, like any other organism, and in proportion as it lives will it be found, I think, that in each of the parts there is something of each of the other parts", besides the impressive metaphors and numerous references to the concept of self-similarity, *GUT Symmetries* displays self-similarity at the structural level as well: the fifth chapter contains a short-story rendered in italics which also appears in Winterson's collection *The World and Other Places*, without the italics, of course. Entitled *Three Friends*, the tale is an allegory of the quest for '*That which cannot be found*', and thus constitutes a *mise-en-abîme* of *GUT Symmetries*

> "compressing into a nutshell the various versions of the quest developed throughout the novel (the Fool's journey along the Tarot trumps/the alchemical search for the Philosopher's Stone/the Jungian quest for individuation/the quest for the Holy Grail) under the medieval topos of 'the Ship of Fools', defined in the glossary as 'Lunatics/saints sailing after that which cannot be found" (Onega, 2006: 181).

Moreover, the narative is structured in stories within stories, as the birth of each main character (Paracelsus, Alice, Stella and Jove) is presented, with detailed hallmarks of their origin and development, namely the encounters of their parents and grandparents[33], as well as the astrological birth-time coordinates, in light of the axioms of medieval alchemy, which, as Onega (2006: 159) recounts, deemed these particular circumstances "determinant for the future development of the individual".

[33] In the case of the last three, namely Alice, Stella and Jove.

The stories recounting the birth and the ancestry of the characters give rise to the most striking example of self-similarity in Winterson's novel, namely the one displayed in the different 2+1 combinations creating the image of spiralling 'dancing triangles', an exquisite artistic expression of fractals: Ishmael and Uta + David, David and his wife + Uta, Uta and David + his wife, Jove and Stella + Alice, Jove and Alice + Stella, Alice and Stella + Jove.

By disrupting the linear structure formed by the original couple, Jove+Stella, having an affair with the former, Alice managed to set her life in order:

> "I had found relief with Jove and did not question it. Relief from the burden of myself. Here was a recognised pattern with room in it for my piece. My gaps and angles now fitted in somewhere. I was joined up, part of a whole not awkward, standing out." (GS 106)

Stella herself noticed the role Alice played in Jove's life, as an agent of positive disorder, working against the establishment of deadly entropy: "Blankets? Blankets? What has he to do with blankets? Warm enough in borrowed arms. His secret heat" (GS 30). But soon enough the relationship between Alice and Jove entered a phase of heat death as well, and Jove's attempts to refuel the flame of passion failed to succeed, causing Alice to wonder:

> "What did we hope for, heating and re-heating ourselves to absurd temperatures? As matter heats up it is subject to demonstrable change. Boiling in our vessel, our water molecules would begin to break down, stripping us back to elemental hydrogen and oxygen gases. Would this help us to see ourselves as we really are?
>
> Heated further, our atomic structure would be ripped apart. He and she as plasma again, the most common state of matter in the universe. Would this bring us closer together?
>
> At about a million degrees K, give or take a furnace or two, he and she might begin to counterfeit the interior of a neutron star and could rapidly be heated further into sub-atomic particles. You be a quark and I'll be a lepton." (GS 100-101)

As a result of the monotonous order leading in slow motion towards heat death, Alice engages in a risky but amazingly new relationship with Jove's wife, much to the man's despair:

> "When I met Jove there was a brief burst of liberation. Then my unconscious watchers reclaimed the land. Old habits twisted round new chances.
>
> When I met Stella, I was so excited and appalled at making love to another woman that the Miseries took much longer to regroup. Old patterns of behaviour could not be re-established because I had never known anything like this before. The shock of the new and it worked." (GS 205)

If Alice was the one who, initially, prevented Jove's life from reaching a state of heat death, it was Stella who, surprisingly, provided Alice with this inestimable service. However, the love triangle contradicts Aristotle's principle of the excluded middle, and Alice, utterly aware of this, worries about the outcome of their triangular relationship:

> "I stood in the doorless kitchen doorway and looked at them both and it was at that second that I had a queasy feeling of being nothing but a tie-beam; a beam connecting the lower ends of rafters to prevent them moving apart." (GS 133)

> " '*Tertium non datur*.' The third is not given, whatever it is that reconciles two opposites. If I was there to reconcile them were they planning to dump me overboard when the job was finished?" (GS 137-138)

And, indeed, the neat symmetry of this three-way love-affair is finally challenged by Jove's jealousy. The problematic situation is not surprising to those who managed to understand the Standard Model metaphor – the problem with the Standard Model is its failure to describe the gravitational force, and Alice's and Stella's comments prove that both women are aware of this:

> ALICE: "It was because we knew that gravity is always part of the equation that we tried to defeat it. Lighter than light in the atmosphere of our love." (GS 102)

> STELLA: "We did escape gravity. If I flew too close to the sun, forgive me. Water claims her own at last. You were the one who understood the theory of flight. You were the one who taught me the aerodynamics of risk." (GS 174)

Alice even describes in a poetic manner the outcome of a possible union of the four fundamental forces:

> "If we had the courage to cook ourselves to a quadrillion degrees, the splitting, the dividing, the ripping, the hurting, will be over. At this temperature, the weak force and the electromagnetic force are united. A little hotter, and the electroweak and the strong force move together as GUT symmetries appear.
>
> And at last? When gravity and GUTs unite? Listen: one plays the lute and another the harp. The strings are vibrating and from the music of the spheres a perfect universe is formed. Lover and beloved pass into one another identified by sound." (GS 100-101)

This paragraph links physics, cosmology, poetry and music, in light of Walter Pater's famous remark that "All art aspires to the condition of music" and, combined with Winterson's use of repetitve structures in dealing with the same set of themes, it brings to mind T. S. Eliot's notes on the similarities between poetry and music:

> "The use of recurrent themes is as natural to poetry as to music. […] There are possibilities for verse which bear some analogy to the development of a theme by different groups of instruments ['different voices,' we might say]; there are possibilities of transitions in a poem comparable to the different movements of a symphony or a quartet; there are possibilities of contrapuntal arrangement of subject-matter."

Actually, on reading Winterson's novels, we are constantly reminded of a symphony by the treatment of recurrent themes with constant modifications of imagery originating either in the various contexts presented, or in their combination with other recurring themes. At first sight, these might seem to be common images, obvious comments and familiar notions, but they gain novel meanings through repetition, blending in ever new contexts, in surprising combinations which may result from the slightest modification:

OF PARTICLE PHYSICS, BOUNDARIES AND RISK

> "**You live on particle physics**. You are a science museum." (GS 210)

> "You dream what you breathe. Images, that in daylight float random and strange, coalesce in the untutored night when **the particle world becomes you**." (GS 211)

> "Say theoretical physics to most people five hundred years from now and perhaps they will say, 'Bombs and destruction.' How to explain that what we saw, briefly, dimly, was a new heaven and a new earth? **There is no discovery without risk and what you risk reveals what you value**. Inside the horror of Nagasaki and Hiroshima lies the beauty of Einstein's $E=mc^2$." (GS 103)

> "Cast up in a body, I find the long past of me like a fossil in stone. What was it that moved so determinedly, and slunk at last into bas-relief? The fern is preserved but it will not grow. The creature in its coildom is safe and safe it stays. **What risk? And without risk what movement**?" (GS 186)

> "The wager was a life. The winner should take the life of the loser in whatsoever way he chooses. […] **What you risk reveals what you value**." (PB 91)[34]

> "**There's no such thing as a limited victory**. Every victory leaves another resentment, another defested and humiliated people. Another place to guard and defend and fear." (P 79)[35]

[34] Winterson, J. (2001 [2000]). *The.PowerBook*. London: Vintage. Subsequent page references in the text are to this edition.

[35] Winterson, J. (1988 [1987]). *The Passion*. Harmondsworth: Penguin Books Ltd. Subsequent page references in the text are to this edition.

"**There's no such thing as a limited victory**. You must protect what you have won." (P 133)

"There is always a city. There is always a civilisation. There is always a barbarian with a pickaxe. **Sometimes you are the city, sometimes you are the civilisation, but to become that city, that civilisation, you once took a pickaxe and destroyed what you hated, and what you hated was what you did not understand**." (PB 17)

"**You play, you win, you play, you lose. You play**." (P 43, 66, 73, 133)

OF SPACE, TIME, HISTORY, REALITY

"Our furnace of love heated time and welded together the separateness of the hours, so that **time became** what the prophet says it is – **continuous, unbroken**." (PB 21)

"**Only in the present do I begin to recognise my own past**". (GS 200)

"What does the end matter?
Here, now, is enough, isn't it?" (PB 173)

"We cannot keep in mind too many things. **There is only the present** and nothing to remember." (P 43, 86)

"**The point that I am, the definite bounded thing in time, is beginning to break up**. I am dispersing myself through my known past and my unknown future. The present is without meaning." (GS 186)

"The universe hangs here, in this narrow strait, infinity and compression caught in the hour. **Space and time cannot be separated. History and futurity are now. What you remember**. **What you invent**. The universe curving in your gut." (GS 219)

"The more I write, the more I discover that **the partition between the real and the invented is as thin as a wall in a cheap hotel room**." (PB 93-94)

"We are what we know. We know what we are. **We reflect our reality**. Our reality reflects us." (GS 18)

"**We are our own history**. A living memoir of time." (PB 103)

"**Why do I question what I see to be real**?" (P 43)

"**Signs, shadows, wonders**." (GS 81, 89)

"**What you see is not what you think you see**." (GS 81)

OF STORIES AND TRUTH, BEGINNINGS AND ENDINGS

"**I'm telling you stories. Trust me**." (P 5, 13, 69, 160)

" 'Facts never tell the truth. **Even the simplest facts are misleading**.' " (PB 38)

"It used to be that the real and the invented were parallel lines that never met. Then we discovered that space is curved, and in curved space parallel lines always meet.

The mind is a curved space. **What we experience, what we invent, track by track running together, then running into one, the brake lever released**. **Atom and dream**." (PB 13, 94)

"Like other exiles, her **longing grew a narrative of its own**. **Her desire told itself as memory**. Her past was a place that none of us could visit without her. It was the only kningdom she could control." (PB 143)

"The alphabet of my DNA shapes certain words, but the story is not told. I have to tell it myself.

`What is it that I have to tell myself again and again? That **there is always a new beginning, a different end**." (PB 4)

"**Love's script has no end of beginnings**." (PB 77)

"Anyway, life is not a formula and love is not a recipe. **The same ingredients cook up differently every time**." (PB 184)

"How do you seem to write me to myself? I am a message. You change the meaning. **I am a map that you redraw**. Follow it. The buried treasure is really there." (PB 109)

"**I can change the story. I am the story**." (PB 5)

Winterson's exquisite choice of words turns what might have been flat repetition into subtle variation on the same theme resounding with delightful musical richness. And in spite of some critics' gratuituos accusations pertaining to Winterson's exhaustion driving her towards endless repetitions, which results in a disordered collection of pretentious maxims, a trained eye matched by a trained ear will soon be able to distinguish between repetition and variation, between monotony and polysemy, and will discover that Winterson's technique is meant to achieve

something far more exacting than merely imitating herself. Winterson's "disorderly text" reveals its hidden meaning to the persistent reader and from the novel there arises the meaningful pattern of dominant themes which, through their interrelation and progression, soon become pregnant with meaning.

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PSYCHO-PEDAGOGY PROBLEMS IN TAKING NOTES

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ABSTRACT. This study shows the problems of taking notes within learning process, and stress out the stages of a efficient notes writing: for the case when the notes have been taken following the teacher's explanation, then a first stage should be active listening, for the case when the notes have been taken as a material reading, like a book, then the first stage should be pre-reading (cross-text lecture or the material up-viewing). In both cases, process or comprehension of those read or listen follows. The next stage consists in information mental selection, organizing, and system, as well as the information writing and, finally the information review.

Taking notes and learning process relevance

Learning is an extremely complex process, analyzed and approached by different perspectives. In a wide meaning, learning is an acquisition (intended or spontaneous) having the result of experience acquiring and individual conduct modifying. R. M. Gagne said that learning is human capacity or position modification that can be sustained and cannot be dealt with growth process. By E.R. Hilgard and G. Bower, learning is a process of acquisition in relation with experience, a process by which some activities or conduct occur or modify itself in relation with variable or repeated environment conditions.

Definition frequently known in the field of education sciences is the following one: scholar learning is understood as intellectual and physic activity systemic undertaken having the result of some information acquiring and to make the skills needed in personality continuous developing. Learning regards a double sense: on the on hand, a informative sense, consisting in information content retaining and preserving (*learning as product*), and on the other hand, a building sense, dealing with develop of cognitive-operational system individual who is learning (*learning as process*).

Scholar learning is a mnemonic acquisition process, of active and interactive information acquiring, of intellectual operations formation, of cognition strategies, of intellectual, motor/practice skills (understands and habituating), of attitudes.

Taking notes is an important stage in learning process. All this process starts with material perception/reception, meaning making a status of attention, of cerebral activation. Within this status active perception of concrete data occurs, and then, by analysis, synthesis, and generalization relevant relations took place. It also occurs data penetration by thinking, meaning information condensation in notions,

rules, and principles, like first understanding efforts. All these condensed information shall be written as notes. Subsequently, in learning process memory fixing, information preserving occurs. Finally, information is used in knowledge upgrade in a form of reproduction, of information operating by transfer in similar conditions, and then in a new context. All stages mentioned above, their way of articulate receive different connotations within learning process, in relation with somebody's knowledge about his own cognitive strategies. Nevertheless more of them, the cognitive strategies can be grouped in three general categories:

1. repetition and practicing strategies
2. knowledge establish strategies (memorize, summary making, paraphrase, main ideas identifying from a text)
3. knowledge organizing strategies (underlining, concept schemes building, taking notes, information relationship strategies).

In instruction and education practice all these strategies are seen either in pure forms, and combined by learning situation conditions. For example, we can see repetition and practicing strategies, in a pure form on mathematics classes, on problems or exercises solving, or we can see knowledge establish and organizing strategies on literature classes – towards text summary making, or main ideas text identifying. We can see all cognitive strategies mentioned above, combined, for the case when encounter with biology, history, and geography lessons, on project, portfolios, summaries elaboration etc.

Meta-cognitive knowledge regarding these strategies refer to efficiency and usage implications, to applying modalities and conditions in terms of efficiency, but also to the reasons on which they function efficiently in some cases and no so efficiently in other cases. Pupils to know that notes taking is a knowledge organizing strategy is not a meaning, but is important to them to possess meta-cognitive knowledge in this regard, meaning to know how these strategies can be efficient or not by a context done. As they grow, the pupils shall become aware about their own cognitive processes characteristics, and shall accumulate more and more knowledge about cognition in general. All these acquisitions, as they are made conscious and frequently used, will facilitate and improve intellectual work, pupils' individual study and will have the result of scholar performing increase.

What a pupil must keep in mind about an efficient learning strategy, and moreover about individual study? We are taking as essential the fact that efficient learning, within individual study is based by material elaboration, understanding, and organizing.

Elaboration consists in usage of old knowledge for interpretation and enrichment of study material. Elaboration's goal is comprehension / understanding, meaning the relation making between integrated knowledge from cognitive system with knowledge already kept, in a way of new active an flexible knowledge structures making. Both processes require old knowledge with new knowledge relationship. Both processes are need for an efficient learning. When a pupil is

studying individually, it does exist some manners of information processing by which elaboration and understanding of learning material is facilitated:

- *knowledge activation* by "material up-viewing" and put the questions regarding of relational knowledge to the knowledge specific to the study material;
- *analogies making*, respectively concepts and ideas "approaching" based on present similarities between them;
- *mnemonic using or a memorization tips*. Mnemonic or memorization tips, useful especially in difficult study material processing, consists in artificial relationship creation between different ideas and concepts, in order to permit a subsequent update of them.

Study material organizing, meaning grouping of linked information in different categories and structures, it is another condition of efficient learning. Thinking operates with knowledge structures, which are dynamic and flexible, and in this regard requires a continuous restructure and reorganizing of information acquired or gained. Thus, grace to logical connections realized by the person, a learning material well organized should be retained more efficiently than a learning material not so well organized. Scholar material (manuals content, teacher's content) is for several times an organized material. In some cases the material structure does exist, but it is not so transparent, because of material difficulty, or the fact of not meeting with the reader expectations, or because of low pupil preparation level. In these cases usage of material organizing strategies are imposed:

- *summary outline* doing of main ideas from material of study;
- scheme of content – by take of notes – based on existing relations between ideas. This relation can be of cause-effect type, up sorting ore under sorting, *chronological order, narration*;
- *graphic representation* of material by a network, a map, a table, a scheme, models etc;
- summary, an efficient way also for the notes review. This requires critical treatment of material in order to ideas selection and making relevant examples, which will be the updating support for other ideas.

Psycho-pedagogic approach of taking notes activity

In order to identify the way in which the pupils of IX-XII grade is individually studying and take notes, we have undertaken a investigation of data collect regarding on taking notes and their valuation as knowledge strategy. For these reasons we used: observation, conversation, interview, quiz, research on pupils activity products (notebooks, paper works etc). Subject of sample for investigation encompasses four classes of IX grade, and four classes of XI grade. Objectives intended to data collect in research described above, have been taken in account the following scopes:

- importance that pupils make in individual study;
- appraisal of the importance given by pupils to the individual study;
- the manner in which the pupils possess information about individual study planning, organizing and progress;
- the manner in which the pupils have the knowledge about individual study planning, organizing and progress;
- methods in pupils' individual study doing;
- identification of methods of pupils' individual study doing;
- individual study techniques used by pupils;
- making an inventory of the main techniques of individual study used by pupils in scholar disciplines study.

Even a short comment upon information acquired shows that pupils from all eight classes are ignorant and non receptive as regards theoretic and practice aspects on individual study strategy. No more than a half of pupils know to combine pertinent and efficiently the notes taken from lessons with information taken from manuals or other sources. Moreover, *a negative aspect of learning pupils' conduct is the inhabit of sole notes using*. This trend increases mostly in upper high school grades. It doesn't deny the usefulness of manuals, it is merely accepted as declarative manner, or as a fact. The explanation is residing in pupils' choosing upon essence and summary, as qualities frequently met in teachers' presentations and rarely in texts of manuals. Almost all interviewed pupils said that it is necessary for a blackboard scheme doing, during teachers' presentation, a scheme that pupils will take as notes – no matter that, as homework preparation practice, they have as study support only the notes, the manuals or both of them. Unanimously recognition of blackboard scheme usefulness shows serious lack in taking notes techniques, as many pupils have declared that they don't know how to take the notes. In this regard it should appear also an indolence of pupils, who are not disposed to make intellectual efforts in the way of summary ideas of texts doing.

Another aspect of worry is that approximate a half of interviewed pupils said they doesn't know how to use the notes and the manuals, as they haven't sufficient developed capacities of analysis, synthesis, essential. Some pupils memorize the notes mechanically, in the way they can do take during presentations; others do memorize whole texts from manuals. "I'm reading with loud voice from manual, and I read again voiceless and than I repeat the lessons by heart" a pupil said.

Poor general situation in notes using and manuals using on the secondary education level (respectively on IX and XI grade) as basis on pupils' individual study indicates a severe lack about pupils inhabit to individual study strategy. We cannot speak about other methods of study on pupils of the first grade in high school. Regarding the pupils of XI grade, situation has changed, but no more. For an example, the pupils' initiation in activities of research and investigation is doing gradually, in small steps and several scholar disciplines contribute about this.

Results acquired in this researches have determined us to contribute firstly in the conceptual-theoretic manner of the problems of individual study and taking notes, and then, by future actions, to contribute in practice-applying manner as well.

We take in account that written recording of some ideas, problems, models does help on memory fixing of information by three modalities complementary linked: hearing, visual, kinesthetic. This fixation is as durable and strong, as it should realize by audition or visual channel. Observations shows that frequently pupils tend to put it down the professor's presentation word by word, with no intention to loose anything. We quote from a pupil's observation "at school I'm putting down all I hear from teachers, nevertheless most of them almost dictate the lesson". Unfortunately, to put it down everything is almost impossible to do without lacks, having in account a common presentation of a lesson. We have to mention the fact that in information transmitting by teacher with voice channel does play a very important role, that make sense practically at any age. The tone, the intonations in voice, pauses in speaking have the role to do the necessary underlining and to put in value of essential, practically suggesting the moments when the pupil will take the notes.

But mostly, in the hurry to collect everything, the pupil uses different abbreviations, not so many, unsorted, inconsistent, and impossible to read again, correctly. Moreover, a short view about the notes taken by pupils shows us blank spaces, for the words and phrases not understood, and in general a hurry handwriting, difficult to read again and again. Whether blank spaces don't fill daily, or it don't be re-written, in many cases all these notes, taken in a neglecting manner, cannot be used after a several time passing. That is why this kind of intellectual work, empiric and done without pay attention cannot have the desired results. Pupils who want to put it down everything exercise only their mechanical memory and put away logical memory, they put away thinking development, creativity, spirit of analysis, of criticism, and thus don't participate to the lesson in an active manner. Preoccupied of putting down integrally of the professor's presentation, they cannot achieve the text comprehension, they cannot be aware of essential ideas, key terms, they cannot see connections between ideas, they cannot understand the lessons really and thoroughly. We have to mention about the mistakes and misunderstanding, in conditions in which logical and rational thinking doesn't occur.

Nevertheless, we appreciate that definitions – in which any word has a meaning absolutely needed – to be put it down integrally, and also the drawings and schemes made on the blackboard.

We define taking notes as a inhabit that mean comprehension, mind systematization of information heard or red and, as well as their put it down in an intelligible manner.

In order to be efficient, the notes taken by pupils should follow, at least some aspects:

- *seeing important aspects, on maximum relevance;*
- *underlining of essential themes, of principal facts, argumentation and their demonstration;*
- *an inventory of illustrative examples that put the themes in value;*
- *formalization of teacher's conclusions, that means comprehension and systematization of information.*

Distinguish of essential matters from those non-essential, separation between arguments of pro and against the principal themes, making of conclusions etc. is not an operation that can be done easily from the beginning, nor spontaneously. It requires systematic practicing, acquiring of relevant experience, becoming thus an intellectual work inhabit.

Taking notes requires for the pupil **to make economy of effort and time**. Wrong words don't be erased with rubber, they ought to be strike through a line, long quotes don't have to be written integrally, but only first and last words, and completion shall be added by bibliography indicated by teacher.

Taking notes to the pupils implies forming and development of such competences regarding information synthesis, text compilation system, teacher's phrases replacing, or more phrases, by a key term, significant. This system implies also an open attitude, selectivity, distributive attention, observation spirit, capacity in information restructuring, to evaluate, generalize, synthesis, abstraction. The subject expressed by a sentence can be understood in the next sentence; the common predicate of several sentences can be omitted; it can be eliminated the secondary parts of sentence, attributes and complements, if the general meaning of this sentence will not be modified or corrupted.

In order to facilitate notes decoding, their subsequent completion, pupils are writing in an different way, splitting chapters an subchapters by titles, using underlining and leaving a blank space to the notebook border, to the sheet, distances between text rows etc. Immediately after de class it should be recommended to fill up the blank spaces, interrupted phrases, to check some data on uncertain numbers, to correct eventual mistakes in orthography, and it should be underlined in black or red the main ideas and important data; it can be done even some explanations on the notebook borders, as bibliography consulting.

For didactic reasons it is recommended that taking notes should be done after the second lecture of material, thus eliminating repetition, non-essential aspects. Material systematization is done in order to facilitate memorization and to facilitate information integration in previous cognitive structures.

For make taking notes easier, during pre-lecture problems or relevant sections should be underlined, or mentioned separately on paper. As the text is red again, only ideas or sectors that resist on this critical lecture will be put it down. We are suggesting that notes to resume correctly, without mistakes or omissions the material of study; that is why they must thoroughly been done, checked and

selectioned. For putting in view essential data and their logical link, figures, schemes, tables or models can be done. This entire conciseness must be at maximum. Words shorting is well used, mostly words frequently known and met, having an economy in space and time. We don't suggest that these word shorting to be so extended, and later illegible; the goal is re-reading facility.

Even on students of first year we are observing one tend to take notes as quotes collected and put together. The reader doesn't succeed to leave the text behind: sometimes all seems to be important to him and there is temptation to put it down everything. Sometimes he isn't capable to collect the main ideas from a text and to play with his own words. Sometimes does exist the wrong opinion that using quotes we have no disturbing, no false information. Let us don't forget that practically, quotes presentation is always enclosed to the reader's comments, to personal interpretation, to his own representation, to some links, and all these making a kind of subjectivism in text decoding.

Although seems to be non important, the visual and esthetic aspect of notes can have unfavorable consequences upon their subsequent usage. We refer to written notes with calligraphy almost illegible, with long phrases, without page disposing in an equilibrate manner, in order to be well followed and memorized.

Efficient notes have three qualities needed such as:

1. exactness (fidelity)
2. conciseness
3. clarity

Moreover, it does exist some useful tips in an efficient taking notes activity:

- Taking notes starts before listening a discourse and stops only after the notes review, completion and correction. Taking notes implies as necessary elements dealing with correction, completion and reviewing of notes.
- Notes completion and their correction assure value of retained information. Notes can be completed or processed by confronting them with other notes, but with caution in data fidelity, a possible transfer in other contexts etc.
- Keeping notes in an organized system by criteria familiar to person, as they can be available for identification and subsequent usage, even for long periods of time.
- It shouldn't have to put it down all hearing or speaking. The notes are important for memorization and learning, but does exist information in bibliography supports. We have to mention now the importance of documentation in intellectual pupils' forming as a part of their integral forming.
- Sheet paper economy is not recommended in taking notes. It is important that notes to have a title and to have been dated.
- Keeping notes in a well-organized system make easier their accessing. Sheets of paper should be numbered and recorded.

- An index of content can be done, eventually with pages indication in different sections.
- Writing instruments are important as well: pen is recommended, but it does decrease the writing speed; pencil and ball pen deforms the handwriting.

Although taking notes by handwriting is traditional way of data put it down, in our contemporary society another alternative forms appeared: tape recorder, laptop etc.

STAGES IN PUTTING DOWN OF NOTES

Systemic observations on classes shows that many pupils consider taking notes as a activity quite easy, but no more of them does have the right technique of this matter.

Considering taking notes as a process we a trying to identify its stages: for the case when notes are taken following the teacher's presentation, then **active listening** shall be the first stage. If we take the notes as we are reading a material like a book, then **pre-reading (cross-text lecture or the material up-viewing**) shall be the first stage. In both situations **processing or comprehension** of those red or heard follows. The next stage is mind **selection, organizing, and systematization** of information, simultaneously with their **put it down** and finally their review. All these stages – review makes exception – are consumed simultaneously and in an very short time.

Active listening means adopting of one suitable mental attitude, but also attention keeping for logically thinking and to obtain a whole understanding. To listen critically requires for the pupil to have doubts regarding the exactness of described facts and to be impartial to supposes and arguments used by teacher (without have his own representation as thinking basis), and to carefully consider the value of proves and logic structure and condensed of the message. To listen active means to listen with attention, and pay attention can be intermittent and selective. In normal manner, for pupils majority the attention curve starts upper, falls during the message and climbs till the end. This tend must be avoided by special effort making on the middle of the message, in order to keep the message receptors' participation as a constant. Listening active, essential points of discourse can be identified. Teachers, in their discourses, "offer" all these essential points by information repeating, voice changing, key terms mark, ideas conclusions etc.

Pre-reading or (cross-text lecture or the material up-viewing) is a preparation in taking notes technique. This preparation is mostly forgotten or probably avoided for the reasons of time.

Scanning means a text organizing mode examination and identification of a place of some information. In the scanning of some text title, summary, subtitles, indexes are easily identified.

Title offers a first information about book content, then summary scanning follows, step to the subtitles and close with the index. Keywords identification

implies searching from a section of relevant words for respective theme. Usually key terms are placed in the first paragraphs of chapters. Cross-text lecture implies seeing of key parts of given material, and it is very useful especially for a large material. By cross-text lecture a primary familiarity of the main ideas of the author is gained, as well as the material's theme. Cross-text lecture is done reading the beginning and the end or reading first phrases of material, as well as isolated sections from its content.

Pre-reading or text up-viewing is a background facilitating the notes putting down, by the fact that offers basis for the main ideas of a given text.

Processing or information comprehension implies thoroughly information processing in order to be reorganized in a new product: notes, summaries, ideas planning etc. This new external representation of material of study makes difference about understanding level gained by the learning subject and can be a feedback source for him. Visual design of information is responsible for speed of processing, for thoroughness, facilitating key elements identification, of the main ideas, of necessary links. During mental processing **selection, organizing and systematization** of information is done, simultaneously with **recording and putting down** of the notes.

It is recommended that notes review to make on the end of teacher's presentation and not a day after or in subsequent days.

Avoiding all these stages have the result of "spontaneous" taking notes (V. Slotte, K. Lonka – Contemporary Educational Psychology, 1999) with severe injuries upon text comprehension. The two authors have made an experiment upon two samples of subjects: one for experiment, and one for reference. The subjects have a text of approximate 10 pages a text they have to learn in a given time. Subjects form experimental lot may take notes on the text border, and the subjects from reference lot may not event to underline the words, or mark the keywords. After the time expiring, the subjects receive a test with items selected from material of study, time when the experimental lot notes are analyzed. It states that the notes are spontaneously taken: separate words, parts of schemes, drawings etc. Moreover, there are no significant differences between the two lots regarding cores obtained by subjects.

That is why we recommend that in learning process and in individual study the usage of at least one system of taking notes, suited to the individual style of intellectual activity.

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DYNAMICAL LEARNING ENVIRONMENT ON MATHEMATICS LESSONS

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ABSTRACT. In this article we analyze the advantages and disadvantages of using a dynamical learning environment, and give some hints about how to use it in the classroom.

1. Introduction

It is still usual in school practice, that teacher presents the new information instead of letting the students to discover them. This is more true in teaching/learning Mathematics: teacher presents the theory, gives the assumptions and prove them, solves some typical problems, to show to the students the algorithm, and then students do exercises. Most of these exercises are using the known algorithms. Using this traditional way of teaching, students are usually passive on the lessons. They are not used with exploring, they always just learn the given facts. To be able to explore, to make assumptions, is very important even in everyday life, so every student should gain this ability. For those, who will do research, it is compulsory to be able to discover new things, rules exploring. There are several of movements, which try to introduce active teaching/learning methods in school, one very well known is the RWCT (Reading Writing for Critical Thinking). Another way is to use an educational software or a dynamical learning environment, as these programs are very attractive to students, and ensure an active learning. There are several of studies about computer use in higher education, for example (Garland, Noyes, 2004) is a review of some results. In some studies students prefer computer-based learning, in others they prefer more traditional methods. In some studies students see computer-based learning as a complementary way beside the traditional methods.

2. The dynamical learning environment (DLE)

A dynamical learning environment gives an active mode of learning/ teaching. It is a program, which can contain a lot of interactive modules beside the traditional ways of presenting information.

One possibility of such an interactive module is the simulation. In (Lunce, 2006) there are presented more type of simulations. The interactive simulation focuses on discovery learning, gives the opportunity to student to build and test

hypothesis and observe the results. She/he learns how to conduct a scientific research. One can think, that simulation is more specific for Physics, Chemistry, Biology or Geography. But there are possibilities to do interactive simulations in Mathematics too.

A simple example: to find out what is the sum of the angles of a triangle, we can use a applet, which displays a triangle and the measure of each angle of it, so students can calculate the sum of these values. Then students can move each vertex of the triangle, always observing the sum of the angles. In this way they can get the conclusion, that this sum is 180.

Another, very attractive way is the instructional simulation game. In (Van Eck, Dempsey, 2002) a game is described, which helps to transfer Mathematics skills from a learning context to a real-world scenario. The game is a home-remodeling project, which requires to solve problems in Geometry focusing on the concepts of volume and area of simple geometric shapes. Students can get help, which is provided in form of a film. An additional aspect of the simulation is that there is another character in the game, which works in another part of the house, and gets similar problems, as the student. Students can observe this character and learn from his activity.

In the following table we can compare the traditional way of teaching Mathematics with the using of the dynamical learning environment.

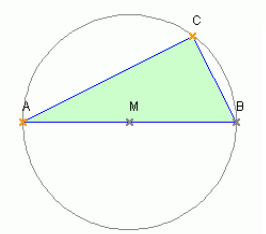
Traditional method	**Dynamical learning environment**
- the teacher gives the theorem/ formula/ rule	- students, exploring, make an assumption, which leads to the theorem/ formula/ rule
- the teacher, eventually discussing with the students, explains the proof	- students, exploring, try to make the proof step by step, getting help or hints from the program
- the teacher gives exercises, and the results are checked in front of the classroom. Teacher doesn't have time to check the work of every student	- using an DLE every student gets a feedback about his/her work

We can observe, that in the traditional way of teaching the teacher is an instructor, it is the key person in the class, but using a DLE this changes. A DLE gives the students the principal role: they explore, they give assumptions, they build the proof, etc. The teacher has only the role of a tutor on the lesson. But he/she has a very important task to prepare all the materials for the lesson.

Example: We would like to teach the following theorem:

If the vertices of a triangle lie on a circle and one side is a diameter, then the triangle has a right angle.

In the following table we compare the traditional way of teaching this theorem with the use of a DLE.

Traditional method	Dynamical learning environment
- the teacher formulate the theorem	- the students get the following task:  $\alpha = 26.77$ $\beta = 63.23$ $\gamma = 90.00$ - Move C on the circle. - Observe the size of the interior angles of triangle ABC. Students see the measure of each angle, so they can observe, that the measure of the angle ACB is always 90. - the students formulate the theorem
- the teacher, building on the suggestions of the students, explain the prove of the theorem	- students, eventually using the hints given by the program, prove the theorem. If they don't know how to prove it, they can get a step by step prove from the program

3. Advantages and disadvantages of using a DLE in the classroom

In the following table we present some of the advantages and disadvantages of using a DLE in the classroom.

Advantages	Disadvantages
- students are active during the lesson - every student learns in his/her own rhythm - every student gets feedback on his/her work - students learn how to explore, how to make assumptions - the creativity of the students is developed - it is attractive to students	- teaching with a DLE needs more time - the teacher has to spend more time to prepare the lesson - it is difficult to use the program for those students, who can't use a computer

Let see the disadvantages and show how to deal with these. It is true, that using a DLE needs more time, then using the traditional teaching methods. But we are not using a DLE on every lesson, we alternate it with the traditional method. Also, there are topics, which are not appropriate for a DLE. The time invested in teaching the students how to use the DLE is not very long, just few lessons, then they can concentrate on mathematical issues. Making some preparation lessons for the usage of the program, help those students, who are not so familiar with the computer. Concerning the time, which the teacher needs for the preparation, we think, that this time is long only in the beginning, while he/she get used with this method. The teacher can use programs, lessons made by others, but also in some programs (for example GEONExT) it is very easy to build their own.

We can see, that the DLE has more advantages, as disadvantages. Dynamic Mathematics can be used for visualization, for exploration, as a construction tool, and supports active learning by discovery.

4. The program GEONExT

GEONExT is a dynamic Mathematics program, which can be used as a construction tool, especially for geometric constructions, but also as a function plotter, a computer algebra system. So using this program we can cover topics from Geometry, Algebra and Analysis. From the technical point of view it has many advantages, because it doesn't depend on the operating system, it based on Java, and can be embedded in html. So it is easy to write educational software using this program. And it is a free software, can be downloaded from the Internet.

This program can be used in the classroom. First of all can be used the program itself: pupils can make constructions with it. The teacher can adapt the toolbar of the program, so students see only those tools, which they are allowed to use or they know them. For example there are many construction were it is allowed to use only a ruler and a compass. If students get a task to construct for example the bisector of an angle using only a ruler and a compass, the toolbar contains only the following tools: point, line, circle with given radius from another object, intersection. Students can move points, so they can see different cases without redrawing the whole construction. They also can visualize the trace of some point, therefore it is convenient to use the program for geometric locus programs.

The program can be used by the teacher for visualization, for construction of some html files, which contains applet made by GEONExT.

5. Conclusions

It is more efficient to teach using a dynamical learning environment. There are several of dynamic Mathematics programs, some of them free, some of them has to be purchased. We mentioned one program in this article, GEONExT, because it has many advantages, and it is a free program, so it can be used in any

schools. Using GEONExT it is easy to construct dynamical learning environments, but the program itself is a DLE.

A DLE can be used for e-learning, too, but in this case the program has to be carefully elaborated, with many explanations. This also depend on which model of e-learning we use (see for some models (Weller, 2004)). If the model gives not too much tutoring for students, then the program has to be very detailed, because practically is the main support for them.

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CAREER ATTITUDES: A STUDY OF THE DEVELOPMENTAL PATTERN IN HIGH SCHOOL STUDENTS

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ABSTRACT. The paper presents the results of an explorative study which intended to assess the pattern of development of high-school students' career attitudes, comparing their evolution by grade level and by some other relevant career choice correlates, as gender, work experience, school achievement and grade specialisation. Through investigating the assumptions of the developmental model of career choice in a Romanian sample we wanted to identify some particularities generated by the specific of the Romanian educational system, and to establish baseline data prior to implementation of a comprehensive career education program. Our study confirmed some of the relationships we expected (with work experience and school achievement level), but found different results for some career choice variables (gender and grade specialisation). The expected evolving pattern by grade level was not confirmed, but a suddenly increase in career attitudes scores was found in 12^{th} grade students, which significantly differed from the younger students. Some relevant suggestions concerning the elaboration of career education programs are discussed.

Theoretical background

In contemporary post-industrial society and post-modern culture, the concept of career evolved from an orderly progression within a profession to a more dynamic and encompassing definition, describing a process of life-long learning and decision making, as the individual adjust to continual changes in their work activities and life roles (Savickas, 2001). The career prospects of young people today are very different from those of previous generations, as the traditional concept of a career as a "job for life" disappeared, and the pathways to employment are much less predictable today.

From this perspective, the career choice is a process which starts early in childhood and is extended along the whole life span of the person. The most important and critical period for career decision-making is adolescence, when the teenagers have to choose a trajectory with long-term consequences for their lives. Adolescents are expected to make a variety of career-related decisions whilst attending high-school. These decisions have the potential to impact upon their

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success in finding suitable employment, job satisfaction and even their overall life-style and general well-being.

According to the career development theories, the fundamental task of adolescents is career planning, concretely, the specification of an educational/ professional path to follow. The career decision-making difficulties in this stage conduct usually to the tendency of transferring the responsibility to other persons, to postponing or avoiding decision-making (Gati & Saka, 2001).

In this context, the career development theories (Super, 1957, 1990) introduced as a central variable the construct of *career maturity*, which has become one of the most prevalent variables in research involving the career development of the adolescents. Career maturity is defined as the extent to which individuals are able to make career-related choices informed and independently, and as the „readiness to cope with the developmental tasks specific for each stage of development" (Super, 1990, p 213).

Crites (1978) extended the work of Super by developing a career maturity model which describes operationally the career maturity construct as the students' performance related to career decision-making processes, self-image, goals selection, knowledge of the occupations, planning and problem solving skills. The model specifies the career competencies and attitudes necessary to overcome the challenges of career choice in adolescence. According to Crites, the competencies which define the construct of career maturity are self-appraisal, occupational information, goal selection, planning and problem solving. The attitudinal component of career maturity comprises five sub dimensions: decisiveness, preoccupation toward career decision-making, orientation toward collecting information, independence and compromise. The reduced development of one ore more of these competencies or attitudes in adolescence is the precursor of a rigid or dependent career behaviour, which in turn creates indecision or less optimal career decisions.

Investigation of the level of readiness of students for career decision-making is extremely relevant if we consider the relationship of the career maturity with career success (Crites, 1978). Many researches tried to empirically test the model of career maturity and to empirically investigate the essence of this construct and its correlates in practice. To accomplish this goal, several assessment instruments have been constructed to measure career maturity. One of the most widely used, the Career Maturity Inventory (CMI, Crites, 1995), was designed to test attitudes and competencies corresponding to the theoretical model of career maturity.

A series of studies realised from the perspective of career maturity model aimed at identifying the developmental differences between students of different ages or grade levels. For age, cross-sectional studies typically reported older students scoring higher on career maturity measures than younger students. This has been found across different countries, for students in Australia (Patton & Creed, 2001), Canada (Alvi & Khan, 1983, see Creed & Patton, 2003), USA (Barnes & Carter, 1995). These studies found a progressive evolution of career attitudes and competencies across grade levels, especially for secondary school

students. However, not all studies report this relationship: Powell & Luzzo (1998) found no association with a group of USA high school students.

Some studies showed different developmental patterns in career attitudes in a different cultural context, findings which could be explained by a combination of demographic factors, or by the specific educational context. These differences could be determined by specific educational requirements, or by the structure of the educational system, depending on the career decision points (Swanson & Fouad, 1999). Recently, Powell & Luzzo (1998, quoted by Patton & Creed, 2001) showed that the developmental differences between grade levels could be minimized through implementing well designed and uniform career education programs and through exposing the students to similar contextual factors (career information, opportunity to have paid-work external to the school, etc.).

The applicability of the career maturity construct in countries other than the country of development continues to be the subject of research (Creed & Patton, 2003). Patton and Lokan (2001) presented a comprehensive report on research into the correlates of career maturity including age, gender, socio-economic status, culture, self-directedness, career indecision and work experience. They stressed the importance of contextualism for this construct and emphasized the need to consider it within a social context.

These demographic variables were investigated in relation with career maturity and especially with career attitudes. For gender, the majority of studies have found that females tend to score higher than males, though some studies have found the opposite and others have found no differences (see Patton & Lokan). Only a few studies have examined career maturity and work experience, and the reported results were mixed. Similarly, a small body of research has established a link between career maturity and school achievement, showing differences between low and high achievers on career attitudes (Raskin, 1998).

There is a growing case for career attitudes to include cultural and time-specific contexts and to have other factors taken into account. The present study seeks to expand earlier work that identified career development variables in relation with career maturity of the students. No studies are known to test the assumptions of the model in a Romanian context. That's why we considered necessary to investigate the particularities of the developmental model of career attitudes in a Romanian context and to assess levels of student career attitudes development. Moreover, the present research intended to collect diagnostic information about the high-school students' career attitudes prior to implement a guidance program in a high-school Romanian sample.

The study

The present study tries to investigate the pattern of development of career attitudes in a Romanian sample of high-school students, according to grade level, and to identify the differences between students by some correlates of career attitudes. We intended to asses the particularities of development of high-school student career attitudes, comparing their evolution by grade level and to investigate

the relationships of career attitudes developmental level with some relevant career choice variables (as found in other studies).

The objectives of the study were:

- To asses comparatively the levels of high-school students' career attitudes development and to analyze the differences between them by grade levels
- To explore the differences between students by some career attitudes correlates, as gender, grade specialisation, work experience, school achievement.

The level of development of career attitudes was operationalised through the global score obtained at the Attitude Scale of the Career Maturity Questionnaire-a romanian version (ASCMQ).

The hypotheses of the study were:

1. The level of career attitudes is constantly evolving by grade level, so that older students will display more mature attitudes when compared with younger students (according to the career maturity model).
2. The students with work experience are anticipated to express higher levels of career attitudes development compared to those without work experience.
3. Students with higher school achievement levels (HA) will express more mature career attitudes than those with satisfactory achievement levels (SA), and the SA students will have more mature attitudes compared to low achievers (LA).
4. There will be significant differences in the level of development of career attitudes by gender, adolescent females being expected to have higher levels of career attitudes development than males, as has been found by many studies.
5. There will be significant differences between students by grade specialisation, the students in real science classes being expected to have higher levels of career attitudes development, comparing with students in human science classes.

Through testing these hypotheses in a Romanian sample we intended to identify some particularities of the pattern of development of career attitudes in a Romanian cultural context, and to establish baseline data prior to implementation of a comprehensive career guidance program.

Method

Participants

The participants were comprised of 243 students enrolled in grades 9-12 in two theoretical high-schools in Cluj-Napoca. We selected two grades at each level (9^{th}, 10^{th}, 11^{th} and $12^{th)}$, one from each high school. Totally were 8 grades included in the study, which were selected so that half of them were real sciences grades, and half were human sciences grades. There were 140 (58%) girls, and 103 (42%) boys, who ranged in age from 14 to 19 years (M=16.53, SD=1.47). From the total, about 32% reported having work experience, and 68% reported they had never worked. Based on their school marks we identified three school achievement levels: 31% were high achievers (HA), 54% had a satisfactory level of school achievement (SA) and 15% were low achievers (LA). The selection criterion was:

including an extensive sample to assure a comprehensive evaluation of the indices of interest and a balanced repartition of students across all high-school grades.

Instruments

The survey consisted of one questionnaire (the Attitude Scale of the Career Maturity Questionnaire-ASCMQ), and four questions of a demographic/contextual nature.

1. *The Attitude Scale of the Career Maturity Questionnaire*-romanian version (ASCMQ) was constructed by us starting from the Career Maturity Inventory-the Attitude Scale (Crites, 1995) and from the german version of the same scale (Seifert & Stangl-1989). Both assessment instruments were adequately tested and used in empirical studies, so that today they are widely used instruments in career research. Their psychometric properties were good. The Attitude Scale of the original instruments asses the level of development of career attitudes, based on the theoretical model of career maturity (Crites, 1978, 1995).

We constructed the ASCMQ by translating, adapting and rephrasing items from the original questionnaires. Some new items were generated based on some qualitative investigations prior conducted in high-schools. A first form of the scale (45 items) was then pilot-tested on a sample of 278 high school students (mean age M= 16, 34, SD=1.32) and the psychometric properties were calculated.

We used Cronbach Alpha to analyse the internal consistency of the scale, which was generally good (0.75), and for the subscales: Career Certainty (CC): 0.80; Involvement in career decision-making (IC): 0.65; Orientation toward career exploration (OC): 0.69; Independence (AC): 0.70; Flexibility and decisional realism (FR): 0.75.

The construct validity was verified by calculating the correlations of each item with the global score, and the correlations between each subscale and the global score. We eliminated six items that had low correlations with the global score.

The correlations coefficients between each subscale and the global score are presented in table 1. The coefficients between the subscales were positively, but moderated, indicating the discriminative aspects between the subscales, and with the global score were positive and significant.

Table 1.

Intercorrelations between subscales and the global score.

	SUBSCALE	I	II	III	IV	V	Total score
I	Career Certainty	__	0.46	0.11	0.40	0.30	**0.74**
II	Involvement in career decision-making	0.46	__	0.39	0.52	0.42	**0.79**
III	Orientation toward career exploration	0.11	0.39	__	0.49	0.52	**0.57**
IV	Independence	0.40	0.52	0.49	__	0.49	**0.69**
V.	Flexibility and decisional realism	0.30	0.42	0.52	0.49	_	**0.68**

	TOTAL SCORE	**0.74**	**0.79**	**0.57**	**0.69**	**0.68**	__

The criterion validity is not well established yet, although the preliminary analyses were positive. The Scale correlates positively with the Career Decision Scale (r=0.49), an instrument translated and adapted after Career Decision Scale (Osipow, 1987).

The Attitude Scale measures the attitudes toward career choice with regard to decisiveness, involvement in career choice process, independence, orientation toward exploring career information, flexibility and decisional realism. The final form comprises 38 items, distributed on five subscales:

- *Career Certainty*: i.e. "I cannot find an occupation that has much appeal to me".
- *Involvement in career decision-making:* „As long as I'm in school, I won't be very concerned with choosing an occupation"
- *Orientation toward career exploration*: "I know very little about the requirements of jobs"
- *Independence:* "If someone would tell me what occupation to enter, I would feel much better"
- *Flexibility and decisional realism*: "I spend a lot of time wishing I could do jobs I can never do

2. One item was designed to assess participants' *work experience*. They had to respond to the question: *„Did you/Do you work in a paid working place?"* by choosing YES or NO. If they had undertaken part-time or full-time work in the past or in the present, they were given a code of 1, denoting work experience. If they declared they were not employed now or in the past, they were coded with 0-no work experience.

3. *School achievement level* was established through ranking the students according to their marks from the last school year, and was coded under five categories: very low achievement, low achievement, satisfactory, high achievement and very high achievement. As responses to the two extremes were minimal, we combined the categories in three groups: those with a low achievement level, those with a satisfactory level of achievement and those with a high achievement level.

4. A straightforward item requiring respondents to place a mark in one of two boxes labelled Female and Male was used to determine participants' gender.

5. The students were asked to write the class specialisation on the answer sheet, which was then coded as real sciences (1) and human sciences (2) specialisation.

Procedure

The data reported here constitute only a part of a larger study examining the correlates of career maturity for high-school students.

Students were part of intact classroom groups since random sampling procedures would have been disruptive to the typical school day. They were administered the survey form to complete it in class time. Students' participation

was voluntary and they were told that this is the first part of a career education program which will be implemented in their school.

RESULTS

We will present the results separately for each variable of interest, comparing the differences between the levels of development of career attitudes according to these variables. We established the differences between the subcategories of participants using the t-test for independent samples and one way ANOVA.

1). First, we examined the differences in means between the students by grade level. Table 2 presents the descriptive statistics by grade level. A one way ANOVA was conducted to determine if globally significant differences were present between the grades. The results showed a statistically significant difference between the grade levels on the total score of ASCMQ: $F(1,243) = 3.32$, $p<0.05$.

Table 2.

Descriptive statistics for ASCMQ by grade level.

Grade level	Mean	Standard deviation
9^{th} grade	2.91	0,27
10^{th} grade	2.93	0.26
11^{th} grade	2.98	0.27
12^{th} grade	3.27	0.36

We used the t-test for independent samples to identify the differences between each two grade levels. Table 3 presents the results of this analysis.

Table 3.

Mean differences between each two grade levels

Grade levels		t	p
9^{th}	10^{th}	-0.923	p>0.05
	11^{th}	-0.935	p>0.05
	12^{th}	-3.276	p<0.001**
10^{th}	11^{th}	-0.824	p>0.05
	12^{th}	-3.302	p<0.001**
11^{th}	12^{th}	-2.958	p<0.001**

We expected gradual differences between the grade levels concerning career attitudes development. Although generally the differences between the grades were significant, when compared separately, we noticed significant differences only between each of the first three grades (9^{th}, 10^{th}, and 11th) and the 12^{th} grade. No significant differences appeared between the 9^{th}, 10^{th} and 11^{th} grades, but each of them differed significantly from the 12^{th} grade. As we expected an evolution across the grade levels for ASCMQ scores, we considered that the first hypothesis of the study was not confirmed. We observed that the students in the first three

high-school grades have a similar level of career attitudes development and that only the 12th grade students have a significantly higher level of career attitudes.

We computed the differences between grade levels for each subscale of ASCMQ.

The same pattern was observed for three of the subscales: at the subscale Involvement in career decision-making, Orientation toward exploring career information, Flexibility and decisional realism, significant differences appeared between the first three grades and the 12th grade, but no significant differences between the 9th, the 10th and the 11th grades. So, the 12th grade differed significantly from the other, reflecting higher values for career attitudes development.

For the first subscale (career certainty), significant differences appeared between 9th and the 11th grade (t= -2.583, p<0.05) and between the 9th and the 12th grade (t= -3.142, p<001); between the 10th grade and the 11th grade (t= -2.736, p<0,05) and between the 10th and the 12th grades (t= -3.052, p<0.001); between the 11th and the 12th grade (t= -3.092, p<0.001). So, the students in the 9th and the 10th grades have a lower level of career certainty than their colleagues in 11th and 12th grades.

For the Independence subscale, we found no significant differences between the four grade levels, which mean that they have a similar level of independence in making career decisions.

2). Whether the students had work experience or not was found to influence their level of development of career attitudes. As expected, we found significant higher scores for the students with working experience when compared with those without (see table 4). Inspection of means shows that those with work experience have more mature attitudes toward career than those without.

Table 4.

Mean differences between the students with and without work experience

Variable	Work experience		No work experience		t
	M	SD	M	SD	
Career Attitudes Score	3.23	0.19	2.75	0.16	18.277**

**=p<0.001

3). Students level of school achievement was examined in relation with the development of career attitudes. Table 4 presents the differences between means according to the level of school achievement. Those who had a higher standard of achievement (HA) displayed higher scores on the career attitudes compared with the students with satisfactory (SA) and low school achievement level (LA). No significant differences were obtained between SA students and LA students.

Table 4.

Mean differences according to school achievement level.

Level of achievement		t	p
LA	SA	-0.832	p>0.05

	HA	-2.932	p<0.001**
SA	HA	-2.258	p<0.05*

4). According to gender, we found no significant differences between girls and boys: t= -813, p>0.05. For the girls the mean was 2.93, SD=0.27, and for boys M= 2.96, SD = 0.30. Contrary to our expectations, boys and girls expressed similar levels of development of career attitudes. The hypothesis which specified that the girls will have higher career attitudes scores was not supported.

5). Contrary to our expectations, no significant differences were found between the students specialisation: t=1.136, p>0.05. The students in the real sciences grades expressed a similar level of career attitudes when compared to their colleagues in the human sciences grades.

Discussion

Our study offered a view about specific particularities of the model of career attitudes development in a Romanian educational context. We started from the premise that we will identify a gradual evolution of the level of career attitudes across grade levels in high-school. In accordance with the theoretical model of career maturity in adolescence (Crites, 1995) and with some relevant studies (Barnes & Carter, 1995; Patton & Creed, 2001; Prideaux, 2003), it was expected that older students will demonstrate higher levels of career maturity than younger students. This assumption that the students posses increased levels of career maturity as they age further demonstrates the notion that the construct is developmental.

At a more general level, research into career attitudes and its demographic correlates (age, gender) showed rather an unsystematic and poorly integrated pattern. For instance, an increase of career attitudes with age has generally been demonstrated, but the decision points in the educational system have been shown to disturb this gradually evolution. Some studies showed differences in the progress of the vocational development generated by the specific of educational system which has different decisional tasks and requirements (Fouad, 1998, quoted by Savickas, 2001).

The results of our study reflect the same findings. We didn't found a gradual evolution between students by grades, as we expected, but we identified a tendency of the 12th grade students to display more mature career attitudes comparing to the younger students, which expressed a similar level of career attitudes. This developmental "gap" between the students in the first three grade levels and the students in the final grade could reflect the tendency of the students to become involved in career decision-making process only when they perceive ending school as close and imminent and they become pressed to make a career decision. This tendency was also clear when we analysed the differences by subscales. The pattern remained the same for most of them, only at the certainty subscale the students in the pre-terminal grade expressed higher scores. This could be interpreted as a tendency of the 11th students to specify a decision as reaction toward the pressures made by some of the educational factors (family, teachers). It is interesting that despite their higher level of

decisiveness compared with the 9th and 10th students, they didn't express more mature attitudes concerning involvement in career decision-making, orientation toward exploring career information, flexibility and decisional realism. That could suggest a "forced" decisiveness for 11th students, which make rather uninformed career decisions without accomplishing the specific decisional tasks. This finding may be a particularity of the sample investigated, but it will be interesting for future studies to see if this evolution pattern remains the same when a bigger and a more representative sample is investigated, reflecting a culturally specific developmental pattern.

The abrupt increase of the scores at the final grade students without being anticipated by a progressive increase at the 11th students reflects the tendency to quickly adopt a career decision related to the proximity of graduation. Most often, these quickly and uninformed decisions reflects the tendency to reduce the anxiety about finishing studies rather than a real option. Moreover, a reduced involvement in career decision making process in the 9th, 10th and 11th students could suggest a reduced ability to identify the long-term problems associated with career choice and a reduced importance attributed to it, consequently an immature pattern of development of career attitudes. A possible cause for this could be the specific of career guidance in the Romanian educational system, which doesn't give to the students the opportunity to progressively develop the attitudes and the abilities associated with career choice.

Synthetic, the identified pattern confirmed less the assumptions of the theoretical model and reflects more specific elements tied to our cultural and educational system. The career choice is made hastily, with the short term goal of decreasing the anxiety associated with finishing studies, without a solid preparation in the preceding school years.

Some interesting aspects were identified when we calculated the differences between students by gender, grade profile, work experience and school achievement levels. No significant differences were found when gender or grade profile was taken in account. The hypothesised association between career attitudes and gender/grade profile was not supported. This finding was not surprising given the equivocal findings reported in literature (Patton & Lokan, 2001).

Those with work experience displayed more maturity in their attitude toward career decision-making than those who had never worked. These results suggested the importance of a direct and real contact of the students with the world of work and give some tips for designing career education programs. Including working opportunities (job-shadowing, internships, part-time jobs, etc.) as activities in career education programs becomes an important aspect in considering the content of these.

Similarly, the level of career attitudes was found to differ in relation to school achievement level of the students. As would be expected, high achievers (HA) displayed more mature career attitudes than those who were achieving at a satisfactory or low level. The gradual evolution was not found, a thing which suggests that the students with low or satisfactory achievement level display a similar level of development and such could become the groups of interest in intervention.

Further research is needed to investigate if these particularities maintain in more representative Romanian samples, if causal path could be identified between the variables measured and the level of career attitudes. Indeed, the need for longitudinal research in order to answer to such questions becomes a priority in career guidance.

The results provided useful guidelines for intervention design. They had the potential to inspire ways in which to enhance more mature attitudes toward career decision-making, by providing contextual information about the variables associated with career attitudes. Specifically, the study provided baseline data pertaining to student career development prior to implementation of a comprehensive school guidance program. Additionally, the baseline data was used for comparative purposes once the comprehensive guidance program has been fully implemented.

This study provides a brief illustration of some possibilities to establish empirical data to support the activities of the career guidance programs by using standardized instruments. Periodic or follow-up studies that measure change in student career attitudes can also be used as a program evaluation tool to direct the teachers toward areas of needed change.

Finally, this study illustrates how important it is that school counsellors recognize the developmentally different needs of students in all grade levels. The identified aspects sustain the idea of designing the career education programs differentiated by grade levels, and by taking into account the specific of the sample involved. An understanding of these aspects has implications for school counsellors and teachers, as they consider curricula selection, career planning and the timeliness of various career-related activities.

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STUDIA UNIVERSITATIS BABEŞ-BOLYAI, PSYCHOLOGIA-PAEDAGOGIA, LI, 2, 2006

SPECIAL EDUCATION STUDENT ATTITUDES TOWARDS PERSONS WITH DISABILITIES

LAURA E. RUNCEANU, CARMEN COSTEA-BĂRLUȚIU

ABSTRACT. This study measures the attitudes of special education students' toward persons with disabilities. The *Modified Issues in Disability Scale* (Makas, 1991) and *Attitudes Towards Disabled Persons Scale, Form O* (Yuker & Block, 1986) were administered to a random sample of 50 students from the Faculty of Psychology and Educational Sciences, Special Education Department in the first year of study. Overall, the students' attitudes toward persons with disabilities are negative, and they do not differ in relation to gender, level of contact and age.

Background and Literature Survey

The study and measurement of attitudes have long been a research focus for professionals working with persons with disabilities because of the assertion that attitudes direct behavior. Attitudes reflect a predisposition to behave in stereotypical and predictable ways toward, or in the presence of members of a particular group. (Hunt & Hunt, 2000)

The importance of studying attitudes toward disability groups is emphasized by the connection between negative attitudes and discriminatory behaviors of individuals without disabilities. These attitudes, which often stem from negative stereotypes and a lack of accurate knowledge, prevent people with disabilities from having equal chances as people without disabilities. Lee & Rodda assert that "...negative attitudes toward people with disabilities appear to steam from faulty information in the belief system about disability and about people who have disabilities" (1994: 232). Moreover, people still succumb to myths and misperceptions about people with disabilities, believing for example that individuals who use wheelchairs are "sick" or that people with psychiatric disabilities are prone to violence. (Hunt & Hunt, 2004) They are thought of not being able to conform to the cultural norms and therefore marginalized in the society. (Krahe & Altwasser, 2006)

The attitudes to persons with disabilities are influenced by demographic variables such as age, gender nationality, marital status, educational grade level, socioeconomic status, place of residence (rural versus urban), and experience with disability. (Tervo, Redinius & Palmer, 2004) This study seeks to address the relationship between student attitudes towards persons with disabilities and some of these factors, namely gender, level of contact and age.

Gender is one of the factors that were taken into consideration when assessing attitudes toward persons with disabilities. In a study that have involved university students from four different departments, Schwartz & Armony-Sivan (2003) found no significant interaction with gender and students attitudes toward persons with mental retardation and people with mental illnesses. Tervo, Redinius & Palmer (2004) have studied the attitudes towards disability in a group of health students; they have found no significant differences based on gender or age.

Generally, individuals without disabilities express discomfort and uncertainty about how to act in the presence of an individual with a disability. (Loo, 2000) But contact with persons with disabilities has been identified in many studies as a key factor in influencing the attitudes toward them. Most of them supported the idea that higher levels of personal contact improve attitudes toward disability groups. (McCaughey & Strohmer, 2005). Rimmerman, Hozmi and Duvdevany (2000) have tested the effect of prior and/or current contact of university students tutoring children with developmental disabilities. They concluded that the association between contact and attitudes is related to the time and length of exposure. Smith (2003) has conducted a qualitative study based on in-depth interviews. University students were involved in service learning projects that put them in contact with students with disabilities. The findings show that these experiences have shaped, and transformed participants' thinking about disability-related issues. The research literature on teachers' attitudes towards disability suggests that negative attitudes lead to low expectations of a person with a disability.

Study design

This study examines attitudes to persons with disabilities. We decided to examine attitudes of first-year university students because they make a suitable research population being mature enough to have developed their own opinion on the issue under study, but at an early stage in their careers not to have a fully formed professional personality, which might sway their response to the questionnaire. We were interested in assessing the attitudes of special education students towards persons with disabilities and included gender, prior personal contact with persons with disabilities and age as intervening variables. We were also interested in comparing the results obtained in the present study to those of other authors who have made researches on this topic.

Objectives

The objectives of this study are as follows:

1. To determine the participants attitudes towards persons with disabilities;
2. To probe the existence of differences between participants based on gender, contacts with persons with disabilities and age;
3. To establish the nature of the participants' attitude towards persons with disabilities;

4. To compare the data collected in the present study to those of other authors who researched the attitude towards persons with disabilities.

Hypothesis

In this study have been had been tested the following hypothesis:

1. There are significant statistic differences concerning the attitude towards persons with disabilities between the participants, based on gender;
2. There are significant statistic differences concerning the attitude towards persons with disabilities between the participants, based on the contacts they have had with persons with disabilities;
3. There are significant statistic differences concerning the attitude towards persons with disabilities between the participants, based on age;

Methods

Research population

This study involved a sample of 50 students from the Faculty of Psychology and Educational Sciences, Special Education Department in the first year of study, selected to participate by simple randomization. The experimental sample is constituted of 5 male participants and 45 females one of which is a person with disability. The participants' age ranges between 19 and 37 years (Figure 1).

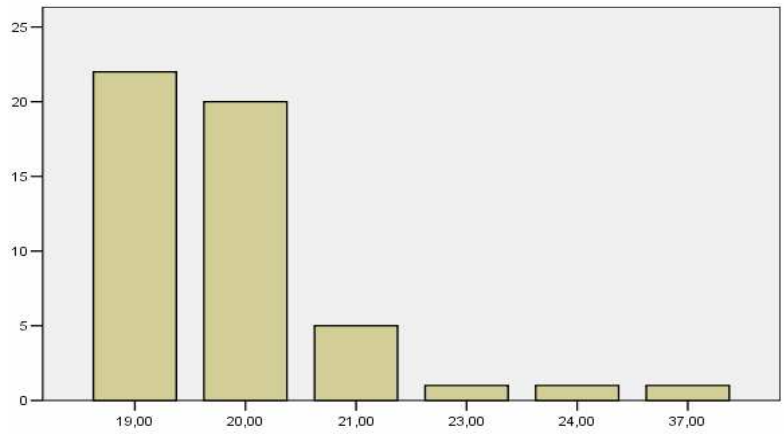

Fig. 1. Distribution of participants based on age

Most of participants' age values (84%) are ranged between 19 and 20 years.

From the point of view of the level of contact with persons with disabilities, participants had no contact (8 %), very little contact (30%), some contact (32 %), quite a bit of contact (24 %) and 6% many contacts (6 %).

Research instruments and procedure

Attitudes are complex, determined by multiple factors and multifaceted, which creates challenges for accurate measurement. In the last 50 years, researchers have developed a number of measures that use direct methods to tap attitudes toward disability groups. We have used in this research MIDS (*Modified Issues in Disability Scale*) Questionnaire (Makas, 1991) and ATDP-O (*Attitudes Towards Disabled Persons Scale, Form O* (Yuker & Block, 1986), both of them examining attitudes towards persons with disabilities. The MIDS-t (transitional MIDS) was applied as well, a version of the questionnaire that contains both the original and the revised MIDS.

The ATDP-O is a 20 items scale, one of the most widely used measures of this type. The ATDP-O was developed to assess the degree to which a person perceives people with disabilities as being similar to people without disabilities, and whether respondents think people with and without disabilities should be treated in the same manner. (Yuker & Hurley, 1987) Sample items include "Persons with physical disabilities are just as intelligent as persons without such disabilities." (agreement indicates a "positive" attitude) and "Persons with disabilities cannot have a normal social life" (agreement indicates a "negative" attitude). Using a six-point Likert scale, responses are listed on a continuum from "I disagree very much" to "I agree very much". Final scores range from 0 to 120, with higher scores reflecting more positive, accepting attitudes toward people with disabilities. The authors found strong validity (concurrent and convergent) and good reliability of the survey as a measure of the attitude towards persons with disabilities.

The MIDS is also a Likert-type scale, with 37 items that the subjects need to assess in terms of agreement/disagreement on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scale reflects the attitude towards persons with physical disabilities and the item selection relied on feed-back from persons with physical disabilities, which is a big difference compared to other measures of the same type. Sample items include "Employers' attitudes are a greater handicap than lack of ability to a person with a disability" (agreement indicates a "positive" attitude), and "A high school student with a physical disability will probably feel inadequate in a regular classroom" (agreement indicates a "negative" attitude). The author has found good psychometric qualities of the scale (internal consistency, validity, fidelity), which led us to use the survey in our study. Final scores range from 37 and the maximum of 259 (Makas, 1991). The MIDS's criterion validity was supported by a significant correlation between MIDS scores and scores on ATDP, the ATDP ($r= .78$, $p< .001$) in a subsample of 225 subjects who had completed both measures. (Makas, 1991)

All the 50 participants completed both the MIDS and the ATDP-O Scale in written form; the instruments were administered for groups of participants.

Psychometric qualities of the instruments

We have analyzed the location and the variability of the data set and found the good reliability of the two scales, proven by the values obtained for the vaulting and the symmetry measures of the data distribution. The results obtained by subjects at the MIDS are normally distributed, as shown in figure 1, in the form of a mesocurtic and symmetrical distribution ($z_{kurtosis}$ =1.03; $z_{skewness}$= 0.41, both measures less than 1.96). The participants' scores for the ATDP-O Scale are also normally distributed, as both measures $z_{kurtosis}$=0.57 and $z_{skewness}$=1.04 are lower than 1.96, which proves that the distribution is a symmetrical, mesocurtic one.

The results obtained at the MIDS-t (transitional MIDS) were separated, in order to establish the participants' scores at the MIDS-r (revised MIDS) and the MIDS-O (original MIDS). We found significant positive correlation between the two versions of the questionnaire ($r = 0.9$, $p < .01$), which represents a strong argument for the content validity of the MIDS.

In order to establish the convergent validity of the survey we analyzed the correlation between MIDS and ATDP-O Scale results and we found significant positive correlation ($r = 0.7$, $p < .01$) between the two, which supports the criterion validity of the two measures on Romanian population. The internal consistency of the translated and adapted Romanian version of MIDS, namely α Cronbach quotient, is: α=0.8. Other psychometric qualities of the two instruments need to be identified, but this operation enforces the administration of the two surveys on larger samples.

Results

Subjects' scores at the MIDS range between 97 and 181, with a mean of 144.58, the possible values of scores being distributed between the minimum of 37 and the maximum of 259 (Makas, 1991). The subjects' scores at the ATDP-O Scale range between 40 and 101, with a mean of 75.1. The results obtained for both of the measures on the experimental sample are low compared to the ones of other authors on different populations. (Makas, 1991, Pace, 2003)

Makas (1991) obtained significant statistical differences between the scores obtained from the application of MIDS on a sample of 305 students without disabilities, based on gender. The female subjects scored significantly higher ($M = 167.31$) than male subjects ($M = 161.03$), $F (1, 303) = 7.65$, $p < .0l$. Also, the author found statistically significant differences between participants based on personal contact with persons with disabilities: $F (4, 300) = 3.54$, $p < .0l$. The subjects with greater personal contact scored higher than the ones with less personal contact.

In the present study, the mean differences of participants' results based on gender are not significant ($t = 0.85$, $p>.05$), so the female subjects' attitude towards persons with disabilities is not significantly different from the male subjects' attitude. The scores' mean obtained by female subjects is higher than the one obtained by the male subjects, with a moderate effect size (1.5%), which shows concordance with Makas' results.

Subjects' attitude is not different according to the contacts they had with persons with disabilities, F (4, 45) =1.46, p>.05. Surprisingly, the subject with disability, who affirmatively had very little contact with persons with disabilities, obtained 136 points, which represents a low score at the MIDS.

Subjects' age doesn't cause significant statistic with regard to the attitude towards persons with disabilities, the differences between the scores obtained at MIDS depending on age are not significant: F (5, 44) = 0.28, p>.05. The interpretation of results at this level is reserved, given the distribution of subjects based on age (figure 1) and, as a consequence, the carrying forward of the study on larger and more homogeneous experimental samples from the point of view of the age variable is enforced.

The ATDP-O Scale results analysis reveals similar conclusions to those obtained at MIDS: differences between female and male subjects' scores are not statistically significant, t = 0.8, p>.05, the effect size is 1.3% in favor of the female subjects; differences between scores based on contacts with persons with disabilities are not statistically significant F (4, 45) = 1.4, p>.05; differences between different age subjects' scores are not statistically significant F (5, 44) = 0.82, p>.05, which leads to the conclusion that subjects' attitude towards persons with disabilities revealed by ATDP-O Scale do not differ based on the above mentioned criteria.

The scores of the experimental sample in the present study were proven to be significantly different compared to the mean value Makas (1991) obtained from the female subjects (M = 167.31), t = 8.8, p< .01. There are statistically significant differences between the mean value of the results Makas obtained from the male subjects (M = 161.03) and the mean value of results obtained by us: t =3.41, p<.05; in both of the cases the means obtained by Makas are higher.

Pace (2003) used ATDP-O Scale on the sample of 20 student teachers supervisors who completed the scale in two phases: pre- and post-test, before and after the attendance of three seminars offered on special education subject, particularly on the movement toward the inclusion of persons with disabilities. The mean value of the scores from Pace's study, obtained in the pre-test phase (M = 84.8) is statistically significant different from the mean value of results from our study (M = 75.1): t = 5.78, p< .01, in favor of the results obtained by Pace.

The data and quantitative interpretation lead us to rejecting the hypothesis: the participants' attitude towards persons with disabilities is not significantly different based on gender, age and contacts with persons with disabilities. The attitudes of participants in the present study are generally negative, compared to the attitude identified by other authors who have used the same surveys.

Discussion

The surveys we used in our study proved to be valid from the point of view of the content and the criterion and reliable, so they can be used to test the attitude towards persons with disabilities, its nature and specificity, the efficiency of different programs designed to change the negative attitudes or improve people's

perception about persons with disabilities. Also, as the MIDS was designed in cooperation with persons with disabilities, given its reliability and validity, it stands for the need to involve these categories of persons in the development of research with impact on their lives.

Other authors, cited by Makas (1991), also found good reliability and validity of MIDS, applied on different other populations: in the U.S.A. (undergraduate students without disabilities; medical, educational, and social-service professionals; secondary school students), Costa Rica (people with disabilities and their instructors, special education teachers in training, public school teachers), rural India (village leaders). The authors of ATDP-O (cited by Pace, 2003) established good concurrent validity of the scale and good reliability as a measure of the attitude towards persons with disabilities. Also, other authors (Makas, 1991) found a good criterion validity of the MIDS, given the correlation between the MIDS and the ATDP-O Scale, similar to the one found by us on the experimental population (Romanian first-year students), using the translated versions of the surveys.

Most of the subjects' answers at MIDS were clustered around the mean of the distribution (Figure 2); the extreme minimum and maximum values are only found at four and, respectively, one of the participants. We found a similar situation for ATDP-O Scale results (Figure 3); most of the data values are close to the mean. Both measures prove high consensus in the participants' opinions, reflecting similar attitudes towards people with disabilities among them.

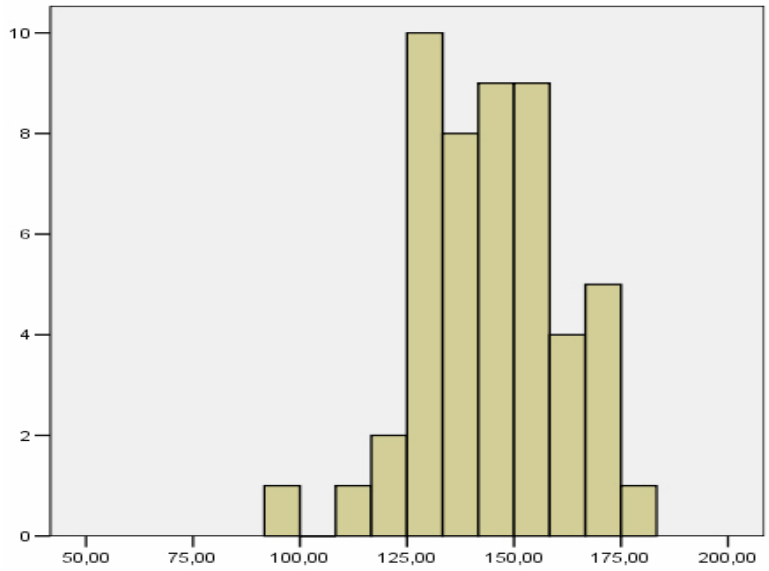

Fig. 2. Distribution of subjects' results for the MIDS

The subjects who scored high at MIDS also scored high at ATDP-O Scale, proving the constancy in subjects' opinion and the fidelity of the two instruments as measures of the attitudes towards persons with disabilities.

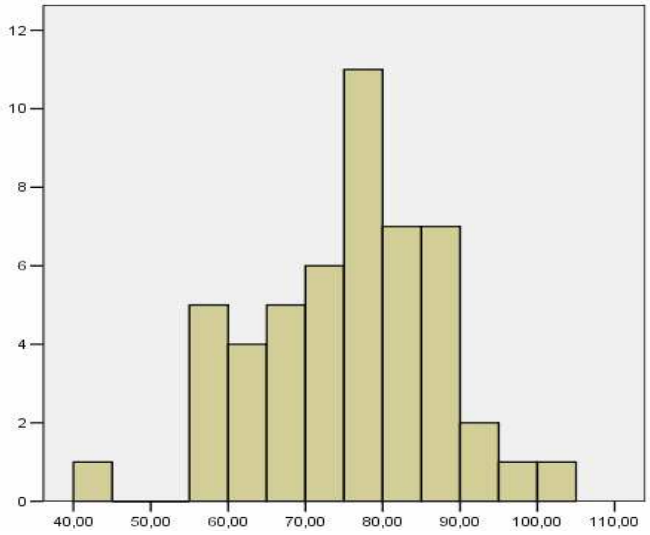

Fig. 3. Distribution of subjects' results for ATDP-O Scale

The results of the present study show that the attitude towards persons with disabilities of the subjects does not differ between male and female subjects, between persons of different ages and between persons with no contact, very little contact, some contact, quite a bit of contact and a many contacts. There is a possibility that the subjects were giving answers “by the books”, influenced by the previous information or socially desirable answers.

Generally, all subjects proved to have negative attitude towards persons with disabilities, compared to other populations on which the surveys were applied (cited by Makas, 1991, Pace, 2003). It is possible that the lack of knowledge about the specificity of different kind of conditions that lead to disabilities may affect the attitude of the population included in our study, as found also by Avramidis et. al. (2000, cited by Pace, 2003) in their study on general education teachers. The subjects were students in the first year of study, so their knowledge about special education and persons with disabilities is limited and influenced by preconceived ideas about these categories of people.

There were high scores, reflecting strong agreement, for items of the surveys stating the higher risk for accidents of persons with disabilities, the bigger difficulties with respect to having children, the need for more affection from others, compared to persons without disabilities, all these kind of responses reflecting stereotyped ideas about persons with disabilities.

The subjects' scores were high for items reflecting protective attitude towards persons with disabilities, such as: exemption from income taxes, overlooking of negative feelings, censorship of the vocabulary used in their presence, sparing the children from certain activities, lowering the expectancies in academic settings, setting jobs aside for persons with disabilities, so that they don't have to compete with other persons, without disabilities. At the same time, there was a sparse opinion among the subjects in favor of inclusion of children and persons with disabilities in schools and in society (for instance, residential areas). The question that arises concerns the type and the severity of disabilities that the subjects would consider most appropriate for inclusion and this issue might be approached as well in a future research.

Although many of the subjects' responses reflected certain gaps in their knowledge about persons with disabilities, their responses showed positive attitude concerning integration, financial support for improving the quality of life for persons with disabilities. Compared to other authors' findings, their responses are different we believe due to differences in the level of contact with persons with disabilities, lack of knowledge and work experience with persons with disabilities. The present research also underlines the need for designing programs for developing abilities and improving knowledge about persons with disabilities. Consequently, Tait & Purdie (2000) argued the importance of pre-service teachers developing positive attitudes towards disability early in their professional development. Having this objective in mind, a number of studies have examined ways of promoting more positive attitudes in pre-service teachers.

The limits of the study are the size of the experimental sample, the heterogeneity of the participants from the points of view of age and gender. As a consequence, the testing of the psychometric qualities of the two surveys needs to be performed on larger samples and the extrapolation to larger populations of the results we obtained should be made with caution.

Implications for further researches

The study has raised some important questions related to students' attitudes towards persons with disabilities, about factors influencing attitudes, and the instruments to be used for the measurement of the attitude.

In future researches we could assess attitudes towards persons with disabilities as expressed by doctors, teachers, specialists working in the field of special education so, the differences between these categories, the implementation of programs for informing different types of population about issues related to disability, inclusion of children with disability in regular schools and later in society. It would be interesting to find out whether the students' attitudes towards persons with disabilities change as they gain knowledge about disability-related issues.

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STUDIA UNIVERSITATIS BABEŞ-BOLYAI, PSYCHOLOGIA-PAEDAGOGIA, LI, 2, 2006

THE COMPLEX EXAMINATION OF THE CHILDREN WITH LANGUAGE IMPAIRMENTS.

MARIA ANCA

ABSTRACT. The current observations and the systematically evaluations can bring up important changes that may appear in the students` pronunciation. In this situation in the report-sheet are put down only the changes that appear in: voice, verbal breathing and speech graphicalness, from the last examination. The phonemes that appeared spontaneously in the child `s speech will be notated when this happens, so that an immediate corrective- compensatory activity could begin for ensuring the consolidation and the automatization in speech of those phonemes.

The planning of the reductive intervention in the psychomotrical field involves the need to investigate the child's psychomotrical abilities before he is asked to solve the task. In order to complete a functional motrical investigation can be used many scales elaborated for investigating the psychomotrical development. Thus the Ozeretzky-Guillman Scale (Pick, L., Vayer, P., 1972) can be used in order to investigate the children and this scale can offer information about the fallowing areas: statically coordination, general dynamic coordination, the dynamic coordination of the hands, and the precision of the simultaneous movements.

In order to complete the children` s with severe disabilities in the language are investigation of the psychomotrical development, according to their ages and to other important aspects, can be used the fallowing tests:

- Sans-Paroles Test.
- Borelli- Oleron (Anca, 2003).

To examine the motrical and psychomotrical development it is necessary to write down the child` s progress when he is investigated by using a certain scale or a list with items. Under this circumstance can be used many aspects from the logopedical examination list elaborated by Guțu (1978) taking into consideration the morphological examination of the head and of the phono-articulatory organs report. As in many types of language impairments are affected differently the mimicry, the gesticulation, the position, it is suggested their investigation and their observation during the speech therapy.

For instance in the open rhynolaly having an organically cause as a result of the trial to minimize the expiated air loss through the nose, the subjects have the tendency to join the nostrils or to do different compensatory movements while pronouncing (alike those executated during the eating process), that influence in a negative way the speech of the one who speak. In different types of stuttering it can be also noticed different parasite movements, certain sinkynetical movements, facial grimace, tics, all these minimizing these subjects` level of the speech intelligibility.

A different chapter concerning these observations is about the investigation of the verbal and non-verbal breathing. Because "speech is movement" and its main coordinates according to which it is analysed are: *space, time, force*, they turn to be the perfect coordinates, too for the speech therapy intervention and they can be put into practice through many different intermediary objectives. Another aspect forgotten in the classical speech therapy is rhythm and its reeducation implies the fallowing elements: *order, succession, duration and stress.*

In the fallowing lines is presented a model of the complex speech examination, a model that was used to guide *a programme of therapeutic intervention*. This programme was put into practice in order to stimulate the speech rhythm in a close connection with the corporal and digital rhythm. In this type of investigation were involved subjects with severe language disabilities, all of them having in common the low level of pronunciation and speech intelligibility as a result of a bad rhythm.

The investigated cases had as initial diagnosis: delay in the language development, polymorphic and complex dislaly, dysfunctions in the auditory processing, dislaly and secondarytonico-clonical shuttering, open rhinolaly caused by the operated palate split and three cases of neurosenzorial auditive impairment, one with a severe auditive loss and the other two with a profound auditive loss. In all these cases the classical speech therapy, taking into consideration the diagnosis went hand in hand with *the therapeutically intervention programme based on rhythm.* The speech recovery was accelerated and the suprasegmental elements of the speech started to be more and more obvious. In order to investigate the efficiency of the therapy, beyond the clinical observations from the presented cases, an investigation was organized along one term. Eight subjects who formed the experimental group benefited by this type of therapy. To quantify the effects of the therapy were made comparisons between the experimental group and a controlling group.

For having two homogeneous groups in selecting the subjects has been taken into consideration the fallowing criteria: the logopedical diagnosis, the age(the subjects should have ages between 12 – 13 years and six months old), the intelligence level being normal, having no other associated disabilities and having a low level of verbal language development. The chosen subjects used to fallow the therapeutically programme in the logopedical offices from Cluj-Napoca and Bistrița, the programme being put into practice by the speech therapists from the logopedical field. In all these cases the speech therapists used the same methods and exercises, fallowing the same steps during the speech therapy. In what the rhythm and the duration of every intervention are concerned they were adapted to the subjects` developmental level, features, to their initial diagnosis and to their rhythm in making progress.

1. The speech and hearing examination.

During the examination process were used many observations made by George Băcanu who during a long period of time, while being in the School for Deaf Children from Craiova improved the techniques of examination and observation the children with hearing impairments.

From our experience and from other therapists` experience, too, is important to be noticed as being extremely difficult, especially in the beginning of the intervention, the planning of the phonetic exercises as the results depend on the way the subject respond to the therapy, depend on the degree of difficulty of the tasks but also on the level of knowledge and on the therapist` s abilities in this field. Starting from a thorough examination along with a precise book-keeping of the level of speech and hearing can organize a corrective- compensatory intervention in order to build or correct the speech. All in all, the results of the investigations can be used for planning in a rational way the content of the frontal and individual activities, activities during which can be brought different elements to stimulate and correct the speech.

A thorough book-keeping of the developmental level of those subjects` speech, subjects with language disabilities allows the investigation of their progress. This can be stimulating for the subjects, determining the increase of their interest in being more intelligible while speaking.

There are used different methods to examine the speech components: voice, verbal breathing, pronunciation, intonation, stress rhythm and articulation. It is important as the results of these examinations to be quantify based on precise criteria and to be used a precise terminology avoiding the situations when on the report-sheet appears strange information. In order to examine the pronunciation and the other component part of speech it is suggested the use of an usual verbal material, familiar to the subjects, according to some authors.

In 1964 Ciumăgeanu underlined an important aspect that can be found in nowadays psycho-pedagogical researches and it is: the hearing (what we hear) can be used as a criterion on appreciating the deaf children`s (not only) speech level, as the communicative function of the language is the aspect that turns language into a social phenomenon. Thus, all the elements of the language has to be defined from this point of view. The technical tools, being either classical or modern complete and improve only the explanation the investigators find by recording with their ears.

1.1 The voice

The voice examination can be made, in the case of the preschool children and the students from the preparatory grade or those attending the first grade, by pronunciation the known phonemes, vowels or direct syllables. Beginning with those from the second grade the examination can be made by reading a certain text or several sentences.

For the children from preparatory and those from the first grade can be used the fallowing verbal material for voice investigation:

pa papapa a or ta tatata a
po popopo o or to tototo o
pu pupupu u or tu tututu u
pe pepepe e or te tetete e
pi pipipi i or ti tititi i.

The direct syllable containing the consonants “p” and “t” are suggested to be used as they don’t imply special difficulties in pronouncing the vowels.

While being examined the children`s voice from the upper grades if their reading of the texts is audio recorded, can be used the same verbal material in order to investigate the level of the phonemes pronunciation. In this way the time and the examining tests are used in an economical way.

The voice examination is made in the beginning and in the ending of the school year, but also as many times as it is considered necessary during the speech therapy. On the report-sheet are notated aspects concerning the: force, pitch and the timber of the subjects` voices.

First is put down the force of the voice. It can be *voiceless (*without sonorous ness, being impossible ta record), *very low* (pp: pianissimo), *low* (piano: p), *regular* (normal, not very loud, mezzo forte: m), *loud* (f: forte) or *very loud* (ff. fortissimo).

Between the brackets were put the abbreviations and the conventional terms used for qualifying the force of a sound both in music and audiology.

Then the students` voice pitch is examined in comparison with the voice of a hearing student, both having the same gender. The pitch can be *normal, high or low*. The comparison can be made also with an adult’s voice but in this situation it is taken into consideration the fact that the child’s voice is with two octaves higher than the adult’s voice, the adult being a male and with one octave in the case the voice belongs to a female adult.

In this chapter the “voice pitch” is to be taken into consideration its fluctuations: *discordation* (the sudden rising or, seldom, the descent of a sound), *monophony* (the emission of the sounds on the same level), *mutation*, just in the cases when the boy’s voice change at the puberty age, phenomenon which is characterized by successive productions of low and high sounds through adding parasite noises in the moment when the phoneme is pronounced (in the moment when the voice turns from the repose state, in the state of uttering sounds).

In the end are notated the deviations from normal situation, from the clear voice, the deviation of the timber. The timber can have the fallowing features: it can be *sombre* (gloomy), *nasal, twanged, guttural* (hoarse) or *strident* (Rosseti, 1967, Stan, 1991). In the end of the evaluation and of the completing on the final report-sheet the subjects` voice can be characterized as being, for example: “a *kind of voice very low, weak, and guttural.*

1.2 Verbal breathing

In the cases of the students with pronunciation or speech disabilities the examination is to be done in the beginning and in the end of the school year or as often as the therapist finds it necessary (having in mind the situations where this aspect is much damaged). The verbal-test material used in order to obtain information about the verbal breathing is represented by lists of words or the several sentences that are suggested to be used for the investigation of the phonemes articulation.

The verbal breathing features can be investigated through direct observation, through listening the verbal material pronounced and through listening the subject's pronunciation on audio recordings.

We have to take into consideration the fact that breathing has an individual feature and there are no "norms" generally accepted. While speaking, normally, *breathing is steady, lithe*, according to the phonation process; *the inspiration* is quick, effortless, on the nose and on the mouth and in *expiration* the air is used gradually, measured as pression in according to the vocal effort. The phonation process begins together with expiration.

At this point can be observed and notated in the final report many deficiencies. Thus, in what *the verbal breathing* is concerned can be observed the situations when the *breathing is too quick (*the hard breathe) or *too slow*, *the breathing effort being exaggerated* (betrayed by grimace, rigidity, untidy movements, exaggerated toraco-abdominal movements and accessory gestures).

While *inspiriting* can be observed the *deep inspirations* (accompanied by the swelling of the chest and the rising of both the chest and the shoulders, the muscles of the neck being contracted and the veins on the neck swelling), can be also observed the tendency *to speak while inspiriting* (the consonants are pronounced while inspiriting), *the use of the inspiriting process after articulating every word of the sentence.*

While expiration can be observed the sudden expiration, the expiration air is little used, *it is used in the beginning of the phonation, the phonation begins after the emission of a stream of air, the sentence is pronounced during a single expiration (as a poli syllabic word).*

All these analytical observation breathing can be very useful as its deficiencies, especially the verbal breathing defficiencies influence in a great degree the voice force and the timber being organically connected with almost all the voice impairments.

When making the final observations on the report-sheet, the verbal breathing of the investigated subjects may be characterized as being, for example *" verbal breathing with exaggerate effort, deep inspiration with the rising of the shoulders and with the muscles of the neck contracted, sudden expiration with quick consumption of the breathing air.*

1.3 The phonemes pronunciation.

This aspect is investigated like in the other mentioned cases or as frequent as the therapist finds it necessary or relevant to the degree of building up higher and higher abilities for correct pronunciation of the phonemes that are component parts of certain words and the sentences. It is suggested as the phonemes` articulation to be investigate while being component parts of different words because in speech this is the natural position in which they can be found.

In the preparatory and in the first grade, but also in other cases in which is difficult to investigate the way the phonemes are articulated inside the words, an optimal solution is the examination of the articulation by using isolated phonemes or in

syllables. Thus by using this method is examined the degree of building up functional abilities for correct articulation of the isolated phonemes. There are used cardboards on which is printed the capital letter and while investigating children with hearing impairments is also printed on the cardboard the corresponding sign. The subject is asked to pronounce once and correct a certain phoneme. The phonemes` pronunciation can be investigated either through direct audition or through listening to recordings.

The last one enables the investigation with efficiency, constancy offering the possibility to listen the recordings whenever one likes and to make thorough comparison or analyse unless we take into consideration the situation when during recording the sounds can le distorted.

The difference between the direct listening without having the possibility to use the visual sensorial channel and to listen audio recordings can be expressed in points 7 -8 % (Ciumăgeanu, 1964), when we calculate the percentage of articulation (p.a), or 11-12% (Anca, 2003) if we take into consideration the intelligibility percentage of the pronunciation (p.i.p).

The audio recording of the pronunciation has to be made fallowing several criteria so that the recordings could be used for examination:

a). The recording should be made in the same room, an acoustic isolated room if possible or a room as quiet as possible, and it has to be the same for all the subjects.

b). The distance from the microphone should be adapted (higher and higher 30 centimetres) in order to avoid the effect of prolonging the voice duration because of the fact that the walls reflect the sounds.

c). The microphone should be placed laterally from the subject in order to prevent the distortion of the sibilants sounds and as far as possible from the loudspeaker in order to avoid the phenomenon of acoustic reaction.

d). Every phoneme, syllable or word should be recorded once.

e). Between the recordings should be took breaks of 5-10 seconds in order to allow, when listening the observations to be written down without being necessary to stop the player frequently.

In the end can be calculated *the percentage of articulation for the isolated phonemes* by using the fallowing formula:

$$p.a. = \frac{v + c}{V + C} \cdot 100$$

where v+ c are the vowels and the consonants pronounced correctly and V+C are the examined vowels and consonants. The articulation percentage represents the ratio of the correctly articulated phonemes from a whole.

To examine the pronunciation of the preschool children can be used images with different objects, beings and actions. Their name has to be well known by the children so that it can be avoided the situation when the pronunciation is influenced, in a negative way, by the fact that they didn`t know or know a little the notion they name.

Every phoneme of the language should be examined in at least three positions inside the word: in the beginning, in the middle and in the end. The words that are in the examination list should have a varied number and structure of their syllables (direct reverse, double syllables, with diphthongs, with consonants groups etc.), and the difficulty in pronunciation should be according to the child` s education and to the level of the therapy he fallows.

In the report-sheet is put down the correct pronunciation, the incorrect one or the omission of certain phonemes. When *the reading task* is used the pronunciation evaluation requires a repeated reading of the word or of the sentences. The first reading is not evaluated because it is necessary in order to help the subject know the content of the task. Before he starts to read for the second time, the subject is asked to read carefully and higher and higher the given text.

The verbal-test material used in order to evaluate the pronunciation of the phonemes (voice and verbal breathing) includes series of words and sentences. Before the investigation starts, the therapist should check if children know the meaning of the verbal-material used during examination. In order to ensure the efficiency and the standardization of the test the therapist should use the same verbal-material for all the subjects.

When the series of words are elaborated it should be taken into consideration the language developmental level according to age and to the established diagnosis.

The evaluation of the pronunciation of the phonemes is made either by direct listening or by listening of recordings. When choosing as evaluating method, the direct listening, the observations are written down and the subject is asked to read again the text in order to be checked if the obtained information is correct.

There are three types of pronunciation errors:

a). articulation errors.

b). mistakes in sonorous ness.

c). adding sounds or noises.

a). In the *articulation errors* category are included:

a.1 *Replacing errors*:

- replacing of a vowel with another one (for instance, i-e, the subject pronounces " pesecă" instead " pisică" – cat).
- replacing of a vowel with a consonant (for instance, the replacing of the vowels " e", " i", "u" with the consonant "l").
- replacing of a vowel with an unarticulated sound.

a.2 *Neutralizing the vowels* (the vowel " a" is pronounced as the vowel " ă", a- ă).

a.3 *The vowels are pronounced as the diphthongs are* (for instance, i- ie).

a.4 *The replacing errors* of a consonant with another one (for instance, p- t or p-k), of a consonant with a vowel (v-u) and of a consonant with an unarticulated sound.

In the report- sheet is put down the incorrectly articulated phoneme and between the brackets what can be heard. For example a (a-ă), this is the case when an intermediate phoneme is incorrectly articulated, another example p(t), this means that "p" is replaced in pronunciation with "t".

b). *The mistakes in sonorous ness* are the fallowing:

b.1 *Mistakes in pronouncing voiceless* the voiced consonants and replacing them with the homonym voiceless consonants (for example, d-t, the child pronounces " tulap" instead "dulap"- wardrobe).

b.2 *Mistakes in pronouncing with voice* the voiceless consonants so that the voiceless consonants are replaced with their homonym voiced consonants (for example, k-g, the child pronounces "vaga" instead " vaca"- the cow).

c). In the third category of mistakes are included:

c.1 *The addition of the parasite sounds or noises* (for example, the child pronounces "opîtî" instead "opt"- eight).

c.2 *The vowels are nasalized* for example," ^{n}a" instead "a" or "a$^{n"}$ instead "a". In the final report sheet is notated the phoneme that is incorrectly pronounced and in the brackets what it can be heard.

The correct pronounced phoneme and those omitted are written down on the corresponding line. It is considered as being correctly pronounced a phoneme when the pronunciation is clear, clean and distinct.

By knowing the number of the correctly pronounced words or sentences we can calculate *the percentage of the pronunciation intelligibility (p.i.p)* by using the fallowing formula:

$$\text{p.i.p.} = \frac{c}{C} \bullet 100$$

where "c" represents the number of the correctly pronounced words and "C" the number of the pronounced words (words repeated after the therapist, read words or named images).

The percentage of the pronunciation intelligibility represents the ratio of the words or the sentences that were easily understood from a whole.

It is known that the speech intelligibility is influenced by the way the one who speaks (intelligible is what can be heard or easily understood). This is why by evaluating the level of pronunciation intelligibility is offered a synthetically perspective on the level of speech intelligibility.

According to the percentage of the articulation of the phonemes or to the percentage of the words pronunciation intelligibility can be appreciated the level of the speech intelligibility in the case of the children with hearing impairments by using the information from the below figure:

Table

The determination of the speech intelligibility

The percentage of the articulation of the phoneme (p.a.)	The percentage of the understood words (p.i.p.)	The level of speech intelligibility
over 98 %	over 96 %	Perfect
88-98 %	85-95 %	Good
68-78 %	65-75 %	Satisfying
below 68 %	Below 65 %	Unintelligibile.

When increasing the results of the examination it has to be taken into consideration the fact that *the intelligibility level*, when as verbal-material are used lists of words, is higher with approximately 5-7% in comparison with the obtained result, in the case when series of sentences are used as verbal-material, they imply difficulties concerning the pronunciation of the syntagms, stress, rhythm and intonation.

If the level of the pronunciation intelligibility is established by the teacher as it usually happens, then this level can be considered as being higher with approximately10-15% than the one obtained in the case when it is established by non-familiar persons with the deaf children` s speech..

If we take into consideration these aspects it can be obtained a more significant evaluation of the speech intelligibility level of those examined.

2. The speech graphicalness.

The evaluation is made in the beginning and in the end of the school year. As verbal- test material are used series of sentences according to the developmental level of the students` from a certain grade. The methods used in evaluation are either the direct listening or the listening of recordings.

In the final report-sheet are put down the investigator` s observations about the speech (reading) intonation, stress, rhythm and about the way the orthoepic rules are respected.

About the *intonation* are put down *the exaggerated tonality variations* in pronunciation the words and the sentences, the monotonous intonation (the pronunciation of all the words in a sentence on the same tone, with the same tonality). At this point can be observed *if the subject can use different intonational patterns: narrative, interrogative or imperative.*

In order to characterize *the rhythm* are notated the most important deviations from the normal pattern: *the rapid rhythm* (hurried, panting) or *the slow rhythm*, then it is noticed if *the syllables and the phonemes are pronounced connected in a word or the child has a stoccato type pronunciation* (the child pronounces the syllables in a word with breaks between them, for instance " ma-ma" instead "mama"- mother).

At this point is to be noticed if the child has *the ability to break up the sentence or the phrase in syntagms (by taking breaks while speaking), as well as the fact that the breaks are correctly taken while speaking.*

These observations, from this chapter about the speech graphicalness end with those about the fact *if the child respects the orthoepic rules while reading words or sentences.*

In the second part of the report-sheet is notated the date, the content of the individualized activity that was organized and the way the student behave during that activity. The work concerning the voice, the verbal breathing, the phonemes` pronunciation, the speech graphicalness and the hearing reeducation is to be notated on separated report-sheets. The recordings are made fallowing the chronological order.

For instance, about the content of the individualized activities concerning the phonemes articulation are put down on the report-sheet the exercises for articulatory gymnastics, those done for giving the student an articulation model, the exercises made for the imitation of the model he was offered in articulating the phoneme, the exercises made for training the co-articulation in syllables and words and the exercises made in order to use the phoneme in daily speech (in daily conversation, reading).

To the current observations the teacher will add, beyond the content of the organized individualized activities, *the way the student behaved during those activities*, his endurance level to the tasks or his tiredness during the activity, his active or passive attitude towards the activity, his interest or lack of interest for having an intelligible speech and for having his pronunciation deficiencies corrected, his refusal to co-operate with the teacher, his will, his lack of will, his perseverance etc.

In the end of an individualized activity, in the end of the school year or just of a term, will be notated on the report-sheet if the progress was reached rapidly, slowly, with difficulty or without any difficulty, the investigated areas being: the voice, the verbal breathing, the phonemes` pronunciation and the speech graphicalness. It will be also notated if one of these areas was entirely recovered or only improved.

The currently recording of the organized individualized activities allows a systematic pursuit of the evolution of the process in which the therapist tries to enables the subject with a correct voice, a correct verbal breathing, a correct phonemes` articulation offering him a higher level of speech graphicalness.

The individualized activities should continue to be organized having in mind the need to record all the new information and the progress, but also the need to know all the observations that were made previously.

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IMPROVING INTERACTIONS USING THE TOTAL COMMUNICATION APPROACH

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ABSTRACT. Deafblind children can use a wide range of modes and systems of communication to express needs, feelings, interests, to initiate and maintain conversations and to relate with the environment. The deafblind child should be allowed to use the system of communication that is the most efficient to him, taking into consideration his functional hearing and vision, intellectual development, use of concepts, previous experiences. The most adequate approach is total communication. Communication skills, acquiring language are not results of a natural process, as there are for an able child. A deafblind child has to learn how to develop these abilities, because of the reduced possibility of imitation and perception of information from the environment. The School of Palo Alto affirms that communication is inevitable. This is why after identifying the mode and system of communication used by the deafblind child, and the level of development of communication that he has reached, one of the aims in intervention is to enlarge the environment that the deafblind children communicates with. He has to engage in meaningful conversations with members of the family, staff, people from shops, neighbourhood,etc. Efficient communication determins the increase of quality of life and assures social inclusion.

Key words: deafblindness, dialogue, communication, diversity, systems of communication

The School of Palo Alto affirms that “Everything is communication”. Communication expresses the relationship of an individual with the world. Communication enables an individual to understand the surrounding environment. Another axiom of the theoretical approach of Palo Alto is that communication is inevitable. If we think of words, gestures, body language, use of symbols, rhythm of breathing, facial expressions, even silence, we realize the importance of this statement to be applied in the intervention with the deafblind child. The foundation of any communication consists in the interactions and personal relationships based on trust between the deafblind child and adult, parent or intervener. It is about “me” and ”you” and the necessity and willingness to create this “dialogue”.

Many people think that communication is only verbal language or sign language for deafblind children, and set the achievement of one of these as long-term objectives in the intervention. But it is very important to take into consideration the levels of communication and the systems of communication that might be used within.

Jacques Souriau says “it does not seem necessary to wait for a child to be totally competent in one level before moving on to a higher level”. This is in correlation with Vigotsky’s theory of “proximal zone development”, that is to construct on what already exists, but anticipate and implement the following stages. For an able child the development of communication and acquisition of language is linear and surpasses different stages. For the deafblind child we suggest the expression “linear in diversity”. This means that communication development is linear and consists of many stages, but a deafblind child can be in his receptive communication at a higher level than the level used for expressive communication, and also that the child can use different systems of communication with different people, who are partners of the conversation.

Communication is the exchange of information by any means possible, in order to determine a change in information, knowledge, behavior and attitude. The deafblind child has to be aware that he can make that change.

When we implemented total communication in intervention, difficulties were overcome, deafblind children became participants and active members of their families, school and community. Total communication “is not a method, but rather a philosophy of approaching any given communication situation. It is recognition that not all modes of communication are effective for individuals in all situations. It incorporates the appropriate aural, manual and oral modes of communication in order to ensure effective communication” (Gregory, Hartley apud Garretson, 1976). This could include the following: body language, facial expression, gesture, speech, objects of reference, deafblind manual alphabet, symbols, Braille, written word.

Progress in communication will enable children to express themselves more flexibly, to have a greater access to events and information, to have a sense of anticipation to what it is going to happen, to be more successful in overcoming isolation and include in the life of the community (Heather Murdoch, 1995).

In the following, a longitudinal case study will prove the importance of total communication.

Roxana was born on the 29th of July in 1987, in Perisani, Valcea County. She has one sister, who is blind, and two brothers. Both her parents are working and the family is organised.

Roxana is congenitally deafblind due to a maternal rubella. Her vision and hearing are affected. She was born with anophtalmia at her right eye. She had a surgery in Germany, and she has now a glass eye. She has coloboma, nistagmus, microphtalmia and astigmatism at her left eye. Even with all these conditions, her functional vision is very good and she can make best of her residual vision to work on tasks and every day activities. She uses glasses.

Her hearing is affected too. She has a severe to profound sensory-neural hearing loss, she can only hear the telephone, the barking of a dog, an airplane and very loud noises. She does not hear speech. She uses hearing aids.

She attended the School for the Deaf in Sibiu, between 1994-1998. She was considered "savage" because she was fighting with the children, she was screaming and throwing things. She was developing behavior disorders. Her cognitive potential was not used at its full potential because she was considered a child who can not acquire skills. She was using German sign language to communicate, but only a few signs.

After four years of continuous struggling, she stayed at home for one year (1998-1999) in her mother's care. Her mother taught her fingerspelling. It was the great wish of her mother that she would be included in school to have access to education. That time they came to Cluj. She spent three weeks at the School for the Deaf in Cluj, but she could not adapt to the class and children. She was considered a problem child, with challenging behavior, hopeless to school and community insertion. At that time she was more and more frustrated, expressing herself aggressively. It was decided that she had to leave school.

In October 1999 she was included in the project for deafblind children, which was developed at Cluj at the School for the Visually Impaired by Sense International UK in cooperation with the Ministry of Education from Romania. And this was a great change for her. Even though the first two years at the unit were difficult for her, her classmates, children from the school, and even for her teachers, because she was still expressing her needs and frustrations in a violent and aggressive way, she soon started to be more confident and relaxed.

Because she was still presenting challenging behavior, that was not socially accepted, we assessed and analyzed, using an ABC model to monitor the behaviors, to find out the triggers of these outbursts like gestures, vocalizing, screaming, scratching, biting, throwing rocks or chairs, kicking. It turned out that she was aggressive when she was not understood or could not understand the others, so it also was a communication impairment. Aitken and Millar (2002) evidentiate that some of the main ways that a child's communication may be impaired are due to:

- difficulties in understanding what people are trying to communicate
- difficulties in expressing views, preference
- visual impairment
- hearing impairment
- language spoken at home.

Each of these factors can operate on its own or in combination.

The first steps in intervention were to develop communication, to create trustful relationships with people in her environment and reduce isolation. We began to develop trustful relationships in the unit with the other deafblind children, teachers and members of the staff in the school. Her attitude changed radically when she felt secure.

Encouraging communication was a priority. This was accomplished by:

- child-centered intervention

- initial and continuous assessment
- establish predictable routines of the day
- provide opportunities to make choices
- use total communication, develop expressive and receptive communication, use the system of communication that she was comfortable with
- use picture cards to express needs and interests
- increase self-esteem
- give reassurance and feed-back
- expose to different systems and partners of communication
- trust the child, make her feel important, a decision maker, control of her life actions
- concept of self, ”who am I?”
- assure success in communication, let her know that she can make a difference
- increase motivation
- use of computer
- encourage interactions with deaf, blind and able children
- involvement of parents

Because at home she just communicated with her mother, it was necessary to develop interactions in the family. Her sister, Flori, began to learn sign language. A personal passport was also elaborated to help family and members of the staff to interact with her.

She knew the letters of the alphabet and she was writing, but the words did not have any meaning. It was a mixture of letters with the form of a word. She was aware the words have value and they transmit messages, because when she was asked what she was writing about, she was signing a whole story. The semantic structure of the language had to be developed. Because she did not want to give up writing, picture cards started being used. The task was to make associations to develop representations and concepts. The associations were diverse in order to ensure transfer and functionality:

- sign-image/ picture/ drawing- fingerspelling- written word
- sign- fingerspelling- written word
- drawing/image /picture – sign – fingerspelling – word
- sign – written word
- image/ picture/ drawing – written word.

After identifying the proper approach in intervention, the increase of active vocabulary was the next objective. Encouragement of interactions with blind and deaf children took place. Roxi was spending the evening in a large dormitory with about ten visually impaired girls of her age. The blind/ low vision girls were taught sign language, even this seemed to be a paradox. They became to interact and share experiences. She was included in the group and the previous complains about her aggressive behavior in the dormitory ceased. At the beginning, Roxi only used German

sign language and just a few Romanian signs. She taught us the signs, but she did not want to learn any other Romanian signs. Why should she? She could communicate with her mother and with us. But we thought of communication with children from the deaf community. As a result, we invited hearing impaired girls from the Vocational School in Cluj. She was motivated to learn with her friends Romanian signs. The learning process started with associating German and Romanian signs and she understood the correspondence between them. Her friends included her in their activities and she became a better communicator, having also a lot of fun.

Routins were established. The routines are considered foundations for the development of communication because it helps the person to:

- anticipate
- understand why things are changing
- feel emotionally secure/ could predict
- develop relationships with key people
- structure their day (McInnes, 2000)

We organized a lot of extracurricular activities, so that communication was developed in natural and daily situations and environment.

Interactions were the best way to ensure functionality of communication. Herbert Blumer talks about "symbolic interactionism" that it is about interpreting symbols in interactive activities. Individuals act towards objects and people based on the significance they have for these. Significance derives from the social interaction of the individual with others. The significance is used and changed in an interpretation process done by an individual in his relationship with the environment (Blumer, 2000).

We followed John McInnes's approach "intervention is not doing for, but doing with". Roxana was a partner in intervention and it was the best approach.

The selection of the communication systems for a deafblind child is taken by a team. The team might include the following: the student himself (directly, if he is able to contribute), the child's family, deafblind specialist, speech and language specialist, classroom teacher, ophthalmologist, audiologist, occupational therapist, people involved in the initial assessment. It is also very important to monitor the choice over the years of the child's education (Miles, Riggio, 1999).

Her self-esteem increased and communication improved. She became more involved in class activities and initiated and maintained interactions with the others. She made friends. She became an active participant of everyday activities. She made choices concerning her life, she decided and had control over what was happening.

At the moment she uses as communication systems: fingerspelling, sign language, adapted sign language (with her sister who is blind and a deafblind teacher from the school), communication through symbols, objects of reference, writing. Because of her visual impairment and her lack of understanding speech, she cannot use lipreading, but she can easily understand attitudes and feelings by "reading" body language, especially facial expressions. Total communication approach and the freedom to express herself using the system of communication

that she is most comfortable with, taking into consideration different partners in conversation, various environment, mood, made a difference in her life. She was not constrained to express herself using a certain modality. It was her choice.

Further intervention consists in developing cognitive skills, but not only, the entire personality, and to focus on the abilities and the things she enjoys, in order to start a vocational training.

She taught everyone a valuable lesson and she is a living proof that in a proper environment, with support and competent staff, with an adequate intervention and use of shared system of communication, there is no "noneducable" child. It is up to parents, teachers and community that these children become active members of our society and their quality of life is improved.

"Society needs to widen its understanding and acceptance of all forms of communication which will require a comprehensive and continuing learning process for all, starting with those who are nearest to people with high support needs and moving out with them into wider society" (Wertheimer, A., FLPD, 2000, p.16)

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ASSESSING THE EFFICIENCY OF A PROGRAMME FOR PREVENTING SCHOOL VIOLENT BEHAVIOUR

ADRIAN ROSAN

ABSTRACT. This study can be used as a flexible guide to determine possibilities for intervention in prevention school violence in specific contexts. Before any intervention it is necessary to define the school and community ‘s strengths, weaknesses and target problems related to violence prevention. This implies an assessment of existing resources to invest in prevention programming (human and financial) and of the willingness of education staff to invest time, human and financial resources in the design of violence prevention programmes. Any prevention program should be evaluated upon the following criteria: a) using of an experimental design, evaluation of the design and adequate analytical procedures; b) empirical validation of the effects; c) implementation procedures; d) multiplication of the results by program’s application in different places; e) persistence of the effects. Need assessment, also implies an analyze of the profile of violence in the local environment. Accurate information on the level and type of violence seen at the local level will help ensure that efforts focus on the real needs, rather than on perceived ones. In addition, collection of data on the profile of violence before beginning the intervention will provide planners a baseline that can be later compared with post-test intervention violence data, to evaluate the changes brought by the programme and his efficiency.

Key words: prevention programme, school violent behaviour, assessment, risk, social climate and educational practice indicators

A holistic approach of the violence reveals three important aspects in prevention: a) understanding the factors that determine the risk of antisocial behavior appearance; b) developing programs to eliminate the risk factors; c) increasing of protective factors to enable the resilience of antisocial behavior.

Violent behavior was defined as a behavior that includes physical attacking and suicide attempts, drugs using, crime and suicide. (Dwyer, Osher & Hoffman, 2000) and the intention to cause physical violence and intimidation. (Elliot, Hamburg & Williams, 1998).

Usually, school violence is not fatal but it can cause disruptiveness in a child or adolescent’s development. It can be described as physical aggression, intentional exclusion, intimidation, fights and sexual harassment/ abuse and arm usage. This kind of violence may be oriented against the students, the teachers, community member’s and/ or members of an institution.

School violence affects positive mental health, causing anxiety, fear, insecure.
Positive mental health includes:

- Positive sense of well-being;
- Personal resources: self-esteem, social abilities, optimism, self-confidence and coherence;
- Ability to initiate, develop and sustain mutually personal relationships
- Ability to cope against disaster;
- Ability to rationalize, understanding and debate certain reason that legitimate violence[1] with colleagues, adults and social institutions.

To be applied and efficient, any prevention violence program needs cooperation between politicians, central and local administration, between the authors of these programs and practitioners, cooperation which starts from an empirical data base regarding the relation between the possibilities of developing the violent behavior, the risk factors and the resilience factors of this behavior. In the United States many schools elaborate different kinds of programs and strategies to prevent violence. Unfortunately, many of these programs are running in the absence of rigorous evidence of their effectiveness (Center for the Study and Prevention of Violence, 2000; Mendel, 2000) although in order to elaborate such a project they have to develop a plan in which they have to demonstrate empirically the validity of results to obtain extramural support (to get finance from federal funding) (Flannery, 1998). It is necessary the need to evaluate rigorously the programs because many of them are inefficient (Elliot et al., 1998; Flannery, 1997, 1998; Satchel, 2001). The research regarding the prevention of violence implied the school, family and the community showing that the most efficient prevention programs are those oriented on risk and protective factors identified adequately in different contexts in which they appear, these programs containing components that proved their efficiency. (Elliot et al., 1998). The approach is based on the evidence that appearance of a violent behavior depends on the relation between risk factors and protective factors as shown in different environmental situations (individual, family, school, community or peer-group) and these factors are differing according to child's or adolescent's age (Satcher, 2001). Efficient programs combine components which include both individual and contextual risks, meanwhile shaping individual skills and competences. The efficient programs point out the social climate's optimization, encouraging the pro social groups' involvement.

Skiba and Peterson (2000) analyzed the school violence's prevention program to identify the components of the success' programs. They observed that efficient programs include a comprehensive combination of the following components: conflict solving and shaping social skills, management strategies of

[1] Public Health Action Framework on Mental Health, National Center of Research and Developing of Well-being and Health, STAKES, Health and Social Problems Ministry, Finland

the classroom, parental involvement and regional san scholar data system regarding the screening and the early identification of the children at risk, security and intervention crises plans, global educational plans regarding the behavior and discipline, functional evaluation, IEPs regarding the behavior.

Any prevention program should be evaluated upon the following criteria: a) using of an experimental design, evaluation of the design and adequate analytical procedures; b) empirical validation of the effects; c) implementation procedures; d) multiplication of the results by program's application in different places; e) persistence of the effects.

For instance in the United States 11 programs identified by CVSP (Center for the Study and Prevention of Violence) are efficient and they contain the characteristics from above: Functional Family Therapy (FFT), Multidimensional Treatment Foster Care (MTFC), Multisystemic Therapy (MST), Prenatal Home Visitation by Nurses (PHVN), Life Skills Training (LST), the Midwestern Prevention Project (MPP), The Bullying Prevention Program (BPP), Promoting Alternative Thinking Strategies (PATHS) Program, Big Brothers Big Sisters of America (BBBSA), The Quantum Opportunities Program (QOP) and Incredible Years Series (IYS)

Indicators to evaluate the intervention's results

It is necessary that violence prevention school programs should be evaluated to establish their efficiency to reduce the violent behavior. It is essential to elaborate a design to evaluate a violence prevention program, to measure the changes and to establish whether the change is due to the intervention or to other environmental factors. Based on the results of evaluation the practitioners can determine if the program has reached its objectives, if it can be continued, modified and/ or applied in other contexts. Evaluation of the results is an essential indicator to continue or to expand the program or to involvement of other factors while applied. It also serves that limited resources are invested in activities that actually lead to desired changes.

It is necessary to use valid methods to track the changes. These changes could be reflected in attitudes, beliefs and behaviors.

An outcome evaluation involves several steps[2]:

1. Definition of problem:

- Target population
- Risk factors to address

[2] Dahlberg, L., Toal, S.B., Behrens, C.B. "Measuring Violence-Related Attitudes, Beliefs and Behaviours among Youths: A Compendium of Assessment Tools". National Centre for Injury Prevention and Control, United States Centre for Disease Control, Atlanta, Georgia, 1998, Nutbeam Don (1998) Evaluating health promotion progress, problems and solutions in Health Promotion International Vol. 13 No. 1 Oxford University Press.

2. Define indicators to evaluate:

- Matched to programme objectives
- Based on the literature and country experiences

3. Selection of evaluation design

4. Selection of appropriate measurement instruments

- Appropriate to culture and educational level of target
- Reliable and valid

5. Collection of data

- Baseline (before programme)
- Process (during implementation- about activities implemented)
- Summative (after programme)

6. Analyze of data

7. Dissemination of findings

Risk indicators [3]

- Types and magnitude of risk behaviours practiced by students (drinking, fighting, carrying weapons, threats, bullying, etc). This can include:
  - Level of violence between students
  - Level of violence toward students
  - Level of violence toward adults, threats and attacks
  - Ethnic conflict: fights between students of different ethnic groups
  - Gang violence: gang members making trouble, conflict between students who are gang members
- Rate of possession of illegal substances
- Rate of violent injury, suicide and suicide attempts
- Arrest for antisocial acts on school grounds
- Level of vandalism in school property

[3] Based on indicators listed in: Birdhistle, I. et al. "Violence Prevention: An important Element of Health-Promoting School", World Health Organization, Geneva, 1999; Janosz, M. et al. "L environnement socioeducatif à l'école secondaire: un modele theorique pour guider l evaluation du milieu." Revue Cannadienne de Psych-education, Vol 27, num ro 2, 1998, 285-306; and Dwyer, K. and Osher, D. (2000), Safeguarding Our Children: An Action Guide. Washington, D.C.: U. S. Department of Education and Justice, American Institutes of Research, Theory and Practice; St Leger Lawrence (2000) Developing Indicators to enhance school health, Health Education Research, Theory and Practice, Oxford University press 2000, Vol. 15, no. 6. 719-728.

- Absenteeism
- Number and type of disciplinary measures enacted
- Number of out-of-school suspensions in a month
- Drop-out rates
- Number and type of weapons confiscated
- Perceptions of risk of victimization

Social climate indicators:

- Adoption of peaceful and constructive methods of resolving conflicts
- Type of disciplinary and violence-related policies: participation in their formulation, acceptance by staff and students, rejection of corporal punishment and harassment by staff and students
- School investment in staff training for violence prevention and social climate promotion and response
- School practices that encourage and give opportunities for staff and families to establish close, caring and supportive relationships with children and youth
- Policies, practices and procedures that foster collaboration between the school and the students ' families
- Number and type of people involved in community violence prevention activities
- Students and teachers presence at school
- Students and teachers attitude toward school
- Active participation to the school life (both pupils and staff)
- Communication and openness at school and with the community
- Effective communication skills
- School recreational facilities; quality, level of safety, isolated areas, appropriate lighting, public spaces for movement and interaction, level of cleanliness, adequacy of classrooms
- Perceptions of safety in school, and trust in other persons
- Pride in belonging to the institution
- Acceptance of school adhesion to them

Educational practice indicators:

- Learning ability, attendance and learning achievement, e.g. literacy and numeracy skills, basic learning competencies
- Co-operation in different levels (teaching methods, team working, etc)
- Emphasis on education success of students
- Systems of positive material and social recognition and selective, reduced punishment
- Quality and time spent in teaching

- Parental participation in education
- Appropriate educational structure: clarity of norms, consistency in application, student participation and adherence to norm
- Opportunities to develop personal, social and technical skills in the school environment
- Supportive administrative leadership for personnel.

The costs- benefits analyze has to be an essential component of the social services evaluating programs (Loeber and Farrington, 2000; Luthar and Ciccetti, 2000) and it would be ideal to this kind of practice to be generalized. For instance, the costs- benefits analyze could be used to evaluate if proactive and prevention 'screening programs are saving financial resources comparing with reactive strategies.

Both the governmental and non-governmental institutions supporting the research and the application of juvenile violence prevention programs should adopt standardized criteria for proposals, with the express need that these projects should include these criteria on their evaluation plans.

State politics should make people conscious on these programs, to offer technical assistance and information, to encourage the community to invest in efficient violence prevention programs.

Proactive and violence prevention screening programs could be sustained through public announcement services, media, public reports, and TV documentaries.

Practitioners must keep themselves informed with the current research in regards with the youth antisocial and violent behavior. They can consult other specialists and form trans- and multidisciplinary partnerships. These partnerships should also include the family. The collaboration between family, school and community is the only efficient way to approach the youth's complex problems (Walker et al., 1991). "The key to orient the pupils with risk behavior disorders from a deviant way is to involve in intervention all the social factors from their life" (Walker and Sprague, 1999, p. 336).

The partnerships between all society fields are necessary to increase the interaction between academic research centers and the practitioners involved in violence prevention.

In developing positive links with the community a multi-disciplinary approach is important to be encouraged. Community institutions can work with the school to replicate non-violent messages beyond the school environment. They will also provide services to manage and protect children at risk or suffering harm from violence

Efficient violence prevention problems must be applied for a long period of time (to prove their persistence) and must include more components and focus both on juvenile and at risk population when adopting a violent or antisocial behavior.

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